

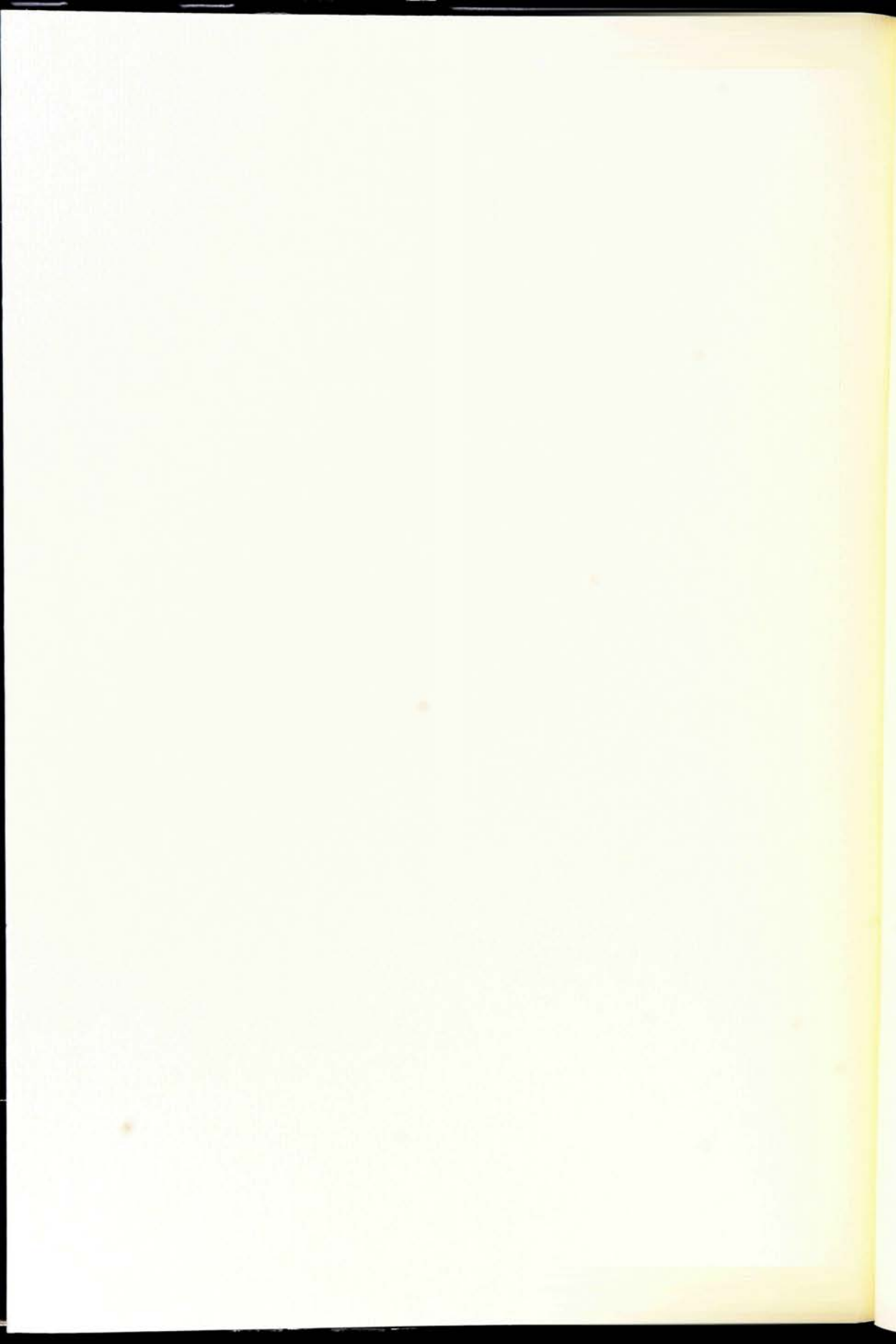
UNIVERSITÀ DEGLI STUDI DI BOLOGNA
FACOLTÀ DI MEDICINA VETERINARIA

SINTESI DELLE PUBBLICAZIONI

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UNIVERSITÀ DEGLI STUDI DI BOLOGNA
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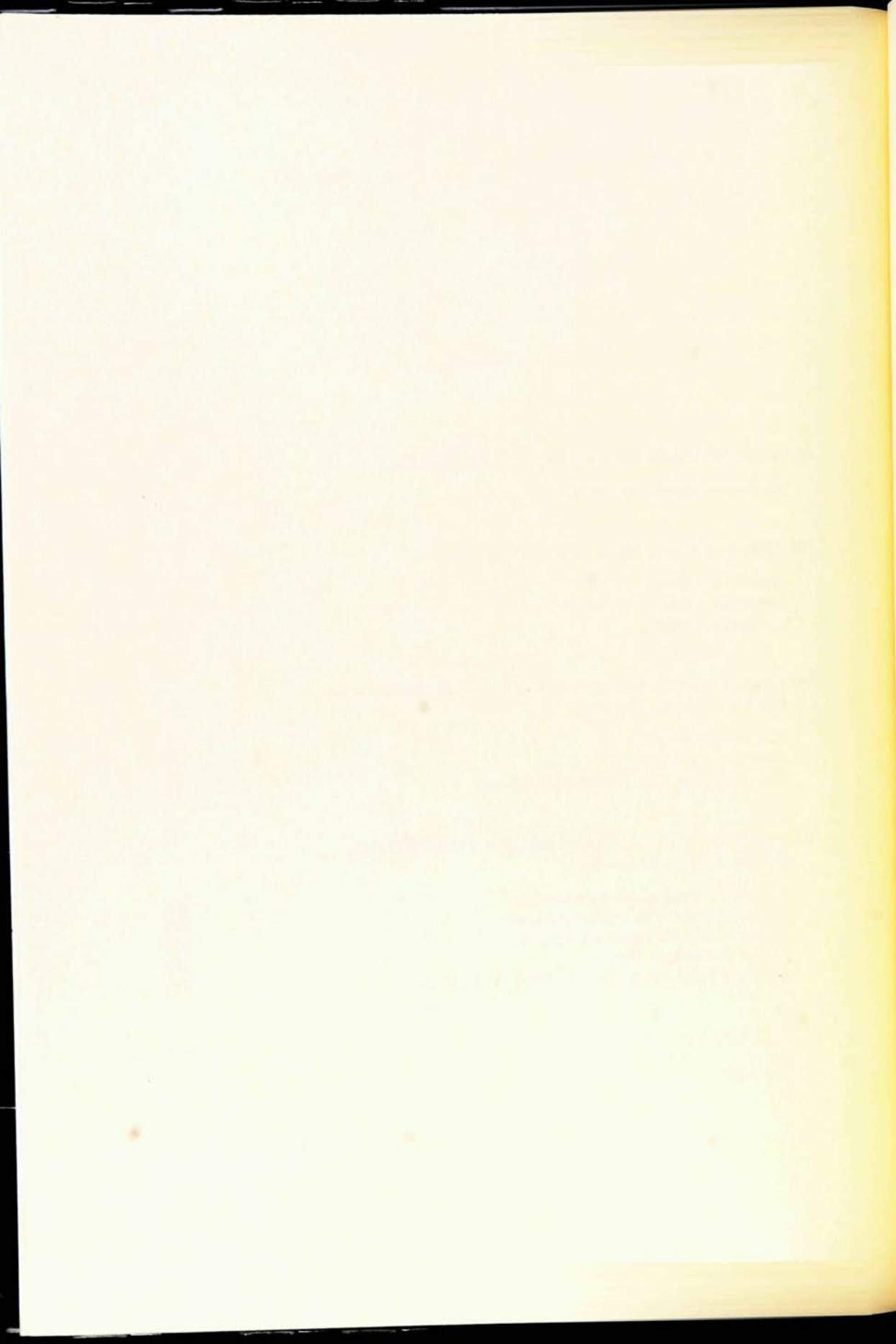
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DIPARTIMENTO DI BIOCHIMICA «G. MORUZZI»

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1988

Cattani O., de Zwaan A., Vitali G., Marchiani M., Isani G., Cortesi P.: Effetti dell'idrogeno solforato nella anaerobiosi di molluschi bivalvi dell'Adriatico. *Effects of hydrogen sulfide in the anaerobiosis of adriatic Bivalvia*. Oebalia, suppl., 16, 627, 1988.

Scapharca inaequivalvis in anoxic sea water or in nitrogen atmosphere survived longer than *Venus gallina*, but the presence of hydrogen sulfide reduced substantially LT_{50} only in *Scapharca*. During 24 hours anaerobiosis the values of energy charge decreased in both species and were not very affected by hydrogen sulfide. A consumption of aspartate and an accumulation of alanine, strombine and succinate were also observed. This latter end product resulted 4-6 times higher in *Venus*, while, in presence of hydrogen sulfide, succinate accumulation increased only in *Scapharca*.

Gesundo N., Casali E., Sartor G., Colombi L., Masotti L., Piretti M.V., Galeotti T.: Perossidazione lipidica in cellule tumorali. *Lipid peroxidation in tumoral cells*. Riv. Ital. Sostanze Grasse, 65, 541, 1988.

This work is a contribution to the understanding of the role of lipid peroxidation products of biological membranes in the control of tumor growth. To this aim we have examined plasma and microsomal membranes isolated from Morris hepatomas, with different growth rate. The peroxidizability of these membranes has been studied by using different exogenous peroxidative agents. Our attention has been focused on microsomal membranes, since they play an important metabolic role in the cell.

Masotti L., Casali E., Gesundo N., Sartor G., Galeotti T., Borrello S., Piretti M.V., Pagliuca G.: *Lipid peroxidation in cancer cells: chemical and physical studies*. New York Academy of Science, 551, 47, 1988.

Lipid peroxidation in tumors has been the subject of thorough investigation by several research groups. There are experimental evidence in support of a possible role of the abnormal oxy-radical metabolism in the control of tumor growth: lipid peroxidation products, which are supposed to be greatly diminished in tumors, would become unable to exert the normal control on cell division. In order to provide a firmer ground for such a role, we then studied the extent of endogenous peroxidation and the chemical nature of its products in hepatoma membranes.

Massa D., Di Paola M., Monaco V., Trenti F., Famigli Bergamini P., Boari A., Gentile G.: Indagini sugli effetti degli inquinamenti ambientali nel bovino. *Survey on the effects of environmental pollution on cattle*. Atti Soc. Ital. Buiatria, 20, 529, 1988.

A survey on cattle exposed to environmental pollution (atmospheric pollutants, heavy

metals, total polycyclic aromatic hydrocarbons and agro-chemicals) in the Emilia Romagna district is presented. The methodology of basic veterinary data collection (mortality, disease incidence, animal turnover, fertility, teratological incidence) is discussed. The survey deals with 23 herds in the low lands and 6 herds in the hill area including 3844 bovine.

Massa D., Salvatori L., Giordani G.: Trasferimento di radionuclidi nelle carni avicole e nelle uova dopo l'evento di Chernobyl. *Radioactivity on poultry meat and eggs after the Chernobyl fall-out*. Atti Soc. Ital. Sci. Vet., 42, 467, 1988.

Radioactivity dosing was performed on poultry meat and eggs produced in an experimental farm near Bologna, just after the Chernobyl fall-out and one year later. After one year both products showed no contamination levels dangerous for food consumption while during the first ten days following the fall-out very high levels of I-131 were detected in the eggs laid by hens reared on free-range.

Pagliarani A., Ventrella V., Ballestrazzi R., Trombetti F., Pirini M., Trigari G.: *Salinity dependence of the properties of gill (Na⁺+K⁺)-ATPase in rainbow trout (Oncorhynchus mykiss)*. Comp. Biochem. Physiol., 100B, 229, 1991 e Atti del 34° Congresso Nazionale della Società Italiana di Biochimica, 169, 1988.

The expected higher gill (Na⁺+K⁺)-ATPase activity in rainbow trout adapted to brackish water (BW) with respect to freshwater (FW) is accompanied by a change in the enzyme activation kinetics by Mg²⁺, ATP, Na⁺ and K⁺ from simple saturation kinetics in FW to cooperativity in BW, whereas the enzyme sensitivity to ouabain is unaffected. The habitat-dependent variations, including an alkaline shift in the optimal pH in BW, are tentatively ascribed to the hypothetical prevalence in FW and BW of presumptive different enzyme forms showing features adaptive to the different environmental salinity.

Pagliarani A., Ventrella V., Trombetti F., Trigari G., Borgatti A.R.: *(Na⁺+K⁺)- and Na⁺-stimulated Mg²⁺-dependent ATPase activities in kidney of sea bass (Dicentrarchus labrax L)*. Comp. Biochem. Physiol., 90B, 41, 1988.

Sea bass kidney microsomal preparations contain two Mg²⁺-dependent Na⁺-stimulated ATPase activities: the ouabain-sensitive (Na⁺+K⁺)-ATPase and an ouabain-insensitive Na⁺-ATPase. Under the respective optimal assay conditions of pH 7.0, 100 mM Na⁺, 25 mM K⁺, 10 mM Mg²⁺, 5 mM ATP and pH 6.0, 40 mM Na⁺, 1.5 mM MgATP, 1 mM ouabain, the former exhibits an average specific activity of 59 μmol Pi. mg protein⁻¹. hr⁻¹ and the latter of 13.9. The (Na⁺+K⁺)-ATPase is specifically inhibited by ouabain and vanadate, the Na⁺-ATPase specifically by ethacrynic acid and preferentially by furosemide; both enzyme activities are similarly inhibited by Ca²⁺. The (Na⁺+K⁺)-ATPase is specific for ATP and Na⁺ whereas the Na⁺-ATPase hydrolyzes other substrates in the efficiency order ATP>GTP>CTP>UTP and can be activated also by K⁺, NH₄⁺ and Li⁺. Minor differences between the two activities lie in the affinity for Na⁺, Mg²⁺, ATP and in the thermosensitivity.

Piretti M.V., Pagliuca G., Vasina M.: *Further investigations concerning the alkaline reducing transmethylation (A.R.T.) of lipids.* Rev. Franç. Corps Gras, 35, 387, 1988.

It was confirmed that alkaline reducing transmethylation (ART) is complete on phosphoglycerides in 20 min at room temperature. In the same conditions it is not complete on neutral glycerides. It was however verified that, in this case, the reaction products does not contain partial glycerides, but consists exclusively of methyl esters and unreacted lipid material. It is thus possible to use ART to determine the fatty acids composition of neutral lipids, with the results that become more precise with the increase in unsaturation of the lipid examined. The reducing medium, in fact, protects the unsaturated constituents from oxidative processes.

Piretti M.V., Pagliuca G., Vasina M.: *Transmethylation of neutral and polar lipids with NaBH₄ in the presence of NaOH.* Chem. Phys. Lipids, 47, 149, 1988.

The chemism of the transmethylation of neutral and/or polar glycerides, carried out using methanolic NaBH₄ in the presence of 2N NaOH added, is discussed. One millilitre of the reagent proposed here enables quantitative transmethylation of 2 mg of neutral lipid and up to 300 mg of polar lipid. The reaction is complete within 20 minutes at room temperature. This seems particularly useful for the study of the fatty acid composition of high unsaturated lipids or when studying the structure of lipid oxidation products.

Piretti M.V., Zuppa F., Pagliuca G., Taioli F.: *Investigation of the seasonal variations of fatty acid constituents in selected tissues of the bivalve mollusc Scapharca inaequalvis (Bruguière).* Comp. Biochem. Physiol., 89 B, 183, 1988.

The seasonal variations in the fatty acid composition of the total lipids were studied in four selected tissues of *Scapharca inaequalvis*: gills, mantle, foot with digestive diverticula and haemolymph. Fluctuations in the percentages of the single constituents were observed over the course of the year. A percentage increase in the unsaturated constituents was noted in the cold months. The percentage composition variations in the fatty acids from the lipid extracts of the different tissues and from the whole organism would seem to be linked to the feeding-growth, nonfeeding-maturation cycle of the mollusc.

Serrazanetti G.P., Davalli P., Carpené E., Corti A.: *Risposta di enzimi epatici al trattamento con cadmio in Carassius auratus in rapporto alle condizioni ambientali. Responses of liver enzymes to cadmium administration in the goldfish (Carassius auratus) at different environmental conditions.* Atti della Società Italiana di Biochimica, 33, 167, 1988.

In order to study the specificity of the hepatic ornithine decarboxylase (ODC) response in teleosts and to establish whether a relationship between the enzyme activity and the metallothionein induction we tested ODC along with two other enzymes, adenosylmethionine decarboxylase and tyrosine aminotransferase in the liver of three different groups of *Carassius auratus* kept at three different temperatures. The metallothionein induction did not exhibit significant differences between the groups of teleosts examined. The results show that the ODC induction by Cd is depending on factors which do not affect the metallothionein induction. The most probable factor seems to be the temperature of environmental water.

Trombetti F., Ventrella V., Pagliarani A., Trigari G., Borgatti A.R.: *Na⁺-and (Na⁺+K⁺)-stimulated Mg²⁺-dependent ATPase activities in gilthead kidney.* Ital. J. Biochem., 38, 28A, 1989 e Atti 34° Congresso Nazionale della Società Italiana di Biochimica (S.I.B.), 168, 1988.

Some features of the Mg²⁺-dependent (Na⁺+K⁺)-and Na⁺-ATPases in gilthead kidney microsomes are described. The mutual behaviour of the two ATPases activities, mainly similar to that previously observed in other animal tissues and species appears to support the hypothesis that the two enzyme activities may be referred to two distinct protein structures. On the other hand, the Na⁺-ATPase diffusion in osmoregulatory tissues hints that it may cooperate with the (Na⁺+K⁺)-ATPase in ionic and osmotic regulation. The source-dependent peculiarities suggest that the mutual relationship and role of the two enzyme activities may vary under different environmental conditions.

Viviani R.: *Effects of chemical pollutants and phytoplankton blooms on the marine biological resources of the Adriatic Sea.* Ann. N.Y. Acad. Sci., 534, 986, 1988.

Studies concerning the content of toxic metals and chlorinated hydrocarbons in shellfish and fish of the North and Middle Adriatic Sea are reported; their concentrations in the different trophic chains; the detoxication mechanisms in marine animals; the evaluation of the residues of pollutants in fish products consumed by humans. As far as the phytoplankton bloom in the coastal area facing Emilia-Romagna is concerned, the types of diatoms and dinoflagellates and the special identification of potentially toxic dinoflagellate species have been identified. Effects of anoxia resulting from the blooms on marine organisms have been studied and methods to determine possible biotoxins produced by dinoflagellates likely to have effects on marine organisms and on man have been investigated.

1989

Barghigiani C., Pellegrini D., Carpenè E.: *Mercury binding proteins in liver and muscle of flat fish from the Northern Tyrrhenian Sea.* Comp. Biochem. Physiol., 94C, 309, 1989.

The subcellular distribution of mercury and the presence of mercury binding proteins was investigated by ultracentrifugation and gel filtration in liver and muscle of the flat fish *Citharus linguatula* and *Lepidorhombus boscii* from the Northern Tyrrhenian Sea heavily contaminated by the metal. In the cytosols, mercury was mainly bound to high molecular weight ligands. Differently from muscle, in the liver part of the mercury content was bound to low molecular weight ligands.

Boni L., Carpenè E., Wynne D., Reti M.: *Alkaline phosphatase activity in *Protogonyaulax tamarensis*.* J. Plankton Res., 11, 879, 1989.

A non-toxic strain of the marine dinoflagellate has been isolated from a bloom in the Adriatic Sea, off the Emilia-Romagna coast. Cultures of the cells were grown in the laboratory in enriched seawater at various initial ambient orthophosphate concentrations. Alkaline phosphatase activity was inversely proportional to ambient orthopho-

sphate levels. From measurements of kinetic parameters, the binding of an artificial substrate to the enzyme was quite strong, maximal activity was observed at pH 8.4, although the pH-activity curve was broad, in contrast to that of other alkaline phosphatases.

Carpenè E., Davis L., Fabris N., Hakim G., Moccheggiani E., Licastro F.: *Zinc and thymulin activity in human plasma*. Joint Meeting of Inorganic Chemicals Group and Inorganic Biochemistry Discussion Group. University College of London, 1989.

A large body of experimental observations suggests that zinc plays a relevant role in regulating the immune system. We have developed a method to separate high molecular weight zinc carriers from those of low molecular weight found in human plasma. Thymulin activity found in low molecular weight fractions could be divided into two groups (peak I, peak II). A low thymulin activity was detected in fractions of peak I only after zinc addition *in vitro*.

Carpenè E., Fedrizzi G., Giani G.: Concentrazioni di Cd, Zn e Cu in fegato e bile di *Carassius auratus*. *Concentrations of Cd, Zn and Cu in liver and bile of Carassius auratus*. Arch. Vet. Ital., 40, 197, 1989.

In goldfish, respectively injected with Cd, Zn and Cu, there was high accumulation of Cd in the liver, whereas the Zn accumulation was less evident but significative and that of Cu was absent. Most of the Cd was cytosolic and bound to metallothionein. Detectable amounts of the injected metals were revealed in the bile.

Carpenè E., Vasak M.: *Hepatic Metallothionein from goldfish (Carassius auratus L.)*. Comp. Biochem. Physiol., 92B, 463, 1989.

Cadmium distribution in tissues of injected fish was determined. Cd-Metallothionein was isolated from liver cytosol after gel filtration and ion-exchange chromatography which revealed the presence of two isoforms; each isoform gave two peaks on reverse phase h.p.l.c.. The molecular weight, metal content and aminoacid composition were characterized. The u.v. and c.d. spectra revealed features typical of cadmium-thiolate clusters common to metallothioneins previously isolated from mammals.

Cattani O., de Zwaan A., van den Thillart G., Vitali G., Isani G., Cortesi P.: Consumo di ossigeno e metabolismo anaerobico in molluschi bivalvi a vari livelli di ipossia. *Oxygen consumption and anaerobic metabolism in bivalve molluscs at different hypoxia levels*. Nova Thalassia, 10, Suppl.1, 631, 1989.

In this study specimens of *Venus gallina* and *Scapharca inaequivalvis* were exposed in a respirometer to different oxygen tensions. The oxygen consumption rate was very different for the two species. In fact *Scapharca* was able to regulate the oxygen consumption to a constant level, while *Venus* adapted the consumption rate to the ambient oxygen concentrations.

Dalla Via G.J., Dallinger R., Carpenè E.: *Effects of cadmium on Murex trunculus from the Adriatic Sea. II. Oxygen consumption and acclimation effects.* Arch. Environ. Contam. Toxicol., 18, 562, 1989.

Marine snails from the Adriatic Sea were exposed to cadmium under chronic and acute conditions. Compared with untreated animals, chronic exposure of *Murex trunculus* resulted in an elevated rate of oxygen consumption. The difference between the two groups of snails increased with time. After one month a 10% greater loss in biomass in treated animals than in controls was observed, reflecting the higher energy expenditure during exposure to cadmium.

Dallinger R., Carpenè E., Dalla Via G.J., Cortesi P.: *Effects of cadmium on Murex trunculus from the Adriatic Sea. I. Accumulation of metal and binding to a metallothionein-like protein.* Arch. Environ. Contam. Toxicol., 18, 554, 1989.

Cadmium contents in the snails increased considerably during the exposure to the heavy metal. However, high amounts of cadmium were also found in unexposed individuals. No significant changes were observed in the concentrations of zinc. Variable amounts of cytosolic cadmium were associated to different molecular weight components. Most of the metal was bound to a protein with a molecular weight of 11000 Daltons. This proteins showed spectroscopic characteristic typical of metallothionein-like protein.

Davalli P., Serrazanetti G.P., Carpenè E., Corti A.: *Responses of liver enzymes to cadmium administration in the goldfish (Carassius auratus) at different times of the year.* Comp. Biochem. Physiol., 94C, 177, 1989.

The activity of goldfish ornithine decarboxylase increased upon cadmium chloride injection in April and November and did not change significantly in June and July when water temperature was higher. Adenosylmethionine decarboxylase exhibited similar patterns. Tyrosine aminotransferase increased significantly in April, but this was not confirmed the following year. Liver cadmium concentrations always increased after the injection and hepatic metallothionein was induced.

Giani G., Riberzani A., Sangiorgi E., Bosco A., Carpenè E., Fedrizzi G.: *Metalli pesanti (Hg, Pb, Cr) in Teleostei di acque dolci della regione Emilia-Romagna. Heavy metals (Hg, Pb, Cr) in fresh water fishes in the Emilia Romagna region.* Arch. Vet. Ital., 40, 190, 1989.

Heavy metals (Hg, Pb, Cr) were determined in samples of lateral muscle of fish caught in different fresh water streams during three consecutive years. A significative positive correlation was demonstrated between the Hg content and the fish length. The values here reported show minor fluctuations according to the different species and streams and the 3 years that have been considered.

Isani G., Cattani O., Carpenè E., Tacconi S., Cortesi P.: *Energy metabolism during anaerobiosis and recovery in the posterior adductor muscle of the bivalve Scapharca inaequalvis (Bruguère).* Comp. Biochem. Physiol., 93B, 193, 1989.

Specimens of *Scapharca inaequivalvis* were exposed to environmental anoxia over a period of 96 hrs. In the posterior adductor muscle of *Scapharca inaequivalvis* both aspartate and glycogen were substrates for anaerobic metabolism. ATP and arginine phosphate only contributed to a small extent. Alanine and succinate were major end products, whereas opines were minor end products. Lactate production was not observed. The ATP turnover rate was reduced by a factor of 6 in the later anoxic period. Glycolysis and aspartate contributed about 90% either during the initial step or during the prolonged anoxia. Recovery of 24 hrs after anoxia was not enough for a complete restoration of energy reserves, whereas anaerobic end products were eliminated over this period. There was no strombine or lactate accumulation during the recovery period.

Mancini L., Milandri A., Pirini M., Poletti P., Pompei M., Volterra L., Aulicino F.A., Bonadonna L., Di Girolamo I., Mancini L., Pietrangeli B., Boni L.: Eutrofizzazione delle acque costiere marine e rapporti con gli aspetti batteriologici. *Marine coastal eutrophication and relationship with bacteriological aspects*. Igiene Moderna, 92, 227, 1989.

Interaction between phytoplankton and bacteria in marine water have increasingly been recognized as important. The present study was undertaken to verify the hypothetical antibacterial activity of algae. Analyses were carried out on sea water samples. Chemical, physical, biological and microbiological parameters were assayed. The results obtained suggest the existence of an antibiotic effect by algae (especially Diatoms) when their densities exceed the value of 10^6 cells/l. Accordingly, in these cases, from both bacteriological and virological points of view, an improvement of the water quality has been observed.

Massa D.: Aspetti ecologici del compostaggio. *Environmental impact aspects of composting*. Riv. Suinicolt., 4, 79, 1989.

The set up of an innovative process for aerobic composting of animal manure in order to produce a compost stable and full of humus is described. The production range of volatile NH_3 in the composting plant and in the surrounding environment and the levels of the presence of pesticides and heavy metals in the compost are indicated.

Orlandini G., Reali N., Soldi M.E., Bacciottini F., Viviani R., Casti A.: Effect of temperature and diet on polyamine concentrations of the European sea bass (*Dicentrarchus labrax* L.). *Comp. Biochem. Physiol.*, 94B (3), 581, 1989.

A fall of environmental temperature causes a decrease in total polyamine concentrations of heart, red and white muscles of sea bass fed on a diet containing 70% herring meal (diet S). When sea bass were fed on a diet partially replaced by casein (diet A), an increase of total polyamine concentration in liver and heart was observed at a lower temperature. In all tissues studied an increase of putrescine concentrations and a parallel decrease of spermidine and spermine levels were found for both S and A groups of sea bass when temperature was lowered. In general, concentrations of putrescine, spermidine and spermine were considerably higher in group A when the temperature was lowered.

Pagliarani A., Ventrella V., Trombetti F., Ballestrazzi R., Trigari G., Borgatti A.R.: *Response of gill ($\text{Na}^+ + \text{K}^+$)-ATPase to oral administration of thyroid hormone (3,5,3'-triiodo-L-thyronine) and NaCl as a tool of adaptation of freshwater rainbow trout to seawater.* Ital. J. Biochem., 39, 139A, 1990 e Atti 19th FEBS Meeting, MO504, 1989.

As first approach to the possible relationship between gill ($\text{Na}^+ + \text{K}^+$)-ATPase, salinity and thyroid hormones, the enzyme activity and some properties were considered in basolateral membrane preparations from T_3 -(T) or NaCl-(N) treated rainbow trout prior to saltwater transfer in comparison to an untreated control (C). The serum T_3 rise in T does not result in any ($\text{Na}^+ + \text{K}^+$)-ATPase activity increase in freshwater whereas N exhibits a similar enzyme activity to saltwater C. In the latter milieu the expected activity increase occurs in all groups in the order $\text{C} < \text{N} < \text{T}$. While in C the activation kinetics by ATP and Na^+ is michaelian in freshwater and cooperative in saltwater, the T_3 treatment makes the kinetics irrespective of salinity as it is always non cooperative for ATP and cooperative for Na^+ . In N the cooperative activation, typical of saltwater is shown in freshwater by Na^+ and not by ATP.

Pagliuca G., Piretti M.V.: *Model system for the study of membrane lipid oxidation products.* Atti del 16° Congresso GIBB (Gruppo Italiano di Bioenergetica e Biomembrane), Riunione gruppo membrane SIB, Parma, 4-6 maggio, 117, 1989.

Preliminary investigations on model systems were carried out in order to isolate some lipid oxidation products to be used as reference standards in the study of the more complex membrane lipids. For this purpose, egg and soy-bean lecithins were subjected to mild autoxidation, with the aim of producing high quantities of the primary oxidation products (hydroperoxides and epoxides), and to limit their decomposition. During the successive analytical phase, a transmethylation procedure, which operates in a reducing medium by means of methanolic NaBH_4 in the presence of NaOH, was utilized.

Piretti M.V., Arias M., Sansavini S.: *L'imbrunimento dei tessuti legnosi congelati: indagine sui polifenoli del pesco. Browning of cold-injured woody tissues: investigation of polyphenols in peach.* Frutticoltura, 51, 53, 1989.

The extreme cold spell in January 1985 (-20 -25°C) resulted the browning of bark and young wood of the trunk and branches, especially those closest to the ground, of peach and other frost-susceptible fruit species. The determination of the polyphenols found in *Prunus persica* (cv. Flavorcrest), and the tentative relationships between them and the extreme temperatures are reported. Monomer, dimer, and oligomer flavanoids, together with a metoxy flavanon glucoside (persicoside), were found in the woody tissues. The differences evidenced between the polyphenol contents of injured and non-injured plants were quantitative only and not qualitative, and hence cannot be correlated to the cold-spell *per se*.

Piretti M.V., Pagliuca G.: *A.R.T. (Transmetilazione in ambiente Alcalino Riducente): nuovo strumento analitico nella chimica dei lipidi. A.R.T. (alkaline reducing transmethylation): new analytical instruments in the chemistry of lipids.* La Chimica e l'Industria, 71, 91, 1989.

The action of the ART reagent is here discussed. Experimental evidence is given for the presence of methoxy ions in the reagent, to which the transmethylation activity must be attributed.

Piretti M.V., Pagliuca G.: *Membrane lipids oxidation products: studies on model and biological systems.* Actes du Congrès international Chevreul pour l'étude des corps gras, Angers 6-9 juin, 420, 1989.

A transmethylation procedure with methanolic NaBH_4 in the presence of NaOH has been worked out, that it has been shown to be particularly useful to convert the polar lipids in the corresponding methyl esters. As advantageous side-reaction, besides the transmethylation of the polar glycerides, the reduction of any hydroperoxyl and carbonyl groups to the corresponding hydroxy groups takes place, whereas the epoxidic rings not occurring in a terminal position are not hydrolyzed. This procedure has been utilized for studying the oxidation products formed in suitable model systems (as oxidized soy-bean and egg lecithins) as well as the oxidation products present in microsomal phospholipids of rat hepatocytes (rat liver). The interesting results obtained in the course of these investigations are presented in this paper.

Piretti M.V., Pagliuca G.: *Systematic isolation and identification of membrane lipid oxidation products.* Free Radical Biol. Med., 7, 219, 1989.

This report discusses the analytical procedure by which it is possible to isolate and identify the oxidation products of cellular and subcellular membrane lipids. The key point of this procedure is the method used for the transmethylation of the lipid material isolated from the tissues. In effect, both the conversion of the glycerides into methyl esters and the reduction of the hydroperoxyl groups into the corresponding hydroxyl groups is performed in one step, without breaking any oxirane rings that may be present. The methyl esters containing functional groups introduced by oxidative processes are separated from the non-modified ones by preparative TLC and are identified by GLC and GC-MS.

Piretti M.V., Pistore R., Pagliuca G.: *Uptake and utilization of lipid constituents dispersed in culture water, by the bivalve mollusc Scapharca inaequalvis (Bruguère).* Comp. Biochem. Physiol., 92B, 755, 1989.

Specimens of *S. inaequalvis* were fed with nutrients prepared so as to reproduce the average protein, glucidic and lipid content of phytoplankton. The lipid fraction of the nutrients was made up to resemble that of diatoms, and each nutrient differed from the others as regards the sterol content. It was observed that when the nutrients were dispersed in the culture water, the sterol constituents were taken up by the molluscs and traces of these sterols remained in the tissues, with the exception of ergosterol which was apparently rapidly metabolized. However, no traces remained of the fatty acids present in the nutrients as these are probably quickly used for energy production. Some considerations are made on the metabolism of $\Delta^{5,7}$ sterols by bivalve molluscs.

Piretti M.V., Viviani R.: *Presence of 4 α -methyl sterols in the bivalve mollusc Scapharca inaequalvis (Bruguère).* Comp. Biochem. Physiol., 93B, 753, 1989.

Specimens of *S. inaequalis* (Bruguère) collected in October 1983 from a tract of shore-line along the Cesenatico coast contained 4 α -methylsterols, compounds never before found among the lipid constituents of this mollusc. Among the fourteen constituents of the fraction of the 4 α -methylsterols, the seven present in the major quantity were identified through the mass spectra of their acetyl derivatives, taking account of the corresponding retention times relative to acetyl cholesterol. Their presence in the *S. inaequalis* specimens, collected in this occasion, must be imputed to blooms of dinoflagellates (*Gymnodinium* sp.) which concerned the area in which the specimens were collected during the last four months of 1983. Given the exogenous origin of the 4 α -methylsterols, it has been verified that the mollusc can modify the molecular structure of the identified compounds.

Piretti M.V., Zuppa F., Pagliuca G.: *Anatomical distribution of sterols in the bivalve mollusc Scapharca inaequalis (Bruguère)*. Comp. Biochem. Physiol., 93B, 819, 1989.

The anatomical distribution of the sterols and their seasonal variations were studied in four tissues of the mollusc *Scapharca inaequalis* (Bruguère): gills; mantle; foot together with digestive diverticula and haemolymph. The qualitative composition of the sterol mixtures extracted monthly from the four tissues was strictly constant. Each mixture contained ten constituents, one of which was not identified, while the others were 3- β -hydroxy sterols, common in marine molluscs and phytoplankton. No $\Delta^{5,7}$ sterols were found. It was observed that the distribution of the sterols in the tissues considered is notably uniform. This could mean that all the sterols are equally important for the correct functioning of each organ.

Piretti M.V.: *Attainment of a systematic method for the isolation and identification of membrane lipid oxidation products*. Acta Med. Romana, 27, 73, 1989.

A new systematic and efficient method for the isolation and qualitative and quantitative identification of membrane lipid oxidation products is described in details and critically compared to classic and new methods reported in the literature.

Serrazanetti G.P., Conte L.S., Baraldi R.: *Sterol content in muscular tissue of Squilla mantis*. Comp. Biochem. Physiol., 96B, 811, 1990 e Proceedings 10th International Symposium on Capillary Chromatography, 2, 821, 1989. Huetig ed., Heidelberg.

Sterols were isolated from *Squilla mantis* muscular tissue from the Northern Adriatic Sea. The composition was determined using capillary gas-liquid chromatography and mass-spectrometry methods. Sixteen sterols were separated and identified. Besides cholesterol, the other main sterols isolated were cholesta-5,22-dien-3 β -ol, 5 α -cholestan-3 β -ol, 24-methyl-cholesta-5,22-dien-3 β -ol, 24-methyl-27-norcholesta-5,22-dien-3 β -ol and 24-ethyl-cholest-5-en-3 β -ol.

Serrazanetti G.P., Conte L.S., Cattani O.: *Aliphatic hydrocarbon and sterol content of zooplankton of the Emilia-Romagna coast (Northern Adriatic)*. Comp. Biochem. Physiol., 94B, 143, 1989.

Aliphatic hydrocarbons ($n\text{-C}_{14}$ to $n\text{-C}_{30}$) and sterols were isolated from zooplankton of the Northern Adriatic Sea. The composition was determined using gas-liquid chromatography and mass-spectrometry. The aliphatic hydrocarbons were mainly represented by a monoolefine with 17 carbon atoms accompanied by remarkable amounts of $n\text{-C}_{15}$ and $n\text{-C}_{17}$. In the sterol fraction cholesterol was shown to be the main component with appreciable quantities of 22-dehydrocholesterol, 5α -cholestan- 3β -ol, 24-methyl-27-norcholesta-5,22-dien- 3β -ol and 24-methyl-cholesta-5,24(28)-dien- 3β -ol.

Serrazanetti G.P., Massa D., Gentile G., Viviani R.: Determinazione di idrocarburi aromatici policiclici in tessuto epatico di bovino. *Determination of aromatic polycyclic hydrocarbons in hepatic cattle tissue.* Atti Soc. Ital. Sci. Vet., 43, 1519, 1989.

Aromatic polycyclic hydrocarbons (PAH) in hepatic tissues of 120 cattle from six Emilia-Romagna areas with different environmental characteristics were determined. After hydrocarbon separation by column chromatography, PAH determination was carried out by spectrofluorimetry. The average group values referred respectively to the benzo(a)pirene and crysene standards are reported. Levels of the different groups did not show significant variations with respect to the control groups.

Serrazanetti G.P., Viviani R.: *Aliphatic and polycyclic aromatic hydrocarbons in Northern and Middle Adriatic.* Boll. Oceanol. Teor.ed Appl., n° speciale, 205, 1989.

The activity carried out in the frame of the Italian-Yugoslav program for the protection of the Adriatic Sea is reported. The total levels of aromatic hydrocarbons were detected by means of fluorescence, aliphatic hydrocarbons were analyzed by means of gas-liquid chromatography. The results of hydrocarbon analysis carried out in sea water, particulate matter and net plankton samples of different stations of Middle and Northern Adriatic Sea are discussed.

Ventrella V., Trombetti F., Pagliarani A., Trigari G., Pirini M.: *Ouabain-insensitive Na^+ -ATPase activity in gills of freshwater and seawater-adapted trout (*Salmo gairdneri* Richardson).* Atti 16° Congresso Nazionale GIBB (Gruppo Italiano di Bioenergetica e Biomembrane), 41, 1989.

The ouabain-insensitive ATPase found in rainbow trout gills as previously in other euryhaline teleosts was studied on microsomal preparations from two homogeneous groups of fish kept in freshwater and at about 20‰ salinity respectively. The main differences between the two habitats lie in the specific activity of the Na^+ -ATPase, far higher in freshwater, and in the pH dependence of the enzyme that in saltwater and not in freshwater exhibits a dramatic activity drop in alkaline range. On the contrary the activation kinetics by MgATP and Na^+ , the K_m values and the ouabain sensitivity do not show any substantial variations. The far higher Na^+ -ATPase activity with respect to the $(\text{Na}^+ + \text{K}^+)\text{-ATPase}$ in freshwater and the different salinity-dependent behaviour of the two ATPases may be hypothetically related to a different physiological role of these enzyme activities in the two habitats.

Viviani R.: Inquinamento delle acque marine costiere: gli animali marini come dispositivo di monitoraggio. *Marine coastal pollution: marine animals as monitoring system*. Atti Soc. Ital. Sci. Vet., 43, 27, 1989.

This review deals with land-sea fluxes of chemical pollutants in worldwide marine coastal waters and the use of animal bioindicators for pollutant monitoring, both for conservative (toxic metals and organic compounds) and non-conservative (nutrients) chemicals. In the Italian seas the residues of conservative pollutants in marine trophic chains and the algal blooms in the North Adriatic Sea are also considered. Concluding, mussels may be used as sentinel organisms in an international environmental quality programme for the preservation of the Mediterranean.

1990

Carpenè E., Cattani O., Serrazanetti G.P., Fedrizzi G., Cortesi P.: *Zinc and copper in fish from natural waters and rearing ponds in Northern Italy*. J. Fish Biol., 37, 293, 1990.

Zinc and copper were detected in several tissues of fresh and saltwater fish. Liver concentrations varied widely, with respect to the storage and detoxication functions of the organ. In muscular tissues the two metals are linked to aerobic metabolism being higher in the heart and lower in the white muscle. High levels of zinc were found in the female gonad, while in the brain zinc has been shown to be more constant and possibly regulated better than copper.

Carpenè E., Roos J., Cattani O., de Vooy C.G.N., de Zwaan A.: *Anaerobic metabolism of the erythrocytes of Scapharca inaequalvis: uptake and effects of cadmium on energy metabolism*. 12th Conference of European Society for Comparative Physiology and Biochemistry, Utrecht 27-31 August, 1990.

Clams that had been exposed to cadmium respired at a significant higher rate. The threshold for anaerobic metabolism of RBCs, however, was not affected by cadmium. However, the concentration found for the erythrocytes was only one-fourth of that in the foot and at least an order of magnitude lower than in the other organs.

Corni M.G., Cattani O.: *Aspects of gonadomorphogenesis and reproductive cycle of Scapharca inaequalvis (Brug.) (Bivalvia; Arcidae)*. J. Shellfish Res., 8, 335, 1990.

Some aspects of the gonadomorphogenesis and the reproductive cycle of *Scapharca inaequalvis* (Brug.) from Cesenatico (Adriatic Sea) were examined during the period April 1984-March 1985. Histomorphological aspects of gametogenesis, minimal size at sex differentiation and gonadal development are described. Gametogenesis clearly starts in May and extends until October. Spawning occurs from June to October with differentiating activity. A reproductive pause, almost total, was observed from November to April.

Cortesi P., Cattani O., Vitali G., Isani G., de Zwaan A., van den Thillart G., Storey K.B., Brooks S.P.J.: *Different physiological and biochemical adaptations of two bivalve species to oxygen deficiency.* Abstract 35° Congresso Nazionale della Società Italiana di Biochimica, Bari, 1990.

Data of studies on different adaptations of the bivalves *Venus gallina* and *Scapharca inaequivalvis* to hypoxia/anoxia are reported. Anoxia survival time of *Scapharca* was 4 times longer than in *Venus*. In this latter mollusc the anoxic exposure had no effect on the kinetic parameters of key glycolytic enzymes; on the contrary in *Scapharca* anoxia determined kinetic modification in PFK and glycogen phosphorylase (leading to less active enzymes). This resulted in a general glycolytic rate depression. As concerning the response to hypoxia (measured with a respirometer at different oxygen tensions between 5.5 and 0.5 ppm), *Scapharca* was able to regulate oxygen consumption (oxyregulator), whereas *Venus* adapted the consumption rate of oxygen to its water concentration (oxyconformer).

Dalla Via G. J., van den Thillart G., Cattani O., Vitali G., Cortesi P., de Zwaan A.: *Solea solea* sotto ipossia a lungo termine: metabolismo intermedio e livelli critici di ipossia. *Solea solea during long term hypoxia exposure: intermediary metabolism and critical levels of hypoxia.* Abstract: Acquacoltura '90, International Fish Farming Conference, Verona, 1990.

In order to find the critical pO₂ levels for the activation of the anaerobic metabolism in *Solea solea*, the animals were exposed to five hypoxia levels (60, 40, 20, 12, 6% of air saturation). Blood samples as well as freeze-clamped muscle tissue, taken at the end of hypoxia periods, show a sharp increase of lactate, glucose and glucose-6-phosphate levels below 20% air saturation. A depletion of the energy store is also evident from the lowered phosphocreatine concentrations.

Davalli P., Carpenè E., Serrazanetti G.P., Bettuzzi S., Viviani R., Corti A.: *Response of polyamine metabolism to metal treatment (Co, Cu, Zn, Cd) in the liver of the goldfish (Carassius auratus): distinct effect of season and temperature.* Comp. Biochem. Physiol., 97C, 305, 1990.

Cobalt, copper, zinc and cadmium injected into *Carassius auratus* in April increased ornithine decarboxylase and adenosylmethionine decarboxylase and not tyrosine aminotransferase activities independently of their accumulation within the liver. Cadmium stimulated ornithine decarboxylase in November but was ineffective in July. Putrescine and polyamine concentrations essentially followed the response of ornithine decarboxylase activity.

Davalli P., Serrazanetti G.P., Carpenè E., Corti A., Viviani R.: *Changes in the activity of hepatic enzymes in the goldfish (Carassius auratus) upon administration of heavy metals.* Ital. J. Biochem., 39, 135, 1990 e Atti Fed. Europ. Biochem. Soc., 20, 191, 1990.

Similarly to the marine teleost *Dicentrarchus labrax*, ornithine decarboxylase (ODC) (EC 4.1.1.17) and adenosylmethionine decarboxylase (AdoMetDC) (EC 4.1.1.50), catalyzing the rate limiting steps of polyamine biosynthesis, are well detectable in the liver of the fresh water teleost *Carassius auratus*. In a study on the effect of heavy metals on liver metabolism of aquatic animals, we measured in the goldfish at different time of the year the activity of the two decarboxylases and, as a comparison, of tyrosine aminotransferase (TAT) (EC 2.6.1.5) after administration of 0.5 $\mu\text{g/g}$ body weight of CdCl_2 or ZnCl_2 or CoCl_2 . The experiments indicate that water temperature is not the only factor affecting the responses of liver enzymes to metal administration. Changes in these responses might result from the interaction between temperature and other factors probably related to the seasonal biological rhythm of these teleosts.

Davis L.J., Carpenè E., Fabris N., Hakim G., Mocchegiani E., Licastro F.: *Thymulin after separation of human sera according to molecular weight*. First International Congress on Neuroimmunomodulation, Florence, May 23-26, 1990.

We have developed a method to separate high molecular weight zinc carriers of thymulin from the free hormone which is found in the low molecular weight fractions of human serum. Apparently, the low molecular weight fractions have a more labile thymulin activity than the high molecular weight fractions.

Falasca A., Pagnucco C., Rossi C.A., Viviani R.: *Plasma free amino acid levels in gilthead (Sparus auratus)*. Minerva Biotecnologica, 2(3), 320, 1990. 35° Congresso Nazionale della Società Italiana di Biochimica, Bari, 1990.

A method for circulating free amino acids (FAA) determination in the plasma of gilt-head (*Sparus auratus*), in particular for essential amino acids (EAA) is reported. Results have been compared with sea-bass (*Dicentrarchus labrax*). Circulating FAA Ile, Leuc, Val, Met, Thr and Phe values seem to be close in the two species examined in similar nutritional and blood sampling (time etc.) conditions, but unlike in weights and environment. Lys values are different in the two species and this might reflect the different content of this amino acid in the diet. Arginine and histidine values are higher in the gilthead than in sea-bass and this might suggest a different metabolic role of these amino acids in the species compared.

Perricone Somogyi R.A., Massa D., De Luca D'Alessandro E., De Arcangelis A.: *Broncopneumopatie e contaminazione chimica: morbosità e mortalità. Toxic responses of the respiratory system to chemical air pollutants: morbidity and mortality*. Centro Ital. Biostatistica e Sociometria, 4, 1990.

The behaviour of morbidity and mortality in Italy of the pulmonary diseases due to chemical air pollutants such as SO_x , PST, NO_x , HC and CO is presented on statistical basis ranging from 1961 to 1985; particularly data from case sheets of patients in two hospitals of Milan and Rome are analyzed.

Piretti M.V., Doghieri P.: Separation of peracetylated flavanoid and flavonoid polyphenols by normal phase high-performance liquid chromatography on cyano-silica column and their determination. *J. Chromatog.*, 514, 334, 1990.

The characteristics of many plant products, *i.e.* taste, palatability, nutritional value, pharmacological and toxic effects and microbial decomposition, substantially depend on their polyphenol content. For this reason studies on such widespread natural compounds are not only of scientific interest, but also of considerable practical significance. Usually separations of flavan- and flavon-oid polyphenols have been carried out by reversed phase HPLC, and only in few cases a normal phase has been used. However the advantages to use the cyanopropyl bonded phase, as normal phase, have been emphasized. This phase, in fact, seems to be a "universal phase", which can exhibit a different character, depending on the polarity of the liquid system. Therefore, our interest has been driven to verify the effectiveness and the versatility of this phase in order to separate complex mixtures of peracetylated polyphenols.

Piretti M.V., Gaiti A.: Chimica propedeutica alla biochimica. *Chemistry propaedeutic to biochemistry*. C.E.A., Milano, 1990.

Didactic text for the students of the Veterinary Medicine Faculty.

Piretti M.V.: The polyphenolic constituents of *Dyospiros kaki*. *Fitoterapia*, 62, 3, 1990.

The paper constitutes a review of the investigations carried out in order to elucidate the chemical constitution of the complex polyphenolic material called "kaki-tannin". Several very interesting extraction procedures of such material from the immature fruits of *Diospyros kaki* are reported, and one of its practical uses are described.

Serrazanetti G.P.: Idrocarburi biogenici e fossili in organismi marini. *Biogenic and fossil hydrocarbons in marine organisms*. *Laguna*, 5, 59, 1991; *Atti Soc. Ital. Sci. Vet.*, Tavola Rotonda, 45, 95, 1991 e *Incontri scientifici*, Sassari, 23 giugno 1990.

Hydrocarbons are the major pollutants in the oceans and are widely distributed in marine and terrestrial environment and moreover are released in the atmosphere. Crude petroleum contains complex mixtures of hydrocarbons which may be divided into n-alkanes, branched alkanes, cycloalkanes and aromatic compounds. The detection of petroleum ("fossil") hydrocarbons in marine samples is complicated for the presence of recently biosynthesized ("biogenic") hydrocarbons. A comparison of the different characteristics of fossil and biogenic hydrocarbons allows estimating petroleum contamination.

Trombetti F., Ventrella V., Pagliarani A., Trigari G., Borgatti A.R.: Mg^{2+} -dependent ($Na^+ + K^+$)- and Na^+ -ATPase in the kidneys of gilthead bream (*Sparus auratus L.*). *Comp. Biochem. Physiol.*, 97B, 343, 1990.

The use of two different stocks of gilthead kept at 33‰ (A) and more than 40‰ salinity (B) made it possible to evaluate the salinity dependence of kidney ($\text{Na}^+ + \text{K}^+$)- and Na^+ -ATPases and to compare it with that of the corresponding enzyme activities in the gills where a similar study was previously carried out. The higher salinity experienced by stock B results into an acidic shift of Na^+ -ATPase pH optimum, parallel to that previously observed in the gills accompanied by a strong depression of the enzyme activity, whereas the ($\text{Na}^+ + \text{K}^+$)-ATPase undergoes a less remarkable decrease and shows an unchanged pH optimum. The properties of the two enzyme activities are compared with literature data and discussed on the basis of the presumptive different role and functional prevalence at different salinities of the two ATPases.

Van den Thillart G., Dalla Via G. J., Vitali G., Cortesi P., de Zwaan A.: *Solea solea* sotto ipossia a lungo termine: consumo di ossigeno, limiti di attività e soglia del metabolismo anaerobico. *Solea solea during long term hypoxia exposure: oxygen consumption, scope for activity and threshold for anaerobic metabolism*. Abstract: Acquaculture'90, International Fish Farming Conference, Verona 1990.

Respirometric studies were carried out on specimens of *Solea solea*, fished on sandy bottom of the adriatic coast. After two days measurements of oxygen consumption at a constant oxygen level (70% air saturation) the animals were exposed to a 12-hour hypoxia periods (6 different pO_2). The oxygen consumption curves show a wide variability, probably related to routine activity. Reduction of pO_2 from 150 to 60 Torr., had no effect on oxygen consumption rate; however reduction to 30 Torr. resulted in a complete disappearance of routine activity. Further reduction showed a significant depression of the resting rate suggesting that 30 Torr. is the aerobic threshold for this species.

Ventrella V., Trombetti F., Pagliarani A., Trigari G.: *Effect of T_3 and NaCl administration on gill Na^+ -ATPase in freshwater trout before saltwater transfer*. 35° Congresso Nazionale della Società Italiana di Biochimica, Italian Biochemical Society Transactions (IBST), 1, 327, 1990.

The effect of oral administration of T_3 or NaCl to rainbow trout before saltwater transfer on the ouabain-insensitive gill Na^+ -ATPase was studied. The Na^+ -ATPase dependence on assay pH and ATP and Na^+ concentrations does not seem to be affected either by the habitat change or by experimental treatments, thus showing an opposite behaviour to the coexistent ($\text{Na}^+ + \text{K}^+$)-ATPase. The Na^+ -ATPase specific activity is depressed by the salt diet and unaffected by T_3 administration. Moreover the treated groups do not show any Na^+ -ATPase decrease in saltwater. Therefore the Na^+ -ATPase modulation by the parameters under study is apparently different from that of the ($\text{Na}^+ + \text{K}^+$)-ATPase of the same tissue under the same conditions.

Ventrella V., Trombetti F., Pagliarani A., Trigari G., Borgatti A.R.: *Gill ($\text{Na}^+ + \text{K}^+$)- and Na^+ -stimulated Mg^{2+} -dependent ATPase activities in the gilthead bream (*Sparus auratus* L.)*. Comp. Biochem. Physiol., 95B, 95, 1990.

Gilthead gill 10^{-3} M ouabain-inhibited ($\text{Na}^+ + \text{K}^+$)-ATPase and 10^{-2} M ouabain-insensitive Na^+ -ATPase require the optimal conditions of pH 6.5, 160 mM Na^+ , 20 mM K^+ , 5 mM MgATP and pH 4.8-5.2, 75 mM Na^+ , 2.5 mM Mg^{2+} , 1.0 mM ATP respectively. Optimal pH, ouabain sensitivity and requirement for monovalent cations, Na^+ plus another ion (K^+ , Rb^+ , Cs^+ , NH_4^+) in the ($\text{Na}^+ + \text{K}^+$)-ATPase and only one species (Na^+ , K^+ , Li^+ , Rb^+ , Cs^+ , NH_4^+ or choline $^+$) in the Na^+ -ATPase are confirmed to be the main distinctive features between the two activities. The aspecific Na^+ -ATPase activation by monovalent cations and nucleotide triphosphates, opposed to the ($\text{Na}^+ + \text{K}^+$)-ATPase specificity for ATP and Na^+ , the mutually different response to ethacrynic acid, vanadate, furosemide and Ca^{2+} and other distinctive features including a different susceptibility to different environmental salinity are discussed.

Viviani R., Boni L., Milandri A., Poletti R. Pompei M.: DSP nell'Alto Adriatico e molluschicoltura. *DSP in the Northern Adriatic and mussel breeding*. Atti Soc. Ital. Sci. Vet., 45, 675, 1990.

Results of researches carried out on samples of water and mussels collected along the Emilia-Romagna coast are reported owing to several cases of intoxication in June 1989 in people who had eaten mussels coming from this area. The symptoms characterized by abdominal pain, vomiting and diarrhoea were associated with the contemporary presence in the water and in the digestive tract of the same shellfish of *Dinophysis sacculus* and *Dinophysis fortii* known to be species which produce enterotoxins which provoke diarrhoeic shellfish poisoning (DSP). From then a temporary prohibition of mussels fishery was imposed damaging the shellfish-breeding industry.

Viviani R.: Filmato scientifico-didattico: Le acque fiorite. Educational scientific videotape: *Water blooms* (A. Canziani, Director), Bologna, Editoriale Grasso, 1990.

Based on the textbook *The veterinarian in the control of aquatic biotoxins* (Viviani, 1981), the 2hr-educational scientific video "Water blooms" consists of five sections. In this video Prof. Viviani and colleagues illustrate the following subjects: Ecological aspects and chemical features (Section 1); Mechanisms of marine biotoxins and toxic syndrome in humans (Section 2); The eutrophication phenomenon (Section 4).

Viviani R.: Il veterinario nel controllo delle biotossine acquatiche. Note aggiuntive. *The veterinarian in the control of aquatic biotoxins. Updating*. Bologna, Editoriale Grasso, 1990.

Worldwide studies carried out from 1981 to 1990 on PSP, NSP, DSP, ciguatera biotoxins and venerupin poisoning are reported. As far as the paralytic shellfish poisoning (PSP) and the neurotoxic shellfish poisoning (NSP) are concerned, the knowledge on toxin-producing organisms, chemistry of toxic components, chemical and immunological methods and therapy has been updated. The diarrhoeic shellfish poisoning (DSP), outbreak in European seas in the 1980s, the studies that defined DSP-producing organism, the chemistry and the methods of toxin analyses are reported. Finally, recent findings on dinoflagellates causing ciguatera and venerupin poisoning are cited.

Bombardelli E., Peterlongo F., Griffini A., Piretti M.V.: *Commiphora mukul extracts: a reinvestigation of chemical constituents and biological activity.* Acts of the International Research Congress on Natural Products, Chicago, Illinois, 21-26 July, 1991.

Commiphora mukul Engl. (syn. *Balsamodendron mukul* Hook) is a small tree of the Burseraceae family, endemic to the Indian peninsula. On injury of the trunk, the plant exudes a yellowish gum-resin; this resin, called guggulu in Sanskrit, in Ayurveda, the old Indian system of medicine, was and is highly valued for the treatment of rheumatoid arthritis and lipid disorder. We have revisited this old remedy looking for antiinflammatory and immunomodulating activity activities. In this work a preliminary analytical characterization of the ethyl acetate extract and its relevant fractions are reported.

Borgatti A.R., Trigari G., Pagliarani A., Ventrella V., Trombetti F., Pirini M.: $(Na^+ + K^+)$ -e Na^+ -ATPasi in organi osmoregolatori di animali acquatici. $(Na^+ + K^+)$ - and Na^+ -ATPases in osmoregulatory organs of aquatic animals. Comm. G. Moruzzi, Accademia delle Scienze, 59, 1991.

Present knowledge on features and activity of the two Na^+ -dependent ATPases investigated by this research group in osmoregulatory organs of euryhaline teleosts and crustaceans, is reviewed. The data collected from sea bass, trout and gilthead are suggestive of a different role played by the two enzyme activities in gills, kidney and intestine, possibly somehow modulated by the environmental salinity to meet the osmoregulatory demand. The role of the two ATPases in different phyla is discussed on the basis of evolutionary considerations.

Borgatti A.R.: Aspetti enzimatici nell'adattamento all'acqua salata. *Enzymatic aspects in saltwater adaptation.* Laguna, 5, 44, 1991 e Atti Soc. Ital. Sci. Vet., 45, 75, 1991.

Gill $(Na^+ + K^+)$ -ATPase involvement in saltwater adaptation of euryhaline teleosts is reviewed. Most attention is paid to the complex and still unclear role of hormones (GH, cortisol, thyroid hormones) in the development of hypoosmoregulatory capability of salmonids with special reference to the $(Na^+ + K^+)$ -ATPase activity increase and the development of branchial chloride cells. Among the research in this field, recent findings by the Author are cited.

Brooks S.P.J., de Zwaan A., van den Thillart G., Cattani O., Cortesi P., Storey K.B.: *Differential survival of Venus gallina and Scapharca inaequalvis during anoxic stress: covalent modification of phosphofructokinase and glycogen phosphorylase during anoxia.* J. Comp. Physiol. B, 161, 207, 1991.

Biochemical mechanisms underlying anaerobiosis were assessed in two bivalve molluscs, *Scapharca inaequalvis* and *Venus gallina*. These species displayed different LT50 values at 17-18°C (17 and 4 days respectively). During 24 hours anaerobiosis both bivalves pro-

duced as major end products alanine and succinate, but this latter is converted to propionate only by *Scapharca*. Reduction of metabolic rate was more pronounced in *Scapharca* that showed an anaerobic ATP turnover rate of 4.51% (12.68% in *Venus*). The two species differed also in the enzymatic regulation. In *V. gallina* anoxia exposure caused only small changes in PFK kinetic parameters and had no effects on glycogen phosphorylase. By contrast *S. inaequalis* foot showed strong modifications of enzyme properties in anoxia. These changes appear to be key to a glycolytic rate depression during anaerobiosis in *S. inaequalis*.

Carpenè E., Gumiero B., Fedrizzi G., Serra R.: Trace elements (Zn, Cu, Cd) in fish from rearing ponds of Emilia-Romagna region of Italy. 13th Conference of European Society for Comparative Physiology and Biochemistry, Antibes, 6-10 October, 1991.

Any correlation has been found between the metal content in the diet and that of the tissues. The source of the rearing waters had no effect in the trace elements patterns which were characteristic of the analyzed organ or species.

Carpenè E., Isani G., Cortesi P.: Cadmium binding proteins in *Scapharca inaequalis*. First SETAC-Europe Conference, Sheffield, 1991.

Preliminary results, based on gel filtration and ion exchange chromatography techniques, have shown the induction of a cadmium binding protein with an identical molecular weight of the metallothionein previously isolated from the fish *Carassius auratus*.

Carpenè E.: Metabolismo di metalli pesanti in animali acquatici. *Heavy metals metabolism in aquatic animals*. Laguna, 5, 52, 1991.

The processes of uptake, accumulation and detoxication of heavy metals in aquatic organisms is reviewed. The induction and distribution of metallothionein in fish and mollusc is also reported; the use of marine mussels as biomonitors of toxic metals is discussed.

Carpenè E.: Struttura e funzione della metallothioneina. *Structure and function of metallothionein*. In: Commemorazione di Giovanni Moruzzi, Editrice CLUEB, 75, 1991.

In this review, the structure and function of metallothionein isolated from different Phyla is reported. Special importance is devoted to metallothioneins which have been isolated from aquatic organisms.

Cattani O., Isani G., Cortesi P., Carpenè E., de Zwaan A.: Adenylate energy charge and metallothionein in *Mytilus galloprovincialis* after exposure to cadmium. Abstract 36° Congresso Nazionale della Società Italiana di Biochimica, Ferrara, 1991.

In order to evaluate if the variations of adenylate energy charge (AEC) can be an useful biochemical indicator of sublethal damage caused by heavy metals, specimens of *Mytilus galloprovincialis* were exposed in sea water containing cadmium (0.5 ppm). Afterwards in muscle, gills and hepatopancreas were determined Cd (A.A.S), AEC (H.P.L.C), Metallothionein (gel filtration). Results indicated that all the tissues accumulate Cd. AEC values were reduced in the treated animals, suggesting that some ATP could be used in the detoxification processes and that the protective role of the metallothionein seemed not to be effective.

Cattani O.: Metabolismo anaerobico del mollusco bivalve *Scapharca inaequivalvis*. *Anaerobic metabolism of the clam Scapharca inaequivalvis*. Abstract 36° Congresso Nazionale della Società Italiana di Biochimica, Ferrara, 1991.

Scapharca inaequivalvis presents an anaerobic metabolism typical of the good facultative anaerobes, with a high flexibility resulting in the formation of several anaerobic end products (alanine, strombine + alanopine, octopine, succinate and propionate). The bivalve is able to depress at high extent the metabolic rate during anoxia. The metabolic arrest is allowed by modifications, during the anaerobiosis, of kinetic parameters of PK, PFK, and glycogen phosphorylase, that lead to less active enzymes. All these factors determine its prolonged survival time during anoxia phenomena occurring in the Adriatic sea area in the last two decades.

Conte L.S., Serrazanetti G.P., Baraldi R.: *Lipid composition of Rapana venosa, an imported species in the Adriatic Sea*. Proceedings 13th International Symposium of Capillary Chromatography, I, 712, 1991, Huetig ed., Heidelberg.

The composition of the lipid fraction of gastropod mollusc *Rapana venosa* recently settled in the Adriatic Sea was analyzed. Fatty acid composition was determined with two different capillary columns to admit different ECL calculation for a correct identification of isomers. 18:1 ω 9 and 16:0 are the most abundant fatty acids but several polyunsaturated fatty acids, characteristic of marine fats, were determined. The kind of trans methylation adopted, admitted the simultaneous elution of squalene, sterols and fatty acid methyl esters. Squalene is about 0.1% of this fraction, while cholesterol is 13.0%. Qualitative composition of free and esterified sterols is quite similar. n-C21 and squalene are the main aliphatic hydrocarbons.

Crociani F., Selli A., Crisetig G., Di Gioia D., Matteuzzi D.: *L-lysine production at 65°C by auxotrophic-regulatory mutants of Bacillus stearothermophilus*. J. Ind.Microbiol., 8, 127, 1991.

The amino acid L-lysine was produced from auxotrophic-regulatory mutants of *Bacillus stearothermophilus* at a temperature of 60-65°C. One of the mutants (AEC 12 A5, S-(2-aminoethyl)-cysteine^r, homoserine⁻), produced L-lysine at the concentration of 7.5 g/l in shaken flasks in minimal medium containing 5% glucose. Culture conditions for optimizing L-lysine production were not investigated. The aspartokinase activity of the wild strain *B. stearothermophilus* Zu 183 was inhibited by lysine alone and by threonine plus lysine. AEC resistant mutants showed an aspartokinase activity genetically desensitized

to the feedback inhibition. Optimal temperature and pH of aspartokinase were 45°C and 9.5, respectively. The data provide significant evidence that mutants of the species *B. stearothermophilus* have a potential value for amino acid production.

Dalla Libera L., Carpenè E., Theibert J., Collins J.H.: *Fish myosin alkali light chains originate from two different genes.* J. Muscle Res. Cell Motil., 12, 366, 1991.

We have determined the amino acid sequences of mullet white skeletal muscle myosin alkali light chains, LC1 and LC3. There are 29 differences between the mullet LC1 and LC3 sequences, spread throughout all regions of their polypeptide chains, leading us to conclude that fish myosin alkali light chains originate from two different genes. This finding is in sharp contrast to all previous studies on vertebrate fast skeletal muscle myosins which showed that LC1 and LC3 are produced from a single gene by alternative RNA transcription and splicing, yielding proteins which differ only in their N-terminal segments.

De Vooy C.G.N., De Zwaan A., Roos J., Carpenè E., Cattani O.: *Anaerobic metabolism of erythrocytes of the arcid clam Scapharca inaequivalvis: effects of cadmium.* Comp. Biochem. Physiol., 98B, 169, 1991.

Anaerobic metabolism was studied in erythrocytes of the bivalve *Scapharca inaequivalvis* and compared with other tissue cells. In all cells aspartate reserves are utilized and alanine and succinate accumulate. Erythrocytes are distinct from other tissues as regard the anaerobic energy supply. Phosphoarginine is not stored in the erythrocytes. The low glycogen content and the absence of glycogen phosphorylase indicate that the former cannot serve as anaerobic fuel. Exposure to Cd did not influence the energy charge but the increase of alanine was significantly lowered.

Massa D.: *Fall-out radioattivo e prodotti della pesca. Radio-active fall-out and fishing products.* Atti Soc. Ital. Sci. Vet., 45, 105, 1991.

The presence of radio-nuclides in fishing products is analyzed. The incidence of radio-nuclides in fishing products of the Northern Adriatic Sea after the Chernobyl fall-out was insignificant.

Orlandini G., Loir M., Bacciottini F., Reali N., Troglia M.G., Viviani R., Casti A.: *Changes of tissue polyamine content in different teleosts under various experimental conditions.* Italian Biochemical Society Transactions, 2, 307, 1991. 36° Congresso Nazionale della Società Italiana di Biochimica, Ferrara, 1991.

In the present paper we show how aging, and seasonal changes of water temperature also modify the concentration of polyamines in several tissues of some fish. We studied the effect of age in two warm water fish as sea bass and gilthead (*Sparus auratus*) and the effect of water temperature in sea bass and in a cold water fish: the rainbow trout (*Salmo irideus* Gibb). Data show a significant decrease of the heart and white muscle polyamine content in the sea bass by lowering the environmental temperature. An opposite trend

occurs in the rainbow trout when a decrease of the water temperature causes a significant increase of heart and white muscle polyamine. Any variation was observed for liver and brain of both kind of fish. Taken together these data indicate that both the age and the environmental temperature modify tissue polyamine content and pattern in a different way accordingly to their evaluation in cold or warm fishes.

Pagliarani A., Trombetti F., Pirini M., Ventrella V., Trigari G., Borgatti A.R.: *Cation stimulated ATPase activities in the midgut gland and other tissues from the marine mussel Mytilus galloprovincialis Lamarck.* 36° Congresso Nazionale della Società Italiana di Biochimica, Italian Biochemical Society Transactions (IBST), 2, 308, 1991.

In mussel gills, mantle and midgut gland two Na^+ -dependent Mg^{2+} -ATPase activities are detected: the classical $(\text{Na}^+ + \text{K}^+)$ -ATPase and an ouabain-insensitive ATPase exhibiting far higher enzyme activity than that of the former. The latter ATPase which can be also activated by monovalent cations other than Na^+ and shares many features with the so-called Na^+ -ATPase of vertebrate tissues, may play a main role in monovalent cation regulation of mussels.

Piretti M.V., Pagliuca G.: *Nuove prospettive nello studio dei prodotti di ossidazione dei lipidi di membrana. New perspectives on the study of the lipid membrane oxidation products.* in: Accademia delle Scienze dell'Istituto di Bologna - Classe di Scienze fisiche Commemorazione di Giovanni Moruzzi Ed. CLUEB, Bologna, 255, 1991.

The study of the chemical composition of the oxidation products of lipids requires both specific analytical methods and rapid execution in order to avoid the formation of artefacts during the various analytical steps. This requirement is greater when the study is carried out on cellular membrane lipids; in fact the amounts of lipids normally available in this case are extremely small and, moreover they frequently contain very small quantities of the primary oxidation products. For these reasons the use of a suitable methods for the lipid sample preparation is recommended.

Piretti M.V., Pagliuca G.: *Regeneration of column activity after the gas chromatographic separation of membrane lipids on thermostable SE-52 phase.* J. Chromatog., 585, 342, 1991.

The phosphoglyceride/cholesterol ratio of membrane lipids may be approximately determined by GLC, by direct injecting into a short capillary column the lipid material extracted from the tissues according, for instance, to the Folch procedure. However, as a result of the pyrolysis of the injected material, in the course of the separation acidic substances are produced that deactivate the stationary phase. With the aid of a suitable scavenger, such as diethylenetriamine, it is possible to regenerate the column activity.

Piretti M.V.: *La perossidazione lipidica negli alimenti. Lipid peroxidation in food.* Atti del simposio su La produzione agro-alimentare: prospettive per la nutrizione dell'uomo verso il 2000. Modena, 2-3 Ottobre, 1991.

This is an overview on the lipo-oxidative processes which cause the food deterioration and on the toxic effects that these products produce on animal health.

Serrazanetti G.P., Conte L.S., Carpenè E., Bergami C., Fonda Umani S.: *Distribution of aliphatic hydrocarbons in plankton of the Adriatic Sea open waters.* Chemosphere, 23, 925, 1991.

Aliphatic hydrocarbons were determined in plankton of the Adriatic Sea open waters in order to evaluate distribution, concentration and origin of these compounds. The samples were collected in eight different stations during two cruises in spring and in summer. The results obtained enable us to divide the samples into two main groups. The first where some biogenic hydrocarbons are dominant, the second where fossil hydrocarbons prevail. In spring samples the average concentrations are significantly higher than in summer samples. This could be linked to the presence in spring of large amounts of recently biosynthesized hydrocarbons in the Adriatic environment or to more active physical, chemical and biochemical processes of release and degradation during the warm season.

Serrazanetti G.P., Conte L.S., Cortesi P., Totti C., Viviani R.: *Seasonal variations of aliphatic hydrocarbons in *Sardina pilchardus* (Walb.) (Teleostei: Clupeidae) tissues.* Marine Chemistry, 32, 9, 1991.

Aliphatic hydrocarbons were determined in some tissues of *Sardina pilchardus* collected during different seasons in the Adriatic Sea. The aim of this research was to evaluate presence, origin and metabolic fate of these compounds. The highest amounts of total hydrocarbons were detected in June and September. Among the tissues, the highest concentrations were found in mesenteric fat, *n*-C₁₇, among the saturated hydrocarbons, and isoprenoid squalene among the unsaturated were in general clearly predominant. In all the tissues and during all periods of the year the prevailing hydrocarbons are considered to be of recent biological origin. It is possible to exclude contamination of *S. pilchardus* by petroleum.

Serrazanetti G.P., Conte L.S., Pagnucco C., Bergami C.: *Identificazione di alcuni costituenti lipidici nella cera di *Squilla mantis*. Lipid constituents in *Squilla mantis* waxes.* Atti Soc. Ital. Sci. Vet., 45, 605, 1991.

In the lipid extract of wax of *S. mantis* some important lipid constituents (hydrocarbons, sterols, fatty acids, triglycerides) were separated and identified by chromatographic techniques. Among the isolated compounds, the recent biological origin hydrocarbons are prevailing. Cholesterol percentage is quite higher with respect to that of the other identified sterols. The fatty acids which present the highest concentrations are 16:0, 16:1, and 22:6.

Theibert J.L., Murphy C., Fenselau C., Dalla Libera L., Carpenè E., Collins J.: *Sequencing of fish myosin light chain by mass spectrometry and Edman degradation.* 5th Symposium of the Protein Society, Baltimore, June 22-26, 1991.

Using a combination of mass spectrometry and Edman degradation, we determined the aminoacid sequences of three light chains of mullet white skeletal myosin. These are the first available fish myosin sequences.

Ventrella V., Pagliarani A., Trombetti F., Trigari G., Borgatti A.R.: *Some properties of kidney (Na⁺+K⁺)-ATPase in trout (Oncorhynchus mykiss Walbaum) adapted to fresh-and brackish water.* 36°Congresso Nazionale della Società Italiana di Biochimica, Italian Biochemical Society Transactions (IBST), 2, 312, 1991.

Kidney (Na⁺+K⁺)-ATPase susceptibility to some assay parameters (pH and MgATP, Na⁺, K⁺ concentrations) and to the inhibitor ouabain was investigated in two groups of rainbow trout adapted to fresh- and brackish water. The constancy of the enzyme features in the two habitats suggests that in this tissue the enzyme role is probably unrelated to the environmental salinity.

Viviani R., Crisetig G., Serrazanetti G.P.: *Inquinanti chimici conservativi e risorse biologiche del Mare Adriatico. Conservative chemical pollutants and biological resources of the Adriatic Sea.* Accademia delle Scienze dell'Istituto di Bologna, Classe di Scienze Fisiche, Commemorazione di Giovanni Moruzzi, Editrice Clueb, Bologna, 327, 1991.

The results obtained in the years 1967-1990 by researchers from the Institute of Biochemistry (Faculty of Veterinary Medicine), the Centro Universitario di Studi e Ricerche sulle Risorse Biologiche Marine di Cesenatico, and the Section of Veterinary Biochemistry, Department of Biochemistry, University of Bologna, on the effects of conservative chemical pollutants (metals, chlorinated hydrocarbons, aliphatic hydrocarbons, aromatic polycyclic hydrocarbons) on the biological resources of the Adriatic Sea are reviewed and also related to the tolerance limits for seafood consumption by humans. The whole of data may be referred to as the basis for future evaluation of the trend of biological resources and of the possible effects of further contamination by conservative pollutants on pelagic and benthic trophic chains of the Adriatic Sea.

Viviani R.: *Biotossine marine e prodotti della pesca e dell'acquicoltura. Marine biotoxins, fishery and aquaculture products.* Atti Soc. Ital. Sci. Vet., 45, 115, 1991.

Marine biotoxins harmful to humans, marine vertebrates and invertebrates are here overviewed. In most countries widespread biointoxications by consumption of bivalve mollusks are at present due to PSP and DSP. Biointoxication by fish consumption such as ciguatera and tetrodotoxic-puffer fish poisoning, though confined to small areas, may affect worldwide consumers through commercial exchanges. Two syndromes due to bivalve poisoning still remain endemic: NSP, confined to Florida and Gulf of Mexico, and ASP (amnesic shellfish poisoning), confined to the Atlantic Canadian coasts. As far as marine biotoxins are concerned, the veterinarian, other than ensuring the sanitary quality of seafood, may contribute to an ecological management of marine coastal environment.

1992

Bombardelli E., Lolla A., Pace R., Willman R., Piretti M.V.: *Proanthocyanidins from Piliostigma thonningii: chemical and pharmacological properties.* 40th Annual Congress on Medicinal Plant Research, Trieste, September 1-5, 1992.

Piliostigma thonningii Schum., a shrubby plant of the Caesalpinaceae family growing in

African tropical and sub-tropical countries, has long been used in folk medicine by natives for the treatment of cough, lung diseases, and gums inflammation but, in spite of its widespread use, the plant was until now poorly investigated. Commonly, the leaves or the trunk and root bark are used as a water infusion or boiled in milk and in the present study all these parts of the plant have been chemically screened and submitted to the bioassay.

Boni L., Mancini L., Milandri A., Poletti R., Pompei M., Viviani, R.: *First cases of diarrhoeic shellfish poisoning in the Northern Adriatic Sea.* Sci. Total Environ., Suppl. (R.A. Vollenweider, R. Marchetti, R. Viviani, Eds), 419, 1992.

In June 1989 several cases of food poisoning characterized by vomiting, abdominal pain and diarrhoea were recorded along the coast of Emilia-Romagna and Marche, facing the north-western Adriatic Sea. The poisoning was attributed to shellfish ingestion, mostly mussels. Microscopic investigations revealed the presence of *Dinophysis* spp. in seawater and mussels guts. *Mytilus galloprovincialis*, *Venus gallina*, *Tapes semidecussatus*, and *Venus verrucosa* have been monitored for toxin by mouse bioassay and diarrhoeic shellfish (DSP) was detected only in mussels. Shellfish samples from Friuli-Venezia Giulia, Veneto, Emilia-Romagna and Marche were monitored for toxin and from June 22 a temporary prohibition on mussels fishing for the period of DSP was imposed.

Borgatti A.R., Pagliarani A., Ventrella V.: *Gill (Na⁺+K⁺)-ATPase involvement and regulation during salmonid adaptation to saltwater.* Comp. Biochem. Physiol., 102A, 637, 1992.

The involvement of gill (Na⁺+K⁺)-ATPase in salmonid adaptation to saltwater (SW) is discussed. Gill (Na⁺+K⁺)-ATPase increase during SW adaptation is mainly related to the increased number and complexity of chloride cells deputed to salt extrusion. During salmonid smoltification the temporal relationship between serum rise of several hormones (T₄, T₃, cortisol, prolactin, GH) and enzyme rise suggests that the enzyme enhancement and thus the acquirement of SW tolerance is under hormonal control. Literature on gill (Na⁺+K⁺)-ATPase response to hormonal treatments is reviewed. The effects produced on the enzyme and chloride cells by exogenous hormones point out a complex interrelationship between the hormones considered, though the mechanisms involved remain a matter of debate.

Carpenè E., Boni L., Naldi S., Gorini A.: *Effects of zinc, copper, iron and cadmium on the marine algae *Cylindrotheca fusiformis* and *Prorocentrum micans*.* In: Marine Eutrophication and Population Dynamics, G. Colombo, I. Ferrari, V.U. Ceccherelli and R. Rossi Eds, Olsen and Olsen, Fredensborg, Denmark, p.129, 1992.

The marine algae were exposed to solutions of zinc, copper, iron and cadmium. Copper was the most toxic element whereas cadmium showed the highest bio-magnification factor. Both species showed continuous cadmium accumulation throughout the experimental exposure period. No specific metal-binding protein was isolated from the diatom cytoplasm; only a small amount of a low cadmium-binding ligand was present in the dinoflagellate supernatant.

Carpenè E., Boni L., Wynne D.: *Heavy metals (Cd, Zn, Cu, Fe) in Dinoflagellates.* Ital. J. Biochem., 41, 239, 1992.

Planktonic algae have wide absorbing surfaces which should quickly interfere with solutes dissolved in the water media. We have studied the effects of zinc, copper, iron and cadmium on the freshwater dinoflagellate *Peridinium cinctum* (from lake Kinneret) and the marine flagellate *Prorocentrum micans* (from Adriatic Sea). Copper was rather toxic for both species, whereas iron as Fe(III) was less toxic.

Carpenè E., Boni L.: *Effects of heavy metals on the algae Nitzschia closterium and Prorocentrum micans.* Sci. Total Environ. Suppl., 921, 1992.

The effect of cadmium, zinc, copper and iron on algal growth was investigated. Heavy metal levels increased in exposed algae with respect to the controls. After centrifugation of the crude homogenate most of the metal was present in the pellet. Gel filtration of the cytosolic preparation failed to show the presence of specific metal binding ligands.

Carpenè E., Camatti A., Isani G., Cattani O., Cortesi P.: *Cd-metallothionein in liver and kidney of goldfish (Carassius auratus): effects of temperature and salinity.* Ital. J. Biochem., 41, 273, 1992.

Treatment of goldfish with cadmium, by intraperitoneal injection, resulted in cadmium-metallothionein synthesis mainly in liver and kidney. The relative amount of cadmium-metallothionein was always greater in fish maintained at 20 °C compared to those reared at 10°C, indicating a temperature dependence of metallothionein biosynthesis; in the kidney this dependence was not so clearly evident.

Carpenè E., Tirelli E., Govoni S., Catelli E., Perco F., Maestrini N.: *Lead, cadmium, zinc and copper in some species of waterfowl.* Proceedings of 9th International Symposium on Waterfowl, 179, Pisa 16-18 September 1992.

In the present paper the metal composition (lead, cadmium, copper and zinc) of six tissues (brain, kidney, liver, bone, muscle and intestine) taken from waterfowl of Italy (mute swan, pochard and wigeon) is reported. High levels of hepatic copper were found in the mute swan.

Cattani O., Corni M.G.: *The role of zooplankton in eutrophication, with special reference to the Northern Adriatic Sea.* Science of the Total Environment, Suppl., 137, 1992.

Because of its peculiar morphological and hydrological characteristics the Adriatic Sea can be considered as three different regions. Zooplankton populations change according to environmental features and show increasing neritic characteristics from south to north. The northern area of the basin is marked by strictly neritic populations, with low specific diversity and high biomass. It is apparent that biomass values of northern adriatic zooplankton is always higher than those of the other Mediterranean areas. Net zooplankton and microzooplankton play a basic role in the control of phytoplankton through the fast regenerating processes of nutritive salts and their predatory action.

Cattani O., Isani G., Carpenè E., Vitali G., Cortesi P.: Sopravvivenza e parametri biochimici nella anaerobiosi di *Tapes philippinarum*. *Survival and biochemical parameters in the anaerobiosis of Tapes philippinarum*. Oebalia, suppl., 17, 563, 1992.

In this paper anoxic survival data and biochemical parameters of the anaerobiosis of *Tapes philippinarum* are reported. This bivalve species showed anoxia survival time (LT₅₀ value of 12 days) intermediate between the ones of *Scapharca inaequivalvis* and *Venus gallina*. Data on energy substrate decrease and end product accumulation suggests that *T. philippinarum* exhibits an anaerobic metabolic pathway typical of good anaerobe facultative animals.

Cattani O., Isani G., Danesi A., Vitali G., de Zwaan A., Cortesi P.: Effetti dell'idrogeno solforato e del cianuro sulla sopravvivenza e sulla attivazione del metabolismo anaerobico in molluschi bivalvi dell'Adriatico. *Sulfide and cyanide effects on survival and activation of the anaerobic metabolism in adriatic molluscs*. Atti Congresso Nazionale della Società Italiana di Biochimica, Perugia, Italian Biochemical Society Transactions (IBST), 3, 107, 1992.

Data on effects of sulfide and cyanide on marine bivalves *Scapharca inaequivalvis* and *Mytilus galloprovincialis* are reported. In *Scapharca* the presence of H₂S or cyanide in normoxia determined the death of the animals in 8.7 e 11.2 days respectively. When sulfide was added in anoxic condition the animal showed a more rapid mortality with respect to mere anoxia. This was probably due to a lower capacity of metabolic arrest. In the two species considered, a strong similarity could be observed relatively to the anaerobic metabolism induced by both toxicants. In fact in normoxic conditions sulfide and cyanide determined the utilisation of aspartate and the accumulation of anaerobic end products more pronounced than in anoxia (remarkable the presence of octopine in the muscle tissues). Octopine was not accumulated in *in vitro* incubated erythrocytes of *Scapharca*.

Davalli P., Carpenè E., Astancolle S., Viviani R., Corti A.: Cadmium induction of renal and hepatic ornithine decarboxylase activity in the rat, effects of sex hormones and involvement of the renin-angiotensin system. *Biochem. Pharmacol.*, 44, 721, 1992.

We investigated the effect of sex hormones on the sex-dependent response of rat kidney decarboxylase activity to cadmium administration and the involvement of the renin-angiotensin system in mediating stimulation of the liver enzyme by the metal. The response of renal ornithine decarboxylase to cadmium, which occurs in intact adult males but not in females, is also detectable in prepubertal and castrated males. Cadmium caused an increase in renin activity starting minutes after its injection. It is suggested that cadmium may induce liver ornithine decarboxylase through the increase in angiotensin II following stimulation of renin by the metal.

Fattorusso E., Ciminiello P., Costantino V., Magno S., Mangoni A., Milandri A., Poletti R., Pompei M., Viviani R.: Okadaic acid in mussels of the Adriatic Sea. *Mar. Pollut. Bull.*, 24(5) 234, 1992.

The diarrhoeic shellfish poisoning from mussels, collected in the main producing areas in the seawater off the coast of Emilia-Romagna (Italy) has been investigated. The ether soluble material from hepatopancreas of highly toxic mussels (*Mytilus galloprovincialis*) was partitioned between n-hexane and methanol-water 9:1. The hydromethanolic phase was successively subjected to repeated chromatographic separations (SiO_2 , Sephadex LH-20 and reversed-phase HPLC). Following the toxicity of each fraction by mouse lethality test, the presence of okadaic acid has been evidenced through ^1H NMR spectroscopy. The investigation of two further toxic fractions is still in progress. The obtained results represent an initial contribution to current Italian legislation and to future health measures to be defined at European Community level.

Licastro F., Morini M.C., Chiricolo M., Belletti D., Malpassi P., Parente R., Carpenè E., Conte R.: *Functional assessment of cellular non-specific and specific immunity in selected healthy elderly.* Arch. Gerontol. Geriatr. (Suppl. 3), 219, 1992.

Healthy elderly were selected according to a simplified SENIEUR admission protocol including clinical, hematological and biochemical parameters. The goal of this protocol was to limit the influence of diseases and/or medications on the assessment of immune functions in the elderly. Plasma zinc levels of healthy elderly were comparable to those of young subjects. Cellular non-specific immunity was determined by measuring chemiluminescence of peripheral blood granulocytes activated by opsonized zymosan particles. Chemiluminescence of granulocytes from healthy elderly was delayed in comparison to that of young controls when autologous serum was used.

Pagliarani A., Pirini M., Trombetti F., Ventrella V., Trigari G.: *Occurrence and salinity dependence of an ouabain-insensitive Na^+ -ATPase activity in the intestine of rainbow trout (*Oncorhynchus mykiss* Walbaum).* 37° Congresso Nazionale della Società Italiana di Biochimica, Italian Biochemical Society Transactions (IBST), 3, 109, 1992.

The intestinal Na^+ -ATPase exhibits similar features in trout adapted to fresh-(FW) and brackish water (BW), but it exhibits a lower enzyme activity in BW. This activity change opposite to that of the coexistent ($\text{Na}^+ + \text{K}^+$)-ATPase alters the reciprocal incidence of the two ATPases in FW and in BW. A different efficiency of the two Na^+ pumps in the two habitats is suggested.

Pagliuca G., Piretti M.V.: *A useful procedure to investigate the chemical composition of neutral ether lipids.* Italian Biochemical Society Transactions (IBST), 3, 118, 1992.

Some analytical methods have been proposed to investigate neutral ether lipids chemical composition, however — because of the ether lipids are more susceptible to autoxidation than ester lipids — the use of methods that minimise the oxidation's risk is awfully advisable. During previous investigations about membrane lipid oxidation products, a procedure to transmethylate polar and neutral glycerides had been set up. Such reaction is carried out into a reducing medium and may be adjusted to identify the fatty acid and the glyceril-ether moiety of alkoxyglycerides. This paper represents a brief report on the usefulness of the modified procedure in order to investigate the chemical constitution of neutral ether lipids.

Piretti M.V., Pagliuca G.: *Contribution to the study of lipid oxidation products: investigation of model and biological systems.* Rev. Fr. Corps Gras, 39, 15, 1992.

Using a new analytical procedure, the oxidation products of two model systems, *i.e.* oxidised soy-bean and egg lecithins and those naturally present in microsomal phospholipids of rat liver cells, have been investigated. The products obtained following treatment of the model lecithin systems with the ART-reagent contained a mixture of allyl hydroxy- and epoxy-C18 methyl esters, together with saturated hydroxy-C18 methyl esters, the formation of which corresponded to a non-regiospecific water addition to the Δ^9 double bond of the octadecenoate moieties. Treatment of the microsomal phospholipids with the ART-reagent allowed us to isolate some novel hydroxyl derivatives the structure of which formally corresponded to a regiospecific water addition to a well-defined double bond of linoleic and arachidonic acid moieties.

Piretti M.V., Tarnai E.A., Pagliuca G.: *Sui costituenti polifenolici del ciliegio (*Prunus avium L.*). On the polyphenol constituents of cherry tree (*Prunus avium L.*).* Rivista di Frutticoltura, 6, 73, 1994. Atti del Convegno del ciliegio, Vignola (MO) 10-11 giugno, 1992.

Seven different tissues from cherry-tree *Prunus avium L.* (Durone della Marca variety): bark; phloem; xylem; peduncle; leaves, ripe and unripe fruits have been studied. Total polyphenols — extracted by aqueous methanol — have been fractionated according to suitable procedures to separate the oligomeric fractions by the polymeric ones. Oligomeric polyphenols have been identified whether by thin layer chromatography (TLC) or high performance liquid chromatography (HPLC) and — if necessary — by mass spectrometry. By using corresponding HPLC calibration curves, most of them have been quantified as peracetyl derivatives. Polymeric fractions have been suitably degraded and the constituting monomeric units have been analysed again whether by TLC or HPLC to obtain information about chemical constitution of the different polymeric fractions.

Pirini M., Trigari G., Ventrella V., Pagliarani A., Trombetti F.: *Lipid composition and mitochondrial respiration in liver of T_3 -treated freshwater trout (*Salmo gairdneri Richardson*) before saltwater transfer.* Ital. J. Biochem., 41, 245A, 1992.

Liver lipid composition and mitochondrial respiratory activities in T_3 -treated rainbow trout were investigated. Analyses were carried out in parallel both on freshwater trout treated with T_3 and then transferred to saltwater with treatment suspension and on untreated trout subjected to the same rearing procedure. In spite of the T_3 serum level doubling in the treated trout, no difference between the two groups arose both in lipids and in mitochondrial respiratory activities. The difference with mammals whose lipid metabolism and mitochondrial respiration are known to be affected by T_3 is discussed.

Selli A., Boni L., Wynne D., Carpené E., Viviani R.: *The influence of orthophosphate on nitrate reductase activity in *Alexandrium spp.** Sci. Total Environ., Suppl. (R.A. Vollenweider, R. Marchetti, R. Viviani, Eds), 929, 1992.

The marine dinoflagellate *Alexandrium sp.* was isolated from the Adriatic Sea and laboratory cultures were grown in *f/2*-enriched seawater at initial ambient inorganic orthopho-

sphate (SRP: soluble reactive phosphate) concentrations ranging from 0.3 to 200 μM . Under these conditions, total cellular P varied between 0.1 and $6 \times 10^{-6} \mu\text{moles cell}^{-1}$. Activity of nitrate reductase (NR) rose with increasing SRP concentrations, reaching maximum values at about 20 μM . Moreover, even at a constant N:P atomic ratio (24.4), a strong dependency of NR on SRP concentrations was observed. Activity of NR in *Alexandrium* sp. was found to be strongly related to the division rate of the cells.

Serra R., Isani G., Carpenè E.: Variazioni Stagionali di elementi traccia in *Sparus auratus*. *Seasonal variations of trace elements in Sparus auratus*. Atti Soc. Ital. Sci. Vet., 46, 777, 1992.

Specimens of seabream, during two different season (winter and autumn), were fed with artificial diets. Metal concentrations (Zn, Cu, and Cd) in different organs were determined by atomic absorption spectrophotometry. Interestingly zinc concentrations in tissues were significantly higher in autumn than in winter.

Serrazanetti G.P., Conte L.S., Pagnucco C., Bergami C., Milani L.: Sterol content in zooplankton of Adriatic Sea open waters. *Comp. Biochem. Physiol.*, 102B, 743, 1992.

Sterol content was determined in zooplankton of Adriatic Sea open waters. Samples were collected in spring and summer from eight different stations. Concentrations of the total sterols were higher in summer samples. Cholesterol was the main sterol with percentages between 45.4 and 57.9. Amongst the other identified sterols, only desmosterol, 22-dehydrocholesterol and brassicasterol are over 10% in some samples.

Serrazanetti G.P., Conte L.S., Pagnucco C., Bergami C.: Identification of lipid constituents in Algae of the Adriatic Sea. *Ital. J. Biochem.*, 41, 264A, 1992.

Given the great variety of lipid constituents in marine organism hydrocarbons, sterols, fatty acids and neutral lipids were analyzed in four species of macroalgae. The n- C_{17} is clearly the dominant hydrocarbon in every species except for *Ulva lactuca* where a monoolefine with 17 carbon atoms is 78% of total concentration. Among the several sterols detected, cholesterol is present in amount close to 90% in two red algae. In *C. fragile* and *U. lactuca* (green algae), respectively, 24-ethyl-cholesta-5,22-dien-3 β -ol (84,6%) and 24-ethyl-cholesta-5,24-(28)-dien-3 β -ol (84,8%) are prevailing. By gas chromatography it has been possible to observe waxes with molecules of 36, 38 and 40 carbon atoms.

Trigari G., Pirini M., Ventrella V., Pagliarani A., Trombetti F., Borgatti A.R.: Lipid composition and mitochondrial respiration in warm-and cold-adapted sea bass. *Lipids*, 27, 371, 1992.

The response to cold of liver and heart membrane lipid composition and mitochondrial respiration in reared sea bass (*Dicentrarchus labrax* L.) was investigated. Cold acclimation was performed by following the natural seasonal cycle from August to March. The data on the fatty acid composition of liver and heart polar lipids and on total lipids of liver mitochondria and microsomes did not indicate any increase in unsaturation in re-

sponse to cold. The enzyme complexes of the liver and heart mitochondrial respiratory chain showed a repeated negative compensation for cold acclimation. The whole of data suggests a thermoadaptive strategy based on the reduction of sea bass metabolic activities.

Trombetti F., Ventrella V., Pagliarani A., Pirini M., Borgatti A.R., Trigari G.: Attività ATPasiche stimulate da cationi monovalenti in microsomi di mantello di *Mytilus galloprovincialis* Lamarck. *ATPase activities stimulated by monovalent cations in mantle microsomes from Mytilus galloprovincialis Lamarck*. *Biologia Marina*, 1, 129, 1993 e Atti del 23° Congresso Nazionale della Società Italiana di Biologia Marina (SIBM), 32, 1992.

The $(\text{Na}^+ + \text{K}^+)\text{-ATPase}$ and the ouabain-insensitive $\text{Na}^+\text{-ATPase}$ coexist in mussel mantle microsomes and respectively exhibit specific responses to assay parameters as well as to inhibitors. The prevalence of the $\text{Na}^+\text{-ATPase}$ on the $(\text{Na}^+ + \text{K}^+)\text{-ATPase}$ activity is related to a presumptive preminent $\text{Na}^+\text{-ATPase}$ role in ionic regulation in lower phyla.

Ventrella V., Pirini M., Trombetti F., Pagliarani A., Trigari G., Borgatti A.R.: Occurrence of Mg^{2+} -dependent monovalent cation-sensitive ATPase activities in the mussel *Mytilus galloprovincialis*. *Ital. J. Biochem.*, 41, 268A, 1992.

The two distinct Mg^{2+} dependent ATPases found in mussel midgut gland, the ouabain-sensitive $(\text{Na}^+ + \text{K}^+)\text{-ATPase}$ and a ten fold higher ouabain-insensitive ATPase, differ in their activation by monovalent cations. While the former is obligatorily activated by Na^+ , the latter can be activated by Na^+ , K^+ , Rb^+ , NH_4^+ and Li^+ , with similar optimal concentration and kinetics. The 100% inhibition by 3 mM ethacrynic acid confirms that mussel $\text{Na}^+\text{-ATPase}$ is similar to vertebrate $\text{Na}^+\text{-ATPase}$. The presumptive role of the monovalent cation-activated ATPase in ionic-regulation of mollusks is discussed.

Ventrella V., Trombetti F., Pagliarani A., Trigari G., Pirini M., Borgatti A.R.: Salinity dependence of the ouabain-insensitive Mg^{2+} -dependent $\text{Na}^+\text{-ATPase}$ in gills of rainbow trout (*Oncorhynchus mykiss* Walbaum) adapted to fresh-and brackish water. *Comp. Biochem. Physiol.*, 101B, 1, 1992.

Rainbow trout adapted to freshwater (FW) and brackish water (BW) exhibit an ouabain insensitive gill $\text{Na}^+\text{-ATPase}$ activity whose features are similar to that previously found in other osmoregulatory organs from euryhaline teleosts. The $\text{Na}^+\text{-ATPase}$ activity is higher in FW than in BW, at odds with the coexistent $(\text{Na}^+ + \text{K}^+)\text{-ATPase}$. The enzyme response to the assay pH, MgATP and Na^+ concentrations is quite similar in the two habitats. The possible role of the $\text{Na}^+\text{-ATPase}$ is discussed and related to teleost osmoregulation under different salinity conditions.

Ventrella V., Trombetti F., Pirini M., Pagliarani A., Trigari G.: Intestinal $(\text{Na}^+ + \text{K}^+)\text{-ATPase}$ activity in rainbow trout (*Oncorhynchus mykiss* Walbaum) adapted to fresh-and brackish water. 37° Congresso Nazionale della Società Italiana di Biochimica, Italian Biochemical Society Transactions (IBST), 3, 108, 1992.

The ($\text{Na}^+ + \text{K}^+$)-ATPase response to the assay conditions (pH and MgATP, Na^+ and K^+ concentrations) and to the inhibitors ouabain and ethacrynic acid is similar in fresh- and brackish water. Conversely the enzyme activity is higher in brackish water. The enzyme modulation by environmental factors in the intestine may involve possible changes in the enzyme microenvironmental lipids, rather than acting on habitat specific enzyme properties.

Viviani R.: *Eutrophication, marine biotoxins, human health.* Sci. Total Environ., Suppl. (R.A. Vollenweider, R. Marchetti, R. Viviani, Eds.), 631, 1992.

Eutrophication phenomena in marine coastal waters today can be explained on the basis of natural or anthropogenic causes. Undesirable effects and also sanitary problems in both types of eutrophication are often produced. At present, toxins from blooms or red tide dinoflagellates are known to be responsible for four bio-intoxications: paralytic shellfish poisoning (PSP) neurotoxic shellfish poisoning (NSP), diarrhoeic shellfish poisoning (DSP), venerupin poisoning. Another bio-intoxication is due to diatom bloom: amnesic shellfish poisoning (ASP). Pathologic phenomena in the respiratory tract are present in association with NSP. Other biotoxins produced by blue algae blooms have effects on the skin. Particular attention is paid to the chemical structure of the biotoxins and to their mechanism of action on a molecular level in order to better understand the biochemical lesion caused by these structures, the damage caused to cells and the consequent health risk and possible therapy.

Zwaan A. de, Cortesi P., van den Thillart G., Brooks S.P., Storey K.B., Roos J., van Lieshout G., Cattani O., Vitali G.: *Energy metabolism of bivalves at reduced oxygen tension.* Science of the Total Environment, suppl., 137, 1992.

This paper describes physiological and biochemical responses of three bivalve molluscs (*Scapharca inaequivalvis*, *Mytilus galloprovincialis* and *Venus gallina*) to reduced oxygen tension. *Scapharca* displayed the highest LT_{50} at reduced oxygen availability, probably due to the presence of haemoglobin in the blood clam. The obtained results showed that *S. inaequivalvis* is apparently better adapted to declining oxygen concentrations in at least two ways: 1) It can regulate, even at very low ambient pO_2 , the oxygen consumption rate at constant level; 2) In anoxia it exhibited the highest energy conservation, being its anoxic ATP utilization about one-half that of the other two species.

1993

Carpenè E., Isani G., Serra R., Vitali G.: *Interazioni tra cadmio e metabolismo anaerobico in Molluschi Bivalvi del mare Adriatico. Interactions between cadmium and anaerobic metabolism in bivalves of the Adriatic sea.* Biologia Marina, Suppl. Società Italiana di Biologia Marina, 1, 115, 1993.

The bivalve molluscs *Mytilus galloprovincialis* and *Scapharca inaequivalvis* accumulate high levels of cadmium when exposed to the metal. Variations in adenylate energy charge and metallothionein were studied in *M. galloprovincialis* after a week of cadmium exposure in different periods of the year.

Carpenè E.: *Metallothioneins in marine molluscs*. In: *Ecotoxicology of Metals in Invertebrates*, P.S. Rainbow and R. Dallinger Eds, Lewis Publishers, Boca Raton, Florida, p.55, 1993.

In the present review, the properties of metallothionein in marine molluscs is reported. The purification and molecular characteristics of metallothionein, isolated from the marine bivalve *Scapharca inaequivalvis* and the marine prosobranch *Murex trunculus*, is reported in detail. The use of reducing agents during the preparation steps is also discussed. The two molluscs, taken from their natural environment, showed evident amounts of cadmium-thionein without previous artificial exposure to the metal.

Cattani O., Cortesi P., Danesi A., Carpenè E., de Zwaan A.: *Aspetti comparati del metabolismo anaerobico in molluschi bivalvi del Mare Adriatico. Comparative aspects of anaerobic metabolism in bivalve molluscs of the Adriatic Sea*. *Biologia Marina, Suppl. Notiz. SIBM (Società Italiana di Biologia Marina)*, 1, 119-124, 1993.

In this paper some aspects of the anaerobic metabolism of *Scapharca inaequivalvis*, *Mytilus galloprovincialis*, *Venus gallina* and *Tapes philippinarum* have been reviewed. Animals survival times during anoxic incubations in laboratory paralleled those in natural environment, characterized by periodic hypoxic/anoxic condition as a consequence of eutrophication phenomena. LT_{50} values resulted in the following order: *S. inaequivalvis* > *M. galloprovincialis* > *T. philippinarum* > *V. gallina*. Our data show that the higher capacity of metabolic arrest allows *S. inaequivalvis* to survive longer than *Venus* and *Tapes*, while its major survival than *M. galloprovincialis* seems due to a greater tolerance to hypoxia.

Cattani O., Isani G., Vitali G., de Zwaan A., Putzer V., Cortesi P.: *Differential utilization of radio labeled substrates in succinate production during anoxic stress*. *Atti 38° Congresso Nazionale della Società Italiana di Biochimica, Italian Biochemical Society Transactions (IBST)*, 4, 122, 1993.

In this work was investigated the role of radio labeled aspartate and glucose in the succinate formation during 12 hour anoxia in *Scapharca inaequivalvis* and *Venus gallina* *in vivo* and in the following anaerobic incubation of posterior adductor muscle *in vitro*. Anaerobic incubation *in vitro* was performed in presence of several metabolic inhibitors (iodoacetate, aminooxyacetate and mercaptopicolinate, inhibitors respectively of glycolysis, transaminases and PEPCK). Data obtained suggest that in both species, during short term-anoxia, the production of succinate depends from aspartate consumption only, whereas it is not operative the utilisation of glycogen by means of PEPCK reaction.

Conte L.S., Pagnucco C., Serrazanetti G.P.: *Simultaneous analysis of several lipid constituents of marine organisms with polar capillary columns*. *Proceedings 15th International Symposium of Capillary Chromatography*, 2, 1321, 1993, Huetig ed., Heidelberg.

Application of whole unsaponifiable GLC elution on TAP capillary column is a preliminary study. This technique may be soundly applied in order to study the several lipid molecules present in the marine environment because it permits a global view of minor constituents present in the samples. The method also admits the isolation of molecules of different chemical structures as well as the comparative quantification of each class.

Dalla Via J., Van den Thillart G., Cattani O.: *Intermediary metabolism and critical levels of hypoxia in the Adriatic sole Solea solea*. *Biologia Marina, Suppl. Notiz. SIBM (Società Italiana di Biologia Marina)*, 1, 109, 1993.

In order to find the critical pO_2 level of hypoxia for the Adriatic sole, the animals were kept in a respirometer to 60, 40, 20, 12% air saturation. The consumption of oxygen at 80% saturation (control condition) was measured after two days of starvation. The animals were sacrificed after 12 hours of hypoxic exposition and intermediary metabolites were determined in blood, muscle and liver. All the tissues show a sharp increase of lactate and glucose below 20% air saturation which clearly indicates the threshold. The sole *Solea solea* survived only for 1-2 hours in anoxic conditions.

Isani G., Carpené E., Serra R., Cortesi P.: *Seasonal variations of Cd-metallothionein and AEC in Mytilus galloprovincialis treated with cadmium*. 14th Conference of European Society of Comparative Physiology and Biochemistry (E.S.C.P.B.), 36, Canterbury, 29 III-2 IV, 1993.

Specimens of *Mytilus galloprovincialis* were sampled in different periods of the year and were exposed to 0.5 ppm of Cd for a week. Cd-metallothionein induced by Cd exposure showed a clear seasonal cycle with a maximum in May- June and a minimum in December. Mt induction can be considered an useful biomarker for the study of cadmium exposure in molluscs, however its presence will not give any information about the toxic effects of the metal. On the other hand, adenylate energy charge (AEC) has been proposed as a biochemical stress index in many organisms. Also AEC showed a clear seasonal cycle with a maximum during the summer and a minimum during the winter. The cycles of both parameters could be related either to the increase in temperature or to the reproductive cycle.

Pagliarani A., Ventrella V., Trombetti F., Pirini M., Trigari G., Borgatti A.R.: Andamento stagionale dell'attività di complessi della catena respiratoria mitocondriale di alcuni tessuti di *Mytilus galloprovincialis* Lam. *Seasonal trend of the activity of mitochondrial respiratory complexes in some tissues of Mytilus galloprovincialis Lam*. *Biologia Marina Mediterranea*, 1, 383, 1994 e *Atti del 24° Congresso Nazionale della Società Italiana di Biologia Marina (SIBM)*, 117, 1993.

The evaluation of mitochondrial respiratory activities in mussel mantle, gills and midgut gland from mussels collected from a mussel farm facing Bellaria (FO) over one year cycle points out remarkable seasonal variations that may be consistent with changes in the energy requirement, in turn presumably related to the reproductive cycle of the species in the North Adriatic Sea.

Pirini M., Ventrella V., Trombetti F., Pagliarani A., Trigari G., Borgatti A.R.: Andamento stagionale delle attività di $(Na^+ + K^+)$ -e Na^+ -ATPasi di *Mytilus galloprovincialis* Lam. *Seasonal trend of $(Na^+ + K^+)$ -and Na^+ -ATPase activities in Mytilus galloprovincialis Lam*. *Biologia Marina Mediterranea*, 1, 381, 1994 e *Atti del 24° Congresso Nazionale della Società Italiana di Biologia Marina (SIBM)*, 116, 1993.

The $(\text{Na}^+ + \text{K}^+) - \text{e Na}^+ - \text{ATPase}$ in gills, mantle and midgut gland monitored in mussels collected from a mussel farm facing Bellaria (FO) over one year cycle, exhibit seasonal variations. The profile of two ATPase activities, evaluated under their respective optimal assay conditions, is independent of salinity seasonal fluctuations and in some tissues is apparently related to the environmental temperature changes. In some cases the activity fluctuations can be related to the biological status of the species.

Reali N., Bacciottini F., Orlandini G., Troglia M.G., Viviani R., Casti A.: *Tissue polyamines and free nucleotides of teleosts during growth.* Trends in Comp. Biochem. Physiol., 1, 933, 1993.

Total polyamines and free nucleotides have been studied in the heart, red and white muscle, brain and liver of one and two years old European sea bass (*Dicentrarchus labrax L.*) and gilthead (*Sparus auratus L.*). The liver has the highest amount of total polyamines than all the other tissues and it is followed by brain heart and red muscle. Only in the sea bass, the single polyamines of the heart, muscle and brain increase according to the age; in the liver of both fish, putrescine decreases while spermidine and spermine increase as regards to the age. During the growth of sea bass, adenylic nucleotides show important but not statistically significant variations in the white muscle and an opposite pattern in the red muscle. The energy charge is not affected in the white muscle and increases significantly in red muscle. In the liver of sea bass, nucleotides triphosphate, UDPAG and NAD^+ increase according to the age.

Selli A., Serrazanetti G.P., Pagnucco C., Nasci C.: *Mixed function oxidase system (MFO) in the bivalve mollusc Scapharca inaequalvis.* Ital. J. Biochem., 42, 256A, 1993.

The mixed function oxidase (MFO) system is widely distributed in marine organisms. The induction of this system is a possible measure of the biological impact of compounds such as polycyclic aromatic hydrocarbons in marine organisms. Results for digestive gland microsomal components of *S. inaequalvis* show that the activities of NADH-ferricyanide reductase, NADH-cytochrome c reductase, NADPH-cytochrome c reductase and of benzo(a)pyrene hydroxylase and the cytochrome b_5 concentration are similar to data reported for mussels. On the contrary, the level of P_{450} cytochrome is clearly higher than that reported in literature for mussel samples.

Serra R., Carpenè E., Torresani G., Andreucci A., Grandini S.: Concentrazioni di Zn, Cu, Fe and Cd in *Liza ramada* e *Leuciscus cephalus*. *Concentrations of Zn, Cu, Fe and Cd in Liza ramada and Leuciscus cephalus.* Arch. Vet. Ital., 44, 166, 1993.

The trace element analyses, obtained from tissues of fishes which were caught in the Northern Adriatic Sea and in two rivers of Emilia Romagna, are reported. Generally metal tissue concentrations showed the following decreasing order: kidney > liver > red muscle > white muscle. Cadmium was above the detection limit in liver and kidney, the latter organ showed maximal values. Zinc levels in the chub were significantly higher ($p < 0.05$) than in the grey mullet.

Serra R., Diegoli G., Isani G., Cortesi P., Carpenè E.: *Heavy metals and Cd-binding ligands in Octopus vulgaris*. Italian Biochemical Society Transactions, 4, 121, 1993.

The high levels of copper in most tissues of *Octopus* were probably due to the respiratory pigment haemocyanin; zinc was also represented due to its importance as cofactor of many enzymes; we have no explanation for the large amounts of iron in the branchial heart. The presence of low molecular weight ligand for cadmium is rather interesting.

Serra R., Isani G., Carpenè E., Cattani O., Cortesi P.: *Seasonal variations of Cd-metallothionein in Mytilus galloprovincialis*. 14th Conference of European Society of Comparative Physiology and Biochemistry (E.S.C.P.B.), 36, Canterbury, 29 III-2 IV, 1993.

When cytosolic preparations were fractionated on Sephadex G75, in the presence of 5 mM mercaptoethanol, most of the metal was bound to a dimeric form of metallothionein. A clear seasonal cycle was observed with an increase in metallothionein concentration in May and June.

Serrazanetti G.P., Pagnucco C., Conte L.S., Totti C.: *Hydrocarbons and sterols in Ascidians of Genova Gulf*. Ital. J. Biochem., 42, 307A, 1993.

Some lipid constituents like hydrocarbons and sterols were determined in samples of ascidians of the Ligurian Sea after the wreck of the oil tanker Haven. These benthonic and sessile tunicate organisms feed by filtering phytoplankton and organic suspended particles. The choice has been pointed to these organisms because it is difficult to find in this area mussels, which are the preminent indicators.

Serrazanetti G.P., Pagnucco C., Conte L.S., Artusi R., Fonda Umani S., Bergami C.: *Sterols and fatty acids in zooplankton of the Gulf of Trieste*. Comp. Biochem. Physiol., 107B, 443, 1994 e *Biologia Marina*, suppl. notiz. Società Italiana di Biologia Marina, 1, 131, 1993.

Zooplankton composition (according to prevailing systematic group and feeding type) was determined in samples collected in autumn, spring and summer in the Gulf of Trieste. Concentrations of total lipids, sterols and fatty acids were determined in the same samples. Total lipids are higher in August, lower in December and intermediate in May; concentrations of sterols show the reverse tendency. Cholesterol is the dominant sterol in our samples with percentages from 60 to 80% but numerous other sterols have also been identified. Amongst identified fatty acids, 14:0 predominates in December, 22:6 in May and 22:1 in August.

Serrazanetti G.P.: *Aliphatic hydrocarbons, polycyclic aromatic hydrocarbons and linear alkylbenzenes in marine trophic chain*. I.B.S.T. (Italian Biochemical Society Transactions), relazione su invito, Atti della Società Italiana di Biochimica, 38, 8, 1993.

Although there are many limitations it suggested that the total annual input of petroleum hydrocarbons is of the same order of magnitude as biogenic hydrocarbons input. If the alkanes and alkenes analyses are carried out especially with the aim to detect petroleum

contamination the studies about aromatic hydrocarbons are prompted by their toxicity. For a long time in the case of certain polycyclic aromatic hydrocarbons (PAH) carcinogenic effects have been observed. It is generally accepted that their effects are due to the metabolites yielded by microsomal enzyme systems of endoplasmic reticulum. Different meaning have the C₁₀-C₁₄ linear alkylbenzenes (LABs). they are synthetic compounds used as precursors for manufacture of linear alkylbenzene sulfonates (LABSs) surfactants and have been proposed as markers of urban domestic pollution.

Trigari G., Barbani R., Marcheselli M., Ventrella V., Pagliarani A., Trombetti F., Pirini M.: Effetto della conservazione a -20 °C sui lipidi di muscolo di sogliola (*Solea solea*) e triglia (*Mullus barbatus*). *Effect of storage at -20 °C on muscle lipids of sole (Solea solea) and mullet (Mullus barbatus)*. Atti Soc. Ital. Sci. Vet., 47, 719, 1993.

Mullet and sole fillets, stored for 9 months at -20 °C showed the following changes in lipid composition: a) increased peroxides; b) constant total lipid content and neutral lipid fatty acid pattern; c) gradual decrease of phospholipids; d) PUFA decrease in polar lipids, more remarkable in the mullet. The results indicate that changes in fishfood quality during freezing are related to the fatty acid composition and species dependent.

Trigari G., Biagi P.L., Hrelia S., Ventrella V., Pagliarani A., Trombetti F.: Δ^6 -desaturase activity in sea bass and gilthead liver. 38° Congresso Nazionale della Società Italiana di Biochimica, Italian Biochemical Society Transactions (IBST), 4, 117, 1993.

In liver microsomes, the Δ^6 -desaturase activity decreases in the order trout > sea bass > gilthead. The different species desaturation capability is not affected by assay temperature. These findings confirm that fish desaturation efficiency is somehow related to the species original habitat freshwater or marine) and food habits (omnivorous or carnivorous).

Trombetti F., Ventrella V., Pagliarani A., Trigari G., Pirini M., Borgatti A.R.: *Intestinal (Na⁺+K⁺)- and Na⁺-ATPase activities in T₃-treated rainbow trout (Oncorhynchus mykiss Walbaum)*. 38° Congresso Nazionale della Società Italiana di Biochimica, Italian Biochemical Society Transactions (IBST), 4, 116, 1993.

No substantial difference in the two ATPase activities between control and T₃-treated trout was shown either during the hormone administration phase in fresh water or after transfer to brackish water and treatment suspension. In this tissue the T₃ uneffectiveness on the two ATPases, in contrast with the reported effects in the gills, a T₃-receptor rich tissue, may be related to the reported lack of T₃ receptors in trout intestine.

Ventrella V., Pagliarani A., Pirini M., Trigari G., Trombetti F., Borgatti A.R.: *Lipid composition and microsomal ATPase activities in gills and kidneys of warm- and cold-acclimated sea bass (Dicentrarchus labrax L.)*. Fish Physiol. Biochem., 12, 293, 1993.

The response to cold of gill and kidney membrane lipid composition and microsomal (Na⁺+K⁺)-ATPase, Na⁺-ATPase and Mg²⁺-ATPase activities in reared sea bass was

investigated. Cold acclimation was performed by following the seasonal cycle from August to March. As shown by lipids, the sea bass does not adopt membrane unsaturation as a cold-facing strategy. In both tissues the $(\text{Na}^+ + \text{K}^+)\text{-ATPase}$ exhibited positive compensation for cold acclimation whereas the $\text{Na}^+\text{-ATPase}$ displayed negative compensation. The $\text{Mg}^{2+}\text{-ATPase}$ showed no compensation in the gills and positive compensation in the kidneys. The cold-promoted enhancement of the $(\text{Na}^+ + \text{K}^+)\text{-ATPase}$ may be advantageous to maintain efficient osmoregulation under thermodynamically unfavourable conditions.

Vollenweider R., Viviani R.: *Contribution of biochemistry to the knowledge and the control of marine coastal eutrophication.* Italian Biochemical Society Transactions, 4, 6, 1993. 38° Congresso Nazionale della Società Italiana di Biochimica, Trieste, 1993.

In view of the substantial economic damage that now results from eutrophication in many parts of the world and also in the Mediterranean Sea it is necessary that governments and international organizations promote and increase the financing of studies on coastal marine eutrophication concerning its various manifestations. In the overview the state of the art of biochemical research on marine eutrophication is reported and research on this subject with respect to biochemistry is proposed divided in four branches: ecology and oceanography; taxonomy and genetics; toxicology and toxin chemistry, public health and seafood safety.

Zwaan A. de, Cattani O., Putzer V.M.: *Sulfide and cyanide induced mortality and anaerobic metabolism in the arcid blood clam Scapharca inaequalis.* Comp. Biochem. Physiol., 105C, 49, 1993.

H_2S and cyanide affect marine organisms in a similar way. Both compounds inhibit aerobic metabolism by blocking cytochrome α_3 . The survival and metabolic adjustments of *Scapharca inaequalis* have been determined during environmental anoxia and tissues anoxia induced by sulfide and cyanide. The time of 50% mortality (LT_{50}) were established in clams placed in oxygenated seawater with and without dissolved sulfide or free cyanide and in deoxygenated seawater with and without dissolved sulfide. Anaerobic metabolism was studied on live animals and in red blood cells incubated *in vitro*. Tissue anoxia due to sulfide and cyanide caused greater changes in the levels of aspartate and in the pyruvate derivatives, compared to environmental anoxia.

1994

Bombardelli E., Cristoni A., Lolla A., Morazzoni P., Mustich G., Pace R., Piretti M.V.: *Chemical and biological characterization of Ptilostigma thonningii: polyphenols.* Fitoterapia, 65, 493, 1994.

(-)-Epicatechin, proanthocyanidin B_2 and catechin oligomers were isolated from root bark, trunk bark and leaves of *Ptilostigma thonningii*, from which three purified extracts were prepared. Preliminary pharmacological investigation of root bark catechin oligomers showed that they are endowed with antitussive activity, in agreement with the use of the plant in African folk medicine. The site of action is probably located in the respiratory tract and not in the cough center in the brainstem.

Carpenè E., Gumiero B., Fedrizzi G., Serra R.: Trace elements (Zn, Cu, Cd) in fish from rearing ponds of Emilia-Romagna region (Italy). *Sci. Total Environ.*, 141, 139, 1994.

Significant differences in zinc and copper content were found between different organs. Zinc reaches its maximum in the kidney of the common carp and consistently has a high value in the ovary of all the species examined; Cu is at its maximum in the liver of goldfish. Seasonal variations in trace element contents have been demonstrated in some organs of catfish; in the ovary, zinc concentrations could be linked with the reproductive cycle, while in the muscle with a growth cycle.

Cattani O., G. Vitali, Carpenè E., Isani G., Danesi A., de Zwaan A., Cortesi P.: Effetti dell'anossia e dell' H_2S sul mollusco bivalve *Scapharca inaequivalvis* (Bruguière). *Anoxia and H_2S effects on the bivalve mollusc Scapharca inaequivalvis (Bruguière)*. *Biologia Marina Mediterranea*, 1, 379, 1994.

Combined effect of anoxia and hydrogen sulfide on the bivalve *Scapharca inaequivalvis* in different experimental conditions are investigated. During anoxic incubations with and without hydrogen sulfide the bivalve show LT_{50} values of 24 and 10 days respectively, indicating that *Scapharca* is very sensitive to the action of H_2S . Enhanced mortality and data of previous studies on the accumulation of anaerobic end products (higher production of pyruvate derivatives) in presence of hydrogen sulfide suggest that the animal fail to achieve the metabolic depression. However if hydrogen sulfide is added 24 hours from the beginning of anaerobiosis (when the metabolic arrest should be already operative) we can observe that end product accumulation and energy reserve utilisation are similar with respect to the experiment with H_2S present from the onset of anoxia. Therefore it is probable that the effects of hydrogen sulphide are others than counteracting the achievement of metabolic depression.

Corni M.G., Cattani O., Vitali G.: Ciclo riproduttivo di *Mytilus galloprovincialis* LMK in una stazione fissa al largo di Bellaria (Mar Adriatico). *Reproductive cycle of Mytilus galloprovincialis LMK in a fixed station off Bellaria (Adriatic Sea)*. *Biologia Marina Mediterranea*, 1, 395, 1994.

Gonadomorphogenesis aspects and the reproductive annual cycle of *Mytilus galloprovincialis* LMK (Bivalvia, Mitilidae) in raft culture at Bellaria (Northern Adriatic Sea) were examined in the period November 1989-October 1990. Gametogenesis cycles with partial spawning occur throughout most of the year. Resting stages, preceded by total spawning, are present from May to October with a maximum in July.

Dalla Via J., van den Thillart G., Cattani O., de Zwaan A.: Influence of long-term hypoxia exposure on the energy metabolism of *Solea solea*. II. Intermediary metabolism in blood, liver and muscle. *Mer. Ecol. Prog. Ser.*, 111, 17, 1994.

Solea solea is a flatfish living on sandy bottom of the Adriatic littoral, therefore it must be well adapted to hypoxic conditions. In this paper the energy metabolism of *Solea solea* at reduced oxygen tension was investigated. The fish were exposed, after preacclimation period (80% air saturation), to several level of hypoxia (60, 40, 20, 12 and 6% air saturation).

tion). Control experiments were carried out at 100% air saturation. In blood, liver and muscle were measured the components of energy metabolism. At 12 and 6% air saturation lactate level increase in all tissues was observed. Unexpectedly for flatfish high concentrations of lactate was found in blood. ATP declined in liver and in blood, but not in muscle. In this tissues the concentration of ATP was stabilized by the decrease of phosphocreatine. Anaerobic energy production was calculated from changes in metabolite levels. At 12 and 6% air saturation total metabolism was depressed by 27 and 48% respectively, indicating that in sole metabolic depression is an effective survival strategy.

Isani G., Cattani O., Carpené E., Cortesi P.: *Kinetic properties of liver and muscle pyruvate kinase of a marine teleost, sea bass (Dicentrarchus labrax L.).* Comp. Biochem. Physiol., 107B, 617, 1994.

Kinetic properties of liver and muscle pyruvate kinase (PK) were determined in specimens of sea bass. Liver PK had hyperbolic saturation curves with both substrates and was not sensitive to alanine, but was inhibited by ATP ($I_{50} = 6$ mM). Both white and red muscle PK showed hyperbolic saturation curves with phosphoenolpyruvate and ADP, and were not activated by fructose-1,6-diphosphate, but were inhibited by ATP (I_{50} were 2.3 and 5.6 mM respectively). When varying Mg^{2+} concentrations in muscle and liver, PK always showed sigmoidal kinetics, whereas with Mn^{2+} only the liver PK saturation curve was sigmoidal. Ca^{2+} was an inhibitor of both liver and muscle PK. Cu^{2+} and Zn^{2+} had inhibitory effects on liver and muscle PK. The I_{50} values were of the same order but slightly lower for the liver.

Isani G., Cattani O., Carpené E., Cortesi P., de Zwaan A.: *Effects of H_2S on anoxic survival and anaerobic metabolism in Mytilus galloprovincialis and Scapharca inaequivalvis.* 15th Conference of European Society of Comparative Physiology and Biochemistry (E.S.C.P.B.), Genova, 20-23 IX, 150, 1994.

Specimens of *Mytilus galloprovincialis* and *Scapharca inaequivalvis* were exposed to anoxia (up to 96 hrs) in the absence and in the presence of H_2S . Both species showed a lower tolerance to anoxia in the presence of sulphide: LT_{50} fell from 20 days to 16 days in *M. galloprovincialis* and from 23 days to 10 days in *S. inaequivalvis*. As expected, adenylate energy charge showed a decrease during the first 14 hours of anoxia in both species, either in the presence or in the absence of H_2S . In *M. galloprovincialis* this toxic compound did not alter the general metabolic pattern, whereas in *S. inaequivalvis* a prolonged aspartate consumption and an increased production of succinate, alanine, lactate and opines was found when sulfide was added to anoxic incubation water.

Kennedy J.F., Pagliuca G.: *Oligosaccharides in Carbohydrate analysis — A practical approach* Second edition. Ed. Chaplin, M.F. and Kennedy J.F., IRL Press at Oxford University Press, 43, 1994.

As oligosaccharides fall into the classification between monosaccharides and polysaccharides it is not surprising that the methods used for oligosaccharide analysis are extensions of those used for either monosaccharide or polysaccharide analysis. Methods for the separation and quantitation of mixtures of oligosaccharides and for the identification

and quantitation of individual purified oligosaccharides are described. Rather than providing a listing of all methods which have been devised, only those which have become the more commonly used techniques are described.

Pagnucco C., Gallina Toschi T., Serrazanetti G.P.: *A chromatographic study on triacylglycerol composition of fish oils.* Proceedings 16th International Symposium of Capillary Chromatography, 1, 594, 1994, Huetig ed., Heidelberg.

The triacylglycerols of three fish species from the Adriatic Sea (*Engraulis encrasicolus* L., *Sardina pilchardus* Walb., *Clupea sprattus* L.) were separated by high performance liquid chromatography (HPLC) in the reversed-phase mode using a binary solvent gradient and determined using an evaporative light scattering detector (mass detector); the analysis required about twenty minutes. Each fraction was collected *via* stream-splitter and the fatty acids were analyzed by capillary gas chromatography (CGC). This method has permitted studying the composition of fish triacylglycerol complex mixtures composed of saturated, monounsaturated and polyunsaturated fatty acids. The main differences between these species concerned the fractions containing monounsaturated and polyunsaturated long-chain fatty acids. High percentages of saturated fatty acids (16:0 and 14:0) were determined in all the samples examined, in agreement with the characteristic composition of marine fish oils.

Pagnucco C., Serrazanetti G.P., Conte L.S., Artusi R., Bergami C.: Idrocarburi, steroli ed acidi grassi in campioni autunnali di zooplancton del Mare Adriatico. *Hydrocarbons, sterols and fatty acids in autumnal zooplankton samples of the Adriatic Sea.* Biologia Marina Mediterranea, suppl. notiz. Società Italiana di Biologia Marina, 1, 141, 1994.

Besides aliphatic hydrocarbons, LAB and TAB were identified in zooplankton samples of the Adriatic Sea. Cholesterol was shown to be the main sterol with noticeable quantities of 22-dehydrocholesterol. The fatty acid distribution showed high percentage of 16:0 and 14:0 and appreciable amounts of 22:1.

Piretti M.V., Gallerani G., Pratella G.C.: *Polyphenol fate and superficial scald in apple.* Postharvest Biol. and Technol., 4, 213, 1994.

Cv. Granny Smith apples were treated in attempts to influence the incidence of superficial scald by (a) storing at 20°C for 10 days, (b) dipped in 2000 ppm dyphenilamine for 20 seconds, or (c) stored in 1% O₂ and 2% CO₂. Polyphenols in the skin were extracted from the apple samples and separated by HPLC using an internal standard. There was a general decline in the polyphenol fractions (epicatechin, quercetin glycosides, procyanidins and unknown polyphenols) in control fruit, which showed increasing scald after about 50 days storage. Of the treatments, (a) was most effective at preventing scald, followed by (b) and then (c). No evidence was found to involve flavonols, condensation between flavonoid glycosides and gallic acid or polymerisation of flavan-3,4-diols in the disorder of scald. The condensation of *o*-dihydroxyphenols in damaged tissue remains as the most likely explanation of the browning.

Recsan Z., Pagliuca G., Deans S.G., Noble R.C., Penzes L., Piretti M.V.: *The dietary effect of essential plant oils on the promotion of polyunsaturated fatty acids of the retina during ageing.* 35th International Conference on the Biochemistry of Lipids, Aberdeen, Scotland, September 6th-9th, 1994.

Age related macular degeneration (AMD) is one of the leading causes of severe visual impairment. Polyunsaturated fatty acids are essential for visual response and it is known that a reduction in retinal levels of polyunsaturates are a feature of ageing. Observations suggest that antioxidants plays a role in AMD. Culinary plant are credited with a range of beneficial properties. The effect of volatile oils from such plants on the polyunsaturate status during ageing through their role as antioxidant sources is presently under evaluation. An investigation has been undertaken to determine the effect of the dietary administration of a selection of plant volatile oils on the polyunsaturate levels in the retina of senescent rats. The daily administration of such oil resulted in a highly significant improvement in retinal levels of the polyunsaturates within phosphoglycerides.

Recsan Z., Penzes L., Piretti M.V., Noble R.C.: A telítetlen zsírsavak változása természetes növényi olajok hatására öregedő patkányok retinájában. *Action of essential plant oils on the polyunsaturated fatty acids of the rat retina during ageing.* III. Semmelweis Tudományos Fórum, Budapest, April, 28, 1994.

Senescence is a multifactorial process. As the n-3 polyunsaturated fatty acids (particularly docosahexaenoic acid) are necessary for the normal electrical response in visual excitation, a decrease in these fatty acids must play an important role among the cause of vision impairment which almost invariably accompanies senescence. Medicinal and culinary plants have for centuries been implicated, often empirically, with a range of beneficial properties for the well-being of man. Substantive amongst those claims are those arising from the presence of antioxidative properties. The positive effect from the range of culinary plants has been investigated from a therapeutic point of view.

Recsan Z., Penzes L., Piretti M.V., Noble R.C.: *Effect of essential oils on the lipids of the ageing rat. A possible therapeutic use.* 7. Jahrestagung der Retinologischen Gesellschaft, Lübeck, Travemünde, Juni, 17-18, 1994.

The effect of essential oils from almond, clove, nutmeg, pepper and thyme on the lipids of the ageing rat and their possible therapeutic use are here discussed. The possibility exists for the application of such oils in the prevention of AMD through their antioxidant capacities.

Selli A., Crociani F., Di Gioia D., Fava F., Crisetig G., Matteuzzi D.: *Regulation of dihydrodipicolinate synthase and diaminopimelate decarboxylase activity in Bacillus stearothermophilus.* Ital. J. Biochem., 43, 29, 1994.

The feedback inhibition of the enzymes dihydrodipicolinate synthase (DHDPS) and diaminopimelate decarboxylase (DAPD) in the wild strain Zu 183 of *Bacillus stearothermophilus* and in its S-(2-aminoethyl)-cysteine resistant L-lysine overproducing strain AEC 12 was studied. The optimum temperature and pH of both enzymes were also evaluated. No

inhibition of DHDPS by L-lysine, L-threonine, L-methionine and L-isoleucine was observed either in the wild strain or in the AEC 12 mutant. DAPD was completely inhibited by L-lysine and only partially by L-threonine and L-methionine in Zu 183 and AEC 12 strains, but the concentration required was found to be much higher in the AEC 12 strain. The regulation mechanism of L-lysine biosynthesis in *Bacillus stearothermophilus* Zu 183 was also discussed.

Serrazanetti G. P., Pagnucco C., Conte L.S.: *Hydrocarbons and sterols in jelly-fish of the Adriatic Sea.* Proceedings 16th International Symposium of Capillary Chromatography, 1, 586, 1994, Huetig ed., Heidelberg.

Some important lipid constituents were analyzed in the jelly-fish *Pelagia noctiluca* of the Adriatic Sea. Hydrocarbons and sterols were identified by capillary gas chromatography with two different capillary columns and mass spectrometry. High levels of squalene and pristane were isolated among aliphatic hydrocarbons and numerous isomers of linear alkylbenzenes (LABs) were identified as well. In the sterol fraction, cholesterol is the main component with appreciable amounts of 22-dehydrocholesterol, 24-methyl-cholesta-5,24(28)-dien-3 β -ol and 5 α -cholestanol.

Serrazanetti G.P., Artusi R., Pagnucco C., Putaturo G.: Idrocarburi, steroli ed acidi grassi in molluschi della costa abruzzese. *Hydrocarbons, sterols and fatty acids in molluscs of Abruzzo coast.* Atti Soc. Ital. Sci. Vet., 48, 114, 1994.

Hydrocarbons, sterols and fatty acids were determined in four species of molluscs. By means of chromatography and mass spectrometry it was observed that squalene and other polyunsaturated aliphatic hydrocarbons prevail among the hydrocarbons. Linear alkylbenzenes, revealing domestic pollution, were found in all the samples. Among the sterols, cholesterol prevailed in all the samples. The 16:0, the 14:0, different monounsaturated, the 20:5w3 and the 22:6w3 are the most abundant fatty acids.

Serrazanetti G.P., Mietti N., Pagnucco C., Cattani O., Conte L.S.: Variazioni stagionali di acidi grassi e steroli in campioni di zooplankton della costa emiliano-romagnola. *Fatty acid and sterol seasonal change in zooplankton samples of the Emilia-Romagna coast.* Atti della Società Italiana di Biologia Marina, 25, 155, 1994.

Total lipids, fatty acids and sterols were determined in zooplankton samples collected off the Emilia-Romagna coast. The levels of total lipids (from 6 to 12%) are rather uniform. Fatty acid and sterol composition may be mainly correlated to the diet but also to physiological needs.

Serrazanetti G.P., Mietti N., Pagnucco C., Cattani O., Cortesi P.: Variazioni stagionali di idrocarburi in campioni di zooplankton della costa emiliano-romagnola. *Hydrocarbons seasonal change in zooplankton samples of Emilia-Romagna coast.* Atti della Società Italiana di Biologia Marina, 25, 156, 1994.

Aliphatic hydrocarbons and linear alkylbenzenes (LABs) were determined in samples of

zooplankton collected from 1991 to 1992 off the Emilia-Romagna coast. The qualitative and quantitative distribution of these compounds is clearly related to algal blooms and is affected by petroleum contamination or domestic pollution.

Serrazanetti G.P., Pagnucco C., Conte L.S., Artusi R.: *Aliphatic hydrocarbons and linear alkylbenzenes in zooplankton from the Gulf of Trieste.* Chemosphere, 28, 1119, 1994.

It has been shown that linear alkylbenzenes (LABs) and aliphatic hydrocarbons are present in zooplankton in the Gulf of Trieste. Samples were collected in December of 1990, May and August of 1991. The total hydrocarbon levels for August were higher than those for December and May. This may be explained by high concentrations of biogenic hydrocarbons in this period. Odd and even n-alkane distribution in the analyzed samples shows a partial contamination by fossil hydrocarbons. Among various isomers of linear alkylbenzenes, the ones isolated in greater quantities were generally those with the largest linear chain. We also identified several tetrapropylene alkylbenzenes isomers (TABs), which may still be used for sulfonate detergents in some Countries.

Tarnai E.A., Pagliuca G., Cipollone M., Piretti M.V.: *Systematic investigation of polyphenol constituents from different parts of cherry tree (Prunus avium L.).* Fitoterapia, 65, 541, 1994.

Oligomeric and polymeric polyphenol fractions from seven different tissues: bark; phloem; xylem; peduncle; leaves and ripe and unripe fruits from cherry-tree *Prunus avium L.* (Durone della Marca variety) were studied. Oligomeric polyphenols were identified and quantified by HPLC. A not yet completely defined (-)-epicatechin polyglycoside was found to be the major constituent of the leaves. Polymeric fractions were suitably degraded to obtain information about the constituting monomeric units. A new interesting EPR-procedure was used to evaluate the antioxidant activity of several polyphenolic constituents.

Trombetti F., Pirini M., Ventrella V., Pagliarani A., Trigari G., Borgatti A.R.: *Kidney ($\text{Na}^+ + \text{K}^+$)- and Na^+ -ATPase activities from T_3 -treated rainbow trout.* 39° Congresso Nazionale della Società Italiana di Biochimica, Italian Biochemical Society Transactions (IBST), 5, 129, 1994.

The T_3 administration during the freshwater phase (FW) enhanced the kidney Na^+ -ATPase activity with respect to untreated trout. The higher Na^+ -ATPase activity with respect to the control was maintained even after brackish water transfer and treatment suspension. Conversely the T_3 -promoted ($\text{Na}^+ + \text{K}^+$)-ATPase depression was confined to the FW phase. Therefore trout kidney was proven to be thyroid-hormone susceptible, in contrast with the intestine. The overall significance of the T_3 -promoted increased incidence of the Na^+ -ATPase on the coexistent ($\text{Na}^+ + \text{K}^+$)-ATPase during the freshwater phase remains to be clarified.

Ventrella V., Trombetti F., Pagliarani A., Pirini M., Trigari G., Borgatti A.R.: *Mercury, zinc and ammonia effects on the ($\text{Na}^+ + \text{K}^+$)- and Na^+ -ATPases in *Mytilus galloprovincialis Lam.** 39° Congresso Nazionale della Società Italiana di Biochimica, Italian Biochemi-

cal Society Transactions (IBST), 5, 130, 1994 e Atti 15th Conference of the European Society of Comparative Physiology and Biochemistry (ESCPB), 30, 1994.

In mussels exposed to Hg, Zn and NH₃, individually and in binary mixtures, gill ATPases are apparently the preferred target of Hg and NH₃ in comparison to mantle ATPases. The more striking effect of Hg may be related to the higher metal accumulation shown by the gills with respect to the mantle. Conversely Zn activates mantle (Na⁺+K⁺)-ATPase. The proven susceptibility of both ATPases to Hg, Zn and NH₃ may be of applied interest in the perspective of the suggested use of enzyme activities of marine organisms to selectively signal abnormal conditions in the marine habitat.

1995

Abram V., Piretti M.V.: *Polyphenols in Sempervivum tectorum*. 1st Meeting of the Slovenian Biochemical Society. Portoroz, September 28th-October 1st, 1995.

Sempervivum tectorum L. is an evergreen plant which belongs to a large family of Crassulaceae. It is known in Slovenia as folks medicine, but spread in other parts of Mediterranean area also. Juice squeezed from fresh leaves of the plant has been used to ease ear pains and inflammation, against insects bites, as a pack for wounds, ect.. Recently, we reported on antimicrobial activity of leaves of *Sempervivum tectorum* against seven tested microorganism. Then we also detected almost three times more polyphenols in skin than in juice of fresh leaves of the plant. The aim of this study was to isolate polyphenols from *Sempervivum tectorum* and to determine the constituents of the oligomeric and polymeric fractions of polyphenols.

Carpenè E., Isani G., Serra R. (A cura di): Argomenti di Idrobiologia e Acquacoltura. *Topics in Hydrobiology and Aquaculture*. CLUEB, Bologna, pp. 1-312, 1995.

The book is made by a collection of 26 minireviews (chapters): 13 on topics dealing with different general subjects in hydrobiology; eleven chapters are devoted to special topics which range from fish culture to fish diseases. The last 2 minireviews are examples of analytical methods that could be adapted to biological studies of aquatic organisms. The book originates from the experience of 38 experts working in different scientific fields.

Carpenè E., Isani G.: Gli elementi traccia negli organismi acquatici. *Trace elements in aquatic organisms*. In: Argomenti di Idrobiologia e Acquacoltura, CLUEB, p. 227, 1995.

The importance of essential and non essential trace elements in aquatic organisms is discussed. Some principles of bio-inorganic chemistry and the biochemistry of metallo-proteins are also reported. The effects of heavy metals on algae, molluscs, fish and aquatic birds is then reviewed.

Carpenè E., Serra R., Isani G., Cattani O., Cortesi P.: *Seasonal variations of trace elements in gilthead (Sparus aurata) during the growing season*. *Physiol. Zool.*, 68, 53, 1995.

Gilthead were fed diets containing different levels of trace elements. Fish showed different growth rates depending on the metal concentration in feed. Zinc concentrations presented higher values in gills, liver and kidney; during the cold season a tissutal decrease of zinc was found associated to the life cycle of fish.

Carpenè E., Serra R., Isani G.: *Effects of heavy metals on algae.* In: Encyclopedia of Environmental Control Technology, Vol. 9, Geotechnical Applications, Leak Detection, Treatment Options, P.N. Cheremisinoff, Ed., Gulf Publishing Company, Houston, Texas, Chapter 20, p. 707, 1995.

The productivity of the aquatic environment is strictly dependent on the rate of photosynthesized carbon by algae which in turn depend on an optimal composition in trace elements to reach maximal productivity. In this chapter the cycling of heavy metals in the marine environment and the biochemical and physiological effects of heavy metals on algae are reviewed; moreover algae may be used as useful biomonitors and biomarkers of toxic element pollution.

Carpenè E., Serra R., Isani G.: *Heavy metals in some species of waterfowl of Northern Italy.* J. Wildl. Dis., 31, 49, 1995.

Concentrations of heavy metals were measured in several tissues of waterfowl of Northern Italy. High mean copper levels were detected in aerobic muscles such as heart and pectoral muscles. Compared to other tissues, the iron content of brain was rather low and constant. Iron concentrations in tissues of moorhens from the Reno river were significantly higher than those from the Sile river. Cadmium was detectable only in the liver and kidney; there was a linear relationship between cadmium levels in these two organs.

Carpenè E., Serra R.: *Spettroscopia ad assorbimento atomico. Atomic absorption spectroscopy.* In: Argomenti di Idrobiologia e Acquacoltura, CLUEB, p. 303, 1995.

The importance of metal analyses of biological systems is focussed. The principles of Atomic Absorption Spectroscopy are briefly introduced, the different techniques (flame absorption and emission, graphite furnace) are also mentioned. At the end of the chapter, the care on the treatment of biological samples is discussed.

Cattani O., Isani G., de Zwaan A., Cortesi P.: *In vivo and in vitro anaerobic metabolism of erythrocytes of Scapharca inaequalvis.* Atti del Congresso Nazionale della Società Italiana di Biochimica, Pavia, Italian Biochemical Society Transactions (IBST), 5, 124, 1995.

Scapharca inaequalvis belongs to the primitive family of Arcidae, which, in contrast to other bivalves, possesses haemoglobin-bearing erythrocytes. Anaerobic metabolism in RBCs was studied *in vivo* incubating specimens of *Scapharca* for 5 days in anoxic sea water and using the blood sampled after fixed periods of anoxia, for measurement of energy substrates and anaerobic end products. In the *in vitro* incubation the medium contained antimycin A (inhibitor of electron transfer). The results obtained indicated

that the PEP branch-point was operating and the shift from pyruvate to oxaloacetate occurred gradually for 12 to 48 hours of anoxia. Due very low glycogen stores and the absence of glucogen phosphorylase in RBCs, glucose taken up from the plasma was probably the main fuel during prolonged anoxia.

Cattani O.: Metabolismo dei composti dello zolfo e tolleranza all' H_2S . *Sulfur compound metabolism and tolerance to the H_2S* . In Argomenti di Idrobiologia e Acquacoltura a cura di Carpenè E., Isani G. e Serra R., Bologna: CLUEB, pp. 263-274, 1995.

In this paper some aspects of environmental metabolism of the sulfur compounds are reviewed. After elucidating the main aspects of the sulfur cycle and of the structure of marine sediments, the assimilative and dissimilative processes of sulphate reduction are described, with particular emphasis on the function of sulphate-reducing bacteria. Since H_2S is extremely toxic for the aquatic animals, the main adaptation displayed by marine organisms to counteract the negative effect of hydrogen sulfide are illustrated.

Ciminiello P., Fattorusso E., Magno S., Oshima Y., Poletti R., Viviani R., Yasumoto T.: *Determination of PSP toxins in mussels from the Adriatic Sea*. Mar. Pollut. Bull., 30(11), 733, 1995.

Blue mussels (*Mytilus galloprovincialis*) collected in the main producing areas in the sea-water off the coast of Emilia-Romagna (Italy) have been investigated for paralytic shellfish poisoning (PSP). Individual toxins were determined in hepatopancreas of mussels using a high-performance liquid chromatographic procedure employing pre-chromatographic oxidation of the toxins to form fluorescent derivatives. The results demonstrated the presence of gonyautoxin 2 and 3 in the sample. The toxicity level is very low, but this detection of PSP in mussels warns of potential PSP problems in Adriatic Sea.

Ferrari D., Muscari C., Pagliuca G., Guarnieri C., Caldarera C.M., Piretti M.V.: *Effect of age on the incorporation of labelled mevalonate into ubiquinone, cholesterol and dolichols studied in perfused aged rat heart*. Società Italiana di Ricerche Cardiovascolari. 2° Congresso nazionale — European Joint Session. Parma, 22-23 settembre, 1995.

Ubiquinone, cholesterol and dolichols share a common synthetic pathway because of their isoprenoid-chain structure. These lipophilic compounds are fundamental components of biological membranes, whose fluidity widely depends on their concentration. The aim of this study was to evaluate in the isolated rat heart if ageing changes the rate of biosynthesis of the isoprenoid constituents, since sarcolemmal and mitochondrial membrane functions are altered.

Isani G., Cattani O., Tartaro M., Carpenè E., Cortesi P.: *The effects of starvation on energy metabolism and enzyme activities in white muscle and liver of gilthead, Sparus aurata*. 40° Congresso Nazionale della Società Italiana di Biochimica, Torino 12-14 IX, 1995.

Fish may undergo natural periods of starvation during the cold season. The dynamics of stored energy and enzyme activities are extremely variable, depending both on the spe-

cies and the length of the fast. Specimens of gilthead were starved for 5 months (November-March) during the cold season; energy reserves and enzyme activities were determined in the liver and the muscle. Hepatic glycogen declined at the onset of starvation followed by the consumption of muscular glycogen during the last two months. Only at the end of starvation a decline in hepatic lipids was noticed. As concerning enzyme activities, the results suggest that starvation causes an increase in hepatic gluconeogenesis, and that the main precursor of hepatic glucose should be lactate instead aminoacids, according to the reported absence of protein mobilization.

Isani G., Cattani O., Zurzolo M., Pagnucco C., Cortesi P.: *Energy metabolism of the mussel, Mytilus galloprovincialis, during long-term anoxia.* Comp. Biochem. Physiol., 110B, 103, 1995.

Specimens of *M. galloprovincialis* were exposed to anoxia for 14 days; energy reserves and anaerobic end products were determined at fixed time intervals. In the mussel, *M. galloprovincialis*, the pattern of metabolic adaptations to long-term anoxia was clearly biphasic. The first phase (transition stage) lasted 24 hrs and was characterized by the decrease of adenylate energy charge, the consumption of aspartate and the accumulation of succinate and alanine. The second phase (stationary phase) was characterized by the depletion of glycogen stores, the production of propionate, which was subsequently excreted into incubation water, and the metabolic depression. The ATP turnover rate was reduced by a factor of 3.9 from short-term anoxia to long-term anoxia.

Isani G., Cortesi P.: Anaerobiosi ambientale negli animali marini. *Environmental anoxia in marine animals.* In: Argomenti di Idrobiologia e Acquacoltura, CLUEB, p.67, 1995.

Aquatic animals can easily experience environmental anoxia. Marine molluscs are characterized by high anoxic survival time. Many physiological and biochemical adaptations have been developed by bivalve molluscs in order to survive anoxic conditions: the diversification of energy reserves and substrates of anaerobic metabolism; the presence of specific metabolic pathways leading to many anaerobic end products (alanine, succinate, opine, lactate, acetate and propionate); the reduction of energy demand; a strict enzyme regulation of anaerobic glycolysis.

Isani G.: Regolazione dell'attività di alcuni enzimi glicolitici nell'anossia ambientale. *Regulation of glycolytic enzymes during environmental anoxia.* In: Argomenti di Idrobiologia e Acquacoltura, CLUEB, p. 79, 1995.

In bivalves a strict regulation of three key enzymes of glycolysis (glycogen phosphorylase, phosphofruktokinase and pyruvate kinase) takes place during environmental anoxia. Glycogen phosphorylase is subjected to inhibition in order to decrease glycogen consumption; phosphofruktokinase inhibition is due to both a mechanism of phosphorylation and a decrease of the activator fructose 2,6- diphosphate; also pyruvate kinase activity is decreased by phosphorylation. Overall, these regulatory mechanisms are coordinated in order to produce a decrease in glycolytic rate leading to a general reduction of energy consumption.

Licastro F., Chiricolo M., Morini M.C., Capri I., Davis L.J., Conte R., Mancini R., Melotti C., Parente R., Serra R., Carpenè E.: *Influence of age and health on immune functions and trace elements.* Gerontology, 41, 235, 1995.

Apparently healthy elderly donors were screened according to a simple protocol that included clinical examination and the determination of hematological and biochemical values. This screening was performed to detect subclinical alterations which might interfere with immune responses and trace element status. Data from two groups of elderly donors were compared with those obtained from healthy young controls. In both groups of elderly donors, plasma zinc levels were normal, while plasma copper concentrations were increased. Our results indicate that only plasma copper levels were affected by age, whereas subclinical alterations in hematological or biochemical values appear to impair immune responses in the elderly.

Pagliarani A., Borgatti A.R.: Meccanismi di regolazione ione-osmotica in animali acquatici. *Ionic-osmotic regulation mechanisms in aquatic animals.* In Argomenti di Idrobiologia e Acquacoltura (a cura di Carpenè E., Isani G., Serra R.), CLUEB, 37, 1995.

Present knowledge on the processes involved in ionic-osmotic regulation of fish, crustacean and molluscs is overviewed. Ionic regulation is essential for life, both for osmoconformers and osmoregulators. In this respect, most attention is paid to NaCl regulation, due in the various tissues and species to the combination of cellular and paracellular transport systems involving antiporters, symporters, canals, pumps and epithelial permeability to ions and water. Such combination, often still unclear in the various species and regulatory tissues, leads in the various cases to either outwards or inwards directed transepithelial NaCl fluxes. Ion-osmoregulatory systems in hypo- and hyperregulating teleosts, marine elasmobranchs and ion-regulating systems in molluscs are considered. The enzymes and mechanisms involved according to the most up-to-date models of NaCl transport in the various tissues are described.

Pagliarani A., Trombetti F., Ventrella V., Pirini M., Trigari G., Borgatti A.R.: *(Na⁺+K⁺)- and Na⁺-ATPase activities in salt fed rainbow trout intestine.* 40° Congresso Nazionale della Società Italiana di Biochimica, Italian Biochemical Society Transactions (IBST), 6, 189, 1995.

In trout intestine salt administration affected only the (Na⁺+K⁺)- and Na⁺-ATPase activities and not the enzyme kinetic parameters. After one month of NaCl administration in freshwater both ATPases were depressed. A delayed effect of salt treatment was shown 7 d after transfer to brackish water (BW) and treatment suspension when both ATPases were higher than that of control trout: the enzyme enhancement was transient for the Na⁺-ATPase and conversely maintained till the end of the trial (22 d in BW) for the (Na⁺+K⁺)-ATPase. The results are discussed on the basis of a possible interaction between dietary salt treatment and environmental salinity change.

Pagliuca G.: *Isoprenoid lipids: cellular ageing biomarkers.* Acta Med. Romana, 33, 148, 1995.

The polymers of the isoprene unit constitute a big family of more than a dozen classes of end-products playing several primary biological roles including: membrane structure (cholesterol), electron transport (ubiquinone), synthesis of asparagine-linked glycoproteins (dolichols). All these isoprenoid lipids have a common initial biosynthetic pathway involving mevalonate as precursor and a sophisticated enzymatic system of regulation. Recently the research has been focused on the main products of the mevalonate pathway because of their involvement in cellular ageing and diseases.

Pagnucco C., Artusi R., Serrazanetti G.P.: Variazioni stagionali di lipidi ed acidi grassi in campioni di *Mytilus galloprovincialis* e *Tapes philippinarum* della costa emiliano-romagnola. *Lipid and fatty acid seasonal variations in Mytilus galloprovincialis and Tapes philippinarum of Emilia-Romagna coast*. Atti della Società Italiana di Biologia Marina, 26, 166, 1995.

Hydrocarbons, sterols and fatty acids were determined in four species of Molluscs. By means of chromatography and mass spectrometry it was observed that squalene and others polyunsaturated aliphatic hydrocarbons prevail among the hydrocarbons. Linear alkylbenzenes, revealing domestic pollution, were found in all the samples. Among the sterols, cholesterol prevailed in all samples. 16:0, 14:0, different monounsaturated, 20:5w3 and 22:6w3 are the most abundant fatty acids.

Piretti M.V., Pagliuca G., Tarozzi G.: Separazione e determinazione quantitativa di lipidi isoprenoidi non polari mediante HPLC in fase inversa. *Separation and quantitative determination of non polar isoprenoid lipids using reverse phase HPLC*. Società Chimica Italiana. Atti del convegno nazionale su Orientamenti e metodologie in chimica farmaceutica, organica e bioorganica, Numana (AN), 2-6 giugno 1995.

An analytical procedure for the rapid identification and quantitation of non-polar isoprenoid lipids from animal tissues was set up. The complete determination can be carried out by reverse-phase HPLC of just two samples. The first one, extracted from unaltered tissues and suitably processed by column chromatography, provides information about free cholesterol, cholesteryl esters, coenzymes Q, free dolichols and dolichyl esters. The second one, obtained from saponified tissue, can be used to detect both total free cholesterol and total free dolichols. Specific calibration curves were constructed for the quantitative determination of the different constituents.

Piretti M.V., Pagliuca G., Tarozzi G.: *Simultaneous reversed-phase high-performance liquid chromatographic separation of non-polar isoprenoid lipids and their determination*. J. Chromatog. B., 674, 177, 1995.

An analytical procedure for the rapid identification and quantitation of non-polar isoprenoid lipids from animal tissues was set up. The complete determination can be carried out by reversed-phase HPLC of just two samples. The first one, extracted from unaltered tissues and suitably processed by column chromatography, provides information about free cholesterol, cholesteryl esters, coenzymes Q, free dolichols and dolichyl esters. The second one, obtained from saponified tissue, can be used to detect both total cholesterol and total dolichols. Specific calibration curves were constructed for the quantitation of the different constituents.

Piretti M.V.: *Lipid oxidation and antioxidants.* Acta Med. Romana, 33, 471, 1995.

Factors affecting lipid autoxidation are firstly considered and particularly there are discussed the involvement of transition metal ions — traces of which are contained in both animal and vegetable lipids — together with the unsaturation degree of the lipid system. Moreover there are considered the principal ways of formation of oxygen-derived free radicals in the cells, that can induce oxidative processes of membrane lipids. Finally the more common synthetic and natural antioxidants are presented and their action is discussed.

Piretti M.V.: Polifenoli vegetali: aspetti analitici e proprietà sensoriali. *Vegetable polyphenols: analytical aspects and sensorial properties.* Bollettino dell'Istituto Agrario di San Michele all'Adige (ISMA), 3, 14, 1995.

The major features of vegetable polyphenols are here discussed by considering the analytical approach. Some practical aspects regarding browning processes occurring after refrigerate storage of fruits are considered.

Pirini M., Trigari G.: Metabolismo degli acidi grassi nei teleostei. *Fatty acid metabolism in teleosts.* In Argomenti di Idrobiologia e Acquacoltura (a cura di Carpenè E., Isani G., Serra R.), CLUEB, 143, 1995.

The central role of fatty acids in lipid metabolism is overviewed, paying attention to the various aspects of fatty acid involvement in fish: temperature adaptation, nutrition and maintenance of fishfood quality during storage. The practical approach to fatty acid biochemistry points out on applied interest in aquaculture. The metabolic pathways of fatty acid biosynthesis and catabolism are outlined. The endogenous and exogenous factors affecting fatty acid composition in marine and freshwater teleosts are discussed on the basis of recent literature. The mechanisms involved in the regulation of elongation and desaturation of fatty acid molecules, the biological fate of fatty acids to yield energy, structural lipids or derivatives involved in the regulation of biological processes are described.

Recsan Z., Pagliuca G., Penzes L.G., Noble R.C., Deans S.G., Piretti M.V.: *Beneficial effects of plant volatile oils on the retinal lipids during ageing.* Nutrition Society, Winter meeting. Nutrition and ageing/ Nutrition for the Elderly, London, February 17th, 1995.

Age related macular degeneration (AMD) is one of the leading causes of severe visual impairment. Numerous risk factors are known to be involved, major amongst them being nutritional. Higher levels of circulating micronutrients with antioxidative capabilities are suggested to reduce the risk of AMD. Since antiquity medicinal and culinary plants have been credited with a range of beneficial properties for the human well-being.

Recsan Z., Szigeti T., Penzes L., Piretti M.V.: *Protective role of volatile oils in the ageing retina.* Society For Free Radical Research. Summer meeting. Budapest, Hungary July 27-29, 1995.

A study has been made on the effects of dietary administration of a selection of volatile oils from medical plants on the polyunsaturated fatty acids (PUFA) composition in the retina of aged (28 months old) rats. PUFA comprised by far the major proportion of total unsaturated content within the retinal phospholipids with docosahexaenoic acid (DHA) predominating. The administration daily of 3.9 mg of volatile oils from almond, clove, nutmeg, pepper and thyme over a period of 17 months resulted in the maintenance of very much higher levels of the PUFAs, in particular DHA, within the phospholipids. This increase occurred mainly at the expense of a reduction level of oleic acid. The possible efficacy for the application of the oils from such medical plants through their antioxidant capacities in the prevention of age related macular degeneration is discussed.

Serra R., Carpenè E., Marcantonio A.C., Isani G.: *Cadmium accumulation and Cd-binding proteins in the bivalve Scapharca inaequalis*. Comp. Biochem. Physiol., 111C, 165, 1995.

In this arcid clam cadmium was accumulated in the kidneys, gills, viscera, mantle, foot, muscle and red blood cells. The accumulation was higher during the warm rather than in the cold season. Concentrations of zinc and copper were unaffected by cadmium treatment, whereas iron levels changed during cadmium exposure. The metal was found in the cytosolic fraction, bound to a low molecular weight ligand, shown by gel filtration to be a Cd-binding protein of 10,000 Da, possibly a metallothionein.

Serra R., Carpenè E.: *Metallotioneina e fitochelatine. Metallothionein and phytochelatin*. In: Argomenti di Idrobiologia e Acquacoltura, CLUEB, p. 239, 1995.

The two main systems involved in the processes of heavy metals storage and detoxication are compared. The first is commonly present in animals the second is active in plants. In contrast to animal metallothioneins, plants possess atypical, non translationally synthesized metal thiolate polypeptides, which are reported as phytochelatin and which respond equally well to metal exposure.

Serrazanetti G.P., Pagnucco C., Conte L.S., Cattani O.: *Hydrocarbons, sterols and fatty acids in sea urchin (Paracentrotus lividus) of the Adriatic Sea*. Chemosphere, 30, 1453, 1995 e Oebalia, 17, 587, 1992.

Aliphatic hydrocarbons, linear alkylbenzenes (LABs), sterols and fatty acids were determined in sea urchins (*Paracentrotus lividus*) of the Adriatic Sea in order to study their relationship with the trophic chain. The prevailing aliphatic hydrocarbons were squalene (40.3%) and n-C₁₇ (24.9%), both of recent biological origin. LABs, on the other hand, are considered tracers of domestic wastes in marine environment. Among sterols, cholesterol (73.5%) and other Δ^5 -sterols are dominant. Fatty acids 16:0 (20.0%), 20:5 ω 3 (12.2%) and 14:0 (7.6%) were prevalent here as much as they are in other echinoid species analyzed by other authors. The distribution of these different compounds seems to be influenced by factors such as physiological needs, available diet and anthropogenic contamination.

Serrazanetti G.P., Pagnucco C., Falasca A., Rossi E., Rossi C.A., Viviani R.: Livelli plasmatici di amminoacidi essenziali liberi in orate alimentate con tre diverse diete. *Plasma essential amino acid levels in giltheaded supplied with three different diets*. Atti Soc. Ital. Sci. Vet., 49, 67, 1995.

Essential free amino acids (EFAA) were determined in plasma of three groups of gilt-head (*Sparus aurata*), two years of age, fed for six months with a commercial trout pellet and two artificial diets with high content of vegetal protein, soybean and potato extract, respectively. The relationship between EFAA content in the diets and in the plasma was considered.

Serrazanetti G.P.: Idrocarburi nell' ambiente marino. *Marine environmental hydrocarbons*. In: Argomenti di Idrobiologia ed Acquacoltura (a cura di Carpenè E., Isani G., Serra R.), CLUEB, 215, 1995.

Marine and land organisms biosynthesize hydrocarbons either *de novo* or from ingested precursor compounds. These hydrocarbons may be released during metabolism or upon the death and decomposition of the organisms. There are chemical synthesis processes which are sources of hydrocarbons. There are also chemical reactions occurring during the diagenesis of organic matter in sediments which yield hydrocarbons. Submarine and coastal land oil-seeps release petroleum hydrocarbons to the marine environment. The inputs of hydrocarbons from accidental and intentional discharge of fossil fuel to the marine environment, their distribution and their effects in the trophic chain have been reviewed.

Ventrella V., Pirini M., Trombetti F., Pagliarani A., Trigari G., Borgatti A.R.: Lipid composition, $(Na^+ + K^+)$ -ATPase and cytochrome oxidase activity in salt treated rainbow trout (*Oncorhynchus mykiss Walbaum*) liver. 40° Congresso Nazionale della Società Italiana di Biochimica, Italian Biochemical Society Transactions (IBST), 6, 268, 1995.

Freshwater (FW) trout were fed on a hypersaline diet for a month and then transferred to brackish water (BW) with treatment suspension. In the liver the salt diet administered in FW had generally a poor effect on lipids: among phospholipids only cardiolipin showed a significant rise in treated trout but confined to BW phase. In total, neutral and polar lipids and phospholipid classes the environmental salinity *per se* affects the fatty acid pattern in a way opposite to the salt diet and in good accordance with literature. Both the $(Na^+ + K^+)$ -ATPase and cytochrome oxidase activities are stimulated by the salt diet but in different phases, the former in BW and the latter only during the administration phase in FW.

Ventrella V., Trombetti F.: Enzimi di membrana e adattamenti alle basse temperature. *Membrane-bound enzymes and cold-adaptation*. In Argomenti di Idrobiologia e Acquacoltura (a cura di Carpenè E., Isani G., Serra R.), CLUEB, 47, 1995.

To cope with temperature changes, ectoterms can modulate to some extent their enzyme activities by controlling either the availability of enzyme molecules or the catalytic activities. The various compensatory adjustments ensuring the maintenance of metabolic

rates physiologically adequate to the changed thermal regime are reviewed on a literature basis. Thermal adjustments of membrane-bound enzymes onset at different times and enclose the so-called homeoviscous adaptation of membrane lipids and the different mechanisms involved in the rearrangement of membrane components. Recent findings by the Authors in cold-adapted sea bass are reported and discussed on the basis of different cold-adaptation strategies in different teleost species.

Viviani R., Boni L., Cattani O., Milandri A., Pirini M., Poletti R., Pompei M.: *Fatty acids, chlorophylls and total silicon in mucilaginous aggregates collected in a coastal area of the Northern Adriatic Sea facing Emilia-Romagna in August 1988.* Sci. Total Environ., 165, 193, 1995.

Fatty acid, chlorophylls *a*, *b*, *c* and total silicon analysis were carried out in mucilaginous aggregates collected in a coastal area of the Northern Adriatic Sea facing Emilia-Romagna in August 1988, with the aim of contributing to determine the taxonomy of the producers. The combined data seem to confirm the idea that the mucilaginous aggregates mostly derive from the diatoms responsible for typical blooms in the Adriatic sea. When the presence and morphology of the organisms in the mucilaginous aggregates is not clear, the biochemical marker study seems to be useful not only for taxonomic determination of marine micro and macro algae and other eukariotic organisms, but also for marine prokariotes.

Viviani R., Boni L., Cattani O., Milandri A., Poletti R., Pompei M., Sansoni G.: *ASP, DSP, NSP and PSP monitoring in mucilaginous aggregates and in mussels in a coastal area of the Northern Adriatic Sea facing Emilia-Romagna in 1988, 1989 and 1991.* Sci. Total Environ., 165, 203, 1995.

In this study, monitoring of marine biotoxins in mucilaginous aggregates and in mussels from coastal area of Emilia-Romagna (Northern Adriatic Sea) in June-August 1988, 1989 and 1991, are reported. Both mucilaginous aggregates and mussels were analysed for NSP and PSP in 1988, and ASP, DSP, PSP in 1989, 1991. Concerning mucilaginous aggregate any presence of biotoxins was never detected. In the mussels it was possible to exclude the presence of PSP, ASP and NSP, but very high levels of DSP were shown in all the considered periods, in relation to the presence in the sea water of cells of the *Dinophysis* genus.

Viviani R., Casadei C., Ceredi A., Magnani F., Milandri A., Milandri S., Poletti R., Pompei M., Serratore P.: *Valutazione delle caratteristiche igienico-sanitarie di molluschi bivalvi in allevamento in un'area del mare Adriatico prospiciente l'Emilia-Romagna. Evaluation of sanitary parameters of bivalve mollusks from a cultivation area in the Adriatic Sea by the Emilia-Romagna coast.* PIM Zone Lagunari, Adriatico settentrionale (M. Bertetti, R. Rossi, E. Spreafico, eds), Copyright Regione del Veneto, 346, 1995.

From November 1993 to December 1994 shellfish samples of *Mytilus galloprovincialis*, *Tapes philippinarum*, *Ostrea edulis*, *Callista chione* and *Venus verrucosa* were collected on the bottom in a breeding area off Cesenatico. In the water analysis were carried out on temperature, salinity, dissolved oxygen, nutrients, chlorophyll *a* and phytoplankton. On

the shellfish samples were taken measurements of growth and mortality, and biotoxicological tests (for PSP, DSP and NSP) were performed. Bacteriological evaluation on mollusks and water indicate the presence of halophilic *Vibrio* species, particularly the ones involved in human intestinal and extraintestinal infection.

Zwaan A. de, Cortesi P., Cattani O.: *Resistance of bivalves to anoxia as a response to pollution induced environmental stresses.* Sci. Total Environ., 171, 121, 1995.

The effect of environmental pollution stress factors on anoxic survival time was established in three bivalve molluscs (*Mytilus edulis*, *Scapharca inaequivalvis* and *Venus gallina*). For the evaluation of the cell energy status and ATP turnover rates the accumulation of fermentative end products and changes in the levels of glycogen, adenylates and phosphoarginine were also estimated. The species showed different responses. In contrast to *S. inaequivalvis*, in *M. edulis* and *V. gallina* accumulated cadmium reduced the tolerance to anoxic conditions. In *M. edulis* this was accompanied with enhanced metabolic activity, indicating a higher anaerobic ATP utilisation rate. Additional evidence from literature shows that the anoxic survival responses is a simple methods to judge if environmental variables might have perturbing effect on cellular processes which lead to reduced fitness.

DIPARTIMENTO CLINICO VETERINARIO

Sezione di Chirurgia

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1988

Bignozzi L., Muttini A., Busetto R.: *Surgical treatment of abdominal wall defect in horses with synthetic mesh.* Proceedings of the European Society of Veterinary Surgery (E.S.V.S.), Milano, 17, 143, 1988.

Two clinical cases of abdominal wall defect in adult horses were successfully treated with the implantation of a monofilament knitted polypropylene mesh. The first horse had a large infected ventral laparocoele caused by the infection of a preceding laparotomy suture, the second case suffered a large traumatic hernia of the right flank. The closure of the defect was preceded by a careful dissection of tissues and a good exposition of the margins of the defect. Both horses healed perfectly and a recurrence of the defect did not take place after one year. The first horse had a normal racing career while the second one is actually in training. The use of polypropylene mesh seems to be advisable also for the treatment of infected hernias or when the region of the defects bears stress during sport activity, but further experimental and clinical data are needed.

Capitani O., Fedrigo M., Valentini S.: *Ecografia toraco-diaframmatica. Thoraco-diafragmatic ultrasound examination.* Atti Soc. Ital. Sci. Vet., 42, 1459, 1988.

The thoraco-diafragmatic region echographic examination has been found to be of little use both for technical difficulties due to the impossible propagation of ultrasound through a gaseous medium and because of the difficulty to access to internal organs. However, it is possible to observe pathologies of the parts of the lung which are not aerated, the pleura and the diaphragm.

D'Addato M., Curti T., Pasquinelli G., Preda P., Masetti L., Paragona O., Fedrigo M., Laschi R.: *Modello sperimentale di endotelizzazione. Studio ultrastrutturale di una nuova protesi in Dacron. Experimental model of endothelialization: ultrastructural evaluation of a new Dacron graft.* Arch. Chir. Torac. Cardiovasc., 10, 4, 350, 1988.

Two types of synthetic vascular grafts, Dacron Triaxial and Dacron Gelseal Triaxial, were implanted into both common carotids of sheep. The animals were sacrificed 1, 2, 8 and 16 weeks after surgery. Multiple specimens were studied. Dacron triaxial grafts has a complete pseudointimal coverage, at 4 months, were myofibroblast and fibroblast are the dominant cells; the endothelium is present in the anastomotic site and in the islands along the graft. A stable endothelial coverage developed on Gelseal Triaxial grafts after 16 weeks. Our findings indicate that gelatin impregnation is useful in promoting the healing process.

Fedrigo M., Valentini S.: *Rilievi statistici sull'impiego dell'esame ecografico nella clinica dei piccoli animali. Statistical data on the use of ultrasound in small animals.* Bollettino dell'Associazione Italiana Veterinari Piccoli Animali (AIVPA), 4, 367, 1988.

The Authors have cited some statistical data on the use of diagnostic ultrasound in small animals. The information is based on 1000 ultrasound examinations performed over a 6 years period by the Veterinary Diagnostic Ultrasound Service in the Clinical Surgery Institute of the University of Bologna. The numerous cases have shown the value of ultrasound as a diagnostic tool in clinical examination.

Masetti L., Medri M.S.: La chirurgia della cataratta nel cane: esperienze e considerazioni personali. *Cataract surgery in the dog: personal experiences and considerations*. Atti Soc. Ital. Sci. Vet., 42, 1399, 1988.

The Authors report their casuistry of 223 surgical removal of cataractous crystalline in dogs, considering beginning period, growing stage, extraction method and their results. Examining the casuistry they take some practical and general considerations about patients selection, diagnostic and surgical equipments, quality and surgical methodology performed. Results are discussed and compared with those of other Authors and the opportunity of new dealing is advanced.

Masetti L., Pedrini L., Pragona O., Pisano E., Pecchi M., Saccà A., Vaona I., Busetto R., D'Addato M.: Ischemia sperimentale: valutazioni ematiche e muscolari della fase ischemica e della rivascolarizzazione. *Experimental ischemia: blood and muscle evaluations of the ischemic phase an of the reperfusion*. Arch. Chir. Torac. Cardiovasc., 10, 3, 227, 1988.

In severe ischemias the cellular damage characterized by the release of enzymes and myoglobin sometimes worsen after the reperfusion. The sudden reintroduction of molecular oxygen to ischemic tissues, in fact, may lead to the production of toxic oxygen free radicals. Among the biochemical systems able to protect the cell from the peroxydation due to the O₂ radicals, the glutathione certainly is one of the most effective and precocious. In order to study this biochemical system, 10 sheep were submitted to an experimental ischemia, using ballon catheters for aortic and caval obstruction.

Masetti L.: Introduzione alla anestesia generale del cavallo: conoscenze di base e principi applicativi. *Introduction to horses general anaesthesia: general knowledge and applied principles*. Atti del Congresso Nazionale della Società Italiana di Ippologia (S.I.D.I.), Grosseto, 21, 1988.

The Author illustrates the most common terminology about general anaesthesia and purposes some useful anaesthetic techniques for the horse. General anaesthesia of the equine species are divided into two big groups: anaesthesias in the field situation, anaesthesias in the hospital. The Author describes and illustrates both anaesthesiological procedures for both groups, considering the substances available in Italy. Advantages of the purposed anaesthesiological methodics are discussed.

Muttini A.: Osservazioni cliniche e radiografiche sulle fessure dell'estremità distale della prima falange nel cavallo trottatore. *Clinical and radiographical observation on proximal phalanx fissures in standardbred trotters*. Atti Soc. Ital. Sci. Vet., 47, 1391, 1988.

The Author describes a peculiar fracture of the first phalanx diagnosed in four standardbred. It is a small fissure of the proximal articular surface of the bone. The lesion did not cause a fracture lameness in three cases. The Author emphasizes the difficulties in the diagnosis and the importance of an early detection.

Spadari A., Giordani L., Muttini A., Cremonini A.M., Masetti L.: Identificazione della soglia anaerobica nel cavallo trotatore mediante valutazione della lattacidemia. *Anaerobic threshold determination in standardbred horse with blood lactic acid content.* Atti Soc. Ital. Sci. Vet., 42, 245, 1988.

The blood content of lactic acid was determined in 10 healthy standardbred trotters after 6 trials (three minutes each) at increasing speed. With the collected data it is possible to draw a curve and the examination of this curve with a mathematic method identifies an anaerobic threshold specific for each horse characterized by a peculiar speed and blood lactic acid concentration.

Venturini A., Joehler M.: Fratture metacarpica e radio-ulnare: facile ed efficace osteosintesi con un economico fissatore esterno. *Metacarpal and radio-ulnar fractures: ready and strong osteosynthesis with economic full pin splintage.* Atti Soc. Ital. Buiatria, 20, 503, 1988.

The Authors describe a method of osteosynthesis with full pin splintage in a metacarpal fracture of a calf and in a radio-ulnar fracture of a buck. The osteosyntheses were performed on calf and buck with Steinmann and Kirschner pins (fiches) and stabilized with simple fish-plates of aluminium. In the first one the prosthesis was removed after 25 days and in the second one after 50 days. In both cases x-ray controls showed a good cicatrization. The Authors believe this method of osteosynthesis, easy to perform and remove, useful in bovine practice.

Venturini A., Joehler M.: Nevrectomia dei nervi laringei e miectomia dei muscoli bronco-tracheali e sterno-tracheali per ridurre la fonazione nei volatili canori. *Laryngeal neurectomy and myectomy of bronco-trachealis and sterno-trachealis muscles to reduce phonation in singing birds.* Atti Soc. Ital. Sci. Vet., 42, 1409, 1988.

The Authors describe a simple methodology of laryngeal neurectomy and myectomy of broncho-trachealis and sterno-trachealis muscles to reduce phonation in wild ducks and cocks. Surgery was performed in five adult cocks and three wild ducks. Anaesthesias were performed with ketamine and xilazine and surgical approach was at the cervical portion of the trachea. The Authors consider such technique efficacious to all singing birds.

Venturini A., Pedrini L., Masetti L., Muttini A.: *Experimental study on the reperfusion damages in skeletal muscle of sheep and relations with post-operative myopathy in the horse.* Proceedings of the European Society of Veterinary Surgery (E.S.V.S.), 17, 185, 1988.

Ischemia in the lower limbs was experimentally induced in eighteen adult sheep in order

to study the damages occurring in skeletal muscle fibers during the revascularisation phase and to find a suitable treatment to prevent them. The experimental model is thought to be similar in its basic lines to the post-operative myopathy of the horse. An important role of oxidative damages occurring during the revascularisation phase can be hypothesized in the pathogenesis of post-operative myopathy.

Venturini A., Pizzoferrato A., Toni A., Sudanese A., Ciapetti G., Tinti A.: *Multilayered bead ceramic composite coating for hip prostheses: experimental studies and preliminary clinical results.* J. Biomed. Mat. Res., 22, 1181, 1988.

The clinical use of a new ceramic composite material made up of multilayered alumina beads and adhered to a ceramic surface with a high-temperature-melting bioglass is proposed. The mechanical resistance of the adherence of this coating for the ceramic substratum was good enough to resist the stress to which it was submitted when used for a new model to prosthetic acetabulum. Experiments with rabbits revealed the good biocompatibility of the composite.

1989

Bignozzi L., Busetto R., Muttini A.: Epistassi mortale in un cavallo sportivo con gutturocistite. *Fatal epistaxis in a horse with guttural pouch disease.* Atti Soc. Ital. Sci. Vet., 43, 2147, 1989.

A case of monolateral guttural pouch disease in a five-years-old arabian horse is described in its peculiar clinical and endoscopic findings. The horse suffered from recurrent epistaxis. *Bordetella bronchiseptica* was cultured twice from bioptic specimens. The horse died for an hemorrhagia. Post mortem examinations of involved tissues of the guttural pouch did not reveal any presence of mycosis.

Busetto R., Pigato M.: Diagnosi endoscopica e trattamento con olive dilatatrici di una stenosi esofagea nel cane. *Endoscopic diagnosis and treatment with dilators in the dog oesophageal stricture.* Atti Soc. Ital. Sci. Vet., 43, 2035, 1989.

Endoscopic examination of the first part of the digestive tract was performed in a dog with food overflowing. An oesophageal stricture was diagnosed just at the level of the heart. The AA. had a good result with a treatment made by dilators which had progressively higher diameters starting from 35 Fr. up to 58 Fr. No sign of the lesion was found at the endoscopic examination after 15 days.

Busetto R., Pigato M.: Gli effetti della creatina fosfato nel cavallo sportivo. *Phosphocreatine efficacy in the racing horse.* Atti del Congresso Nazionale della Società Italiana di Ippologia (S.I.D.I.), 9, 29, 1989.

During highest exercise on 10 standardbred trotters Conconi's test, with cardiac output recorded by a cardio-frequency-recorder, was performed. The same test was repeated after a 10-day-administration of 1 g of phosphocreatine every 100 Kg. p.v.. Statistical

analysed data have pointed out an increase of the mean speed with a decrease of the mean cardiac output.

Busetto R., Pigato M.: Sindromi nervose neonatali del puledro da anossia. *Anoxic nervous syndrome in neonate foals*. Atti del Congresso Nazionale della Società Italiana di Ippologia (S.I.D.I.), 9, 143, 1989.

The AA. describe the case of a new-born foal which two days after birth showed the symptoms of a nervous syndrome. Incapacity in standing, dilatation of nostrils, during both inhalation and exhalation, difficult respiration, opisthotonos, chewing the air, were the symptoms that the foal showed, but the most remarkable thing was that the foal barked during inhalation. Anatomic-histo-pathological examinations have been carried out post-mortem.

Capitani O., De Fanti C.: Diagnosi precoce di gravidanza nella cagna e controllo ecografico dell'evoluzione fetale. *Early diagnosis of pregnancy in the bitch and echographic check-up development of the phoetus*. Atti Soc. Ital. Sci. Vet., 43, 2191, 1989.

We consider the diagnosis using ultrasound, the method of choice for the early diagnosis of pregnancy. Its unique properties such as being harmless, non-invasive and its easy execution allow us to repeat it daily without risks for the pregnant animal and for the product of conception. Besides, the echographic exam allows us to evaluate the embryonic development and the vitality of the embryo itself. Our research was done on subjects of different species and followed up from the time of breeding to the time of bitch.

Fedrigò M., Muttini A., Valentini S.: Diagnosi ecografica di alterazioni dei tessuti molli dell'estremità distale dell'arto di cavallo. *Ultrasonographic diagnosis of some soft tissues of the horse distal limb*. Atti del Congresso Nazionale della Società Italiana di Ippologia (S.I.D.I.), 9, 193, 1989.

Some clinical spontaneous cases of soft tissue injuries located on the equine distal limbs have been investigated echographically. The Authors emphasize the significance of ultrasound diagnostics for the perfecting of the physical examination, in order to detect both the exact site and features of the injury, thus supporting the diagnosis as well as the prognosis and therapy.

Fedrigò M., Valentini S.: Ultrasuonodiagnostica in gastroenterologia veterinaria. *Diagnostic ultrasound in veterinary gastroenterology*. Atti XI Incontro Aggiornamento Permanente SCIVAC, 147, 1989.

Ultrasonography can be contributory to the diagnostic process by supporting the clinical, radiographic and endoscopic diagnoses. Echography is a non-traumatic, non-invasive method which can be utilized whatever the animal's condition may be. Inflammations, tumors, dislocations, foreign body and lesions of the peritoneum, omentum and mesentery can be detected. In addition, peritoneal collection, both free and loculated as well as other abdominal organs can also be clearly visualized.

Fedrigio M., Valentini S.: Ultrasuonodiagnostica in oftalmologia veterinaria. *Ultrasound diagnostics in veterinary ophthalmology*. Veterinaria, 2, 5, 1990. Atti Soc. Ital. Sci. Vet., 43, 2039, 1989.

The eye, adnexa and orbit echography has proven its diagnostic validity in ophthalmological pathology. Eyeball examination is feasible even when ophthalmoscopy is impossible due to the opacity of the dioptric structure. A highly reliable diagnosis of any alteration of the adnexa or retro-bulbar zones can be realized. Echographies have been effected on different animals with a B-mode, real time echotomographer with a 7 MHz sectorial transducer.

Joehler M., Masini P., Venturini A.: Plastica cutanea per intasamento nel gatto. *Cutaneous plastic surgery by pocketing in the cat*. Atti Soc. Ital. Sci. Vet., 43, 2157, 1989.

The Authors describe a plastic surgery method to resolve serious traumatic extirpations of the forearms and/or the terminal portions of the limbs skin in the feline species. Cutaneous pocketing technique of the injured part has been ulteriorly applied. Precocious operation, accuracy and meticulousness by choosing the implanting site, allowed a successful aesthetic and functional clinical recovery.

Masetti L., Bortolotti L., Muttini A., Piretti M.V.: Miopatia post-operatoria del cavallo: studio delle modificazioni dei lipidi di membrana. *Experimental post-operative myopathy of the horse: investigation on the possible modifications of the cell membrane lipids*. Atti Soc. Ital. Sci. Vet., 43, 2151, 1989.

Post-operative myopathy was induced in two healthy horses in which a forelimb had been preoperatively stressed in order to identify an oxidative mechanism during the reperfusion. Muscle samples were taken pre-ischemia, during it and after the reperfusion in order to verify the occurrence of modifications of the cell membrane lipids. The results show a peculiar oxidative mechanism possibly related to enzyme activity.

Masetti L., Peruccio C., Pugliese A., Pizzirani S., Schiavi L., Lotti D., Lombardi A., Bindi M., Zunino M.: Indagine policentrica sull'uso del bendazac lisina per la terapia della cataratta nel cane. *Polycentric study on the use of bendazac Lysin in the cataract therapy of the dog*. Veterinaria, 3(1), 107, 1989.

With the purpose to identify a drug able to condition cataract evolution in the dog, the Authors tested bendazac lysin, at single daily dosage of 10 mg/Kg for 3 months periods with 1 month suspending. The experimentation was performed at 3 University Clinics and 12 Private Centers on 255 cataractous eyes at different evolutive stages, aetiology, localisation and time of appearance. The Authors' opinion is that the administration of bendazac lysin, in selected cases, seems to be useful to reduce or stop cataracts evolution in the dog through a mechanism of protein aggregation inhibition.

Medri M.S., Joehler M., Masetti L.: Il glaucoma secondario del cane: esperienze di terapia chirurgica. *Secondary glaucoma in the dog: experiences of surgical therapy*. Atti Soc. Ital. Sci. Vet., 43, 2161, 1989.

The Authors report their experiences of surgical treatment of 90 secondary glaucomas in the dog. Causes, surgical techniques and results are described and compared with those of literature. In the opinion of the Authors is the necessity to realize routinely the clinical examination of visual apparatus in order to discover early cases and predisposed subjects. This will qualify the clinician to apply promptly the right therapy so to have better results.

Muttini A., Martini L.: Aspetti clinici e radiografici in un caso di malattia navicolare in un arto posteriore di un cavallo. *Clinical and radiographic findings in a case of navicular disease in a hindlimb of a horse*. Atti del Congresso Nazionale della Società Italiana di Ippologia (S.I.D.I.), 9, 25, 1989.

Navicular disease is a condition typically related to forelimbs of the horse and reports of navicular disease in the hindlimbs are extremely rare. The pathogenesis of the condition is also poorly understood. This report describes a case of navicular disease of a hindfoot of a saddlebred horse. The Authors emphasize the difficulties encountered during the diagnosis. The horse resumed its previous work after neurectomy of the digital plantar nerves without the recurrence of the lameness. It is suggested that the navicular disease of hindlimbs is perhaps due to a combination of mechanical and vascular factors.

Muttini A., Martini L.: Primo approccio alla chirurgia artroscopica della giuntura cruro-tarsica del cavallo. *First approach to arthroscopic surgery of the tibio-tarsal joint of the horse*. Atti del Congresso Nazionale della Società Italiana di Ippologia (S.I.D.I.), 9, 25, 1989.

This report describes the arthroscopical removal of an osteochondral fragment away from the medial malleolus of the left tibia of a horse. The surgical procedures are described in the light of the difficulties encountered about the position of the horse, the approach to the joint, the method devised to avoid bleeding within the joint and the orientation within the limited field of view. The Authors outline the need for further practical experience and comparison with other experienced surgeons.

Pigato M., Venturini A.: Rottura del legamento crociato craniale nel cane: nuova tecnica chirurgica. *Cruciate deficient stifle in the dog: a new surgical technique*. Atti Soc. Ital. Sci. Vet., 43, 2143, 1989.

The AA. introduce a new periarticular surgical technique (FHT) to stabilize the cruciate deficient stifle and they compare the efficacy of the FHT technique with the preceding ones. Five operated dogs had demonstrated the clinical performances are equal or superior after FHT to other surgical methods for the repairing of the cruciate-deficient stifle in the dog.

Valentini S., Fedrigo M., Capitani O.: Aspetti semiologici dell'esame ecografico B-mode nella visita oculistica veterinaria. *B-mode echography in veterinary ophthalmology semiological findings*. Atti Soc. Ital. Sci. Vet., 43, 2043, 1989.

An accurate ophthalmological examination may be validly supported by echography for

diagnostic, prognostic and therapeutic purposes. The eye, adnexa and the orbit are analyzed quantitatively, qualitatively and kinematically. Echophtalmography is rather easy to practice, but difficult in its interpretation due to the many technical factors and semiological aspects involved. Even beginners will benefit of this synthetic and accessible presentation of the main aspects of interpretation.

Venturini A., Joechler M., Pigato M., Masini P.: *Plastica cutanea per intascamento nel gatto. Cutaneous plastic surgery by pocketing in the cat.* Bollettino dell'Associazione Italiana Veterinari Piccoli Animali (AIVPA), 28(3), 187, 1989.

The Authors describe a plastic surgery method to resolve serious traumatic extirpations of the forearms and/or the terminal portions of the limbs skin in the feline species. Cutaneous pocketing technique of the injured part has been ulteriorly applied. Precocious operation, accuracy and meticulousness by chosing the implanting site, allowed a successful aesthetic and functional clinical recovery.

1990

Bignozzi L., Busetto R., Muttini A., Masetti L.: *Experiences in the treatment of radial and cannon bone fractures in foals with bone plates.* 18th Congress of the European Society of Veterinary Surgery (E.S.V.S.), Uppsala, 1990.

Six cases of long bone fractures in foals were treated by internal fixation with bone plates. Three were fractures of the third metacarpal bone, while the radius was fractured in other three cases. The cannon bone fractures were treated with a single DCP plate, while for the radial fractures two DCP (two cases) or one DCP plus an angular nail plate were used. A good callus developed in all cases; however only one horse could race. Besides the problems related to infection and mechanical strenght, it is thought that the opportunity of removing the implants and the most correct period of the removal may be very important factors for what concern the athletic performance of the patients.

Bignozzi L., Busetto R., Muttini A.: *Osteosintesi con placche a compressione dinamica in frattura del radio di una puledra. Osteosynthesis with compression bone plates in a radial fracture of a filly.* Atti Soc. Ital. Sci. Vet., 44, 1841, 1990.

An arabian 3-month-old filly was operated for a closed multiple diaphyseal fracture of the left radius. The osteosynthesis was performed with two DCP bone plates fixed on the cranio-medial and cranio-lateral surfaces of the radius. The use of the limb was immediately after the operation. The filly had a good recovery and after three months of box-stall rest it was allowed to have a limited exercise in a little paddock. Monthly radiographycal controls show a good formation of bone callus. Bone plates were removed after six months.

Busetto R., Pigato M.: *Diagnosi endoscopica e trattamento chirurgico in un caso di ematoma progressivo dell'etmoide in un cavallo. Endoscopic diagnosis and surgical treat-*

ment in a progressive haematoma of the ethmoid region in a horse. *Atti Soc. Ital. Sci. Vet.*, 44, 1875, 1990.

The AA. describe a progressive haematoma of the ethmoid region in a 8-year-old Irish saddle horse. Surgical removal of the polypus has been made through the opening of frontal and nasal bones. After three months it was necessary to make a new endoscopic examination and a new surgical curettage. Till now (one year) the horse has had no problem; even the histopathological diagnosis has been of progressive haematoma of the ethmoid region.

Masetti L., Joehler M., Medri M.S.: *Neuroleptoanalgesia (N.L.A.) in the dog.* Proceedings of the 2^o European Symposium of Veterinary Anaesthesiology, 24, 1990.

Four groups of 15 dogs each were anaesthetized by means of a neuroleptoanalgesic combination containing ketamine and flunitrazepam. The awakening time, modifications in respiration and heart rates and post-operative clinical patterns were studied in the first group. A number of specific antagonists were administered at the end of the surgical intervention in the other groups: flumazenil in group II, yohimbine and 4-aminopyridine in group III and yohimbine, 4-aminopyridine and flumazenil in group IV. The same parameters as in the first group were examined in groups II, III and IV. Findings show that, on the basis of the administration of the neuroleptoanalgesic treatment, the antagonist of choice is the one used in group III.

Masetti L., Medri M.S., Joehler M.: Verifica della efficacia di un antagonista specifico per le benzodiazepine nella N.L.A. del cane. *Efficacy verification of a specific antagonist for benzodiazepines in dogs N.L.A.*. *Atti Soc. Ital. Sci. Vet.*, 44, 1983, 1990.

The use of N.L.A. in the dog is just consolidated by the possibility of using ketamine associated with a benzodiazepine. The peculiarity of this anesthesiological procedure consists in having the possibility to use antagonizing substances to allow a quick awakening of the patient. Ketamine specific antagonists have just been identified, while benzodiazepine antagonists since now proposed are only generic. The Authors demonstrated the efficacy of an imidobenzodiazepine, flumazenil, as specific antagonist against benzodiazepines. They confirm the efficacy of the proposed substance in the dog and indicate administration procedure and dosage.

Masetti M., Medri M.S., Joehler M.: *Intravenous anaesthesia with ketamine and flunitrazepam in dogs.* Proceedings of the European Society of Veterinary Surgery (E.S.V.S.), 18, 79, 1990.

Intravenous anaesthesia with ketamine alone in dogs induces convulsions and other side effects which make its use unadvisable for anaesthetic purposes. Intravenous administration to effect in a single syringe of a ketamine-flunitrazepam mixture following on sedative vagolytic premedication gives optimum surgical anaesthetic results particularly suitable in operations of short to medium duration in patients at risk. The Authors tested this anaesthetic procedure on 250 dogs in the course of routine operations carried out at the veterinary surgical clinic of Bologna. The Authors illustrate the results of the clinical experience supported by ample clinical data and laboratory findings.

Medri M.S., Joechler M., Spadari A.: La terapia chirurgica di alcune neoplasie degli annessi oculari del cane. *Surgical therapy of some ocular adnexa neoplasms of the dog.* Atti Soc. Ital. Sci. Vet., 44, 1939, 1990.

The increased interest for ophthalmology, particularly regarding ocular adnexa in the dog, allows to diagnose and perform surgical treatments in several neoplasms, some of them without bibliographic knowledge. The Authors report some of their observed and surgically treated cases. They describe their surgical techniques and illustrate the histological appearance and their results. The Authors compare their experiences with those of the literature and conclude in opposition to other Authors that the relapse of the observed malignant neoplasms are very rare.

Muttini A., Bignozzi L., Busetto R., Spadari A.: Terapia chirurgica e trattamento postoperatorio di alcune coliche intestinali nel cavallo. *Surgical treatment and p.o. management in abdominal colic in the horse.* Ippologia, 1(3), 63, 1990.

Recently the number of surgical interventions for equine abdominal colic is increased and, at the same time, the technical problems are diminished. However the percentage of recovery can further improve. In literature numerous and different p.o. complications are described. The most frequent are shock and ileus, but one must be careful to other problems, like: peritonitis, diarrhoea, laminitis, myopathies and traumatic lesions during the awakening. In bibliography we found only one work (Gerring & Hunt, 1986) limited to prevention of the p.o. ileus and no other specific recommendations concerning this period. The knowledge of the importance and the incidence of any of the p.o. complication can help its evaluation and treatment (Hunt, Edwards and Clarke, 1986). This paper concerns our experience in 39 colic horses with particular attention to the surgical treatment and p.o. complications.

Muttini A., Bignozzi L., Busetto R.: *Surgical treatment and postoperative management of some intestinal disorders in the horse.* Proceedings of the European Society of Veterinary Surgery (E.S.V.S.), 18, 103, 1990.

Thirty-nine adult horses have been subjected to abdominal surgery during the last five years. A celiotomy was performed in all cases. When indicated a pelvic flexure colotomy was performed to empty and to flush the lumen; this allowed a better handling of the viscera. Side to side anastomosis was used in cases of muscular hypertrophy of the terminal ileum (jejunocolic anastomosis), in cases of small intestine resection, and in cases of pelvic flexure removal. Postoperative management was based primarily on complete fasting, rehydration and supportive therapy. Particular attention was placed to the early detection of the signs of diarrhea and laminitis. The percentage of recovery in this survey is slightly higher than that reported by other Authors, but this may be correlated to the high incidence of large intestine problems. The high incidence of laminitis during the p.o. period can be explained, in the Authors' opinion, considering that the disease may be induced by vasoactive lipopolisaccarids which, in turn, may be due to large intestine surgery.

Pigato M., Venturini A.: Protesi provvisoria in filo di nylon come coadiuvante nella tenorrafia della corda del garretto nel cane. *Nylon-thread temporary prosthesis supporting the tenorraphy of the fetlock cord in the dog.* Atti Soc. Ital. Sci. Vet., 44, 1845, 1990.

The AA. suggest the use of a nylon-thread as limiting device of foot flexure after tenorrhaphy for breakage of the fetlock cord in the dog. This subcutaneous prosthesis is proximally fixed to the tibial crest and distally to the calcaneal bone. It has the function to avoid the loss of tendinous sutures during the p.o. period.

Spadari A.: Celiotomia e ileo-ciecostomia in cavalla gravida all'ottavo mese affetta da colica. *Celiotomy and ileo-caecal anastomosis in an eight-month-pregnant mare*. Atti Soc. Ital. Sci. Vet., 44, 1813, 1990.

Partial torsion of the large colon was diagnosed through the clinical signs and the rectal exploration in a pregnant (8 months) trotter mare which was presented for a colic. A celiotomy was performed. A muscular hypertrophy of the terminal ileum and a jejuno-ileal stenosis were identified after the colon emptying and the exploration of the intestine. A side to side ileo-caecal anastomosis was operated. The p.o. period was uncomplicated. The pregnancy went to normally and the foal was alive and viable.

Valentini S., Fedrigo M.: Distacco dell'epifisi prossimale della tibia di un gatto e relativa osteosintesi. *Proximal tibial epiphiseal fracture and osteosynthesis in a cat*. Prax. Vet., 11(4), 4, 20, 1990.

The osteosynthesis of a proximal tibial epiphiseal fracture of a cat is described. The lesion is classified as an O'Brien lesion I and it is not very frequent. The Authors describe a kind of technique particularly useful for small size subject which shows good clinical and functional results.

Venturini A., Moroni A., Giannini S., Zaffe D., Ravaglioli A., Kraiewski A., Pompili M., Pezzuto V., Trinchese L.: Comparative histological and chemical-physical analyses on alumina, bioactive glass, bioglaze and hydroxyl-apatite sheep bone implants. *Bioceramics*, 2, 125, 1990.

Four samples of alumina, bioactive glass, bioglaze and hydroxy-apatite were obtained in the shape of a cylinder and numbering four for each of the bioceramics. The samples were implanted into predrilled holes in the lateral cortex of four adult merino sheep femurs. The results show alumina samples were surrounded by bone which never came into direct contact. The bioactive glass samples showed a direct contact with bone, the bioglaze samples, instead, appeared surrounded by fibrous tissue. Hydroxyapatite samples were totally surrounded by bone structured in longitudinal osteons that came into direct contact with the surface of the implants.

Venturini A., Nicoli-Aldini N., Stea S., Donati M.E., Righini S., Rocca M., Fini M., Giardino R., Poppi V.: Rigenerazione dei tronchi nervosi attraverso condotti artificiali: contributo sperimentale. *Nerves regeneration obtained by artificial ducts: experimental contribution*. Congresso della Società Italiana di Ricerche in Chirurgia (S.I.R.C.) e della Società Italiana di Fisiologia Chirurgica (S.I.F.C.) e Ist. Ric. Codivilla Putti, XV e V, 1333, 1990.

The Authors describe preliminary results of regeneration on interrupted nerves obtained with artificial ducts (biological and non biological) in ischiatic nerves of Sprangue Dawley rats with microsurgical technique. The histological tests 30 days after show signs of nervous regeneration.

Venturini A., Nicoli-Aldini N., Stea S., Donati M.E., Righini S., Rocca M., Fini M., Giardino R., Poppi V.: Protesi biologiche per la ricostruzione dei nervi periferici. *Biological prosthesis for the reconstruction of periferal nerves*. Atti Congresso Nazionale della Società Italiana Applicazioni Tecnologiche in Chirurgia (S.I.A. Te.C.), 6, 655, 1990.

The Authors describe an experimental research of reconstruction of nerves with prosthesis (ducts of fibrin glue and segments of homologous vein) treated with glutaraldehyd. Histological tests show nervous regeneration in experimental rats.

Venturini A., Pigato M., Moroni A., Zaffe D., Pezzuto V., Trinchese L., Pompili M.: *Utility of bioinert and bioactive ceramic materials. Histological and chemical-physical analyses*. Proceedings of the European Society of Veterinary Surgery (E.S.V.S.), 18, 197, 1990.

The Authors evaluate the utility of experimental implants of bioinert and bioactive ceramic materials. The aim of our research is to evaluate from histological and chemical-physical points of view the different materials implanted in the same animal and in the same experimental conditions. The study would like to find out the best material to use as coating of uncemented prostheses.

Venturini A., Martini L.: Lussazione inveterata laterale della rotula nel cane: trasposizione della cresta tibiale con embricazione muscolare. *Inveterate lateral luxation of patella in the dog: trasposition of tibial ridge with muscular imbrication*. Atti Soc. Ital. Sci. Vet., 44, 1837, 1990.

In dogs of small size the inveterate luxation of the knee dysplasia can be resolved not only with the classic transposition of the tibial ridge, but also with medio-lateral muscular imbrication of the sartorius. This method improves the containment of the patella and loss of material that is achieved with transposition of the tibial ridge.

1991

Bignozzi L., Spadari A.: Fissazione interframmentaria monocorticale con vite a compressione in frattura "a ciotola" della superficie dorsale del metatarso. *Dorsal metatarsal fracture treated by unicortical fixation with a bene-screw*. Atti Soc. Ital. Sci. Vet., 44, 2009, 1991.

The case of a horse with a saucer fracture of the dorsal aspect of the left third metatarsal bone associated with dorsal metatarsal disease ("bucked shins") type 3 is presented. Definitive diagnosis is made by the radiographic examination. The preferred method of treatment was the unicortical fixation with a bone-screw. The horse healed uneventfully. The Authors discuss some aspects of the pathophysiology and treatment of the disease.

Capitani O., Valentini S., Fedrigo M.: Esame ecografico dell'apparato urinario di cane e gatto. *Ultrasound diagnosis of canine and feline urinary system*. Veterinaria, 6(2), 79, 1992. Atti Soc. Ital. Sci. Vet., 45, 2153, 1991.

Ultrasound examination of canine and feline urinary system is very useful as it allows to differentiate, in the early stages of their formation, degenerative, inflammatory and neoplastic lesions without risks for the patient and the operator. The examination is carried out on the awake patient in dorsal or lateral recumbency. The Authors present some cases showing that ultrasound examination could be a simple, non invasive technique able to give information not only about the diagnosis, but also about the therapy and evolution of the pathological process.

Fedrigo M., Valentini S., Muttini A.: Prime note sullo studio vascolare nel cavallo e nel cane mediante eco doppler a codice di colore. *First reports on ultrasonic evaluation of vessels in the horse and dog using echo-color-doppler*. Atti Soc. Ital. Sci. Vet., 45, 2145, 1991.

After a brief description of the basic principles of color-doppler ultrasound technique, the Authors describe their first findings regarding the study of peripheral vessels in the horse and dog. This study includes the use of doppler ultrasound together with real time ultrasound.

Joechler M., Venturini A., Giorgi G.: Mandiblectomia rostrale: un trattamento per le neoplasie orali del cane. *Rostral mandibulectomy: a treatment for oral neoplasia in the dog*. Atti Soc. Ital. Sci. Vet., 45, 1993, 1991.

The Authors describe a partial mandibulectomy for treatment of oral neoplasia involving the mandible or soft tissues adjacent to the mandible. This surgical technique allows a wide excision of the tumor. The Authors verify, on the basis of their experiences, that the cosmetic result of this surgical treatment is quite acceptable and the animal is able to take and chew solid food.

Masetti L., Joechler M., Medri M.S., Giordani L., Marchetti S.: L'anestesia endovenosa con chetamina e flunitrazepam nel cane. *Intravenous anaesthesia with ketamine and flunitrazepam in dogs*. Veterinaria, 5(4), 17, 1991.

Intravenous anaesthesia with ketamine alone in dogs induces convulsions and other side effects which make its use unadvisable for anaesthetic purposes. Intravenous administration to effect in a single syringe of a ketamine-flunitrazepam mixture following on sedative-vagolytic premedication gives optimum surgical anaesthetic results particularly suitable in operations of short to medium duration in patients at risk. The Authors tested the anesthetic procedure on 250 dogs in the course of routine surgery carried out at the veterinary surgical clinic of Bologna. The Authors illustrate the results of their clinical experience supported by ample clinical data and laboratory findings.

Masetti L.: Le strutture sanitarie veterinarie e la pubblicità sanitaria. *About the veterinary sanitary structures and their publicity*. Guida all'esercizio professionale per i medici veterinari. Ed. Med. Sci., 1111, 1991.

On the context of the guide-book for veterinary practitioners the definitions of the veterinary work structures in order to the force laws are treated after a swift reference to the rules from 1934 up to 1990, year of the F.N.O.V.I.'s regulament for the veterinary practitioners publicity enaction. The requirements for many veterinary sanitary structures as the office, the surgery, the first aid station, the centre, the clinic, the hospital, the laboratory are referred. As counterpart the rules of the request for authorization are described as those for wastes, for X-ray equipments and the regulament of the veterinary practitioners publicity is given.

Medri M.S., Joechler M., Masetti L.: Impiego di protesi intrasclerali nel cane e nel gatto. *Use of intrascleral prosthesis in the dog and cat.* Atti Soc. Ital. Sci. Vet., 45, 1975, 1991.

The Authors implant intrascleral prosthesis previous evisceration of the globe as alternative to enucleation, in case of serious intraocular pathology with loss of vision but without corneal damages. This type of surgery is preferred by the owners because of their unavailability in mutilating their animals. After description of the surgical technique the Authors believe, on the ground of their experiences and positive results, that the proposed implant surgery can be considered as resolute and certainly aestetically useful.

Muttini A., Capitani O.: Trattamento di alcune artropatie del ginocchio del cane con ialuronato di sodio: sperimentazione clinica. *Treatment of some joint diseases of the stifle in dogs with sodium hyaluronate. Clinical trial.* Atti Soc. Ital. Sci. Vet., 45, 2069, 1991.

Ten cases of joint diseases of the stifle in dogs have been treated with intra-articular injection of sodium hyaluronate. The injections have been performed in each case, with aseptic technique, 7 days apart. Clinical results in the light of follow up can be considered encouraging. Further experiences are needed to precisely define the exact indications of this treatment.

Pigato M., Venturini A.: Nuovo metodo per una resistente tenorrafia del tendine d'achille del cane. *New strong tenorrhaphy of calcaneal tendon in the dog.* Bollettino dell'Associazione Italiana Veterinari Piccoli Animali (AIVPA), 1(3), 41, 1991.

The Authors suggest the use of a nylon-thread as limiting device of foot flexure after tenorrhaphy for breakage of fetlock cord in the dog. This subcutaneous prosthesis is proximally fixed to the tibial crest and distally to the calcaneal bone. It has the function of avoiding the loss of tendinous sutures during the p.a. period.

Pinna S., Venturini A.: Chirurgia ortopedica dell'avambraccio del cane. *Orthopaedic surgery of forearm in the dog.* Bollettino dell'Associazione Italiana Veterinari Piccoli Animali (AIVPA), 1(2), 29, 1991.

Because of the variety of radius and ulna growth disorders, no elective operating technique exists for this pathology, but each case requires an "ad hoc" solution: the choice is conditional on diagnostic precocity and will be deduced through radiography. We propose a review of various operations carried out by different Authors so as to

help orthopaedic surgeons with the selection of a suitable solution for each clinical case.

Ragionieri M., Venturini A.: Contributo alla terapia chirurgica della osteocondrite dissecante dell'epifisi prossimale dell'omero del cane. *Contribution to surgical treatment of osteochondritis dissecans of humerus in the dog.* Bollettino dell'Associazione Italiana Veterinari Piccoli Animali (AIVPA), 1(1), 5, 1991.

This inlet procedure of the shoulder joint, taking advantage of the anatomic path, considers only a slight damage to the soft tissue of the region as to permit an extremely rapid rehabilitation. This last condition rewards the operator about the difficult articular view that takes place where there is the highest incidence area of osteocartilaginous pathology of the humeral head.

Spadari A.: Frattura apicale di osso sesamoideo prossimale in un bue. *Apical fracture of proximal sesamoid bone in an ox.* Atti Soc. Ital. Buiatria, 23, 479, 1991.

A lateral sesamoid bone fracture of the fourth digit of the right hindlimb in a six-year-old employed in fast races is reported. The surgical treatment was the apicectomy of the fractured bone.

Spadari A.: Identificazione del centro di deviazione, in avambraccio di puledro con valgismo carpico, per correzione mediante periostiotomia laterale. *Identification of the pivot point for correction of carpus valgus in a foal by periosteal transection.* Atti Soc. Ital. Sci. Vet., 45, 2023, 1991.

The center of deviation (pivot point) was determined in a six-month-old foal with carpus valgus, crossing the lines that on a DP radiograph bisect the radius and the metacarpus. The foal was treated by hemicircunferential section and elevation of the periosteum on the lateral side of the distal radial metaphysis. The Author describes the surgical technique and makes some considerations, pointing out the importance of early diagnosis and treatment, to achieve a good prognosis.

Spadari A.: Litiasi intestinale quale causa di colica in una cavalla. *Colic due to an enterolith in a mare.* Atti del Congresso Nazionale della Società Italiana di Ippologia (S.I.D.I.), 10, 116, 1991.

A 10-year-old mare, with colic due to the presence of an enterolith in the distal small colon, was submitted to surgical treatment. The horse died few hours later for pre-existing perforations of the intestinal wall, caused by the migration of the concretion. In the Author's opinion enterolithiasis can be difficult to diagnose as a cause of colic in horses.

Spadari A.: Pontage articolare carpico in frattura dell'epifisi prossimale del metacarpo in due tori. *Carpal pontage in two bulls with metacarpal fracture of the proximal epiphysis.* Atti Soc. Ital. Buiatria, 23, 469, 1991.

Two bulls, twenty months old each, were presented with metacarpal fracture of the proximal epiphysis. In one patient the fracture was open. The Author describes the technique used to create a carpal articular "pontage". This was obtained with an external fixation device. A hindlimb myositis complicated the recovery. It is hypothesized that the cause of the muscle problem was related to ischemia of the lower limb due to the abnormal recumbency caused by the device. One bull healed completely after two months; the other (who had the exposed fracture), became functionally unable.

Venturini A., Giannini S., Moroni A., Ceccarelli F., Trinchese L., Pezzuto V., Cantagalli S., Zaffe D., Krajewski A., Ravaglioli A., Pigato M.: I Bioceramici in chirurgia ortopedica: stato dell'arte e risultati preliminari. *Bioceramics in orthopedic surgery: know how status and preliminary results*. Giornale Italiano di Ortopedia e Traumatologia, 18(4), 443, 1992. Bioceramics and the Human Body, 00, 295, 1992 IRTEC-CNR, Bioceramics and the Human Body, 00, 46, 1991.

Ceramic materials which can be utilized in orthopedic surgery are classified as bioinert and bioactive ceramics. Bioceramics can be used in orthopedics as substitutes of the bone grafts to fill bone cavities and defects due to benign bone tumors and looseness of total joint replacements. Moreover these materials can be utilized for vertebral arthrodesis. The most suitable bioceramics to this purpose are bioactive ceramics as hydroxyapatite and Beta-TCP. Bioinert bioceramics can also be utilized to make pins and screws for bone fractures internal fixation.

Venturini A., Moroni A., Giannini S., Zaffe D., Ravaglioli A., Kraiewski A., Pigato M., Pezzuto V., Trinchese L., Rollo G.: Bioinert and reactive ceramic materials. Symposium Intern. du Group de Recherche sur les Biomateriaux et les Greffes, 7, 57, 1991.

Cylindrical samples of alumina, bioactive glass, bioglass and hydroxyapatite were obtained in the shape of a cylinder and numbering four for each of the bioceramics. The samples were implanted into predrilled holes in the lateral cortex of four adult merino sheep femurs. The results show that all the samples were surrounded by newly deposited bone. Six months after the bioactive glass samples showed a direct contact with bone. Hydroxyapatite samples were totally surrounded by bone structured in longitudinal osteons that came into direct contact with the surface of the implants.

1992

Bignozzi L., Spadari A.: Tecnica per la immissione del liquido di contrasto per la mielografia cervicale nel cavallo. *Contrast fluid immission technique for cervical myelography in horse*. Atti Soc. Ital. Sci. Vet., 46, 2169, 1992.

Cervical myelography is a diagnostic procedure used in equine medicine to make evidence for disease in the cervical vertebral column or in its contents. The technique employed for immission of contrast fluid in the cisterna is described. The introduction of the spinal needle is performed with the patient under general anaesthesia, with aseptic technique and under radioscopic control. During and after the operation we did not have any complications or other problems.

Capitani O., Valentini S., Fedrigo M.: Diagnosi ecografica di lesioni tiroidee nei piccoli animali. *Echographic diagnosis of thyroid lesions in small animals*. Atti Soc. Ital. Sci. Vet., 46, 2181, 1992.

Besides the tests at present available to evaluate the morphology and function of the thyroid gland, the echographic examination is a collateral technique that can be useful to study the normal structure and some of the pathologic abnormalities of the gland. Ultrasound scanning is performed examining carefully both lobes of the thyroid. In this way we can note the presence of inflammatory lesions; the presence of a neoplastic benign form, that appears as homogeneous texture, or a malignant form, that appears as a non-homogeneous mass with no clear boundaries; it also permits us to differentiate different types of struma.

Delogu M., Valentini S., Fedrigo M.: Immagini ultrasonodagnostiche in testudo graeca ed hermanni. *Ultrasound diagnostic images in testudo graeca and hermanni*. Atti Soc. Ital. Sci. Vet., 46, 2187, 1992.

The Authors communicate their first experiences on echodiagnostic exploration of reptiles and particularly of testudines as a new possibility of non-invasive survey. This preliminary study is just restricted to identify acoustic gaps as well as to recognize the different structures which can be investigated by ultrasound in order to achieve normal anatomico-physiological criteria of reference essential to apply this technique.

Fedrigo M., Muttini A., Valentini S.: *Ultrasonographical evaluation of some soft tissue diseases of equine metacarpus and metatarsus*. Premier Symposium international d'echographie veterinaire, 102, 1991. Ippologia, 3(2), 71, 1992.

The Authors describe their experiences in the echographic evaluation of some tendon and ligament injuries of equine metacarpus and metatarsus. Clinical and radiographic studies were always carried out before ultrasound examination. In most cases lesions appear as ipoechoic areas of various size within the tendon or ligament. The advantages of this technique are outlined and can be summarized as follows: 1) ease of performance, 2) diagnostic precocity and 3) possibility to monitor the healing process.

Joechler M., Medri M.S., Masetti L.: Allargamento della pelvi ristretta, causa di costipazione nel gatto osteodistrofico. *Widening of the reduced pelvis, cause of constipation, in the osteodystrophic cat*. Atti Soc. Ital. Sci. Vet., 46, 2273, 1992.

Pelvic channel narrowness induces constipation in the osteodystrophic cat probably because of the early maturation of the growth plates of the pelvis. The Authors suggest the use of a very simple and easy to manage steel prosthesis on the pelvic symphysis previously interrupted. The prosthesis does not need fixation means. Distance results of nine cases are reported and discussed. The use of a steel prosthesis is to prefer to the one of bone.

Masetti L., Freyrie A., Curti T., Rodio M., Bignozzi L., Sanguinetti V., Joechler M., D'Addato M.: *Interaction between vascular prostheses and rifampicin in the prevention of*

the grafts infection: an experimental study. Journal of International Angiology, 11(2), 113, 1992.

Five sheep were operated on making a prosthetic graft on both of the common carotid arteries: on one side a Gelseal Dacron prosthesis was implanted after being soaked for 15 minutes in a solution containing 1 mg/ml rifampicin. A Knitted Dacron prosthesis was implanted in the controlateral carotid artery, again after pretreatment with rifampicin. Explants were made after 2, 24, 48, 72 and 96 hours and the concentration of rifampicin on the prostheses were assessed on the basis of the diameter of the inhibition area on *Staphylococcus aureus* cultures. The results showed that the Gelseal Dacron prostheses maintained rifampicin concentrations with an antibacterial activity up to 72 hours.

Masetti L., Medri M.S., Joehler M.: Assistenza anestesiológica nelle risoluzioni incruente delle ostruzioni da corpo estraneo dell'esofago e della trachea del cane. *Anaesthesiological assistance for bloodless resolutions of esophagus and tracheal foreign bodies obstruction in the dog.* Atti Soc. Ital. Sci. Vet., 46, 2217, 1992.

Bloodless removal of trachea and esophagus foreign bodies in the dog often causes respiratory and sometimes heart failure with death of the patient. The Authors, on the basis of their critical casuistry valuation and having picked out the causes, propose an anesthesiological protocol to save the animal from the accident. The protocol shows the steps of drugs administration and the type of useful drugs. The new procedure raised the percentage of recovery.

Masetti L., Pedrini L., Catizone L., Muttini A., Motta R., Fiocchi E., Guarnieri C., Fornino G., D'Addato M.: Local haemofiltration with free radical scavenger treatment during revascularisation of severe muscular ischaemia induced in sheep. *European Journal of Vascular Surgery*, 6, 47, 1992.

The aim of our study was to investigate the effect of combining haemofiltration with a treatment using compound oxy-radical scavengers in order to prevent or to reduce the appearance of the revascularisation syndrome. The study was performed on 13 sheep. Eight animals underwent 4 hours of aortic and vena cava occlusion, followed by normal reperfusion (control group). Five sheep underwent the same period of ischaemia, followed by 1h of local haemofiltration and re-oxygenation and 2 hours of normal revascularisation. The treatment produced good protection against oxydative stress, shown by an increase in the glutathione ratio, reduced muscular damage, confirmed by a moderate increase in CPK levels.

Muttini A., Vannucci, G.L.: Studio preliminare sull'evoluzione dell'osteochondrosi dissecante del rilievo intermedio della coclea tibiale nel cavallo. *Preliminary study on the progress of osteochondrosis dissecans of the intermediate ridge of the distal tibia in the horse.* Atti Soc. Ital. Sci. Vet., 46, 2315, 1992.

The Authors refer the results of a radiological study on foals, concerning the progress of osteochondrosis dissecans of the intermediate ridge of the distal tibia. Animals have been subjected to conservative treatment. The results indicate the possibility of spontaneous healing.

Pinna S., Ragionieri M., Venturini A.: Osteoclasia mascellare per la riduzione della palatoschisi nel cane. *Maxillary osteotomy for the reduction of the palatoschisis in the dog.* Prax. Vet., 15(3), 7, 1994. Atti Soc. Ital. Sci. Vet., 46, 2261, 1992.

This technique has been used when the palatoschisis was so serious that it did not allow the plastic surgery of drawing of the only soft tissue. The plastic surgery of the palate is possible with drawing of the maxillary bone, the osteotomy of the interincisive suture and the facial skull bone elasticity of the young animal help the circlage wire. The technique permits the survival of the subject that would be destined to certain death.

Spadari A., Bignozzi L.: Tecnica chirurgica per la cateterizzazione permanente del dotto pancreatico della bovina. *Surgical technique for permanent cannulation of the bovine pancreatic duct.* Atti Soc. Ital. Buiatria, 24, 659, 1992.

The collection of pancreatic juice, needed for a study of external secretion of the pancreas, was obtained with the permanent cannulation of the pancreatic duct in a 6-year-old cattle. The technique employed allows the pancreatic juice to re-enter the duodenum when it was not collected. Considerations are made about the p.o. care and the stability of the implant in order to avoid sepsis and juice diffusion in the abdominal cavity.

Spadari A.: Esperienze di innesto cutaneo a isola nel cane e nel cavallo. *Experiences in punch graft technique in the dog and horse.* Atti Soc. Ital. Sci. Vet., 46, 2157, 1992.

Autologous punch graft technique was employed in a dog with a sore on the lateral aspect of the right thigh and in a horse with a sore shin with great defect in the left hindlimb. The procedure and p.o. care are described. The procedure is quite easy and there is no need of expensive instrumentation. The technique lead to good healing in both cases, even in the difficult case of the horse, in which the lesion did not progress towards resolution after four months of conservative care.

Valentini S.: Criptorchidismo. *Cryptorchidism.* Obiettivi e Documenti Veterinari, 4, 84, 1992.

Echographic images of cryptorchidism are described.

Valentini S.: Diagnosi ecografica di lesioni congenite in un gatto. *Echographic diagnosis of congenital lesions in a cat.* Obiettivi e Documenti Veterinari, 3, 17, 1992.

Congenital lesion in a cat are echographically examined. Echography shows the presence of a diaphragmatic hernia and polycystic kidneys.

Venturini A., Moroni A., Pompili M., Pigato M., Antolotti A., Stea S., Pizzoferrato A.: Titanium hip prosthetic stems plasma sprayed with hydroxyapatite implanted in sheep. IV World Biomaterials Congress, Berlin, 4, 297, 1992.

The aim of this study was to analyse six hydroxyapatite coated femoral stens implanted in

sheep in order to determine the efficacy of the hydroxyapatite coating to support direct bone mineralization. The femoral prosthesis was designed through an accurate anatomical study on sheep cadaveric specimens. The acetabular component was manufactured with high density polyethylene and cemented. The femoral component was hydroxyapatite plasma sprayed with an in air technique. Results demonstrate that at a one year follow up the titanium hydroxyapatite interface was stable and a direct contact between bone and hydroxyapatite occurred in the proximal area on the prosthesis.

1993

Bignozzi L., Spadari A., Pigato M.: Proposta di variante alla tecnica classica di artrodesi pastoro-coronale nel cavallo. *Pastern joint arthrodesis: a varying technique in comparison to the classic one in the horse*. Atti Soc. Ital. Sci. Vet., 47, 2345, 1993.

A varying technique for pastern joint arthrodesis has been made in four horses which were affected with a degenerative joint disease of the proximal interphalangeal joint. The therapeutic arthrodesis had been made in order to immobilize the joint just to relieve pain. We have made a varying technique of the pastern joint arthrodesis in comparison to the classic one. The difference consists in: 1) demolition of the articular cartilage making more closed lateral-medial drilling parallel to the joint; 2) the joint have been fixed by 3 transarticular screws which have been passed through small incisions of the skin and of the common digital extensor tendon.

Busetto R., Pigato M., Spadari A.: Enterolithiasi nel cavallo. *Enterolithiasis in the horse* Atti del Congresso Nazionale della Società Italiana di Ippologia (S.I.D.I.), 11, 229, 1993.

The Authors describe 3 cases of enteroliths found during surgery for colic syndrome. The animals had different sex and age and the surgical removal allowed ablation and qualitative analysis of the foreign body. All 3 enteroliths had different morphology.

Capitani O., Delogu M.: Ecoanatomia e potenzialità ecodiagnostica in medicina aviaria. *Echoanatomy and echodiagnostic potentialities in avian medicine*. Atti Soc. Ital. Sci. Vet., 47, 2209, 1993.

Some orders of birds (Ciconiformes, Columbiformes, Falconiformes) were examined by ultrasonographic techniques. For placing the transducer in contact with the skin, substernal and abdominal unfeathered areas (apteria) were utilized. There are no pneumatized structures below these areas. Ultrasound images of the liver, spleen and digestive apparatus have an important value in birds. Non-invasive survey applied in pet birds and in endangered wild birds allows a large number of diagnostic potentialities.

Delogu M.: Il ripristino strutturale dell'omero negli uccelli mediante R.G.T. e tecniche di fissazione esterna ed interna associate. *Humeral repair in birds by guided tissue regeneration and external and internal associated fixation techniques*. Atti Soc. Ital. Sci. Vet., 47, 2349, 1993.

Ten pigeons (*Columba livia* domestic form) with humeral diaphysis fracture were treated with external and internal fixation techniques (Boston technique and intramedullary pin). A longitudinal space was intentionally left between fracture surfaces during osteosynthesis. This space was filled with bovine lyophilized collagen, set around an intramedullary pin, in five samples. Ossification process was checked by radiography every 7 days. Results show the utility of this technique in pneumatic bird bones. In fact shortening control and callus formation facility were observed.

Fedrigio M., Muttini A., Valentini S., Petrizzi L.: Esame eco-doppler a codice di colore delle arterie digitali dell'arto anteriore del cavallo. Note preliminari. *Echo-color-doppler examination of forelimb digital arteries in the horse*. Atti Soc. Ital. Sci. Vet., 47, 2225, 1993.

The described method was employed to study the anatomical features and blood flow of the equine forelimb digital arteries using an ESAOTE AU 590 asynchronous echograph with linear probe (7,5 MHz). The parameters considered were systolic and diastolic peaks, mean velocity (Vm), pulsatility index (P.I.), resistance index (R.I.) and vascular diameter. Constant ranges of analyzed values were obtained as first result. Because of the analyzed values and easy employment, this method is thought to be useful for early detection of podal vascular disorders.

Joehler M.: Allargamento della pelvi ristretta, causa di costipazione, nel gatto osteodistrofico. *Widening of the reduced pelvis, cause of constipation in the osteodystrophic cat*. Clinica felina, 2(1), 13, 1993.

Pelvic channel narrowness induces constipation in the osteodystrophic cat probably because of the early maturation of the growth plates of the pelvis. The Author suggests the use of a very simple and easy to manage steel prosthesis on the pelvic symphysis previously interrupted. The prosthesis does not need fixation means. Distance results of nine cases are reported and discussed. The use of a steel prosthesis is to prefer to the one of bone.

Joehler M.: Assistenza anestesiológica nelle risoluzioni incruente delle ostruzioni da corpo estraneo dell'esofago e della trachea del cane. *Anaesthesiological assistance for bloodless resolutions of esophagus and tracheal foreign bodies obstruction in the dog*. Bollettino dell'Associazione Italiana Veterinari Piccoli Animali (A.I.V.P.A.), 32(1), 39, 1993.

Bloodless removal of tracheal and esophagus foreign bodies in the dog often causes respiratory and sometimes heart failure with death of the patient. The Author, on the basis of the critical casuistry valuation and having picked out the causes, proposes an anaesthesiological protocol to save the animal from the accident. The protocol shows the steps of drug administration and type of useful drugs. The new procedure raised the percentage of recovery.

Joehler M.: Impiego del filo da osteosintesi nella realizzazione di "bande di tensione" per alcune fratture nel piccolo animale. Use of osteosynthesis wire to realize "tension bands" in some fractures in the small animal. Atti Soc. Ital. Sci. Vet., 47, 2397, 1993.

In avulsion and osteotomic fractures sometimes the fragment fixation by a compressing screw doesn't allow the primary bone union. Often the synthesis screw bends or breaks because of its trasversal tension shocks or of its non guaranted strong fragment stabilization. Tension bands have been studied and proposed to contrast tension strenghts and to transform them in compression. The Author describes his own experiences by realizing very simple tension bands with osteosynthesis wire and shows the obtained results.

Masetti L., Joechler M., Medri M.S.: Impianto del cristallino artificiale nel cane. *Intraocular lens implant in the dog*. Atti Soc. Ital. Sci. Vet., 47, 2391, 1993.

The Authors describe the surgical procedure of intracapsular prosthesis (I.O.L.) insertion and report their experiences. Ten intraocular lenses were implanted. After a follow up of 10 months they had 7 positive results. These preliminar results produce a percentage of successes (complete visual function restoring) superior to that obtained by the simple intracapsular lens extraction.

Masetti L., Pedrini L., Guarnieri C., Pisano E., Vaona I., Muttini A., Motta R., Sardella L., Saccà A., D'Addato M.: *Prevention of reperfusion syndrome in acute muscular ischaemia with free radical scavengers and membrane-protecting compounds: an experimental study*. Cardiovasc. Surg., 1(4), 325, 1993.

The prevention of oxidant-induced damage following reperfusion was experimentally evaluated. Two pharmacological regimens containing different combinations of antioxidant factors and membrane-stabilizing compounds, such as alpha-tocopherol, methionine, dexamethasone, mannitol and cysteine, were administered. The reduced/oxidized glutathione (GSH/GSSG) ratio in muscle was used to evaluate oxidative stress. Although oxidative stress is not the only cause of damage in revascularisation, this study confirms the protective ability of treatment with free radical scavengers and membrane-stabilizing compounds.

Muttini A., Pellizzari M., Verzella F., Petrizzi L.: Cheratoplastica con patch sclerale nel trattamento di due casi di perforazione corneale nel cavallo. *Keratoplastic with corneal patch for the treatment of two cases of corneal perforation in the horse*. Atti Soc. Ital. Sci. Vet., 47, 2309, 1993.

Two cases of corneal perforation caused by infectious keratoconjunctivitis was treated with a patch of human sclera. The procedure consists in the closure of the defect with the direct suture of the patch onto the cornea, after the reconstruction of the anterior chamber and the reposition of the iris. Four months after surgery, follow up demonstrates corneal trasparency and good vision. This procedure can be considered a good alternative to other techniques, because of the availability and good tollerance of the patch.

Spadari A., Cinotti S., Pietra M.: Tecnica chirurgica sulla fistolizzazione permanente del rumine nel bovino. *A technique for permanent ruminal fistulation in cattle*. Atti Soc. Ital. Buiatria, 25, 687, 1993.

A surgical technique for the creation of a ruminal fistula in two distinct operations is presented. In the first the rumen is fixed to the abdominal wall. In the second the ruminal wall is opened. The purpose of this procedure is to obtain complete and definitive isolation of the abdominal cavity before the rumen is opened, so preventing leakage of exudates and ruminal content in abdomen.

Spadari A., Joechler M.: Osteosintesi a compressione interframmentaria in frattura di Salter-Harris del 2° tipo del 3° metatarso in un puledro trotatore. *Osteosynthesis by interfragmentary compression in 2nd type Salter-Harris fracture of the hind metatarsal bone in a colt.* Atti del Congresso Nazionale della Società Italiana di Ippologia (S.I.D.I.), 11, 221, 1993.

The Authors describe the osteosynthesis technique by interfragmentary compressing screws in 2nd type of Salter-Harris fracture of the distal end of the hind metatarsal bone in a five-month-old colt. The subject healed in 70 days. Positive clinical and radiographic results are commented also considering literature data.

Spadari A.: Estesa sequestrazione della compatta del metacarpo in una bovina: trattamento chirurgico. *Surgical treatment of broad sequestrum of metacarpal cortex in a heifer.* Atti Soc. Ital. Buiatria, 25, 499, 1993.

Clinical evaluation of a heifer with osseous sequestration of a fragment of metaphysis and of the entire cortical bone of the left metacarpus. The surgical removal of the two sequestra was operated separately, in two times and gave good results. Some short considerations are made about clinical, radiological features and technique employed.

Spadari A.: Proposta di omentopessi parietale e circumcostale per impedire le recidive di torsione gastrica nel cane. *Proposal of parietal and circumcostal omentopexy to prevent recurrence of gastric volvulus in the dog.* Atti Soc. Ital. Sci. Vet., 47, 2339, 1993.

The Author proposes a personal surgical technique with the aim to prevent recurrency of the gastric volvulus of the dog. In three patients with acute gastric volvulus it was created immediately a gastrostomy in the right hypocondral. After few days the stoma was closed, the stomach reposed and in the same intervention the omentum inserted to the pyloric antrum was fixed to the abdominal wall near the 12th rib; this omentopexy was completed with a circumcostal passage of a plica. The p.o. period was uncomplicated and there was no recurrence.

Valentini S., Fedrigo M., Zoli P.: Ecografia transrettale della prostata nel cane. *Transrectal ultrasonography (TRUS) of the canine prostate.* Summa, 3, 23, 1994. Atti Soc. Ital. Sci. Vet., 47, 2213, 1993.

The Authors described transrectal ultrasound scanning of the canine prostate using bi-plane probe. This technique is very useful as it allows to observe the whole glandular structure with a little attenuation of the ultrasound beam: the beam attenuation appears to be a very common problem in the transabdominal examination. Moreover, bladder

filling is not required. The only limit is due to the scanner size: patient size ratio; for this reason it is possible to carry out the examination only on middle ad large breeds.

Valentini S., Fedrigo M.: *Echo-color-Doppler in two cases of artery occlusion in dogs.* Atti del 2° Congresso Annuale EAVDI, 46, 1993.

Color-doppler echography is one of the most appropriate examination procedures for the study of occlusion pathologies affecting the vascular system. This technique is particularly suited both for confirming diagnosis and for identifying the exact area where the lesion is located. The Authors describe two cases of artery occlusion in dogs examined by doppler-color flow mapping (CFM).

Valentini S., Fedrigo M.: *Esame echo-doppler a codice di colore del sistema vascolare periferico del cane. Echo-color-doppler of the peripheral vascular system of the dog.* Bollettino dell'Associazione Italiana Veterinari Piccoli Animali (AIVPA), 4, 23, 1993.

Echo-color-doppler is a new diagnostic technique for the study of the peripheral vascular system of the dog in veterinary medicine. This technique is the combination of 3 methods: a) traditional echography which permits to evaluate the walls of the vessels and endovascular lesions; b) Doppler effect which allows to evaluate haemodynamic characteristics of the vascular region and c) color which identify the presence of the blood flow, its direction and the kind of flow.

Valentini S.: *Cisti ematica nell'utero di una gatta. Haematic cyst in the uterus of a cat.* Obiettivi e Documenti Veterinari, 1, 58, 1993.

The presence of an haematic cyst in the uterus of a cat has been described. Radiographic and echographic images are shown.

Valentini S.: *Esame ecografico di alcune lesioni della milza nel cane. Echographic examination of some splenic lesions in the dog.* Bollettino dell'Associazione Italiana Veterinari Piccoli Animali (AIVPA), 2, 21, 1993.

Echography is a useful diagnostic tool to examine structural lesions of the spleen of the dog (tumors, haematomas, lacerations, etc). It is a non traumatic and non invasive technique that supplements information obtained by clinical and radiological examination. Echographic images of some of the most commonly identified spleen pathologies are described.

Valentini S.: *Follow up ecografico di lesioni prostatiche. Echographic follow up of prostatic lesions.* Obiettivi e Documenti Veterinari, 2, 53, 1993.

Prostatic pathologies are very frequent in the mature dog. Ultrasound examination is a very useful technique to evaluate the gland structure. The Author describes a case of prostatic lesion echographically examined and the follow up after pharmacological and surgical therapy.

1994

Busetto R., Spadari A., Pigato M., Bignozzi L.: Proposta di tecniche chirurgiche in caso di quadri patologici del pene e del prepuzio del cavallo. *Surgical techniques for pathologic conditions of the equine penis and prepuce*. Atti Soc. Ital. Sci. Vet., 48, 1994 (in press).

The Authors refer about more than 10 pathological cases on equine penis and prepuce causing "impotentia coeundi". Treatments performed started from reduction and forced maintenance of the prolapsed organ into the sleeve, to the prepuce exeresis and penis amputation. The Authors relate hereafter about clinical cases, surgical techniques and the upshots.

Delogu M., De Marco M.A., Valentini S.: Il trattamento ortopedico operatorio nella correzione della perosi in uccelli domestici e selvatici. *Surgical orthopedic treatment in the correction of perosis in domestic and wild birds*. Zootecnica International, 44, Giugno 1994.

Perosis is a frequent clinical finding in the breeding of wild and ornamental species. Both uni- and bilateral conditions are irreversible in most cases and the birds usually develop serious complications. Because of the emotional, biological and economic value of the various species, surgical solutions to this problem were tried. On 5 chickens suffering from bilateral perosis using a reconstruction technique of the tibial-troclea at the point of the tibiotarsal-tarsometatarsal joint. This surgical technique is similar to that used in the treatment of congenital medial dislocation of the patella in dogs. Following these encouraging results, the technique was used successfully on wild and ornamental birds.

Delogu M., Fedrigo M., Valentini S., De Marco M.A.: Influenza delle fratture di radio e ulna sulla portanza dell'ala nelle specie aviarie. *Influence of radius and ulna fractures on the wing supporting surface in wild birds*. Atti della Società Italiana di Chirurgia Veterinaria (SICV), 1, 329, 1994.

The Authors have measured the wing supporting surface in 60 wild birds of 24 species. The distribution of this parameter in different wing regions (brachium, antebrachium, manus) has made it possible to correlate radius and ulna fractures with the biomechanical mechanism which consequently decrease the flying ability of the wing. Functional loss depends on the wing pattern and it results more evident in wings showing an elevated elongation factor.

Fedrigo M.: Frattura delle ossa pneumatiche e loro trattamento. *Pneumatic bone fractures and their treatment*. Atti della Società Italiana di Chirurgia Veterinaria (SICV), 1, 231, 1994.

The anatomical, physiological and biomechanical knowledge of pneumatical bones is very useful for the correct surgical approach. In order to treat fractures, some techniques appear to be particularly indicated because they do not interfere with bone homeostasis. This characteristic allows an easy healing process and, thus, a rapid return to functional activity.

Joechler M., Masetti L.: La riparazione chirurgica del tendine d'Achille del cane (corda del garretto) mediante fascia lata. *Surgical repair of the Achilles tendon of the dog by fascia lata transplant*. Atti Soc. Ital. Sci. Vet., 48, 1994 (in press).

The termino-terminal suture of the superficial digital flexor tendon does not only offer an immediate and sufficient mechanical support to assure an efficacious recovery in acute and chronic lesions. In these cases we have an incomplete functional sliding restoration with secondary bad function of the leg and sometimes relapse. Considering various surgical techniques suggested in order to obviate to these disadvantages the Authors preferred to repair the lesion with fascia lata transplant. The obtained recoveries were immediate and complete. The treated dogs had an excellent functional recovery to the sport activity without relapses.

Masetti L., Pedrini L., Pisano E., Muttini A., Facchini A., De Pasquale V., Ruggeri A., Saccà A.: Ischemia-reperfusion syndrome: an alternative experimental model. *J. Cardiovasc. Surg.*, 35, 431, 1994.

Ischemia was induced under general anaesthesia in the posterior limbs of 10 sheep by occluding the aorta and vena cava by means of two-way balloon catheters. Ischemia was stopped after 4 hours and blood and histologic parameters determined in the first three hours of revascularisation. The animals were divided into three groups: a group of 3 sheep in which a sham operation was performed; a control group to assess the efficacy of induced ischemia; the third group to determine the effect of antioxidant and membrane protective drugs to assess the reliability of the model to study the ischemia-reperfusion syndrome. This model is an effective experimental strategy and a mean of assessing preventive treatment.

Masetti L., Trucchi G.: L'anestesia generale del cavallo traumatizzato. *General anaesthesia in the traumatized horse*. Atti della Società Italiana di Chirurgia Veterinaria, (S.I.C.V.), 1, 27, 1994.

In the realisation of a general anaesthesia of the traumatized horse it is necessary to evaluate the risks produced by the patient farther to have the correct treatment (behaviour) considering the fundamental concept of prevention instead of therapy. Anaesthetists, patients and structure requirements are evaluated, considering the importance of this kind of anaesthesiological procedure. On the basis of their experiences and of the careful comparative examination of the recent insufficient scientific literature the Authors describe the possible modern anaesthesiological techniques and propose the one which they suppose to offer the best results.

Muttini A., Petrizzi L., Spadari A.: Fisiopatologia molecolare delle articolazioni: giustificazione di un modello sperimentale. *Molecular physiopathology of joints: justification of an experimental model*. Atti della Società Italiana di Chirurgia Veterinaria (S.I.C.V.), 1, 445, 1994.

Studies conducted on experimental and natural articular diseases demonstrated that defects in proteoglycan aggregation and hyaluronate depolymerization can be considered

the basis for the development of articular changes. Furthermore abnormal aggregation of proteoglycans have been attributed to hyaluronic acid alterations. Since recent researches showed that hyaluronate damages may be due to the action of oxygen derived free radicals generated by hypoxic/reperfusion injuries in rheumatoid arthritis, inducing articular devascularization and revascularization may be useful to study reactive oxygen radicals action on hyaluronate in synovial fluid and in cartilage proteoglycan aggregates.

Muttini A., Petrizzi L., Tinti A., Bertoluzza A.: *Synovial fluid parameters in normal and osteochondritic hocks of horses with open Physis.* J. Biol. Res., 12, 70, 1994.

An investigation was carried out on most common synovial fluid parameters of normal and osteochondritic hocks of horses less than 12 months old in order to confirm the presence of an inflammatory process. Furthermore, a spectroscopic study was performed on synovial fluid from both normal and diseased hocks. A depolymerization of hyaluronic acid was demonstrated in synovial fluid from diseased joints, similar to that reported in human rheumatoid arthritis. A one-month-rest seems to normalize all parameters considered and in one joint a return to normal infrared spectrum was demonstrated.

Pigato M., Spadari A., Busetto R., Muttini A., Bignozzi L.: *Cortical screws osteosynthesis in two cases of Salter Harris type II lesion in foals.* Second International Colloquium on Working Equines. Rabat, Marocco, pagg. 34-36, 1994.

The classification of Salter Harris lesions is commonly used in veterinary medicine even if it originally comes out from humane medicine. The Authors describe the radiological findings, the surgical treatment (reduction and internal fixation using cortical screws) and the outcome of 2 cases of type II Salter Harris lesion, which is a fracture passing through the physis across part of the width of the bone and through the metaphysis leaving a segment of metaphysis attached to the epiphysis. The good results in both cases gave fracture healing and allowed longitudinal growth. The Authors consider that it is not easy to compare the results of growth plate lesions treatments in foals because there are several factor to consider when evaluating the whole case.

Spadari A., Busetto R., Pigato M., Bignozzi L.: *Fissazione secondaria, integrativa o sostitutiva, dopo osteosintesi "AO" in fratture di ossa lunghe del puledro.* *Secondary fixation, integrative or in substitution of "ASIF" osteosyntesis in the foal long bone fracture.* Atti Soc. Ital. Sci. Vet., 48, 1994 (in press).

During the recovery period from long bone diaphyseal fracture in foals, treated with reduction, fixation and stabilization by "ASIF" technique, some complications responsible of delaying or preventing healing may occur. A continuous and attentive assistance can reveal on time the arising of those problems. With some secondary device, integrative or in substitution of the first employed, we reached a good outcome also in the complicated cases.

Spadari A., Dora Genocchi E., Legnani C., Legnani F.: *Obliterazione di fistola oronasale in un cane con protesi permanente protetta da scheletrato temporaneo.* *Oronasal fistula*

occlusion with permanent prosthesis and temporarily skeleton in a dog. Veterinaria, 8(3), 23, 1994.

The Authors describe the planning, the manufacture and the technique for the application of a metallic prosthesis used to occlude a traumatic oronasal fistula in a dog, after some attempts for surgical repair failed. In the first 50 days p.o. the prosthesis was temporarily protect with a metallic scheleton. Immediately after the application it has been possible to observe the disappearance of clinical signs associated with presence of oronasal communication. Four months p.o. the prosthesis is still firmly present and does not create any problem to the patient.

Spadari A., Joechler M.: Le lesioni del disco epifisario negli animali domestici: considerazioni sulla classificazione, patogenesi, trattamento ed esiti. *Growth plate injuries in domestic animals: classification, pathogenesis, treatment and outcome. Bollettino dell'Associazione Italiana Veterinari Piccoli Animali (AIVPA), 33(1), 51, 1994.*

The Authors show the Salter-Harris classification of growth plate injuries and follow the original paper statement. Comparing man and domestic animals it is possible to verify how the Salter-Harris classification was suitable in the description of morphology. Considering the paper it is noticed that the complete classification considers prognosis, treatment and, consequently, the following bone growth. The Authors consider epiphyseal disc lesions in domestic animals, their prognosis and treatment and outline the differences between man and domestic species. In their opinion the original classification seems not completely adaptable in veterinary medicine.

Spadari A., Toniato M.: La periostiotomia emicirconfrenziale nelle deviazioni angolari degli arti del puledro: basi teoriche e guida alla esecuzione pratica. *Periosteal transection and stripping in angular limb deformities: theoretical principles and guide to the technique. Ippologia, 5(1), 31, 1994.*

Periosteal emicircumferential section and stripping is commonly and succesfully used for the correction of carpal angular deformity in foal. This intervention causes a stimulation of enchondral ossification on the side operated. For long time the mechanism responsible for the stimulation was discussed. In this paper the Authors describe the role of the periosteum in the long bone growth, review the most important theories explaining the mechanism and refer the consideration to make a correct intervention.

Valentini S., Della Salda L.: Analisi comparata tra referti ecografici ed istopatologici relativi ad un seminoma in un cavallo. *Equine seminoma. Comparative analysis between echographic and histopathological studies. Ippologia, 4, 23, 1994.*

A seminoma of an autopic testicle of a stallion is described. The authors explain the methodology adopted to make a diagnosis, with particular reference to the comparison between echographic and histopathological images. They emphasize the utility of ultrasonographic examination as a collateral technique to evaluate objectively changes and to allow the best therapeutic approach.

Valentini S., Delogu M., Medri M.S.: Studio angiografico delle vie chirurgiche di accesso all'ala degli uccelli. *Study of the wing vascularisation for a correct surgical approach.* Atti Soc. Ital. Sci. Vet., 48, 1994 (in press).

Orthopedic surgery for the rehabilitation of wild birds is actually very requested. In order to make the subject able to live in wilderness it needs to carry out surgical procedures which respect quite completely structural and functional wing homeostasis: as a matter of fact, this is the body part mostly injured. We can obtain useful information for the best surgical approach identifying the course and the relations of great vessels with the help of an injection of a radiopaque contrast medium. Wing vascularization has to be well-known as the small size of these animals can make even a limited haemorrhage dangerous.

Venturini A., Medri M.S., Coppola L.M.: Lussazione del bicipite brachiale nel cane: trattamento chirurgico. *Dislocation of the biceps brachii in the dog: surgical treatment.* Atti Soc. Ital. Sci. Vet., 48, 1994 (in press).

A lateral dislocation of the proximal tendon of the biceps brachii has been detected in three dogs. In view of the fact that the simple reduction of the biceps sulcus would bring about a relapse, tenotomy has been performed which produced an immediate functional recovery. We think that gymnastic plays an important role in the functional improvement to reduce amyotrophy of the muscular masses of the shoulder.

Venturini A., Pinna S.: Le deviazioni angolari degli arti del cane. *The angular deformity of limbs in the dog.* Atti della Società Italiana di Chirurgia Veterinaria (S.I.C.V.), 1, 277, 1994.

The Authors describe the orthopedic techniques to correct the abnormal growth of radius and ulna in the dog.

1995

Delogu M., De Marco M.A., Fedrigo M.: Il tavolo operatorio Delogu: un'unità finalizzata alla chirurgia aviaria. *Delogu operating-table: an operative unit for avian surgery.* Atti del 2° Seminario Nazionale Centri Recupero Animali Selvatici, 1995 (in press).

The Authors describe the planning and the realization of a specific operating table suited for the anatomic and physiologic characteristics of birds. This table allows to optimize the surgical approach opening, closing or turning the wings without moving the patient and without contaminating the surgical field. The Authors describe technical and functional aspects of the table.

Delogu M., Diquattro G., Fedrigo M., Valentini S., De Marco M.A.: Trattamento chirurgico della cataratta in un gufo reale. *Surgical correction of cataract in an eagle owl.* Atti del 2° Seminario Nazionale Centri Recupero Animali Selvatici, 1995 (in press).

The Authors describe extracapsular extraction of the right cataractous lens in a Eagle owl (*Bubo bubo*). Gaseous anesthesia was performed. Because of the anatomic characteristics of the bird eye, it was necessary to curarize the iris muscular component using succinylcholine in order to extract the lens. After a post-operative follow up, the subject returned successfully in a captive-breeding program.

Delogu M., Fedrigo M., De Marco M.A., Valentini S., Medri M.S.: Il ripristino dell'angolo di torsione assiale nella chirurgia dell'omero aviare, una nuova possibilità: l'approccio standardizzato. *The re-establishment of the axial torsion angle in the avian humerus surgery - a new possibility: the standardized approach*. Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

30 nocturnal and diurnal adult birds of prey were examined to evaluate the axial torsion angle of the left humerus. Results show that the angle created by a line crossing the dorsal and ventral epicondyles of the distal humeral epiphysis and the pectoral crest is strictly species dependent. Therefore, it should be possible to modify the incidence angle of fixation pins and the shape of the external fixation system in order to obtain a correct incidence angle of the wing.

Delogu M., Fedrigo M., Valentini S., De Marco M.A.: Diagnosi mielografica di frattura della colonna vertebrale in Strigiformes. *Myelographic diagnosis in owls (Strigiformes)*. Zootecnica International, 94, Febbraio 1995.

10 little owls (*Athene noctua*) and 5 long-eared owls (*Asio otus*) were investigated by myelography (a standard anaesthetic regimen was used). The contrast agent (iopamidol) was introduced via a spinal needle: 0.06 ml / little owl and 0.1 ml / eared owl. The agent was injected into the sinus lumbo-sacralis. In this study the Authors suggest that myelography is worthwhile when it is used to assess spinal disease in birds.

Joechler M., Masetti L.: La laringectomia perorale nella paralisi laringea del cane. *Peroral laryngectomy on laryngeal paralysis in the dog*. Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

Four cases of idiopathic and not laryngeal paralysis were surgically treated per os by bilateral partial aritenoidectomy and cordectomy. Good symptomatological results after 6 months confirm the value of the proposed surgery. It is in the Author's opinion that laryngeal paralysis is frequently seen with the generalized neuro-muscular disease.

Masetti L., Bernardini D., Joechler M., Carluccio A., Marsilio F.: Le lesioni oculari come "marker" di virosi nel bovino. *The ocular lesions as a "marker" of virose in milk cows*. Atti Soc. Ital. di Buiatria, 27, 539, 1995.

The ocular aspects of 5 cows are the only type of pathology found on a farm with eighty Italian Frisian subjects: the Authors found in this cattle a high seropositivity (81%) for BHV-4. They describe the characteristic ocular damages and suggest the "increased lachrymation, photofobia and epiphora" complex can be considered a "marker" of probable BHV-4 infection. Since the relation between ocular lesions and antiBHV-4 antibo-

dies cannot be considered the sure demonstration of ocular lesions etiology, the Authors analyse the possible pathogenetical processes.

Masetti L., Joechler M., Pisoni L., Bortot A.: La displasia dell'anca del cane (DAC): considerazioni patogenetiche e valutazione di un protocollo terapeutico. *Canine hip dysplasia (CHD): pathogenetic evaluations and proposal of a therapeutic protocol*. Atti della Società Italiana di Chirurgia Veterinaria (S.I.C.V.), 2, 21, 1995.

Factors which influence the development of hip dysplasia in the dog (CHD) are examined. Adduct muscles action, primarily the one induced by the pectineus muscle, the quantitative and qualitative effect of nutrition and the premature strong exercise are considered as inductors of osteodystrophic symptoms, which end in changes of the articular surfaces. The effects of a therapeutic protocol which consists in early pectineal myotomy (6-8 months), associated with limited exercise and appropriate diet are evaluated. The AA. consider the effects at 12, 18 and 24 months over 3 groups of 5 dogs each, afflicted by less (C), medium (D) and strong (E) dysplasia. The AA. support protocol efficacy limited to less dysplasia, confirming partly the pathogenetic role of osteodystrophy on the basis of the partial reversibility.

Masetti L., Joechler M., Pisoni L., Zanoni R., Cattoli G.: Contributo casistico allo studio delle congiuntiviti batteriche del cane. *Some notes to the study of bacterial conjunctivitis in the dog*. Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

Clinical methodologies, adopted therapies and results after short and long time in 80 dogs affected by bacterial conjunctivitis mono- and bi-lateral, are described and discussed. Microbiological examination and antimicrobial sensitivity tests establish the antibiotic therapies. Those, after a follow up of minimum six months from the last treatment, present clinical recovery in the 80% of cases. The cytological examination alone does not offer a sight therapy. Therefore this will be done when the microbiological examination will appear negative.

Masetti L., Joechler M., Truscowska B., Battigelli A.: Efficacia clinica dell'acepromazina in formulazione orale nel cavallo. *Clinical efficacy of orally administered acepromazine in the horse*. Rivista S.I.D.I., 1(2), 53, 1995.

The clinical efficacy of acepromazine gel administered by oral route at dosages of 2.5-26 mg/100 Kg was assessed in 72 equines. The undersigned believe that the use of the tested formulation is more advantageous than the injectable solution. The positive effect on irritable animals and the fact that side effects were less intense and significant (although final results were the same) are among the main advantages.

Masetti L., Joechler M.: Ancora sulla cheratite superficiale cronica del cane: protocolli terapeutici a confronto. *Chronical superficial keratitis of the dog: a comparison of therapeutic planes*. Bollettino dell'Associazione Italiana Veterinari Piccoli Animali (A.I.V.P.A.), 2, 77, 1995.

Considering that the pathogenetic mechanism of the chronic superficial keratitis of the dog has not been clarified, a large number of therapeutic approaches has been proposed without complete and definitive results. The Authors report about their cases of chronic superficial keratitis. They effect a critical analysis and compare the obtained results by medical and surgical treatments. It is the Author's opinion that therapies like subconjunctival injections of mesotherapeutic mixtures and/or cyclosporine instillment give good results. For that reason the surgical treatment (keratectomy) may be used in very few cases.

Masetti I., Joechler M.: Patologia degli organi di movimento del cavallo (le fratture delle ossa lunghe). *Pathology of the legs of the horse (long bone fractures)*. Atti del Convegno Nazionale dell'Associazione Italiana Patologi Veterinari (A.P.I.V.), 14, 135, 1995.

Anaesthesiological and orthopedic surgical techniques allowed the approach to the long bone fractures of the horse. While orthopedic surgery on short bones offers a high percentage of good recovery, also in the adult subject, long bone surgery seems to offer good results only in foals. Internal fixation techniques with compressing screws, dynamic compression and neutralization plates and/or external fixation are to prefer compared to the internal endomedullary fixation. The Authors describe and discuss their obtained results.

Muttini A., Spadari A., Bignozzi L., Petrizzi L.: Esperienze e problematiche di chirurgia artroscopica nel cavallo sportivo. *Experiences and problems in arthroscopic surgery of the horse*. Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

The many advantages of arthroscopic surgery are well-known and spread over a wide literature. Our experiences confirm the utility of arthroscopy especially for investigating defects of articular cartilage, otherwise not detectable with normal radiological techniques, for reducing the convalescence period and for the almost complete absence of complications.

Muttini A.: Trattamento chirurgico delle principali malattie delle vie aeree superiori del cavallo. *Surgical treatment of the most important upper respiratory tract diseases in horses*. Atti della Società Italiana di Chirurgia Veterinaria (S.I.C.V.), 2, 135, 1995.

The aim of upper respiratory tract surgery in horses affected by stenotic diseases is to improve the air flow particularly during exercise at high speed. Decrease of air flow is the main alteration in upper respiratory tract diseases. Since roaring is not always detectable, the diagnosis is often presumptive and the most important clinical sign is a decrease in the performance level. A precise diagnosis and a careful selection of surgical candidates is important in increasing the success rate of surgery. Surgical procedures for the treatment of laryngeal hemiplegia, dorsal displacement of the soft palate and epiglottis entrapment are discussed. After a brief historical review, the principal techniques for the correction of laryngeal hemiplegia are described considering the rationale for their use and the success rate reported. Surgical procedures for dorsal displacement of the soft palate and epiglottis entrapment are more recent since the recognition of such diseases took place in the last decades. Endoscopic surgery seems to be the most promising advance in upper respiratory tract surgery in the horse.

Pinna S., Venturini A., Diquattro G., Contri A.: Indagine radiografica delle patologie della colonna del cane. *X-Ray investigation of spine pathology in the boxer*. Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

The X-ray pictures relating to 108 boxer dogs have been examined. The following parameters have been used to define comparative and absolute data: pathology identification and classification of the different X-ray pictures, spine sectors most severely affected, age and sex. The symptomatology related to injuries to the spine has not been considered. The results confirm a marked predisposition of this breed, and of females in particular, to developing spondylarthrosis in 3 different sectors of the spine in the young age.

Spadari A., Capitani O., Muttini A., Bignozzi L.: Protocollo di lavaggio esofageo o "idropulsione" nel trattamento delle occlusioni esofagee da materiale alimentare nel cavallo. *Esophageal lavage or "hydropulsion" in the treatment of esophageal obstruction due to feed impaction in horse*. Atti della Società Italiana di Chirurgia Veterinaria (S.I.C.V.), 2, 65, 1995.

Esophageal obstruction due to feed impaction was treated in 9 horses by lavage and hydropulsion via nasogastric tube under general anesthesia. During the intervention the patients were maintained hanging from the ceiling with the head sloping down. The immediacy of the treatment, the inflation of the cuff of the Magill tube to seal the tracheal lumen, the sloping position of the head, gave us good results with absence of severe complication.

Spadari A., Muttini A., Petrizzi L., Bignozzi L.: Prospettive dell'artrosopia diagnostica nel cavallo: microartrosopia con mezzo di contrasto. *Possibilities in diagnostic arthroscopy in the horse: microarthroscopy with vital staining*. Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

Microarthroscopy, a magnifying arthroscopic examination technique, offers the possibility of observing the aspect and the vascular pattern of synovial villi and vitally stained synovial lining cells. The technique, employed for the first time in the hock of horses, demonstrated to be easy and quick. The Authors believe that the magnification provided by the microarthroscope could be very useful for the research and diagnosis of equine joint diseases.

Spadari A., Pigato M., Busetto R., Bignozzi L.: Decubito dorsale e arto posteriore in trazione verticale per la miotomia del semitendinoso nella miopatia fibrosa del cavallo. *Dorsal recumbency and hindlimb pulled upward in semitendinosus myotomy for the treatment of fibrotic myopathy in the horse*. Atti della Società Italiana di Chirurgia Veterinaria, (S.I.C.V.), 2, 275, 1995.

In a horse with left hindleg affected by fibrotic myopathy the Authors performed the semitendinosus tenotomy. Because of absence of results, a traditional myotomy was operated with the horse in dorsal recumbency and the affected limb pulled upward by a winch. This device allowed to transect and remove the anelastic structures limiting (evidently) the complete extension of the limb.

Valentini S., Fedrigo M., Delogu M.: Analisi ecografica di parametri fisiologici dell'aorta addominale del cane. *Echographic analysis of normal parameters of the canine abdominal aorta*. Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

Ultrasound diagnosis of endovascular pathologies is mainly due to the visualization of the primitive lesion and/or velocimetric curve abnormalities. In order to make the results more objective is useful to evaluate parameters such as pulsatility index and resistance index. These parameters have been calculated in aortic segments frequently interested by occlusive lesions in the dog (lumbar tract and the one proximal to the internal iliac arteries bifurcation).

DIPARTIMENTO CLINICO VETERINARIO

Sezione di Medicina interna

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1988

Calamosca M., Trenti F., Zaghini L., Pagano P., Morandi L.: Studio della contaminazione da ^{137}Cs nel bovino in corso di gravidanza. *A study of ^{137}Cs contamination in pregnant cattle.* Atti Soc. Ital. Buiatria, 20, 735, 1988.

The Authors evaluated the degree of ^{137}Cs body contamination in a significative group of pregnant bovines slaughtered normally, studying the dependence on the heifer/cow state and stage of pregnancy. No significative differences in absolute ^{137}Cs retention appeared between heifers and cows or in various stages of pregnancy. A dependency on stage of pregnancy was evidenced using the renal concentration and muscle concentration ratio.

Cinotti S., Gentile A.: Stimolazione del riflesso del solco rumino-reticolare mediante farmaci: valutazione degli effetti in osservazione endoruminale. *Stimulation of oesophageal groove contraction by drugs: evaluation of the effects through endoruminal observation.* Atti Soc. Ital. Buiatria, 20, 877, 1988.

In order to improve the knowledge of the oesophageal groove function the Authors filmed its behaviour after the administration of some chemical substance. The Authors evaluated the possibility that the contraction of the oesophageal groove in adult cattle could be used for drugs by-pass of the rumen. Only vasopressin at the dose of 0.08 U.I./Kg B.W. i.v., produced a consistent effect. To obtain a total rumen by-pass of drugs, those should be administered during the 3-4 minutes of oesophageal groove contraction induced by the action of vasopressin.

Cinotti S., Rosmini R., Boari A., Della Salda L.: Lavaggio bronco alveolare nel cane: aspetti citomorfologici. *Bronchoalveolar lavage in the dog: cytomorphological aspects.* Atti Soc. Ital. Sci. Vet., 42, 997, 1988.

A bronchoalveolar lavage (BAL) was performed on 33 dogs (divided into two groups: healthy and affected by pneumopathy) and postmortem examination was subsequently carried out on the lung tissue. The percentual variations of the different cellular components of the BAL reflected similar modifications of the pulmonary histologic findings.

Cinotti S.: Sul commercio di bovini portatori di leucosi. *Marketing of cattle infected by BLV.* Atti Soc. Ital. Buiatria, 20, 467, 1988.

After a review of Italian regulations regarding enzootic bovine leukemia, the aspects of marketing of infected animals are examined. Forms of contract which offer the best protection to buyers against the risk of acquiring falsely seronegative animals are exposed.

Cipone M., Tazzari P.L., Gobbi M., Cremonini A.M., Gentile G., Tura S.: Rivelazione della glicoproteina gp60 del virus della leucosi bovina enzootica (BLV) in corso di infezione sperimentale. *Detection of bovine leukaemia virus (BLV) gp60 during experimental infection.* Atti Soc. Ital. Sci. Vet., 42, 665, 1988.

By experimentally infecting cattle and sheep with bovine leukaemia virus (BLV), a study on the early appearance of the glycoprotein gp60 with immunoperoxidase assay has been performed on lymphnodes and peripheral blood samples. The results of glycoprotein gp60 tissue expression and seroconversion will be discussed.

Famigli Bergamini P., Ferri G., Gentile A., Cremonini A.M., Bagni A.: Alcalosi metabolica nutrizionale bovina e caratteristiche del latte. *Bovine nutritional metabolic alkalosis and milk characteristics.* Atti Soc. Ital. Buiatria, 20, 519, 1988.

Sub-clinical nutritional metabolic alkalosis was experimentally reproduced by administering an alkalosis-inducing diet to 4 lactating cows in order to evaluate the repercussion on milk characteristics. The metabolic disturbance, evidenced by ruminal alkalinity and an increase of urea concentration in ruminal fluid, blood and milk, observed after the dietary change, had negative repercussion on milk quality, causing decrease in casein content. This reduction has a negative incidence of approximately 10% on the cheese transformation potential of milk.

Famigli Bergamini P., Gentile A., Cazzoli M.: Su di un episodio di collasso puerperale in un allevamento di bovine lattifere ad elevata produzione. *An episode of parturient paresis in a high production dairy cow herd.* Atti Soc. Ital. Buiatria, 20, 529, 1988.

The Authors describe an episode of high incidence parturient paresis (15 out of 16 cows with 3 or more lactations) which occurred on a stockfarm of high production dairy cows (more than 80,000 Kg/head/year). The causes were found to be: concentrated excess (9 kg/head/day); high administration of Ca and P during the end of the dry period (90 g and 100 g respectively). The hypothesis of an etiological corresponsability of an excess dietary alkalinity caused by the use of ion exchange resins to reduce water hardness is advanced.

Gentile G., Trenti F., Calamosca M.: Professione veterinaria e protezione delle produzioni animali dalle contaminazioni radioattive. *Veterinary profession and protection of the animal productions from radioactive contamination.* Annonaria, 2, 9, 1988.

An informative-divulgative note published on a magazine with a circulation among managers and businessmen of the food, industry and consumer organizations. The objective to illustrate the role of Veterinary profession in controlling and combating radioactive contamination of animals and their products destined to human consumption, was pursued.

Trenti F., Calamosca M., Gentile G., Zaghini L., Pagano P.: La radioactividad y la especie bovina. *Radioactivity and bovine species.* Proceedings of the 15th World Buiatric Congress, 2, 1569, 1988.

During the environmental contamination which followed the Chernobyl incident we carried out a series of study for the control of the parameters which determine the degree of contamination of the bovine, focalizing our attention on the following point: 1-mechanism of incorporation of contaminants by the animal. 2-methodology and standardization of sampling. 3-relationship between level of fodder contamination and bovine contamination. 4-verification of the forecasting validity of the comportamental mathematical model of the bovine metabolism.

Trenti F., Calamosca M.: La radioattività, gli animali ed i loro prodotti alimentari. *Radioactivity, animals and deriving alimentary products*. Contaminazione radioattiva: Chernobyl ieri oggi domani. Capitolo V.2. Maggioli Editore, 197, 1988.

Chapter V.2 of the volume belonging to the chain of studies on environmental protection, published by the University of Bologna in occasion of its IX Centenary, is dedicated to the analysis of passage of radioactive contaminants from the environment to animals and then to the alimentary products deriving from them. Particular attention is given to meat and its by-products, milk and its derivatives, and to the assessment of the dose sparing to the population, obtained through the safety measures adopted by the Veterinary Service after Chernobyl.

Trenti F., Calamosca M.: Produzione igienica degli alimenti di origine animale: problemi connessi con l'inquinamento dell'ambiente da radionuclidi. *Hygienic production of foods of animal origin: problems connected with environment pollution by radionuclides*. Atti della conferenza internazionale Sanità e Produzione bovina nell'area del Mediterraneo, Bologna, 73, 1988.

The Authors describe the phases of environmental contamination by radionuclides, and the transmission of these along the vegetable — animal — animal product food chain. The levels of radio-contamination of meat and meat products, of milk and dairy products are considered. Particular attention is given to the data gathered after the radioactive fall out of Chernobyl. Decontamination intervention strategies of animal diets, and live animals, and edible products are illustrated. Finally, a programme of veterinary monitoring of the radioactivity present in the matrices of veterinary interest is proposed as an indispensable aid to the protection of consumers.

Trenti F.: Le emergenze nucleari: aspetti tecnici e legislativi. *Nuclear emergencies: technical and legislative aspects*. Atti Corso intensivo di perfezionamento. Emergenze Veterinarie: tecnica e legislazione, 137, 1988.

The Author defines the principal radiologic units of measure and then proceeds to illustrate the biological effects of ionizing radiations at high, medium and low doses, and their effects of radioelement contamination of animals. Particular attention, due to its public health significance, is given to the appearance of radioactive residues in foods of animal origin. Finally, a synthesis of Italian and EC norms regarding radioactivity of food is presented.

1989

Calamosca M., Trenti F., Pagano P., Zaghini L., Calabri E., Morandi L.: Andamento della ritenzione e distribuzione del ^{137}Cs in un campione di feti bovini a diverso stadio di sviluppo. *Trend of retention and distribution of ^{137}Cs in a sample of bovine fetuses at varying stages of development.* Atti Soc. Ital. Buiatria, 21, 549, 1989.

The Authors present ^{137}Cs contamination values from tissues and organs of 26 foetuses at different stages of development together with an analysis of the kidney/muscle, liver/muscle and heart/muscle ratio of the foetuses. An evaluation and discussion on the trend of the ratio between foetus organs and muscle of the respective dams during the course of pregnancy is made.

Calamosca M., Trenti F., Pagano P., Zaghini L., Morandi L., Calabri E.: Trasferimento del ^{137}Cs nel bovino adulto: valori rilevati in campo e valori previsti da un modello biocinetico. *Transfer of ^{137}Cs to the adult bovine: values obtained in the field and values expected with a biokinetic model.* Atti Convegno Nazionale Trasferimento dei radionuclidi nei prodotti di origine animale, Piacenza, 145, 1989.

Comparison between retention values of slaughter in the tissue of the adult bovines, fed on diets with a degree of the ^{137}Cs contamination monitored through serial samples from May to October 1986, and retention values expected, in the same tissue, using a provisional model. It was established that the model cannot predict the contamination values of beef with sufficient accuracy, but it does furnish conservative data.

Cinotti S., Gentile A.: Osservazione in endoscopia ruminale nel vitello lattante: funzionalità della doccia esofagea. *Observation in ruminal endoscopy in lactating calves: oesophageal groove functionality.* Atti Soc. Ital. Buiatria, 21, 283, 1989.

The film shows the effects on functionality and capacity of the oesophageal groove in lactating calves with references to administration of milk of different temperatures (20°C and 38°C) and mode of administrations: from mammary gland, using nipple and open bucket.

Cinotti S., Gentile A., Guerzoni V.: Riscontro citomorfologico nell'aspirato tracheobronchiale di cavallo. *Cytomorphological evaluation of tracheo-bronchial aspirate of horses.* Atti Soc. Ital. Sci. Vet., 43, 1349, 1989. Obiettivi e Documenti Veterinari, 11(9), 55, 1990.

The Authors have examined tracheo-bronchial aspirate from healthy horses and from subjects which are affected by chronic respiratory diseases. Percentage evaluation of cell types confirms the prevalence of the neutrophils in the chronic forms. This differs from the normal cytological aspects which are almost always characterized by the predominance of epithelial cells.

Cipone M., Capucci A., Guarda F., Amedeo S.: Blocco di branca sinistra e blocco trifascicolare nel cane. Descrizione di due casi clinici. *Bundle branch block and trifascicular block*

in the dog. Description of two clinical cases. Annali della Facoltà di Medicina Veterinaria di Torino, 33, 1, 1989.

Electrocardiographic aspects, clinical findings and histopathological examination in two cases of left bundle branch block in the dog are described. The first case was characterized by the presence of a trifascicular block which evolved in a II A-V block in a patient suffering from recidivous syncope. The second was distinguished by a complete bundle branch block in a subject with left ventricular decompensation. The alternating delay of conduction in the left branches, associated with negative giant T waves in the first case and the qR shape in D1 and aVL in both cases, give rise to interesting elements of discussion and correlation with human pathology.

Famigli Bergamini P., Boari A., Cipone M.: Atrofia congenita del pancreas nel cane: osservazione di un episodio in consanguinei di setter inglese. *Juvenile atrophy of the canine pancreas: repeating observed events in a blood-line of the English-setter breed.* Atti Soc. Ital. Sci. Vet., 43, 1475, 1989. *Obiettivi e Documenti Veterinari*, 12(2), 41, 1991.

The Authors describe an episode of Juvenile Pancreatic Atrophy observed in 3 English setter female, 2 month-old-puppies born in two successive litters from the same parents. The recurrence of at least one case of the disease in both litters, verified by the histological features of the glandular lesion, is indicative for the hereditary character of the pancreatic atrophy observed. The finding of phenotypically normal subjects and the occurrence of the disease exclusively in puppies of the female sex allow to consider that the disease is tied to the transmission of a recessive gene.

Famigli Beramini P., Di Paola M., Massa D., Monaco V., Trenti F., Boari A., Gentile G.: Indagini sugli effetti degli inquinamenti ambientali sul bovino (Nota II): contenuto renale di As, Hg e Se ed epatico di Cd, Cr, Mn, Ni, Pb, e V. *Survey on the effects of environmental pollution on cattle (part 2): renal content in As, Hg, Se and hepatic content in Cd, Cr, Mn, Ni, Pb, V.* Atti Soc. Ital. Buiatria, 21, 609, 1989.

Liver and kidney samples were taken at slaughter from 128 bovines from 6 areas in the Emilia Romagna district. Liver samples were tested for Cd, Cr, Mn, Pb, V, while kidney samples were tested for As, Hg and Se. There was no difference between mean values for each element calculated for cattle groups from each single area. Mean group values for each element expressed in p.p.m./w.w. ranged as follows: Hg (0.019 — 0.033); Se (0.61 — 0.87); Cd (0.085 — 0.152); Cr (0.037 — 0.058); Mn (1.61 — 2.19); Ni (0.35 — 0.48); Pb (0.29 — 0.57); V (0.030 — 0.046). All levels were always below test sensitivity (0.5 p.p.m.).

Gentile G.: Aspetti di patologia nervosa del bovino. *Aspects of bovine neuropathology.* Atti Jornadas Uruguayas, 17, C.1, 1989.

Description of the principal nervous syndromes of bovines treated under syntomatological aspects. The discussion develops itself following a classification of aetiological type; with short references, trying to explain them, the different forms-genetic, by lack of, toxic or metabolic — are exposed. The infectious forms of bacterial or viral characterization,

are longer discussed. The syntomatologic part is preceded by brief considerations about the sense of semiological examination of the nervous system and about the procedures to be performed in spite of the difficulties that the veterinarian finds.

Gentile A., Guglielmini C., Cipone M.: Alterazioni del ritmo cardiaco nel bovino in rapporto col digiuno. *Bovine cardiac arrhythmias in relation to fasting*. Atti Soc. Ital. Sci. Vet., 46, 1527, 1992 — Arch. Vet. Ital., 44(3), 100, 1993.

8 cows were fasted for 14 days and were monitored clinically and electrocardiographically. Blood and ruminal liquid samples were regularly analysed. Bradycardia was a constant finding and in 3 cases was associated with a non-respiratory arrhythmic sinus arrhythmia. These findings would appear to be related to variations in rumen biochemistry. No similar alteration was observed in the 2 control animals.

Tazzari P.L., Cipone M., Tassi C., Bontadini A., Cremonini A.M., Gobbi M., Gentile G., Tura S.: *S-phase evaluation with bromodeoxyuridine in lymphocytes from cattle infected with bovine leukemia virus (BLV)*. J. Vet. Med. Ser. B, 36, 691, 1989.

Bromodeoxyuridine (BrdUrd), an analogue of thymidine, can be detected by means of monoclonal antibodies and utilized as a marker of S-phase. In this paper a determination of the S-phase in BLV+ cattle with lymphocytosis has been performed by incorporating bromodeoxyuridine in the DNA. This evaluation was compared to the DNA content, demonstrating that I) bromodeoxyuridine incorporation is a reliable marker of S-phase in BLV+ cattle with lymphocytosis and II) cytofluorimetry is the method of choice, together with immunocytochemistry, to demonstrate bromodeoxyuridine incorporation.

Trenti F., Calamosca M.: L'inquinamento dell'ambiente da radionuclidi: effetti sugli animali e sui loro prodotti. *Environmental pollution by radionuclides: effects on animals and animal products*. Atti Convegno Internazionale su Inquinamento ambientale e popolazioni animali, Pisa, 327, 1989.

The Authors describe the causes and phases of environmental pollution by radionuclides and the transmission of these along the environment-vegetable-animals-animal products food chain. Special attention is given to the contamination of food, animals and food-stuffs of animal origin, on the diet-meat and diet-milk transfer coefficients of ^{131}I , ^{137}Cs , ^{90}Sr , and biokinetic models. Finally, a program of prophylaxis of animal products contamination is described.

Trenti F., Calamosca M.: Sistemi di prevenzione e di abbattimento dei contaminanti radioattivi negli alimenti di origine animale. *System of prevention and lowering of radioactive contaminants in foods of animal origin*. Atti Convegno Nazionale Trasferimento dei radionuclidi nei prodotti di origine animale, Piacenza, 269, 1989.

After having recalled modern procedures of radioprotection and the role of human contamination through ingestion, in occasion of environmental radio-contamination episodes, the Authors illustrate the theoretic principles which form the fundament of radio-

active contamination prophylaxis of animals and derived food products. System of prevention and lowering of radioactive contaminants are described, with particular reference to ^{131}I , ^{137}Cs and ^{90}Sr . Finally, the practicability and efficacy of the proposed systems are underlined.

Trenti F.: Prevenzione e abbattimento dei contaminati radioattivi negli alimenti di origine animale. *Prevention and lowering of radioactive contamination in foods of animal origin.* Prax. Vet., 10(1), 18, 1989.

The Author draws up a plan for radioisotope contamination prophylaxis of animals and products derived from them, subdivided in prevention system and lowering system. The proposed plan corresponds to the present radioprotection philosophy, which demands a maximal dose-sparing to the individual and to the population and at the same time requires economic (costs) and social (benefits) considerations.

Zanotti Casati M., Longeri M., Ceriotti G., Stancanelli A., Ceccarelli A., Gentile G.: Parametri immunitari in una popolazione di bovini da carne in funzione degli antigeni di istocompatibilità (BoLA) di classe I. *Immunological parameters in beef cattle and their relation to class I histocompatibility antigens (BoLA).* Atti Soc. Ital. Sci. Vet., 43, 1807, 1989.

95 beef cattle were typed for lymphocyte antigens (BoLA) class I. Among these, 48 animals were chosen to form groups, representative for the five BoLA specificities that were more frequent within the cattle population. The typing of the histocompatibility antigens was performed with a microlymphocytotoxicity test carried out using reagents from different sources. Some haematological and immunological parameters, such as leucocytes count and formula, serum level of lysozyme and IgM, serum bactericidal activity and haemolytic complement, were tested in the animals under study. These parameters were re-tested, after 3 and 4 months, in order to evaluate their time kinetics. Statistical analysis was performed to display probable significant variations in relation to the BoLA specificities and within the tested parameters.

1990

Calamosca M., Pagano P., Trenti F., Zaghini L., Gentile G., Tarroni G., Morandi L.: *A modelistic approach to evaluate the factors affecting the ^{137}Cs transfer from mother to fetus in cattle.* Dtsch. Tierärztl. Wochenschr., 97, 452, 1990.

The relationship between ^{137}Cs radioactivity and pregnancy in a significant group of bovines at various stages of pregnancy, fed with fodder exposed to radioactive fallout, are investigated. The Authors describe the result of the radiometric analysis of muscle, kidney and liver of the mothers, of muscle, kidney, liver, myocardium of the fetus and its ratios: they have included the fetal body weight growth to get a more realistic description of the ^{137}Cs transfer in the mother-fetus system; this approach enables to evaluate the kinetic constant so introduced.

Cinotti S.: La bronchite cronica ostruttiva degli equini: criteri attuali di giudizio per validità commerciale. *The horse's chronic obstructive bronchitis: evaluation in the field of purchase and sale.* Rassegna di Diritto, Legislazione e Medicina Legale Veterinaria, 24, 15, 1990.

In regards to the clinical aspects of the disease in question the Author has underlined the difficulty in reaching on early diagnosis with direct clinical examination only. The use of collateral methods, in particular tracheo-bronchial endoscopy and secretion examination, seems to be useful in ascertaining the presence of the initial phases of chronic obstructive bronchitis. The chronic aspects of the process revealed by the cytological results is one of such grave consequence as to allow contractual recourse action such as resolution.

Cipone M., Venturini A., Medri M.S., Venturoli M.: Aspetti clinici e terapeutici della persistenza del dotto arterioso di Botallo nel cane. (Descrizione di cinque casi clinici). *Clinical and therapeutic aspects of the patent ductus arteriosus in the dog. (Description of five clinical cases).* Obiettivi e Documenti Veterinari, 11, (9), 41, 1990.

Five cases of Patent Ductus Arteriosus (PDA) are described. Direct and indirect clinical elements, (wide- pressure and hard arterial pulse; precordial thrill and continuous so-called tunnel or machinery-like murmur in the aortic-pulmonic valve region, high voltage R wave in D2; continuous murmur with a mesosystolic acme in the phonocardiogram and changes of the silhouette and volume of the heart in the radiographic examination) permit to anticipate the PDA diagnosis with a sufficient safety margin and also a precise therapeutic approach. Four out of five cases were resolved by a surgical procedure which did not require particularly sophisticated instruments.

Famigli Bergamini P., Pietra M., Zaghini A., Giordani L.: Effetto del metabisolfito sul contenuto ruminale in animali di specie ovina. *Effects of metabisulphite on the ovine rumen.* Atti Soc. Ital. Buiatria, 22, 459, 1990.

Metabisulphite was administered daily to sheep for approximately two months at dosage of 500 and 250 mg/head/day in order to evaluate effects on some characteristics and constants of the ruminal liquid. The entity of the changes of the ruminal liquid did not vary in relation to the different dosages. In the first two weeks of treatment the concentration of V.F.A. were halved and there was also a slight reduction in the number of protozoa. During the remainder of the experiment, V.F.A. concentration continued to decrease, while the number of protozoa returned to its initial value.

Gentile G.: La diagnostica collaterale nella patologia epatica della bovina. *The laboratory diagnosis of bovine liver diseases.* Prax. Vet., 11, 5, 1990.

The Author describes the most valuable haematobiochemical parameters for the diagnosis of liver diseases in dairy cattle. In liver steatosis the determination of AST, ALT, LDH5, as indicators of cytolysis, is proposed, whereas the increase in GLDH, SDH, VST and ALP concentrations indicates a generic hepatic disturb. In conclusion the importance of the clinical examination of the individual animal and the whole herd is emphasized before examining the laboratory findings.

Gerardi G., Soldati G., Cordioli P.: La diagnosi allergica nell'infezione da BHV 1. *The allergic test in the BHV 1 infection.* Atti Soc. Ital. Buiatria, 22, 681, 1990.

Against BHV 1 infection, the Authors tested 393 cows by specific allergic test parallelly with ELISA. The specific allergic test, able to pass a diagnostic judgement in 48-72 hours, showed itself reliable if compared with serological test, still turned to account on its more frequent use. In order to index the sensibility, the allergic test has provided values of correspondance with ELISA equal to 96.77% in the serumpositive subjects.

Guglielmini C., Cremonini A.M., Brini G., Grandini S., Milani G.: Indagine sulla filariosi canina nella zona di Bologna. *Survey on canine filariosis in the area of Bologna.* Obiettivi e Documenti Veterinari, 11, (5), 71, 1990.

A search for circulating microfilariae using a direct exam of samples and a filtration technique was conducted on blood samples from 446 dogs. Positivities were 27.9% and 30.1% in two areas of the province of Bologna and 14.8% in the city itself. Such values were analysed in relation to sex, age, type of housing, capacity of the animals and recorded clinical symptoms. A significant difference in sensitivity between the two methods was found.

Trenti F., Calamosca M., Cipone M.: Fattori di trasferimento e fattori di conversione dieta-carne e dieta-latte del ^{137}Cs nel bovino: possibilità applicative e limiti. *Transfer and conversion factors of ^{137}Cs from feedstuff to animal products in the cows: application possibilities and limits.* Atti Soc. Ital. Buiatria, 22, 565, 1990.

Transfer and conversion factors of radioisotopes from feedstuff to animal products are discussed. In order to verify the application possibilities and limits of these factors, formulae and some examples are presented with respect to ^{137}Cs in calves, beef and dairy meat and cow milk. The role of these operative possibilities for the radiological protection of animal products is described.

Trenti F., Calamosca M., Pagano P., Zaghini L.: Il ruolo della gravidanza nella ritenzione e distribuzione del ^{137}Cs nella madre e nel feto del bovino. *The role of pregnancy in the retention and distribution of ^{137}Cs between mother and fetus in cattle.* Proceedings of the 16th World Buiatric Congress, 1102, 1990.

The Authors have analysed the relationship between ^{137}Cs radioactivity and pregnancy in cattle with radiometric analysis of muscle, kidney and liver of 24 cows at various stages of pregnancy, fed with fodder exposed to radioactivity fall-out. Also the relative fetal muscle, kidney, liver and myocardium have been analysed. The automatic spectra analysis and the statistical one have given the following results: there is no correlation between ^{137}Cs retention and the pregnancy stage in the cattle sampled. The fetal concentration in muscle, kidney and liver is generally homogeneous. The Authors have examined the obtained results and suggested a monoexponential equation which gives the value of the ^{137}Cs exchange between mother and fetus in cattle.

Trenti F.: Norme sanitarie e lotta alle epizootie in area modenese fra il XVIII e il XIX secolo. *Health regulation about the epizootic diseases in the area of Modena between XVIII and XIX century.* Atti Convegno Nazionale di Storia della Medicina Veterinaria, 1, 113, 1990.

The Author examines the laws against an epizootia of cattle plague at the end of XVIII century and against erysipelas in pigs at the beginning of 1800 in the duchy of Modena. The study of the laws can put in evidence the evolution of the veterinary medicine from the empiricism to science. In particular this evolution is underlined by stamping out as prophylaxis to avoid the contagion and leaving the bleeding and purgation as only therapy.

1991

Boari A., Famigli Bergamini P.: Un caso di insufficienza pancreatica esocrina nel gatto. *A study case of exocrine pancreatic insufficiency in a cat.* Atti Soc. Ital. Sci. Vet., 45, 1471, 1991 — Veterinaria, 1, 111, 1992.

Given the rarity of exocrine pancreatic insufficiency in the feline species, the Authors described a case that occurred in a 18-month-old male British Blue cat. The syndrome is characterized by weight loss, increased appetite, diarrhea with voluminous and fatty feces. Laboratory findings based on the evaluation of fecal proteolytic activity carried out by means of radial enzyme diffusion in agar gel after a suitable stimulation of the pancreas, demonstrated to be useful instruments in confirming clinical suspect of the disease. The daily addition of pancreatic enzyme to an easily digestible diet managed to keep the deficient state under control even for a long period.

Cinotti S., Bernardini D., Gentile A., Pietra M.: Ulteriori osservazioni sull'esame citomorfologico del secreto tracheo-bronchiale di cavallo. *Further observations upon cytological tests of tracheo-bronchial aspirate of horses.* Atti Soc. Ital. Sci. Vet., 45, 1295, 1991.

The cytological studies performed on the tracheobronchial secretions of 10 clinically healthy horses, 16 with emphysema, and 51 with clinically demonstrated chronic bronchial disease were used in defining the relative percentages of goblet cells and granular containing cells. In subjects with emphysema and subjects with chronic bronchial disease these cells showed different degrees of increase demonstrating, also in the initial phase, conditions of hyper-dyscrinia.

Cinotti S.: Normativa nazionale per la riproduzione della specie equina. *National rules regarding the equine reproduction.* Prog. Vet., 7, 247, 1991.

The Author examines the law n. 30 (01.15.1991) regarding the regulation of animal reproduction. In particular the establishment of the genealogical register, the choice of the stallions and mares, the use of sperm and ovule and their import and export are reported.

Gentile A., Cazzola A., Giordani L., Gerardi G.: Il laboratorio di chimica clinica in buiatria: possibilità di impiego del sistema Kodak Ektachem DT. *The chemical clinical pathology in buiatriac practice: possibility of use of the Kodak Ektachem DT system.* Atti Soc. Ital. Buiatria, 23, 583, 1991.

The Kodak Ektachem DT System, which is based upon dry, multilayered chemical technology, has been subjected to study in regards to the possible usefulness in buiatriac laboratory diagnostics. Although there still remains the problem of the system higher operating cost compared to the commoner methods, which we used in confrontation, has shown to be clearly advantageous for its time-saving capabilities, for its simplicity and reduction of manual operations, for its almost perfect repetition of results, and for its stability of values obtained in relationship to time.

Gentile A.: Kälberleukose bei zwei Zwillingspaaren. *Juvenile leucosis in two pairs of twin calves (case report).* Tierärztl. Umsch., 46, 269, 1991.

Juvenile lymphatic leucosis was observed within a short period of time in two pairs of twin Simmental calves aged 2 months. Each pair comprised one male and one female. The clinical picture was: enlarged lymph nodes, respiratory and/or enteric complications and a rapid deterioration. Only one pair had leukemic blood pictures. Results of blood and post mortem examinations are described.

Gerardi G., Gentile A., Soldati G., Cordioli P.: Ulteriori indagini sulla diagnosi allergica dell'infezione da BHV 1. *Further investigation about the allergic test in BHV 1 infection.* Atti Soc. Ital. Buiatria, 23, 577, 1991.

In 179 subjects treated in part with live and in part with inactivated BHV 1 vaccine, the persistence of serological (ELISA and SN) and allergic positivity has been controlled. For the use of inactivated vaccine the allergic negativity precedes that of the serological tests, at least for controls carried out at 270 or more days after vaccination.

Trenti F., Cipone M.: La contaminazione da ^{131}I e da ^{137}Cs dell'ovino: fattori di trasferimento e trattamenti di prevenzione. *The radioactivity and the ovine — Transfer factors for the pasture-meat and pasture-milk for ^{137}Cs and ^{131}I and preventive treatments.* Atti Fe. Me. S. P. Rum., 1, 119, 1991.

The Authors, based on what has emerged from a study conducted on radioactive contamination of ovines and bovines, in addition to information collected on the subject from other literary sources, describe the procedures and the types of transfers for ^{131}I and for ^{137}Cs through the networks of the food chain vegetables-ovine-ovine products. The particular sensitivity of the ovine is emphasizes with respect to the two radioactive contaminants considered and the possible applications in the field of preventive practices is also illustrated.

Trenti F.: Radiocontaminazione ambientale e tutela delle produzioni animali. *Environmental radiocontamination and animal production protection.* Il Veterinario d'Italia, 10, 45, 1991.

On the basis of EC rules regarding radioactivity levels of human food (2218/89) and animal feed (770/90) in case of radioactivity emergencies, the Author describes the different phases of radionuclear transfer from environment to human beings via the alimentary chain vegetable — animal — animal products. A prophylactic plane against radionuclide contamination of animals and their products is showed, stressing the great saving of contaminated dose that can be obtained.

1992

Boari A., Guglielmini C., Famigli Bergamini P.: Iperinsulinismo da tumore delle cellule beta del pancreas nel cane: rilievi clinici in 6 casi. *Hyperinsulinism in the dog due to pancreatic islet-cell tumor: clinical features in 6 cases.* Atti Soc. Ital. Sci. Vet., 46, 1551, 1992.

The Authors describe the clinical findings and the differential diagnosis of hyperinsulinism due to pancreatic islet-cell tumor in 6 dogs. Hypoglycemia together with elevated insulinemic values, constantly present in all dogs, were associated with adrenergic signs (tremors, irritability, intense hunger) and neuroglycopenic signs (visual disturbances, syncope, seizures).

Boari A., Guglielmini C., Pietra M., Gentile A.: Infezione da feline immunodeficiency virus (FIV): indagine sieroepidemiologica nella provincia di Bologna. *Feline Immunodeficiency Virus (FIV): seroepidemiological investigation from the area of Bologna.* Prog. Vet., 17, 538, 1992.

The prevalence of FIV infection was evaluated with an ELISA test for the research of the specific antibodies against the virus on a sample of 380 sera of cats from the area of Bologna. The whole positivity was 12.4%, with a rate of 6.8% in 103 healthy animals and a rate of 14.4% in 277 sick cats. Such values were analysed in relation to sex, age and type of housing of the animals.

Boari A., Venturoli M., Minuto F.: *Non-islet-cell tumor hypoglycemia in a dog associated with high levels of insulin-like growth factor II.* Proceedings of the 17th Wsava World Congress 2, 677, 1992.

A 12-year-old mixed breed male dog was presented with recurrent episodes of seizure of hypoglycemic origin and a palpable mass in the cranial portion of the abdomen. Hypoglycemia was associated with abnormally low plasma insulin levels. After resection of a large leiomyoma (g 780) of the gastric wall, the hypoglycemia rapidly and permanently resolved demonstrating the causal effect of the tumor. In order to investigate the origin of hypoglycemia, sera samples, obtained both before and after surgery together with 50 sera samples from healthy dogs, were submitted to IGF I and-II. IGF II levels (1132 ng/ml) which were 3-4 fold normal levels (\bar{x} = 293.8+56.6) rapidly decreased after surgery (239 ng/ml), and simultaneously IGF I (7 ng/ml) and insulin values (3 uU/ml) both abnormally low, were normalized by surgery (respectively 30 ng/ml and 11uU/ml). This data shows that tumor induced hypoglycemia could be accounted for by increased concentrations of IGF II.

Cinotti S., Gentile A., Famigli Bergamini P.: Lesioni del velum abomasicum nel vitello. *Lesions of the Velum abomasicum in calves*. Atti Soc. Ital. Buiatria, 24, 669, 1992 — Summa, 4, 29, 1992.

The Authors examined the Vela abomasica of 478 abomasums of calves slaughtered at a weight of about 220Kg b.w.. Lesions were observed in 204/478 examined stomachs (42.6%): in 164 cases lesions were localized exclusively on the Vela abomasica; in the remaining 40 cases lesions were diffused to the whole abomasal mucosal surface. These findings suggest that disfunctions of Vela abomasica may take part in the pathogenesis of some digestive disorders of calves.

Cinotti S., Sala A.: Procedimenti medico-legali nella visita di compravendita del cavallo da sport. *Forensis medical rules of the sale examination of the sporting horse*. Ippologia, 3, 87, 1992.

The procedure and the rule of sale examination of the sporting horse are described. In particular the Authors indicate an iter to express a judgement of health, through clinical examination and laboratory and instrumental findings.

Cipone M., Lalatta Costerbosa G., Montagna P., Medori R., Liguori R., Venturoli M.: Distrofia miotonica nel cavallo — Descrizione di un caso. *Dystrophic myotonia in the horse — A case report*. Atti Soc. Ital. Sci. Vet., 46, 1543, 1992.

A five-month old A.A.S. colt was presented with marked symmetric hypertrophy of some muscular groups of the hindlimb. Dystrophic myotonia was diagnosed on the basis of delayed muscular relaxation of the middle gluteus, semimembranosus and semitendinous muscles after voluntary movement (action myotonia) and also after mechanical percussion (mechanic myotonia). EMG showed diffuse myotonic discharges and myopathic features in paraspinal muscle. Repetitive stimulation and both sensory and motor CV were normal. Biopsy of the gluteal muscle showed a lot of fibers with internal nuclei, splitting, whorled and ring fibers. All muscles presented fiber type grouping, adipose and connective tissue infiltration.

Cipone M., Venturoli M.: Ritmo idioventricolare accelerato nel cavallo: descrizione di tre casi clinici. *Accelerated idioventricular rhythm in the horse: description of three clinical cases*. Atti Soc. Ital. Sci. Vet., 43, 1255, 1989 — Ippologia, 3(3), 57, 1992.

Accelerated idioventricular rhythm is characterized by the coexistence of two pacemaker; the normal pacemaker, the S-A node, and an idioventricular heterotopic pacemaker which competes with the S-A node when this is inadequate. This particular arrhythmia, which is very difficult to detect at the clinical examination, has been documented in three horses by electrocardiogram. The Authors discuss differential diagnosis and some ethio-pathogenetic hypotheses for this arrhythmia.

Famigli Bergamini P., Boari A., Impalà A.: La determinazione delle fruttosamine nel cane: valori di riferimento e dati preliminari in soggetti con diabete mellito. *The determi-*

nation of fructosamine in canine medicine: normal values and preliminary data in diabetic dogs. Atti Soc. Ital. Sci. Vet., 45, 1387, 1991. — Veterinaria, 6(3), 67, 1992.

In human medicine the determination of glycated hemoglobin has recently been integrated with the determination of fructosamine as indicators for retrospective assessment of the medium and long term carbohydrate metabolism of the diabetic patients. The Authors determined the concentrations of fructosamine in 40 healthy dogs and in 10 diabetic dogs before starting any therapy. In diabetic dogs mean value of $606.70 \pm 119.99 \mu\text{mol/l}$ was found significantly higher ($p < 0.0001$) compared to the mean concentration in healthy subjects ($301.53 \pm 24.46 \mu\text{mol/l}$). These results show that this parameter can be useful in medium term control of the carbohydrate metabolism of the diabetic dogs.

Famigli Bergamini P., Boari A., Williams D.A.: *Serum trypsin-like immunoreactivity (T.L.I.) assay in the diagnosis of canine exocrine pancreatic insufficiency (E.P.I.). Observation in an affected family of English setter.* Proceedings of the 17th W.S.A.V.A. World Congress, ed. A. Delfino, 17, 819, 1992.

The aim of the present paper is to illustrate the use of serum trypsin-like immunoreactivity (T.L.I.) assay in the diagnosis of Exocrine Pancreatic Insufficiency (E.P.I.), and also to report observations of T.L.I. in serum samples collected from relatives of an affected group of English Setters examined at Clinica Medica Veterinaria — University of Bologna. Since we observed high prevalence of pancreatic degenerative atrophy (P.D.A.) in this line of English Setter dogs, we wanted to evaluate the significance of serum T.L.I. assay for potential use as an assay to screen subjects at risk. From the results of our investigation and from earlier observations in dogs clinically suspected of E.P.I., it can be stated that among the tests used for the functional evaluation of the exocrine pancreas, assay of serum T.L.I. is simple, specific and sensitive. Regarding the use of T.L.I. as an early biochemical marker in the screening of dogs at risk for P.D.A., our experiences with the limited number of dogs available to us, show that the serum enzyme activity is able to identify apparently healthy dogs destined to show E.P.I. within a short period. The test does not seem to be capable in identifying dogs that are healthy carriers of the gene for P.D.A.

Gentile G., Cipone M., Tassi C., Pileri S., Tazzari P.: *Ki-67 antigen expression in lymphocytes of cattle infected with bovine leukemia virus (BLV).* Dtsch. Tierärztl. Wochenschr., 99, 165, 1992.

The Ki-67 monoclonal antibody, which recognizes an antigen present on the nuclear membrane surface of mammalian cells in the replication phase, has been used for the determination of the cellular cycle of peripheral blood lymphocytes on a group of cattle positive for bovine leukemia virus (BLV) and with blood values showing a persistent lymphocytosis. The results obtained have shown that: 1. Both of the techniques used (immunofluorescence and immunoperoxidase) are easily applicable and give uniform results; 2. Cattle with a persistent lymphocytosis show an absolute number of cells in cycle significantly more elevated compared with cattle positive for BLV with normal blood values.

Gentile A., Guglielmini C., Cipone M.: Alterazioni del ritmo cardiaco nel bovino in rapporto col digiuno. *Bovine cardiac arrhythmias in relation to fasting*. Atti Soc. Ital. Sci. Vet., 46, 1527, 1992 — Arch. Vet. Ital., 44(3), 100, 1993.

8 cows were fasted for 14 days and were monitored clinically and electrocardiographically. Blood and ruminal liquid samples were regularly analysed. Bradycardia was a constant finding and in 3 cases was associated with a non-respiratory arrhythmic sinus arrhythmia. These findings would appear to be related to variations in rumen biochemistry. No similar alteration was observed in the 2 control animals.

Guglielmini C., Pietra M., Gentile A., Boari A.: L'incidenza dell'infezione da FeLV nei gatti della provincia di Bologna. *Incidence of FeLV-infection in cats from the area of Bologna*. Prog. Vet., 47, (15-16), 504, 1992.

3656 feline serum samples taken in the area of Bologna were submitted to an ELISA test for the detection of FeLV p27 antigen. The 4.1% of the tested animals gave a positive reaction. The incidence of the infection was examined in relation to age, sex, habitat and clinical findings.

Trenti F., Calamosca M., Pagano P., Cipone M.: *The diet-meat and diet-milk transfer of ^{137}Cs in the cattle: values of a dynamic model and values obtained in field*. Proceedings of the 17th World Buiatrics Congress, 318, 1992.

The Authors have applied a dynamic model that considers intake of ^{137}Cs by ingestion (diet), transfer to the meat and removal through the milk. They conducted the study on 19 cattle (9 cows and 10 heifers) which in the semester preceding the slaughter had been fed the rations composed of forage and concentrates on which the concentrations of ^{137}Cs was determined. The values of ^{137}Cs supplied by this model were compared with those obtained from the radiometric analysis of meat and milk samples collected at the site of slaughter. The average values of ^{137}Cs from the model for meat and milk for the 9 cows resulted in good agreement, in regard to those of radiometric analysis: the values supplied by the same model for the 10 heifers presented more considerable margins of error. The Authors in conclusion have proposed the opportunity of changing the values of some transfer constants for the heifers.

1993

Boari A., Famigli Bergamini P., Williams D.A.: Contributo casistico all'impiego del dosaggio dell'attività tripsinica simile sierica (TLI) nella diagnosi della Insufficienza Pancreatica Esocrina (IPE) del cane. *Diagnosis of canine exocrine pancreatic insufficiency by the assay of serum trypsin-like immunoreactivity (TLI)*. Veterinaria, 4, 35, 1993.

The aim of this paper is to illustrate the use of serum trypsin-like immunoreactivity (TLI) assay in the diagnosis of Exocrine Pancreatic Insufficiency (EPI). TLI was assayed in 12 serum samples belonging to dogs diagnosed as having EPI based on clinical findings and conventional laboratory tests. From the results of the investigation and from earlier observations in dogs clinically suspected of EPI, it can be stated that among the tests

used for the functional evaluation of the exocrine pancreas, assay of serum TLI is simple, specific, and sensitive.

Boari A., Guglielmini C., Famigli Bergamini P., Miniario R.: Iperinsulinismo da tumore delle cellule beta del pancreas nel cane: rilievi clinici in sette casi. *Hyperinsulinism in the dog due to pancreatic islet-cell tumour: clinical features in 7 cases*. Veterinaria, 4, 41, 1993.

The Authors describe the clinical findings and the differential diagnosis of hyperinsulinism due to pancreatic islet-cell tumor in 7 dogs. In the presence of neuroglycopenic signs (visual disturbances, syncope, seizures), the simultaneous finding of hypoglycemia and hyperinsulinism strongly supported the diagnosis of insulinoma which, in 6 cases, was confirmed by laparoscopy and/or necroscopy.

Boari A., Pinna S., Guglielmini C., Famigli Bergamini P., Venturini A.: Shunt portosistemico nel cane: aspetti clinici in 7 casi e della possibile correzione chirurgica. *Portosystemic shunt in the dog: clinical features of 7 cases and possibility of surgical management*. Atti Soc. Ital. Sci. Vet., 47, 1531, 1993.

The Authors reported the diagnostic features of 7 cases of portosystemic shunt in the dog. Most of the clinical signs, usually occurring after feeding, were referred to hepatic encephalopathy (i.e. sensory changes, circling, blindness, ptialism). Ascites was present in 4 dogs. Ammonia tolerance test, measurement of post feeding serum bile acid concentrations and contrast portography were the most diagnostic tests. The Authors also describe the surgical management of the 4 cases in which the shunt was extrahepatic.

Cinotti S., Bovo A.: Norme sanitarie sugli scambi intra ed extra comunitari di sperma, ovuli ed embrioni. *Rules regarding the intracommunity exchanges and the importation of sperm, ovules and embryos*. Prog. Vet., 19, 397, 1993.

The Authors examine the law n. 30 (01.15.1991) regarding animal reproduction. In particular the rules concerning cattle, pigs, horses, sheep and goats are reported.

Cinotti S., Peccolo G.: L'importazione nel territorio comunitario di bovini provenienti da paesi terzi, aspetti normativi. *Community rules regarding the importation of cattle from extracommunity countries*. Proceedings of the 18th World Buiatrics Congress, 18, 881, 1993.

The Authors examine and integrate the set of community laws regarding bovine intracommunity exchanges and the importation of cattle from extracommunity countries.

Cinotti S., Pietra M., Boldrin F., Venturoli M.: Analysis of tracheobronchial washes in horses with chronic obstructive bronchitis (COB). *Morphological changes in epithelial ciliated cells*. Swiss Vet., 11-s, 31, 1993.

34 samples of tracheobronchial washes were analysed to evaluate percentage of epithelial cells with or without cilia and ciliar motility. 18 samples were obtained from healthy

horses, 6 from horses with moderate COB and 10 from horses with severe COB. The percentage of ciliated cells was 63.3% in healthy horses, 31.2% in horses with moderate COB and 15.1% in horses with severe COB. Ciliar motility was retained in 61.1% of ciliated cells in the first group, 33.3% of ciliated cells in the second group and was absent in those from the third group. These results show that the tracheobronchial epithelial changes during COB can be quantitatively correlated to clinical findings and that the cilia damage is among a complex of cytological changes which occur in tracheobronchial epithelium during the disease.

Cinotti S., Venturoli M.: Visita di compravendita nel cavallo da sport: esame dell'apparato respiratorio e cardiocircolatorio. *Sale examination of the sporting horse: the respiratory and cardiovascular systems.* Atti del Congresso Nazionale della Società Italiana di Ippologia (SIDI), 11, 71, 1993.

The Authors describe the most frequent clinical findings and the applicability of the instrumental techniques (i.e. endoscopy, electrocardiography, ultrasound) during the sale examination of the respiratory and cardiovascular systems of the sporting horse. In particular the approach to chronic respiratory disease, heart murmurs and arrhythmias is discussed.

Cinotti S.: Protesi oblitterativa mobile per fistole ruminali permanenti. *Obliterating and mobile prosthesis for permanent ruminal fistula.* Atti Soc. Ital. Buiatria, 25, 685, 1993 — *Prax. Vet.*, 4, 12, 1994.

The Author suggests a permanent ruminal prosthesis which contains well the ingesta and is easily removed. The prosthesis is of nylon and is characterized by a good fixation system inside the ruminal cavity and it consists of four mobile positional hemi-helices which are adjustable from the outside. Some latticed positioned tubes which are between the prosthesis and cutaneous and ruminal surface limit the loss of the gaseous ruminal contents.

Cinotti S.: Visita di compravendita del cavallo da sport: richiami legislativi. *Sale examination of the sporting horse: legislative rules.* Atti del Congresso Nazionale della Società Italiana di Ippologia (SIDI), 11, 65, 1993.

The rules concerning sale examination of the sporting horse are reviewed. In the absence of other specific laws, the subject of the artt. 1353, 1492, 1496, 1920, 1921 of the Civil Code is discussed.

Cipone M., Pietra M., Venturoli M.: Rilievi eco-Doppler in corso di trombosi aortica nel cane: descrizione di due casi. *Vascular Eco-PW Doppler in two dogs with thrombosis of the abdominal aorta.* *Veterinaria*, 7 (3), 11, 1993.

Two cases of thrombosis of the abdominal aorta are described. Clinical signs, ultrasound and necroscopic findings are correlated. The evolution of aortic Doppler tracing in relation to the development of thrombosis is recorded. In particular it is showed the reduc-

tion of the velocity of systolic wave and the disappearance of diastolic wave. Furthermore the Doppler tracing morphology recorded from aorta and from a distal artery (femoral artery), in relation to the different phases of vascular occlusion, is discussed.

Famigli Bergamini P., Boari A., Gentile A., Miniero R., Cinotti S.: Su di un caso di sindrome di Cushing nel cavallo. *Cushing syndrome in a horse*. Atti Soc. Ital. Sci. Vet., 47, 1553, 1993.

The Authors describe the clinical features, the clinical pathology and the therapy of a case of Cushing syndrome in a horse. Cachexia, hypertrichosis, polydipsia and polyuria were associated with glycosuria, hyperinsulinism and hypercortisolism. The results of ACTH stimulation test and dexamethasone suppression test suggested that the syndrome was secondary to pituitary adenoma. Administration of cyproheptadine resulted in improvement of body condition, clinical signs and in normalization of laboratory data.

Mantovani A., Keck G., Cautin J.F., Trenti F., Bussi B.: *Veterinary action in disaster*. European Centre for disaster medicine (CEMEC) Monographs, 5, 1, 1993.

A review about disasters involving veterinary action is distinguished in four chapters: 1-Actions to be taken in earthquakes. 2-Major traffic accidents. 3-Chemical accidents. 4-Radionuclear accidents. In particular the radio-nuclear emergencies are subdivided in accidents in nuclear installation and in control failure of radioactive sources. The Authors emphasize that the action to be taken by veterinary service to prevent radionuclear contamination must integrate the surveillance on radioactive level on vegetables and the surveillance and radiometric control of animal products, namely meat and meat products, milk and milk products, fish, eggs, honey.

Spadari A., Cinotti S., Pietra M.: Tecnica chirurgica per la fistolizzazione permanente del ruminale bovino. *A technique for permanent ruminal fistulation in cattle*. Atti Soc. Ital. Buiatria, 25, 687, 1993.

A surgical technique for the creation of ruminal fistula in two distinct operations is presented. In the first the rumen is fixed to the abdominal wall. In the second the ruminal wall is opened. The purpose of this procedure is to obtain complete and definitive isolation of the abdominal cavity before the rumen is opened, so preventing leakage of exudates and ruminal content in abdomen.

Trenti F., Cipone M., Bollini D., Pallotti C., Pettazzoni P.: *The electronic image in veterinary radiology*. Atti 2nd European Association Veterinary Diagnostic Imaging Congress, 2, 75, 1993.

The Authors describe the possibility of acquiring the results of X-ray examination directly by means of an image intensifier or through the electronic of radiographic films. Wide variety of appliance, standard layout of information and easy remote transfer on-line and real-time of the complete pictures are the most important advantages of these techniques. Critical aspects of the systems for the analysis of electron X-ray images are also described.

Trenti F., Cipone M., Bollini D., Pallotti C., Pettazzoni P.: *Improvements of X-ray diagnosis through the analysis of the electronic image.* Atti 2nd European Association Veterinary Diagnostic Imaging Congress, 2, 77, 1993.

The Authors describe the operation of a computer-based image analysis in which standard exposure radiographs of the abdomen of cats were digitalized and processed in order to reveal densitometric properties and structural patterns of the organs. The conversion of the signal from analogic to digital and the storing of the images in an image memory of adequate characteristics make the data available for successive processing and/or visualization.

Trenti F., Cipone M., Gentile A.: *Il ciclo del radiocesio dall'ambiente alle produzioni animali nell'area mediterranea. The transfer of radiocesium from the environment to the animal products in the mediterranean countries.* Atti Fe. Me. S. P. Rum., 3, 43, 1-10, 1993.

Given the possibility of incidental radiocesium emission, the Authors describe the influence of some climatic and environmental factors on the transfer of ¹³⁷Cs from the environment to the foodstuff of animal origin. The varied combination of the different transfer coefficients that can take place even in the mediterranean area, can give rise to extremely different radiocesium contamination levels in meat and milk.

1994

Boari A., Cinotti S., Guarda F., Biolatti B.: *Aspetti anatomico-isto-patologici dell'edema del velum abomasicum. Anatomico-histopathological findings of edema of the vela abomasica.* Proceedings of the 18th World Buiatrics Congress, 2, 1307, 1994.

Following a first report regarding gross lesions observed in vela abomasica in calves, the Authors researched further data on vela abomasica through histopathological exams. The results demonstrated that edema of the vela abomasica was present in 111 subjects out of 478 examined. The edema was localized in the submucosa and associated with foci of inflammation and mucosa erosions.

Boari A., Williams D.A., Famigli Bergamini P.: *Observations on exocrine pancreatic insufficiency in a family of English setter dog.* J. Small Anim. Pract., 35, 247, 1994.

The aim of this paper is to report serum trypsin-like immunoreactivity (TLI) concentrations in the progeny of a pair of English setters. These dogs had a history of producing puppies with a high prevalence of exocrine pancreatic insufficiency (EPI) secondary to either congenital deficiency or early onset juvenile atrophy of pancreatic acinar cells. Serum TLI concentrations in the clinically healthy parents of the puppies with EPI were normal, as were serum TLI concentrations in the unaffected puppies. However, serum TLI concentrations were extremely low (less than 1 µg/l) in three puppies at eight to 12 weeks of age when clinical signs of EPI were present. One of the three puppies had also serum TLI concentrations of 0.7 µg/l at two weeks of age even though no clinical signs were evident at that time. These results suggest that serum TLI assay may be a useful diagnostic aid in identifying puppies at a very early age with this unusual form of EPI.

Cinotti S., Peccolo G., Manescalchi A.: Diritto di stabilimento, prestazione di servizi ed esercizio della libera professione di medico veterinario in Italia, tra disciplina nazionale e norme comunitarie. *National and community rules regarding the place of residence and the profession of the veterinarian in Italy*. Sanità Pubblica, 10, 1061, 1994.

The Authors reviewed the Italian and community jurisprudence about the right of residence and profession in Italy and European community for the veterinarian.

Cinotti S., Peccolo G.: La mutua assistenza tra autorità amministrative in materia di applicazione della legislazione veterinaria e zootecnica. *The assistance between administrative authorities in the application of veterinary and zootechny jurisprudence*. Prog. Vet., 4, 105, 1994.

The Authors examine and comment on the decree 01.30.1993.

Cipone M., Gentile A., Boari A., Famigli-Bergamini P.: Aspetti ecocardiografici in un caso di endocardite verrucosa nel bovino. *Ecocardiographic aspects of a case of bovine endocarditis*. Obiettivi e Documenti Veterinari, 15(5), 61, 1994.

Given the rarity of the use of diagnostic ultrasound in bovine cardiovascular disease, the Authors describe the echocardiographic findings in a case of vegetative endocarditis in which the absence of specific clinical signs could not permit to make a diagnosis. The Authors stress the importance of the use of ultrasonography in bovine medicine, as an aid in cases of uncertain clinical diagnosis.

Famigli Bergamini P., Cantoni A.M., Trenti F., Lugli M., Di Lecce R.: Rapporti tra epato-steatosi ed andamento dei parametri condizionanti il processo di caseificazione nella BLAP. *Relation between liver lipidosis and the cheese making process parameters*. Proceedings of the 18th World Buiatric Congress, 18, 965, 1994.

The characteristics of bovine milk produced by cows bred on farms destined to the production of P.R. cheese was considered comparatively through histomorphological and histomorphometrical examen of the liver. The evaluation of hepatic conditions was carried out through histological analysis on bioptic samples. In severe hepatic steatosis, negative repercussions were found in the quality of milk produced altering some parameters of the cheese making process.

Gentile A., Cantoni A.M., Corradi A., Pietra M., Famigli Bergamini P.: Lipidosi epatica nella bovina da latte: parametri emato-biochimici e biopsia epatica. *Hepatic lipidosis in dairy cows: clinical biochemistry and liver biopsies*. Proceedings of the 18th World Buiiatrics Congress, 18, 401, 1994.

In 169 Italian Frisian dairy cows destined to the production of Parmesan cheese, the A.A.s evaluated in a parallel way the most frequently used blood biochemical parameters in the diagnosis of cattle liver diseases and the status of lipidosis of the liver. The analysis of liver conditions was conducted through the histologic and histomorphometric exami-

nation of bioptic samples. The results show that liver steatosis might be more accurately represented by the behaviour of NEFA and biliary acids. It remains to be verified whether the steatosis index is directly related to changes in the above-mentioned biochemical parameters.

Gentile A., Guglielmini C., Cipone M., Ru G., Ligabue A.: Eritrocitosi secondaria ad emangiopericitoma renale in un cane. *Erythrocytosis associated with renal hemangiopericytoma in a dog*. Atti Soc. Ital. Sci. Vet., 47, 1499, 1993 — Veterinaria, 8(1), 29, 1994.

The Authors describe a case of secondary erythrocytosis suspected in a 7-year-old, female English Setter for the presence of brick-red mucous membranes and elevated PCV: ultrasonography revealed an abnormal renal mass. Serum erythropoietin was elevated, as determined by an ELISA test. Surgical resection of the pathologic kidney normalized erythropoietin concentration and the hematocrit. Upon histologic examination the renal mass was identified as hemangiopericytoma.

Guglielmini C., Galuppi R., Boari A., Sanguinetti V., Gentile A., Morganti L.: Su di un caso di infezione da *Pseudallescheria boydii* nel cane. *Pseudallescheria boydii infection in a dog*. Atti del 2 Congresso Nazionale della Federazione Italiana di Micopatologia Umana e Animale (F.I.M.U.A.), Torino 10-12 novembre 1994.

The Authors describe a case of *P. boydii* infection in a dog that shows depression, anorexia, weight loss, pale mucous membrane and abdominal masses on clinical examination; anemia, neutrophilia and hyperproteinemia with hypergammaglobulinemia were the most remarkable findings on clinical pathology. At necropsy multiple masses were present in the abdominal cavity and impression of them stained with MGG revealed fungal structures. On culture on Agar-Blood, Brain heart Infusion Agar and Sabouraud Dextrose Agar added with Chloramphenicol multiple whitish fungal colonies were seen which were successively identified as *Scedosporium apiospermum*, the anamorphic phase of *P. boydii*.

Pietra M., Guglielmini C., Gerardi G.: Prevalenza dell'infezione da *Borrelia burgdorferi* in cani del territorio bolognese. *Serological survey on Borrelia burgdorferi infection in dogs of the area of Bologna*. Prog.Vet., 49, 122, 1994.

The sera of 78 dogs from the area of Bologna were examined with an ELISA test for the presence of antibodies against *Borrelia burgdorferi*. 36 dogs were healthy and 42 were sick. Only one serum tested positive (prevalence rate 1.3%). It was obtained from a dog who had suffered of lameness and, at the moment of venipuncture, was affected by otitis, localized pyoderma and cystitis.

Russo S., Montermini L., Berkovitz R., Bonizzi L., Gentile A., Poli G.: E. Coli and Baculovirus as expression systems for the production of Bovine Leukemia Virus GP51 antigen. Proceedings of the 18th World Buiatrics Congress, 18, 725, 1994.

Viral antigens production by genetic engineering is more advantageous than the tradi-

tional methods of viral proteins extraction and purification. We are studying the production of recombinant proteins of zootechnical and veterinary interest in both the *E. coli* and baculovirus expression systems. The protein we are first expressing is the BLV gp51, the external component of the viral envelope. This glycoprotein is employed in AGID and ELISA diagnostic tests in official State eradication programs, for its strong immunogenicity in vivo; a biotechnologic way to obtain a convenient and inexpensive in vitro veterinary diagnostic is presented.

Rutili D., Rondini C., Cipone M., Gentile A., Di Giuseppe A., De Mia G.M.: Use of polymerase chain reaction for the early detection of bovine leukosis virus infection. *Use of polymerase chain reaction for the early detection of bovine leukosis virus infection*. Proceedings of the 18th World Buiatrics Congress, 18, 833, 1994.

The application of a relatively simple and fast PCR method to diagnose EBL in experimentally infected sheep and calves is reported. The method does not involve the isolation of the lymphocytes and the use of proteolytic enzymes. The results obtained were compared with those given by other virological and serological procedures. BLV infection was detected earlier, especially in calves, using PCR (14 to 32 days) than with SIA (24 to 32 days), ELISA (20 to 68 days) and AGID (24 to 72).

1995

Andreani E., Flammini C.F., Gentile G., Mandelli G.: Retroviridae. *Retroviridae*. In **Farina R., Scatozza F.** Trattato di malattie infettive degli animali. Ed. UTET, Torino, 769, 1995.

Boari A., Barreca A., Bestetti G.E., Minuto F., Venturoli M.: Hypoglycemia in a dog with a leiomyoma of the gastric wall producing an insulin-like growth factor II-like peptide. *European Journal of Endocrinology*, 132, 744, 1995.

A 12-year-old mixed breed male dog was referred for recurrent episodes of seizures due to hypoglycemia with abnormally low plasma insulin level. Resection of a large leiomyoma of the gastric wall resulted in a permanent resolution of the hypoglycemic episodes. Before surgery, circulating immunoreactive IGF-I was significantly lower than the control values, while IGF-II was significantly higher than control values. Tumor tissue IGF-II concentration was higher than normal gastric wall tissue IGF-II concentration. Evaluation of the molecular distribution of the IGFs in the circulation evidenced that IGF-II immunoreactivity was predominantly in the 35-65 kD region and barely detectable in the other regions. These results show that in the dog, non-islet cell tumor hypoglycemia, as demonstrated in humans, can be ascribed to overproduction of IGF-II circulating in a molecular form that can more easily cross the capillary wall, thus exerting its insulin-like effects on target tissues.

Boari A., Testoni S., Famigli Bergamini P.: Insulino resistenza in un cane affetto da diabete mellito e ipotiroidismo. *Insulin resistance in a dog with diabetes mellitus and hypothyroidism*. *Atti Soc. Ital. Sci. Vet.*, 49, 1995.

Insulin resistance was demonstrated in a 12-year-old spayed mixed breed dog with diabetes mellitus and primary hypothyroidism. Insulin resistance was suspected because of very high daily blood glucose concentrations (> 300 mg/dl) in spite of a correct diet (W/D Hill's) and excessive amount of insulin (2.4 U/Kg). Baseline serum thyroxine concentrations was 5 nmol/l (normal 20-40 nmol/l) and serum thyroxine concentration after TSH stimulation was 10 nmol/l (normal > 65 nmol/l). The beginning of sodium levothyroxine (20 mcg/Kg b.w. BID) administration determined increased activity and improved blood glucose concentrations with gradual decrease of insulin dosage. The endocrine alopecia totally resolved within 2.5 months after initiation of thyroid hormone supplementation.

Cinotti S., Peccolo G.: Gli art.216-217 T.U.LL.SS. sulle lavorazioni insalubri. Breve rassegna della giurisprudenza in materia di allevamenti. *Artt. 216-217 of the civil code concerning the unhealthy processing: review of the jurisprudence about farm.* Atti Soc. Ital. Buiatria, 27, 151, 1995.

The Authors reviewed the Italian jurisprudence about the articles 216-217 of the Civil Code regarding the activity of the farm.

Cinotti S., Peccolo G.: Il medico veterinario e l'obbligo di custodia delle sostanze velenose ex art.146 T.U.LL.SS. *The veterinarian and the custody of poisonous substances.* Prog.Vet., 8, 266, 1995.

The definition of poison and the rules concerning the custody of poisonous substances used in veterinary medicine are reported.

Cinotti S., Peccolo G.: La garanzia per i vizi redibitori nella compravendita degli animali: breve analisi storico-comparativa. *The discipline regarding the flaws guarantees in the animal sale: short analysis historical and comparative.* La Carne (in press).

The Authors analyse the origins and the evolution of the discipline regarding the flaws guarantees in the animal sale. They show how some XVIII and XIX century codes provided for a special and very detailed discipline in this subject, and further how such special discipline has been mostly lost in the present Italian Civil Code.

Cinotti S., Peccolo G.: La garanzia per i vizi redibitori nella compravendita degli animali: breve analisi storico-comparativa. *The warranty of the faults in course of animal sale. A brief historical study.* Convegno sulla Storia della Medicina Veterinaria, Reggio Emilia, 1995 (in press).

The Authors reviewed the Italian, Austrian and French jurisprudence about the faults in course of animal sale that can annul the contract.

Cinotti S.: Endoscopia delle prime vie aeree del cavallo: stato delle conoscenze e prospettive. *Endoscopy of the equine upper respiratory tract: present knowledge and prospects.* Atti della Società Italiana di Chirurgia Veterinaria (S.I.C.V.), 2, 127, 1995.

The Author describes the anatomical and functional aspects of upper airway structures (i.e. nasal cavity, pharynx and guttural pouch) living fiberoptic endoscopic examination. To date aspects of upper airway diseases and the univent endoscopic techniques to diagnosing them are discussed with special regard to larynx diseases.

Cipone M., Pietra M., Guglielmini C., Venturoli M.: Insufficienza aortica in un cavallo: rilievi elettrofonocardiografici, ecocardiografici ed eco-Doppler carotidei. *Aortic regurgitation in two horses: electrophonocardiographic, echocardiographic and carotic echo PW-Doppler findings*. Obiettivi e Documenti Veterinari, 16(2), 37, 1995.

The Authors describe the clinical signs and the electrophonocardiographic, echocardiographic (two- dimensional real-time, M-mode, PW-Doppler) and carotid PW-Doppler findings in two cases of aortic regurgitation in the horse. Abnormalities of the motion of aortic and mitral valves (two-dimensional real- time echocardiography, M-mode), aortic regurgitation (PW-Doppler) and abnormal flow profiles in the carotid (PW-Doppler) have been detected.

Famigli Bergamini P., Chiocchetti R., Moretti M., Gentile A., Boari A.: Alterazioni istomorfologiche del midollo spinale in tori con sindrome spastica. *Isto-morphological changes of the spinal cord in bulls with Spastic Syndrome*. Atti Soc. Ital. Buiatria, 27, 519, 1995.

The Authors describe morphological changes of the spinal cord observed in bulls with spastic syndrome. The lesions were confined in L3 segment and consisted in modifications of the perimeter of the area and in changes of the silhouette of the gray substance in the right dorsal horn and occasionally in the right ventral one too. Such anatomical modifications confirm the hypothesis of an altered regulation of the postural reflexes due to an incoordination between afferent stimuli during the course of spastic syndrome.

Gentile A., Baur T.: Conseguenze della somministrazione intraruminale di soluzioni reidratanti o di latte. *Consequences of the intraruminal administrations of milk or solutions for oral rehydration*. Giornata Buiatrica Italo-Tedesca Le indigestioni del vitello, in Atti Soc. Ital. Buiatria, 27, 571, 1995.

The force-feeding of young calves, listless to suck or suffering from neonatal diarrhea, with milk or nutrient- electrolyte solutions containing easily digestible carbohydrates includes the risk of the outbreak of ruminal acidosis. The risk of this consequence is confirmed from experimental investigations which studied the influence of intraruminal administration of milk and different oral rehydration solutions, as well as by clinical observations on hospitalized calves with a history of having been force-fed repeatedly.

Gentile A.: Untersuchungen über die Azidität der Pansenflüssigkeit von Kälbern nach intraruminaler Verabreichung von Rehydratationslösungen. *Investigations on the acidity of the rumen liquid of calves after intraruminal administration of solutions for oral rehydration*. Dtsch. Tierärztl. Wochenschr., 102, 244, 1995.

Investigations on the acidity of the rumen liquid after intraruminal administration of oral

rehydration solutions (ORS) were carried out in 7 young calves: After voluntary intake of about one liter of milk replacer, three times a day, 1 liter of rehydration solution (A, B, C or D) was administered intraruminally by a stomach tube. Prior to every meal rumen fluid samples were aspirated for the determination of the pH, the concentrations of lactic acid and volatile fatty acids. After intraruminal administration of the ORS the pH values of the rumen fluid samples decreased from initial values of about 6.5 to values of about 5.0 or even lower in all calves. Simultaneously, the concentrations of the acids, mainly lactic acid, increased markedly, with some differences depending on the respective solution. The results confirm that force-feeding of young calves with ORS as used in these experiments can induce ruminal acidosis and, therefore, should be avoided as far as possible.

Peccolo G., Cinotti S., Talone T., Magliulo R.: La protezione degli animali utilizzati a fini sperimentali (D.L.vo 116/92): ambito di applicazione e rilevanza del dolore. *The protection of the experimental animals (decree 116/92): application and pointing out the pain.* Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

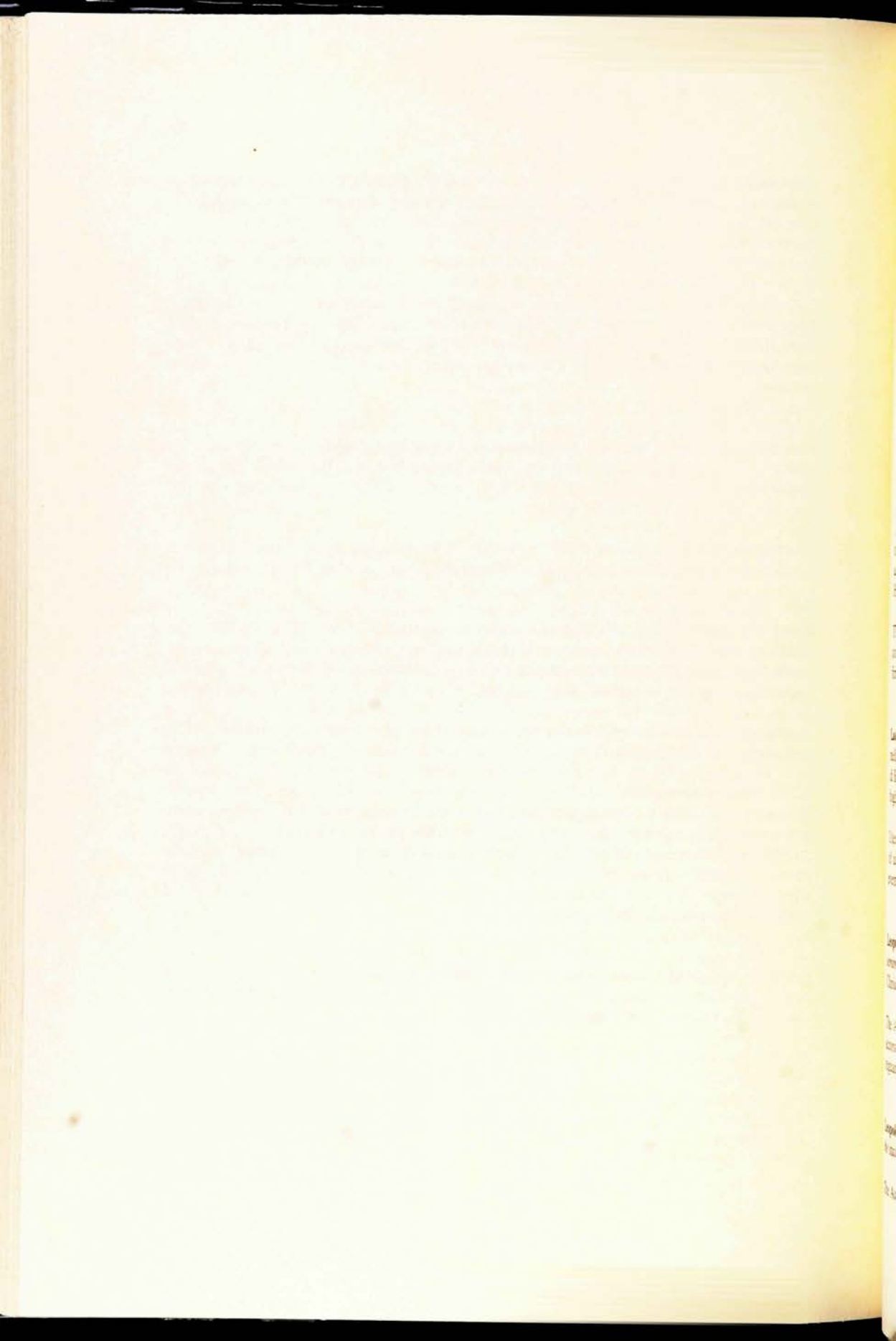
The application of the decree 116/92 is discussed. In particular the definition of pain in relation to the experiment and the determination of pain threshold are reported.

Pietra M., Guglielmini C., Famigli-Bergamini P., Cinotti S.: Utilizzo di una colorazione cellulare vitale (Trypan blue) per la valutazione dell'integrità dell'epitelio ciliare in cavalli con C.O.B. *Use of a vital stain (trypan blue) for the evaluation of the integrity of ciliary respiratory epithelium in horses with C.O.B.* Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

Tracheobronchial secretion samples were taken by means of tracheobronchial wash via endoscopy in 9 horses with C.O.B. and in 8 healthy horses and stained with a vital non ionic dye (Trypan blue). The percentage of completely stained cells (C.O.B. $82.9 \pm 22.3\%$, healthy horses $30.5 \pm 24.9\%$) and not stained cells (C.O.B. $10.2 \pm 15.8\%$, healthy horses $51 \pm 32.2\%$) showed significant differences between the two groups examined, whereas a non significant difference was present in the partially stained cells (C.O.B. $6.9 \pm 8.4\%$, healthy horses $18.5 \pm 23\%$). No statistical differences were present into the classes of completely, partially or not stained neutrophils between healthy and C.O.B. affected horses. The test can be useful as a screening test for the evaluation of the epithelial respiratory cells integrity.

Pietra M., Lugli M., Potenza D., Rossi L., Famigli Bergamini P.: Rene policistico in bovina gravida e feto: diagnosi *intra vitam*. *Polycystic kidney in heifer and its fetus: diagnosis intra vitam.* Atti Soc. Ital. Buiatria, 27, 523, 1995.

The Authors describe a case of polycystic kidney diagnosed *intra vitam* at the same time in an heifer and in its fetus. In addition to clinical signs and anatomo-histological findings, they report the ultrasonographic findings obtained by using transabdominal and transrectal scanning. The ethiopathogenesis of polycystic kidney in cattle is discussed and the possibility that it could be related to a genetic factor is confirmed by the simultaneous finding in mother and calf.



DIPARTIMENTO CLINICO VETERINARIO

Sezione di Ostetricia

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1988

Belluzzi S., Garnum F., Soatti A.: Fecondazione artificiale nel cane con seme congelato. *Artificial insemination in the dog with frozen semen*. Atti Soc. Ital. Sci. Vet., 42, 183, 1988.

A report is presented on results obtained artificially inseminating bitches with frozen semen. The intra-uterine trans-cervical method of insemination was used. Semen was frozen by a modified method. A group of 7 bitches was inseminated, 6 were found pregnant after 40 days gestation, 2 aborted and the remaining delivered 7, 4, and 2 alive and normal pups.

Belluzzi S., Matteuzzi A.: Episodio di aborto precoce e problemi riproduttivi in un allevamento di bovine da latte. Isolamento di Virus Herpes bovine 4 (BHV-4). *A case of early abortion and reproductive problems at a stock farm of dairy cows. Isolation of the bovine Herpes Virus 4 (BHV-4)*. Prax. Vet., 3, 12, 1988.

The Authors point out how the infective agents associated with bovine infertility increase constantly. They refer to an investigation at a stock farm of dairy cows, where, for the first time in Italy, the bovine herpes virus 4 was isolated in a episode of early abortion.

Lacalandra G.M., Sciorsci R.L., Crovace A., Belluzzi S.: Su alcuni casi di torsione uterina nella pecora e nella capra. *Uterine torsion of the ewe and goat*. Estratto da Problematiche di Biologia Fisiopatologia e Clinica della Riproduzione a cura di P. Minoia, Ed. Quadrifoglio, Bari, 160, 1988.

Uterine torsion in the ewe and goat is uncommon. The Authors have encountered 4 cases of uterine torsion in these small ruminants. The etiology, clinical signs, diagnosis and eventual surgical treatment have been discussed.

Leopold A.: Il congelamento del materiale seminale nel cavallo. *Deep freezing of the seminal material in the horse*. Estratto da: Problematiche di Biologia, Fisiopatologia e Clinica della riproduzione animale a cura di Minoia P., Ed. Quadrifoglio, Bari, 190, 1988.

The Author explains the method used in the freezing of seminal material in the horse according to Merkt and Coll. (1987) confirming the validity in relation to the results regarding its application.

Leopold A.: La valutazione della fertilità nel cavallo stallone. *The valuation of fertility in the stallion*. Atti della Società Italiana di Ippologia, 37, 1988.

The Author indicates 3 schemes, each different from the other, to estimate the fertility of

the stallion. Each of these 3 schemes has a particular validity, which depends on the various situations and also on the individual stallions. However, it becomes evident that the clinical examination and the examination of the semen are important in order to carry out a correct valuation of potential fertility. In the second part of his research the Author analyses the problems relating to the artificial insemination in the horse, using fresh and frozen semen.

Matteuzzi A., Belluzzi S.: Rilievi ecografici su ovaie di bovine gravide trattate con PMSG. *Ecographic examination of the ovaries of pregnant cows treated with PMSG.* Atti Soc. Ital. Buiatria, 20, 835, 1988.

The Authors describe ovarian modifications in pregnant cows after a treatment with 2000 u.i. of PMSG and determined by ecographic examination. The examination showed an increase in volume of several follicles with a tendency toward luteinization in certain cases. A return to the initial ovarian situation was obtained 25/30 days from the treatment.

Matteuzzi A., Cianti L.: Patologia della gravidanza: la mole nella bovina. *The pathology of pregnancy: moles in the cow.* Prax. Vet., 2, 17, 1988.

The Authors highlight the clinical and pathogenetic difference between the different forms of mole in bovine obstetrics. The etiopatogenesis of the hidatid, vesicular and eshy mole is of the Amorphus Globosus. In the field of the activities of the Institute of Obstetrics a few cases of Amorphus and moles have been collected which enable us to determine the cause of these phenomena.

Minoia P., Leopold A., Dell'Aquila M.E., Barile V.L., Sciorsci R.L., La Calandra G.M.: Recupero di ovociti da bovine gravide. *Recovery of oocytes from pregnant cows.* 15° Congresso Mondiale di Buiatria, II°, 11, 1988.

The possibility to collect oocytes from pregnant cows to use for experimental procedures has been considered. Ovaries were obtained from pregnant slaughtered cows in different gestational age. The follicular fluid was aspirated and oocytes recovered were denuded, fixed, stained and observed under a light microscope. A high rate of oocytes showing normal morphology, as in cyclic females, with an intact cumulus, a compact ooplasm and the chromatin in the dictyate stage or in resumption of meiosis was found.

Minoia P., Leopold A., La Calandra G.M., Matteuzzi A., Sciorsci R.L.: Trattamento con PMSG in bovine gravide: osservazioni cliniche ed endocrinologiche. *PMSG treatment of pregnant cows: clinical and endocrinological remarks.* 11th Inten. Congress on Anim. Repr. and Art. Insem., Dublin, Vol. 1, 49, 1988.

The treatment of pregnant cows with PMSG induces follicular growth and development of new corpora lutea with successive regression, temporary volume increase of the pregnant corpus luteum and increase of progesterone levels, but not of 17β oestradiol. Furthermore the treatment did not provoke abortion or other inconveniences. The follicular

growth observed would suggest that there are no impediments to follicular maturation in ovaries during pregnancy. These observations confirm the complexity of endocrin balance in pregnancy and show that it is possible to condition the ovary in pregnant females so making it to have female gametes without interfering with pregnancy.

Minoia P., Leopold A., Lacalandra G.M., Matteuzzi A., Sciorsci R.L.: Stimolazione ovarica in bovine gravide mediante somministrazione di gonadotropina serica. *Ovarian stimulation in pregnant cows by administration of serum gonadotropin*. Estratto da *Problematiche di Biologia Fisiopatologia e Clinica della Riproduzione* a cura di P. Minoia, Ed. Quadri-foglio, Bari, 46, 1988.

Pregnant cows were stimulated by 2000 U.I. of PMSG, to test the possibility of inducing follicular growth and to record possible side effects. Treatment causes increase in size of both ovaries as well as follicular corpus luteum of pregnancy and of the follicles. In some cases there was formation of new corpora lutea. Treatment induced temporary increase of plasma progesterone while it had no effect on 17β estradiol. Treatment did not disturb pregnancy. Follicular development during pregnancy is discussed with implications resulting from this research.

Minoia P., Matteuzzi A., Dell'Aquila M.E., Barile V.L., Lacalandra G.M., Sciorsci R.L.: Osservazioni morfologiche sugli ovociti follicolari recuperati durante la gravidanza nella bovina. *Morphological observation of follicular oocytes recovered during pregnancy in cattle*. Estratto da *Problematiche di Biologia Fisiopatologia e Clinica della Riproduzione* a cura di P. Minoia, Ed. Quadri-foglio, Bari, 59, 1988.

The possibility to collect oocytes from pregnant cows to use for experimental procedures (i.e. *in vitro* maturation, *in vitro* fertilization, embryo transfer, micro-manipulation, gene transfer) has been considered. As compared to non-pregnant cows the rate of recovery (41.2%) was the same for oocytes exhibiting normal morphological features including an intact cumulus, a compact ooplasm and the chromatin in the dictyate stage or in resumption of meiosis. Our data show that it is possible to recover from pregnant cows about 41% oocytes exhibiting normal morphological features and to hormonally induce ovarian activity. These animals could be considered as good oocyte donors as the cyclic cow.

1989

De Fanti C., Capitani O.: Diagnosi precoce di gravidanza nella cagna e controllo ecografico dell'evoluzione fetale. *Early pregnancy diagnosis in the bitch and echographic check-up development of the fetus*. *Atti Soc. Ital. Sci. Vet.*, 43, 2191, 1989.

We consider the diagnosis using ultrasound the method of choice for the early diagnosis of pregnancy. Its unique properties such as being harmless, non-invasive and its easy execution allow us to repeat it daily without risks for the pregnant animal and for the product of conception. Besides, the ecographic exam allow us to evaluate the embryonic development and the vitality of the embryo itself. Our research was done on subjects of different species and followed up from the time of breeding to the time of delivery.

De Fanti C., Matteuzzi A., Cianti L.: La torsione dell'utero nella bovina. Aspetti attuali del problema. *Bovine uterine torsion: recent consideration on this problem*. Atti Soc. Ital. Buiatria, 21, 161, 1989.

The Authors discuss ample case studies concerning bovine uterine torsion based upon observation made in recent years in the North-Central regions of Italy. Evidence has shown that this dystocia comprises 8.16% of the total number of dystocias. It has been shown that there exists a higher incidence in cattle raised in confinement with respect to those raised in semiconfinement ($P < 0.001$). Moreover the possibilities of treatment and the choice of methodology for intervention in the dystocia in relation to the particular needs of the cattle farm are discussed.

Matteuzzi A., Camporesi A., Perazzetta G.: L'ecografia nella diagnosi di gravidanza nella scrofa. *The use of ultrasonography in the sow. The existing of the problem*. Sel. Vet. 30, 1649, 1989.

Research to test the reliability and importance of early ultrasonographic pregnancy diagnosis was carried out by the Authors on 3,268 sows during 1987-88. Two portable ultrasonographs with electronic linear transducers of 3.5 and 5 MHz respectively, were used. Research was carried out on two farms and the utility of this method in the field was confirmed; optimal sensitivity and specificity were reached at 24-26 days of gestation, with 97.58% positive pregnancies with respect to farrowing and 98.80% positivity was reached at 35 days gestation.

Matteuzzi A., Minoia P., Belluzzi S., Sciorsci R.L.: Effetti della stimolazione gonadotropica in gravidanza nella scrofa. *Effects of gonadotropic stimulation during pregnancy in the sow*. Sel. Vet., 30, 323, 1989.

The Authors report the initial results of the stimulation of the pregnant sow with P.M.S.G.. They note that the treatment with P.M.S.G. does not interfere with the normal development of the pregnancy, and induces the growth of follicles that assume dimension equal to those of preovulatory follicles five days after the treatment. Such follicles regress without luteinizing after 12 days.

1990

Belluzzi S., Cianti L., Galeotti M.: Attendibilità della biopsia endometriale della bovina. *The reliability of endometrial biopsy in the cow*. Atti Soc. Ital. Buiatria, 22, 511, 1990.

The present research was performed to study the attendibility of endometrial biopsy. Forty-two bioptic catches were executed with two different tools on 21 Frisian cattles. After slaughter 3 endometrial samples were picked up for each cow. The histological observations performed on bioptic samples and postmortem specimens were compared. The average numbers of granulocytes, plasmacytes and mastocytes obtained from 5 specimens for each cow were compared through the statistic calculation of multiple correlation coefficients. The statistic analysis showed high significance levels for granulocytes and plasmacytes ($p < 0.001$) and significant result for mast cells ($p < 0.01$).

Belluzzi S., Mari G., Mari L.: La gemellarità nella cavalla: aspetti clinici ed ecografici. *The twin pregnancy in the mare: clinical and ultrasonographic reports*. Rivista di Ippologia, 1, 73, 1990.

The twin pregnancy in the mare is considered an unfavorable event, because most of the time it gives an abortion, the birth of dead subjects or anyway not vital. In the review the physiologic processes implicated in the twin pregnancy, and the clinical and ultrasonographic methods of diagnosis are considered. The object of the present report is to give an ultrasonographic documentation about the course of events which follows the clinical and therapeutic interventions to terminate the twin pregnancy in the mare.

Samoggia G., Lo Fiego D.P., Bergonzoni M.L., Steri G.: Effetti dell'orchietomia sulle performances produttive del coniglio da carne. *Effects of castration on productive performances of the meat rabbit*. Atti Soc. Ital. Sci. Vet., 44, 1657, 1990.

This research looks into the possibility of obtaining a meat rabbit with a heavier slaughter weight than the current one (2.4-2.5 Kg l.w.) which can provide muscular masses characterized by superior gastronomical quality. Performances yields of entire and castrated N.Z.W. X Californian crossbred rabbit have been compared. No statistically significant difference between the two groups has been found for carcass characteristics and meat quality.

Soatti A., Bergonzoni M.L., Carluccio A.: Risultati riproduttivi dopo terapia nelle endometriti croniche della bovina. *Reproductive results after chronic endometritis therapy in the cow*. Atti Soc. Ital. Buiatria, 22, 329, 1990.

The Authors show the results of a research on 994 cows affected with chronic endometritis and treated with iodine and antibiotic douchings. The therapy with Lugol permitted to recover 431 heads of 749 which corresponds to 57.5%. Through treatment with Neomycin Sulphate 91 cows out of 147 recovered (61.8%). Finally 40 heads out of 58 were recovered with Oxytetracycline treatment (68.8%).

Truszkowska B., Paggi J., Belluzzi S., Masi M.: Comportamento della rifaximina in formulazione schiumosa dopo somministrazione endouterina. *Distribution of rifaximin in foam formulation after intrauterine administration*. Summa, 7(2), 98, 1990.

The distribution of rifaximin in foam formulation was examined after intrauterine administration in isolated uteri and the uteri of live cows culled 6, 12, 24, 48h following treatment. The distribution and persistence of rifaximin in the uteri were determined by gross examination and by microbiological assay of uterine liquids and endometrium tissue fragments. Rifaximin locally administered in foam form determined mechanical dilatation of the treated uterus and was uniformly distributed within the uterine cavity and along the endometrium persisting in concentrations capable of inhibiting the growth of the test microorganism over a period of at least 48 h following treatment.

1991

Belluzzi S., Libralesso L., Cianti L.: Mortalità embrionale della bovina. (Osservazioni sperimentali e possibilità terapeutiche). *Some aspects of embryonic mortality and therapeutic possibilities*. Obiettivi e Documenti Veterinari, 3, 49, 1991.

The Authors give a brief account of embryonic mortality in the cow, with reference to stress-related embryonic mortality and to the maternal recognition process of pregnancy. On the basis of known data and in order to verify reports of other Authors, some repeat-breeder cows were experimentally injected with 0.25 mg of a synthetical analogus to GnRH, 11 days post breeding. The pregnancy rate recorded in treated cows, 45 days post-breeding, is not significantly different from the one recorded in the comparative group, and the mean interval between breeding and return to oestrus recorded in treated cows varies in a remarkable, but not yet significant, way. Although the obtained results refer to a limited number of cases, they seem not to confirm the fact that a GnRH injection 11 days post-breeding could increase the conception rate in repeat-breeder cows.

Belluzzi S., Zambelli D., Mari G.: Sulla crioconservazione dello sperma di cane. *About the freezing of dog semen*. Atti Soc. Ital. Sci. Vet., 45, 477, 1991.

The semen of 3 subjects was frozen according to two methods: a) using a computered freezer and following different temperature programs, b) using a controlled exposure to the nitrogen vapour in a special steel cylinder set up by the Authors. The semen was thawed slowly, moderatly and quickly. The spermatic motility was then analyzed and it gave us the opportunity to evaluate the best method to follow.

Soatti A., Steri G., Matteuzzi A., Diquattro G.: Correlazione tra analisi quali-quantitativa del muco cervicale estrale e fecondità in bovine trattate con PGF2 α . *Correlation between quantitative and qualitative analysis of cervical mucus and fertility in cows treated with PGF2 α* . Atti Soc. Ital. Buiatria, 23, 147, 1991.

A single dose of PGF2 α was administred to 215 cows with functional corpus luteum. The Authors relate the manifest or silent oestrus, the quantity and quality of the cervical mucus with the fertility rate after a single artificial insemination.

1992

Belluzzi S., Carluccio A., Cianti L., Matteuzzi A.: Utilizzo delle PGF2 α al momento dell'inseminazione nella bovina e risultati riproduttivi. *Use of PGF2 α at the moment of insemination in the cow and reproduction results*. Atti Soc. Ital. Buiatria, 24, 437, 1992.

The Authors report the results of a research on 199 cows carried out using PGF2 α at the moment of insemination. The use of PGF2 α at a tenth of the therapeutic dosage led to an overage increase in fertility of 4.4%.

Belluzzi S., Zambelli D.: Valutazione morfologica dell'acrosoma e del nucleo di spermatozoi di cane sottoposti a diverse metodiche di congelamento. *Morphological evaluation of the acrosoma and nucleus in canine spermatozoa which underwent many different methods of freezing.* Atti Soc. Ital. Sci. Vet., 46, 289, 1992.

The second fraction of ejaculate was obtained by fractions collected and then it was diluted using the following extender: Tris-fructose-citric acid, 20% of yolk and 9% of glycerol. The seminal material has been frozen with nitrogen vapours, according to different curves obtained following various methods. After an intermediate (37°C/1m) thawing, the vitality %, the quality of movement, the integrity of acrosome have been valued using rose bengala and eosin-nigrosin and integrity of nucleus was valued through acridine orange staining. The different freezing methods have been compared in accordance to structural damage of spermatozoa.

Bergonzoni M.L., Arav A., Sheu D., Zambelli D.: Crioconservazione dello sperma di coniglio usando la tecnica del congelamento direzionale. *Cryopreservation of rabbit semen using directional solidification.* Atti Soc. Ital. Sci. Vet., 46, 271, 1992.

A systematic study was performed in order to establish a procedure of cryopreservation of rabbit semen. In the first part of the study different cryoprotectors were used (glycerol, DMSO, propyle glicol, ethylene glicol) at different concentration and times of exposure. Results show that a concentration of 3% glycerol is the least toxic to rabbit semen. In the second part the effect of different cooling rate was studied. Taking into account the post-thaw motility it was found that the optimal cooling rate was 60°C/min.

De Fanti C., Bergonzoni M.L., Zanoni R.: Piometra nella cagna, aspetti clinici, ormonali e batteriologici. *Pyometra of the dog: clinical, hormonal, and bacteriological aspects.* Obiettivi e Documenti Veterinari, 7, 89, 1992.

Based on the personal observation of 112 cases of pyometra in the dog, it is recommended a therapy based on antibiotics, a bacterial exam, and a relative antibiogram, in alternative to an ovariectomy.

Leopold A., Mari G., Cascio G.: Valutazione clinica dei follicoli estrali nella cavalla e risultati riproduttivi. *Clinical evaluation of the estral follicolites in the horse and reproductive results.* Prax. Vet., 13(4), 5, 1992.

Routine ovarian examinations were made in 378 mares before artificial insemination with fresh semen. Tension and volume were evaluated in 580 follicles and related with reproductive records. Best results, 71.8% of pregnancy, were obtained from fluctuant follicles of more than 4 cm, but this class was found to be only the 12.3% of total examined follicles; with follicles between 3 and 4 cm with reduced tension or fluctuant, pregnancy is about 60%; follicles with high tension until 2 cm give 48.5% of pregnancy; insemination in mares within a few hours after follicle dehiscence gives only 25% of pregnancy.

Mari G., Belluzzi S.: L'impiego degli ultrasuoni nell'esame dell'apparato riproduttivo maschile. *The use of ultrasound in the examination of the masculine reproductive apparatus.* Ippologia, 4, 1992.

The A.A. review the present ultrasonography application utilized to study the physiological and pathological aspects of the stallion reproductive apparatus. Furthermore, they report the results of their own experience about the ultrasonography examination of the stallion accessory sex glands before and after ejaculation. They also describe a case of sterility due to necrospemia. This case was also characterized by microbial pollution of the ejaculate and monolateral hypertrophy of the prostate.

Matteuzzi A., Ferlini L., Marchi F.: Relazione tra impiego sistematico e mirato dell'ossitocina durante il parto ed il tasso di natimortalità nell'allevamento suino. *Relation between systematic or aimed use of oxytocin during farrowing and stillbirth rate in pig farms.* Sel. Vet., 33, 865, 1992.

The research was carried out on three "closed cycle" farms situated in the same province. The stillbirth rate regarding 10,623 spontaneous farrowings in function of different oxytocin administration dosages is reported. On farm A, oxytocin was systematically administered. On farm B and C, oxytocin was administered only in the interval between the expulsion of the piglet and the following and it lasted longer than 45-60 minutes. Stillbirth rates in A, B, and C of respectively 8.09, 4.51, and 5.33 ($P < 0.001$), demonstrate the evident relation between systematic use of oxytocin at the above mentioned dosages and increased stillbirth rate.

1993

Belluzzi S., Carluccio A., Molinari A., Matteuzzi A.: Utilizzo di farmaci β -bloccanti al momento della inseminazione artificiale nella bovina e risultati riproduttivi. *The effectiveness of β -blockers for improving the bovine fertility in the artificial insemination.* Atti Soc. Ital. Buiatria, 25, 337, 1993.

In order to oppose the negative effects on uterus tonicity caused by the release of stress-induced catecholamine, just after the artificial insemination (A.I.), the Authors administered 2.5 mg propranolol i.v. or placebo (saline 0.9%) in a group of 204 dairy cows and 40 heifers from 2 breedings (A and B). In the group A, where we with a low percentage of fertility, we obtained a significative increase of pregnancy, 17.6% ($p < 0.01$). In the group B, with a normal fertility, the increase of pregnancy was 8.8% (n.s.). Considering the uterus tonicity at the moment of A.I. the increase of pregnancy was of 9.87 (n.s.) (cat. A) and 39.3 ($p < 0.01$) (cat. B) in animals with good uterus tonicity and 33.3% ($p < 0.01$) cat. A; but we had decrease in animals with poor uterus tonicity (cat. B).

Belluzzi S., Zambelli D., Bergonzoni M.L.: L'inseminazione artificiale nel cane con seme congelato. *Artificial insemination of the dog using frozen sperm.* Prax. Vet., 14(2), 12, 1993.

The freezing of canine sperm is destined to become more popular, and the sending of the frozen sperm creates problems for the veterinarian who receives it; for example how to

bring about the artificial insemination. This up to date article explains how to thaw out and value the frozen canine sperm, how to choose the right moment for insemination and the techniques which give the best results.

Bergonzoni M.L., Ognibene A., Marchi F., Matteuzzi A.: Rilievi batteriologici in corso di endometrite nella scrofa. *The bacteriological observation in the case of sow endometritis.* Obiettivi e Documenti Veterinari, 10, 47, 1993.

A bacteriological and serological research have been performed in two herds of sows with both hypofertility and purulent and mucopurulent vaginal discharge from 15-25 days after natural or artificial insemination. An investigation for Ureaplasma has been carried out too. The importance of metoestral phase in facilitating the onset of endometritis in the sow has been pointed out.

Carluccio A., Belluzzi S., Soatti A., Incorvaia R.L.: Studio comparativo fra componenti biochimiche nel siero di sangue e nel plasma seminale di toro. *Comparative studies between biochemical components in the blood serum and seminal plasma of the bull.* Atti Fe. Me. S. P. Rum., 26, 1, 1993.

The Authors have found some biochemical components in the blood serum and seminal plasma of the bull. Calcium, potassium, magnesium and glucose have been found in all animals tested and have resulted with significantly higher concentration within the hematic compartment. This aspect needs further examination in some areas as well as the research dealing with variations of fertility.

Carluccio A., De Fanti C., Zambelli D., Bergonzoni M.L., Giosuè M.A.: Studio preliminare sull'induzione della lattazione nella bovina con Aloperidolo (I). *Induction of lactation in the cow by haloperidol inoculation: a preliminary study.* Atti Soc. Ital. Sci. Vet., 47, 489, 1993.

The Authors wanted to see whether haloperidol is able to induce lactation in the cow. Six Frisian cows (non pregnant and in a dry period) were used. The animals were injected with 17 β E2 (in the morning) and P4 (in the evening) for one week as already described by other Authors. Haloperidol was inoculated every other day from the 8th until the 16th day. The cows were milked for the first time on the 18th day and until the 4th month from the beginning of the treatment their milk production was not lowered.

Carluccio A., Soatti A., Zocca A., Diquattro G.: Dati statistici e metodi di intervento nel prolasso dell'utero della bovina: sopravvivenza e successiva fecondità. *Statistical data and resolution of bovine uterine prolapse: outliving and secondary fertility.* Atti Soc. Ital. Buoiatria, 25, 663, 1993.

The Authors report the results obtained after resolution of 144 uterine prolapse. In the total bovine population the incidence of the pathology was 0.64%, the mortality 8.33% and the voluntary slaughtering 9.72%. After the resolution of the pathology, 118 cows were inseminated with a ratio of pregnancy of 84.74%.

Galeotti M., Belluzzi S., Volpatti D., Bergonzoni M.L., Dogaro E.: Valutazione dell'infiltrato mastocitario in uteri di vitelle e manze puberi. *Evaluation of mastocyte infiltration in calf and heifer uteri.* Atti Soc. Ital. Buiatria, 25, 654, 1993.

A survey to evaluate the number of mast cells in the uterus of normal animals was performed with the aim of obtaining a reference value to use in the evaluation of infertile cows. Thirty calves (group A) and 29 heifer (group B) were chosen on the basis of absence of genital apparatus pathological changes. After slaughter, three uterine tissue samples were collected from the uterus body and one from each horn. The average number of mast cells in group A was significantly different ($P < 0.01$) between sampling site (body: 2.34 vs horn 4.84). The mean values, including s.d. and rounded, for group A were: body 2-5; horn 3-6; for group B: body 5-8; horn 6-8.

Matteuzzi A.: Repeat Breeders. *Repeat Breeders.* Atti Soc. Ital. Buiatria, 25, 73, 1993.

The Author describes widely and clearly the ethiology of repeat breeding in cows, with particular regard to embryonic death and unsuccessful fertilisation. The administration of HCG or GnRH on day 7 or 10 after insemination is confirmed as a current and effective therapy. The Author reports the results obtained on 46 repeat breeders cows coming from lowland farms and pastured with a fertile bull for a period of 90 days. The goal was to assess the influence of environmental factors on repeated heat. In this way a 65% pregnancy rate was obtained in cows with "sine materia" infertility.

Samoggia G., Bergonzoni M.L.: La determinazione precocissima del sesso. *The immediate determination of the sex.* Riv. Coniglicolt., 3, 35, 1993.

The A.A. explain the procedures used to bring about a differentiation of the two sexes during the first hour of life, which permits the preparation of persons who are experts in this field and who will be placed in intense breeding farms in which results in the production of hybrids with the necessity of maintaining purification in the lines of male and female.

Zambelli D., Bergonzoni M.L., De Fanti C., Carluccio A.: Tecniche per la valutazione morfologica degli spermatozoi di gatto, di coniglio e cane. *In vitro methods for the evaluation of semen quality in cat, rabbit and dog.* Atti Soc. Ital. Sci. Vet., 47, 279, 1993.

Morphologic assessment of spermatozoa gives an important information about semen quality. It is well-known that evaluation of acrosomal integrity is positively correlated with fertility, therefore the present research was undertaken to find the better staining method suitable for any of the species studied. Furthermore, the Authors wanted to check the influence of the dilution method of the staining quality. The results of this multivariate study will be discussed.

1994

Belluzzi S., Galeotti M., Carluccio A., Matteuzzi A., Boschi F.: Raffronto fra parametri istologici e livelli di mediatori chimici della flogosi in biopsie endometriali di bovine

ipofertili. *The comparison of histological parameters and chemical mediator levels of phlogosis in the biopsy of hypofertility cows.* 18th World Buiatric Congress, 313, 1994.

The goal of this research is to describe the localisation exam of endometrial tissue which has been made contemporarily with quantitative research for Tromboxane B2 (TXB2) and Leukotriene in cows which regularly gave birth and cows affected by clinically diagnosed endometritis. The comparison between medium values of TXB2 and LTB4 mediators of cows with endometritis in respect to the healthy ones resulted statistically significant. Only two cows out of seven in the group of repeat breeders have had values of the mediators TXB2 and LTB4 referable to an inflammatory state. A good correlation has been evidenced between high values of LTB4 and the presence of granulocyte infiltration.

Bergonzoni M.L., Zambelli D., Monfredini R., Carluccio A., De Fanti C.: Valutazione dei quadri colpocitologici, ormonali, comportamentali, e laparoscopici in relazione al ciclo estrale, alla pseudogavidanza e gravidanza nella coniglia. *Evaluation of vaginal cytology, hormonal and laparoscopic aspects during estrus cycle, pseudopregnancy and pregnancy in the does.* Atti Soc. Ital. Sci. Vet., 48, 1994 (in press).

The aim in this work is to acquire information about the physiology of reproduction in the doe in order to optimize common practices such as A.I. and hormones utilisation, for the improvement of reproductive performances in this species. The work has been performed with N.Z. white does submitted to vaginal cytologic examination, blood sampling for 17 β -estradiol assay, behavioural test and laparoscopy during estrus cycle, pseudopregnancy and pregnancy. The results will be discussed.

Bergonzoni M.L., Zambelli D., Samoggia G.: Influenza del diluente, temperatura e del periodo di conservazione del seme. *The effects of diluent, temperature of storage and period of cryopreservation of rabbit semen on the success of A.I.* Riv. Coniglicolt., 31(4), 37, 1994.

A comparative study was undertaken to evaluate the effect of five diluents generally used in semen cryopreservation on rabbit semen vitality. In addition, *in vitro* assessment of semen motility and acrosome integrity was recorded for each diluent in correlation to the time and temperature of storage. The results show that after a conservation period of 36-37 hours the semen had better characteristics (motility and acrosome integrity) when stored in BF5 or Tris- Buffer. In the range of the storage temperatures tested, optimal characteristics were obtained when the semen was stored at 15°C. However, in each of the diluents assessed (for the whole range of temperatures) the vitality of semen after every storage period was not more than 60%.

Carluccio A., Belluzzi S., Zambelli D., Soatti A., Matteuzzi A.: Comparazione fra componenti biochimiche del liquido seminale e morfologia degli spermatozoi di toro in relazione alla crioconservazione. *Comparison between biochemical components present in seminal liquid and morphology of bull spermatozoa with regards to crioconservation.* 18th World Buiatric Congress, 1099, 1994.

The presence in seminal plasma of intracellular enzymes has been correlated to the

percentage of spermatozoa with pathological characteristics and with increase of the number of those which present loss of integrity of acrosomal membrane. Relationship have been advanced between characteristics of seminal material and the G.O.T. values in plasma, and between proteins in seminal plasma and spermatozoic vitality. The object of this research is to compare the values of some of the analytes studied in seminal plasma at the moment of sampling and after freezing-defreezing to ejaculative characteristics, with particular reference to eventual structural damage to spermatozoa. Researched analytes were G.O.T., G.P.T., L.D.H..

Carluccio A., De Fanti C., Bergonzoni M.L., Zambelli D., Vecchi G.: Indagini in un allevamento bovino con problemi di subfecondità. *Inquires on a dairy cattle farm with reproductive problems*. Atti Soc. Ital. Sci. Vet., 48, 1994 (in press).

Infertility is polyfactorial as a syndrome making the exact diagnosis difficult. Different causes can be involved such: genetic, functional, congenital disorders, acquired anomalies, and factors associated with gynecological practices. In this paper the Authors report an inquiry protocol for the identification of the possible cause of infertility on a dairy cattle farm.

Carluccio A., Mari G., Maltoni P., Matteuzzi A.: Comparazione di alcuni parametri biochimici nel liquido seminale e nel siero di sangue di cavalli stalloni (nota preliminare). *Studies of some biochemical parameters in the semen and in the blood serum of stallions*. Atti 6° Meeting Nazionale Studio della efficienza riproduttiva degli animali di interesse zootecnico, Bergamo, 135, 1994.

Biochemical components usually evaluated in seminal plasma are lower than those in blood serum. Seventeen stallions of different breed and age have been studied. Every 7 days samples of blood serum and seminal plasma from every stallion were examined. The concentration of different constituents has been analyzed: urea, creatinine, uric acid, cholesterol, tryglicerides, proteins, GOT, GPT, gGT, ALP, LDH, CPK, P-CHE, amylase, Ca, P, Na, K, Cl, Mg, Fe. The obtained results show a high significant difference for the major concentration of K in the semen, for the proteins, colesterol and amylase in the concentration of the blood serum.

De Fanti C., D'Angelo G., Carluccio A.: Incidenza delle distocie nella specie bovina. *Incidence of dystocia in the cow*. Prax. Vet., 15(2), 8, 1994.

The aim of our study was that of finding the most frequent cause of dystocias in the cow, the categories and races most affected and to calculate the economic damages which derive from the loss of the cow and/or calf.

Galeotti M., Belluzzi S., Volpatti D., Bergonzoni M.L., D'Angaro E.: *Evaluation of mast cells infiltration in calf and heifer uterus*. 18th World Buiatrics Congress, 1135, 1994.

The aims of the present research are to describe the localisation of mast cells in the layers of normal cows uteri, and point out the qualitative and quantitative evolution of

the mast cells infiltration due to age. Thirty calves (group A) and 29 heifers (B) were chosen on the basis of absence of genital apparatus pathology. Samples were collected from the uterine body and from each horn. The number of mast cells in the layers for calves and heifers was respectively: st. compactum 5.5 and 11.2; st. spongiosum 2.8 and 2.7; st. muscularis 0.8 and 2.8; st. vascularis 3.0 and 4.6; tonaca serosa 1.4 and 3.9. The results point out that: the number of mast cells increases with age (calves 2.6 vs heifers 6.7; $P < 0.001$). Particularly in heifers, the values of uterine body and horns are not different (4.5 and 4.8); SC and SV show the highest values in both groups.

1995

Carluccio A., Belluzzi S., Mari G., Molinari A., Bernardini D., Matteuzzi A.: Impiego di un farmaco β -bloccante nella prevenzione della ritenzione degli invogli nella bovina. *Use of a β -blocker in the prevention of retained placenta.* Atti Soc. Ital. Buiatria, 27, 215, 1995.

The A.A. used Carazolol, a β -blocker, to prevent placental retention in the cattle. In treated cows the administration of this drug has been done during the expulsion phase. The incidence of placental retention was of 9.55%, 5.96% lower than in the control group. This data seems not to be significant. In the treated cows we verified a decrease of placental retaining of 9.06% as to the control group. These different results are statistically significant.

Mari G.: Metodiche per il congelamento del materiale seminale dello stallone. *Freezing techniques of stallion semen.* Atti delle Giornate di Studio Riproduzione equina inseminazione artificiale, Spineto, 15-17 Settembre, 74, 1995.

The Author explains the various techniques used to freeze the stallion semen, from those used from the beginning to those most used today. The results are presented using the French method (I.N.R.A. 1982). Particular attention is given to the variability of different subjects, and within the same subjects for different ejaculation with in mind the conservation of spermatozoa, and the fact that the technique, in light of results obtained, cannot yet be used on a large scale.

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1988

Lalatta Costerbosa G., Barazzoni A.M., Lucchi M.L., Bortolami R.: *Fiber sizes and histochemical characteristics of the rectus abdominis muscle of the rabbit under conditions of pregnancy and mechanically induced stress.* Anat. Rec., 222, 136, 1988.

Lalatta Costerbosa G., Barazzoni A.M., Lucchi M.L., Bortolami R.: *Histochemical consequences of normal and simulated pregnancies in the rectus abdominis muscle of the female rabbit.* Atti Accad. Sci. Ist. Bologna, serie XIV, Tomo V, 23, 1987-1988.

The fibers of the rectus abdominis (RA) muscle of the female rabbit were compared with those of RA muscle of (1) pregnant females at term of pregnancy (30 days); (2) pregnant females in which the stretch on the abdominal wall natural to pregnancy was artificially prolonged with a 40-day period of intraabdominal appliance; (3) virgin females subjected to intraabdominal appliance for 30,45,60 and 70 days. The stimulation on RA muscle due to either normal pregnancy or implant in virgin females provoked changes in muscle fiber diameters only; with the normal pregnancy plus the subsequent period of mechanical stimulation there was also a significant increase in the percentage of type I fibers and a concomitant decrease of type IIA and IIB fibers.

Mascarello F., Rowleron A., Scapolo P.A., Veggetti A.: *Differentiation of lateral muscle fibres in Dicentrarchus labrax (L.).* "Sarcomeric and non-sarcomeric muscles: basic and applied research prospects for the 90's" ed. Carraro, Unipress, Padova, 1988, 505.

Mascarello F., Rowleron A., Scapolo P.A., Veggetti A.: *Differentiation of lateral muscle fibres in Dicentrarchus labrax (L.).* J. Muscle Res. Cell Motil., 10, 174, 1989.

Several differences were seen between the peptide maps of myosin heavy chains from adult red (AR), adult white (AW) and 9 day larval (L1W) muscle, confirming the histochemical and immunohistochemical observations indicating that these muscles contain different isoforms of myosin. The 28 day larval (L2W) muscle myosin heavy chain was closer to the AW form, but not identical; this is also consistent with other observations: although the L2W and AW forms were indistinguishable immunohistochemically, they do differ in their myosin ATPase activity.

Mascarello F., Veggetti A.: *Tipi di fibre muscolari nella muscolatura intrinseca della lingua. Fibre types composition of the intrinsic muscles of the tongue.* Atti Soc. Ital. Sci. Vet., 42, 385, 1988.

The intrinsic muscles of the tongue of cat, rat, guinea pig, rabbit, sheep and monkey (*Macaca fascicularis*) were studied. In the guinea pig and rabbit type 2A, in the rat type 2B, and in the sheep, cat and monkey type I fibres were predominant. Other fibre types such as the "X type" (rat and guinea pig), 2C type (sheep and cat) and a type intermediate between 2A and 2B (guinea pig) were found in less quantity.

Scapolo P.A., Peirone S.M., Filogamo G., Veggetti A.: *Histochemical, immunohistochemical, and ultrastructural observations on the iris muscles of Gallus gallus.* Anat. Rec., 221, 687, 1988.

The sphinter muscle in proximity to the ciliary margin was composed predominantly of slow fibres. In the intermediate tract, a large group of fast oxidative fibres were evident and the pupillary margin was exclusively composed of slow fibres. The slow fibres were composed of at least three slow types. In the dilator muscle, the oblique system was uniquely composed of fast oxidative fibres. The radial system was predominantly composed of slow fibers with isoforms of myosins different from the slow fibres of the sphinter muscle. Smooth muscle cells were ultrastructural evident at the pupillary margin. The hypothesis of a mesenchymal origin for all irideal striated muscles is discussed.

Scapolo P.A., Veggetti A., Mascarello F., Romanello M.G.: *Developmental transitions of myosin isoforms and organisation of the lateral muscle in the teleost Dicentrarchus labrax (L.).* Anat. Embryol., 178, 287, 1988.

In sea bass the differentiation of lateral muscle fibres occurs at different stages and in different ways in the red, pink and white regions of the myotome. Our results suggest that in both red and white muscle fibres there is a transition in myosin composition from an early larval form (L1R and L1W) to a late larval form (L2R and L2W) and then to the isoforms typical of adult red and white muscle. The first appearance of the adult isoform (AR) in the red muscle occur from 80 days. The pink muscle first appears relatively late (80 days), but then acquires the histo-immunohistochemical profile characteristic of the adult form much more rapidly. In the deep fibres (AW) occur later, from about 20 months.

Veggetti A.: Il Museo di Anatomia Normale Veterinaria. *The Museum of veterinary anatomy.* "Storia illustrata di Bologna", vol. 7, S. Marino 1988, 101.

Veggetti A.: Il Museo di Anatomia Normale Veterinaria dell'Università di Bologna. *The veterinary anatomy museum of Bologna University.* Obiettivi e Documenti Veterinari, 11(9), 33, 1988.

Veggetti A., Claroni G.: Le Musée d'Anatomie Normale Vétérinaire de l'Université de Bologne. *The veterinary anatomy museum of the Bologna University.* Actes du 4° colloque des conservateurs des musées d'histoire des sciences médicales. Coll. Fond. Merieux, Lyon 1990, 165.

The official foundation of the Museum was delayed because of the instability of veterinary teaching in Bologna during the Napoleonic period and the Papal restauration. It was only in 1882 that it was properly organized, and thirty years later it contained more than 2600 preparations of the main domestic species. The collection, created with an educational purpose is mostly made up of "dry" preparations of very refined manufacture and surprising beauty. The Museum also owns a small number of excellent quality models, but made of poorly-durable materials, among which are some particularly interesting painted papiermachés which represent a horse's head and leg muscle, made before 1882.

1989

Casali A.M., Lucchi M.L., Millo R., Militenda Floriani F., Ferreri Santi L., Re G., Cavalli G.: L'organo subfornicale oggi: aspetti morfologici e ruolo funzionale. *The subfornical organ today: morphological aspects and functional involvement.* Arch. Ital. Anat. Embriol., 94, 1, 1989.

The subfornical organ (SFO) neuronal perikarya show four different aspects, but it is not yet clearly defined if such aspects refer to distinct cell types or to different transitional features. Nerve and glial cell processes form a dense plexus through the SFO and the nerve fibers terminate at various levels. Dendritic processes are especially distributed in the subependymal area, as well as in the connective tissue perivascular spaces. These may be narrow or wide and surround fenestrated and non fenestrated capillaries, assuming sometimes a labyrinthine aspect. The ependymal lining of the SFO ventricular surface shows large variations and regional differences concerning the cell height, the number and development of microvilli, the cilia distribution.

Lalatta Costerbosa G., Scapolo P.A., Barazzoni A.M., Lucchi M.L., Bortolami R.: *Different intrafusal fiber composition of spindles in sheep and pig extraocular muscles.* *Experientia*, 45, 563, 1989.

Lalatta Costerbosa G., Scapolo P.A., Barazzoni A.M., Lucchi M.L., Bortolami R.: *Histochemistry of intrafusal fibers in extraocular muscles of the sheep and pig.* *Boll. Soc. Ital. Biol. Sper.*, 64, 1013, 1988.

Bortolami R., Lucchi M.L., Callegari E., Lalatta Costerbosa G., Scapolo P.A., Barazzoni A.M.: Tipologia e innervazione sensitiva delle fibre muscolari dei muscoli estrinseci dell'occhio. *Sensory innervation and fiber types of the extraocular muscles.* *Atti della 57° Ass. Gen. della Società Italiana di Biologia Sperimentale*, 31, Alghero, sett. 1988.

Scapolo P.A., Lalatta Costerbosa G., Barazzoni A.M., Lucchi M.L., Bortolami R.: Different compositione delle fibre intrafusali dei muscoli oculari estrinseci in pecora e suino. *Different composition of intrafusal muscle fibers of extraocular muscles in sheep and pig.* *Atti Soc. Ital. Sci. Vet.*, 42, 115, 1988.

Histochemical profiles of intrafusal fibers have been examined in muscle spindles of extraocular muscles of sheep and pig. Results show that in the sheep the intrafusal content presents, in addition to chain fibers, at least one bag₁ and one bag₂ fiber, whereas in the pig almost all the spindles are one bag fiber spindles.

Lucchi M.L., Lalatta Costerbosa G., Barazzoni A.M., Faccioli G., Petrosino G., Bortolami R.: *The fine structure of the area postrema of the sheep.* *Arch. Ital. Biol.*, 127, 37, 1989.

The ultrastructural features of the area postrema (AP) were investigated in the suckling lamb, weaned lamb and adult sheep. No morphological differences were observed between lambs and sheep. Unciliated ependymal cells, linked by zonulae adherentes-type junctions and gap junctions, cover the AP ventricular surface. Clusters of pyriform neurons, glial cells and axons are present in the parenchyma. The blood vessels are surrounded by wide perivascular spaces (PS); the capillaries are of the fenestrated type. Perivascular glial cells joined together by gap junction form a continuous ensheathment

of the PS. From our observations it appears that the overall cellular morphology of AP of the sheep does not differ substantially from that of monogastric mammals.

Manni E., Draicchio F., Pettorossi V.E., Carobi C., Grassi S., Bortolami R., Lucchi M.L.: *On the nature of the afferent fibers of oculomotor nerve.* Arch. Ital. Biol., 127, 99, 1989.

The oculogyric nerves contain afferent fibers originating from the ophthalmic territory, the somata of which are located in the ipsilateral semilunar ganglion. These primary sensory neurons project to the Subnucleus Gelatinosus (SG) of the Nucleus Caudalis Trigemini (NCT), where they make presynaptic contact with the central endings of the primary trigeminal afferents running in the fifth cranial nerve. After complete section of the trigeminal root, the antidromic volleys elicited in the trunk of the third cranial nerve by stimulating SG of NCT consisted of two waves belonging to the A alfa and C groups. The area of both components of the antidromic volleys decreased both after bradykinin and histamine injection into the corresponding cutaneous region and after thermic stimulation of the ipsilateral trigeminal ophthalmic territory.

Mascarello F., Scapolo P.A., Veggetti A., Rowleron A.: *An immunohistochemical study of the tensor tympani muscle in bovine and pig.* Bas. Appl. Histochem., 33S, 73, 1989.

Using specific antibodies it was possible to show that the adult bovine and pig tensor tympani muscle contains type I and type II fibres. This muscle also contained fibres strongly stained by anti-neonatal antiserum. This results confirm the opinion that the tensor tympani of bovine and pig undergoes precocious degeneration even before reaching the complete differentiation.

Scapolo P.A., Luprano S., Biscotto A., Veggetti A., Mascarello F.: *The adductor mandibulae muscle in Teleost fish with protrusible or non protrusible jaws: a histochemical and immunohistochemical study.* Anat. Anz., 168, 205, 1989.

A study was made of the morphology and fibre type composition of *adductor mandibulae*(AM) muscle in teleost with very protrusible (carp) moderately protrusible (cod) and non-protrusible (trout and cat-fish) jaws. In contrast to the trout and cat-fish, in which the AM is formed by only two component (mandibular and mental), in the carp and cod there is a third portion (maxillary). The anatomical characteristics and different fibre type composition of the various components forming the AM are discussed in relation to the extent of jaw protrusion and the relevant physiological data concerning other movements in which this muscle participates.

Veggetti A.: Bisturi, rosolio e...cioccolata. Un curioso documento d'archivio. *Scapel, rosolio and... chocolate. A strange record office document.* Obiettivi e Documenti Veterinari, 12(8), 41, 1989.

The Author presents a letter got from correspondence kept in the October 1801, under the government of the Cisalpine Republic, between the citizen Casali, chancellor of the Department University of Bologna and the Administration of the Reno river Depart-

ment. The letter regards the course of anatomy that the citizen Carlo Mondini was preparing to do. Joined to the letter there is an enclosure, whose title is "Bill of necessary expenses for lessons and anatomic demonstrations in the Public Schools". This bill includes some requests really unusual if they are related to today's times.

1990

Bortolami R., Lucchi M.L., Callegari E., Barazzoni A.M., Lalatta Costerbosa G., Scapolo P.A.: *Simultaneous cell death in the trigeminal ganglion and in ganglion neurons present in the oculomotor nerve of the bovine fetus.* J. Anat., 169, 103, 1990.

A well-developed ganglion and scattered ganglion cells are present in the intracranial portion of the oculomotor nerve during the first half of fetal life in the ox. In the second half of fetal life a dramatic reduction of the ganglion cells associated with the oculomotor nerve occurs because of spontaneous cell death. Concomitantly, the same phenomenon of cell death is found in the trigeminal ganglion, especially in its rostromedial portion. Free degenerating perikarya can be found in the cavernous sinus.

Lalatta Costerbosa G., Scapolo P.A., Barazzoni A.M., Petrosino G., Clavenzani P., Lucchi M.L., Bortolami R.: *Analysis of the sternotrachealis muscle fibers in some anseriformes: histochemistry and sex differences.* Am. J. Anat. 189, 357, 1990.

Scapolo P.A., Lalatta Costerbosa G., Barazzoni A.M., Lucchi M.L., Bortolami R.: *Alcune caratteristiche istochimiche del muscolo sternotracheale dell'anatra (*Anas platyrhynchos*). Histochemical characteristics of the sternotrachealis muscle of the duck (*Anas platyrhynchos*). Atti Accad. Sci. Ist. Bologna, serie XIV, Tomo V, 115, 1987-88.*

Scapolo P.A., Lalatta Costerbosa G., Barazzoni A.M., Lucchi M.L., Bortolami R.: *Sex differences in the histochemical characteristics of the sternotrachealis muscle of the duck.* Boll. Soc. Ital. Biol. Sper., 64, 831, 1988.

Lalatta Costerbosa G., Scapolo P.A., Petrosino G., Barazzoni A.M.: *Studio istochimico del muscolo sternotracheale in alcuni anseriformi. Histochemical characteristics of the sternotrachealis muscle of some anseriformes.* Atti Soc. Ital. Sci. Vet., 43, 191, 1989.

Histochemical characteristics and sizes of the fibers of the sternotrachealis (ST) muscle have been investigated in some Anseriformes (mallard, Pekin duck, Muscovy duck, and goose) of both sexes. A sexual dimorphism has been shown in the muscle of the species examined. In the mallard and Pekin duck, the male ST muscle shows type IIIA fibers in addition to the type I, IIA, and IIB fibers observed also in the female. In the Muscovy duck, the male muscle has only type I and IIA fibers, whereas the female muscle presents type I fibers and both types IIA and IIB fibers. Moreover, the mean frequencies for each fiber type were significantly different between males and females. In the goose, both male and female muscles present only type I and IIA fibers.

Manni E., Bortolami R., Passatore M.: *Mesencephalic trigeminal nucleus and the masseteric reflex.* Estratto dal vol. Scritti in onore di Ugo Carcassi a cura di F. Pitzus, CEPI, pp. 253, Roma, 1990.

Bortolami R., Lucchi M.L., Marini R., Lalatta Costerbosa G., Scapolo P.A., Barazzoni A.M., Clavenzani P., Adamo E.B.: *Spinal projection of neurons of the mesencephalic trige-*

minal nucleus in the duck. A study using fluorescent tracer technique 13th Annual Meeting of ENA, Stockholm, sept. 1990, Supplement to the European Journal of Neuroscience, 96, 1990.

Bortolami R., Lucchi M.L., Scapolo P.A., Lalatta Costerbosa G., Barazzoni A.M., Clavenzani P.: Sull'origine del fascio di Probst negli Uccelli e nei Mammiferi. *Probst's tract in the birds and mammals*. Atti del Convegno Nazionale della Società Italiana di Anatomia, 44, 169, Bologna, sett. 1990.

By the use of two fluorescent tracers it has been investigated if the neurons of mesencephalic trigeminal nucleus (MTN) projecting to spinal cord (SC) and forming the Probst's tract were also involved in the sensory innervation of the masticatory muscles (MM). After injection of the tracers respectively in the SC (C1-C2) and in the MM of the duck, rabbit and rat in the MTN could be observed: a) large ovoidal unipolar neurons labeled by the tracer injected in MM; b) small fusiform multipolar neurons labeled by the tracer injected in SC. No double-labeled neurons were found. Our data demonstrate that the Probst's tract originates from MTN multipolar neurons, whereas the large unipolar neurons are involved in the proprioceptive information from MM.

Scapolo P.A., Lalatta Costerbosa G., Barazzoni A.M., Lucchi M.L., Bortolami R.: *An immunohistochemical approach to the intrafusal fibers of extraocular muscle spindles in sheep, cow and pig*. Anat. Rec., 227, 314, 1990.

Intrafusal muscle fibers of the extraocular muscles (EOMs) of the sheep, cow, and pig were studied by a combination of standard histochemical methods and immunohistochemical staining with antibodies selective for slow-tonic (antitonic ALD) and slow twitch (anti-I BA-D5) myosin. In sheep and cow spindles, three intrafusal fiber types, namely the bag₁, bag₂, and chain fibers, were identified. Anti-tonic ALD preferentially stained the bag₁ fibers whereas anti-I BA-D5 labeled the bag₂ fibers. Chain fibers did not react with either antisera. In the pig EOM spindles, in general, one bag and some chain intrafusal fibers were identified; the only one bag fiber is antigenically similar to the bag₁ fiber of the other species examined.

Scapolo P.A., Veggetti A.: *The oesophagel musculature in Teleost fish. A anatomical and histochemical study*. Atti Soc. Ital. Sci. Vet., 44, 219, 1990.

The oesophagus in some Teleost reveals species differences in relative amount and organization of striated muscle layer. Species-dependent variations are also seen in fibre type composition. Unusual isoforms of myosin are present and are distinct from the lateral muscle myosin.

Scapolo P.A., Veggetti A., Mascarello F.: Studio istochimico ed immunoistochimico sulla muscolatura mandibolare di alcuni uccelli. *Histochemical and immunohistochemical study on the mandibular muscles of some birds*. Abs. Atti del Convegno Nazionale della Società Italiana di Anatomia, 44, 272, 1990.

Scapolo P.A., Veggetti A., Mascarello F.: *Mandibular muscles of some birds: a histochemical and immunohistochemical study*. Abs. XIX European Conf. Muscle Contraction and Cell Motility, Brussels, 1990 in: J. Muscle Res. Cell Motil., 12, 83, 1991.

Mandibular muscles of male and female chickens and duck, and of male kestrel were examined histochemically for myosin ATPase and SDH activity, and immunohistochemically with polyclonal antibodies specific for various isoforms of myosin. The fibre type composition shows marked species differences related to masticatory habits, but no between males and females.

Veggetti A.: La veterinaria tra empirismo e scienza. Il suo riscatto dalla mascalcia a partire dal secolo XVIII. *The veterinary medicine between empiricism and science. Its deliverance from a farriery starting with XVIII century.* "Scuola Comunale di Veterinaria di Lugo (1824-1853)", Lugo 1990, 10.

After a description of veterinary medicine in ancient times, the Author passes to stress the significance of the School of Veterinary Medicine to raise to the value of science an empirical art.

Veggetti A., Maestrini N.: La Medicina Veterinaria nell'Università di Bologna. *The Veterinary medicine in the Bologna University.* Parte I°: Obiettivi e Documenti Veterinari, 11,(2), 47, 1990. Parte II°: Obiettivi e Documenti Veterinari, 11(3), 32, 1990.

Veggetti A., Maestrini N.: Note storiche sull'insegnamento della Medicina Veterinaria nell'Università di Bologna. *History of Veterinary medicine teaching in the Bologna University.* "La Facoltà di Medicina Veterinaria dell'Università degli Studi di Bologna", Bologna 1994, 7.

The Authors have reconstructed, mainly by means of archives research, the history of Veterinary medicine at the University of Bologna. Starting in 1695, when the Association of Blacksmiths of the City decided to protect and guarantee all those who dedicated themselves to the medicine of animals, the Authors have followed all the steps which led veterinary medicine to be a science taught at a university level.

Veggetti A., Mascarello F., Scapolo P.A., Rowlerson A.: *Hyperplastic and hypertrophic growth of lateral muscle in the Teleost Dicentrarchus labrax (L.). An ultrastructural and morphometric study.* Anat. Embryol., 182, 1, 1990.

During the larval period, growth of the presumptive red and white muscle layers of the lateral muscle in *Dicentrarchus labrax* occurs both by hypertrophy and by production of new fibres in germinal zones specific to the two muscle layers. Morphometric analysis confirms that whereas these hyperplastic processes are important during the larval and juvenile periods, when growth is very rapid, they have ceased by the time the adult stage is attained. By contrast, fibre hypertrophy continues through into adult life.

1991

Bortolami R., Calzà L., Lucchi M.L., Giardino L., Callegari E., Manni E., Pettorossi V.E., Barazzoni A.M., Lalatta Costerbosa G.: *Peripheral territory and neuropeptides of the trigeminal ganglion neurons centrally projecting through the oculomotor nerve demonstrated by fluorescent retrograde double-labeling combined with immunocytochemistry.* Brain Res., 547, 82, 1991.

Bortolami R., Lucchi M.L., Callegari E., Scapolo P.A., Barazzoni A.M., Manni E.: Duplice via d'ingresso nel tronco dell'encefalo delle afferenze dai muscoli oculari estrinseci nell'agnello. *Two anatomical pathways for entry into the brain stem of extraocular muscle afferents in the lamb.* Atti Soc. Ital. Sci. Vet., 42, 117, 1988.

Bortolami R., Lucchi M.L., Scapolo P.A., Callegari E., Lalatta Costerbosa G., Barazzoni A.M., Manni E.: Determinazione del territorio periferico di alcune fibre afferenti trigeminali presenti nell'oculomotore. *Peripheral field of some trigeminal afferent fibers running within the oculomotor nerve.* Boll. Soc. Ital. Biol. Sper., 64, 1067, 1988.

Calzà L., Lucchi M.L., Giardino L., Bortolami R., Callegari E., Manni E.: *Neuropeptides in trigeminal oculomotor afferents and their influence on the central endings of primary trigeminal fibers.* Neuroscience letters, suppl. 33, S 34, 1988.

Bortolami R., Lucchi M.L., Callegari E., Lalatta Costerbosa G., Scapolo P.A., Barazzoni A.M., Manni E.: *Double labeling of trigeminal ganglion neurons after injection of two fluorescent tracers into the oculomotor nerve and extraocular muscles of the sheep.* Atti Accad. Sci. Ist. Bologna, serie XIV, Tomo VI, 1, 1988-89.

Calzà L., Lucchi M.L., Bortolami R., Giardino L., Callegari E., Manni E.: *Immunocytochemical characterization of the population of the trigeminal cells which have their central process in the oculomotor nerve.* Atti Accad. Sci. Ist. Bologna, serie XIV, Tomo VI, 1, 1988-89.

Lucchi M.L., Bortolami R., Calzà L., Giardino L., Callegari E., Manni E.: Neuroni trigeminali che inviano il processo centrale nell'oculomotore: loro territorio periferico e caratteristiche immunocitochimiche. *Peripheral territories and immunocytochemical characterization of the trigeminal cells centrally projecting through the III cranial nerve.* Atti Soc. Ital. Sci. Vet., 43, 187, 1989.

Manni E., Bortolami R., Pettorossi V.E.: *Afferent trigeminal fibres in the oculomotor nerve.* In Neurologia e Scienze di Base, Univ. Catt. S. Cuore, MI, 63, 1989.

Manni E., Bortolami R., Pettorossi V.E.: *Trigeminal afferent fibres in the oculomotor nerve.* Neurologia Psichiatria Scienze Umane, suppl. X, 239, 1990.

The peripheral territories of sheep trigeminal neurons which send their central process to the brainstem through the oculomotor nerve were investigated by the use of fluorescent tracers in double-labeling experiments. For this purpose Diamidino yellow (DY) injection into the oculomotor nerve was combined with Fast blue (FB) injection either into the extraocular muscles (EOMs), or the cornea, or the superior eyelid. Double-labeled DY+FB cells were found in the ophthalmic region of the trigeminal ganglion in addition to single-labeled DY or FB cells. The DY and DY+FB-labeled trigeminal cells were analysed immunocytochemically for their content of substance P (SP)-, calcitonin gene-related peptide (CGRP)-, and cholecystochinin-8 (CCK-8)-like.

Bortolami R., Scapolo P.A., Lucchi M.L., Clavenzani P., Lalatta Costerbosa G., Barazzoni A.M.: Localizzazione dei neuroni del nucleo di Edinger-Westphal che proiettano al midollo spinale e al cervelletto. *Localization of the neurons of Edinger-Westphal nucleus projecting to the spinal cord and cerebellum.* Atti del Convegno Nazionale della Società Italiana di Anatomia, Alghero, 45, 13, 1991.

Lucchi M.L., Bortolami R., Scapolo P.A., Lalatta Costerbosa G., Barazzoni A.M.: Proiezioni spinali e cerebellari del nucleo di Edinger-Westphal in Uccelli e Mammiferi. *Spinal and cerebellar projections of the Edinger-Westphal nucleus in Birds and Mammals.* Atti Soc. Ital. Sci. Vet., 44, 329, 1990.

Lucchi M.L., Scapolo P.A., Clavenzani P., Lalatta Costerbosa G., Barazzoni A.M., Borto-

Iami R.: Nuovi aspetti del nucleo di Edinger-Westphal. *New aspects of Edinger-Westphal nucleus*. Atti Accad. Sci. Ist. Bologna serie XIV, tomo VIII, 119, 1990/91.

The spinal and cerebellar projections of the Edinger-Westphal (W) nucleus were studied in the Duck and some Mammals by the use of the retrograde axonal transport of fluorescent tracers (Diamidino yellow dihydrochloride = DY and Fast Blue = FB) in double labeling experiments. After injection of the tracers respectively into the spinal cord (C3-C4) and cerebellum, either DY or FB labeled cells were found intermingled within the EW nucleus. Since no cells labeled with both DY and FB were present, no evidence was found that individual EW neurons project to both spinal cord and cerebellum.

Castagnaro M., Guarda F., Lucchi M.L., Bortolami R.: *The morphology and location of atrial specific granules and the demonstration of atrial natriuretic factor in porcine, lapine and bovine heart by immunoelectronmicroscopy*. Vet. Res. Commun., 15, 335, 1991.

The atrial specific granules (ASGs) were studied in samples collected from the right and left auricles of cows, pigs, and rabbit. In addition, the presence of atrial natriuretic factor (ANF) was detected by immunocytochemistry. Mature ASGs, characterized by the presence of highly osmiophilic and electron-dense material surrounded by a membrane, were present in all atrial myoendocrine cells and their diameters ranged from 100 to 470 nm in pigs, from 100 to 235 nm in cattle, and from 125 to 275 nm in rabbits. Immunoelectronmicroscopical studies revealed the presence of ANF in the ASGs of pigs and cattle, whereas anti-ANF polyclonal serum failed to detect any significant reaction in lapine ASGs. The ultrastructural features of the ASGs of pigs, cattle and rabbits described may be useful in comparing the morphological picture of several cardiac endocrine pathological conditions.

Scapolo P.A., Rowleron A., Mascarello F., Veggetti A.: *Neonatal myosin in bovine and pig tensor tympani muscle fibres*. J. Anat., 178, 255, 1991.

In this study were examined the tensor tympani from pigs and cattles of various ages immunohistochemically using a panel of antimyosin antibodies, including one (anti-NE) specific for neonatal & embryonic myosins. Fibres positive to anti-NE were found in both species in all ages; only a few of these fibres reacted exclusively with this antibody. Some also contained slow myosin and the majority also contained adult fast (IIA) myosin. The morphological appearance, the widespread presence of NE myosin and the persistence of this composition from birth to adult, could be explained by an incomplete development of the muscle fibres, resulting in a "muscle" much better suited to the role of ligament.

Scapolo P.A., Veggetti A.: *The relationship between size and growth in teleosts muscle. A study in *Lebistes reticulatus* Peters*. Atti Soc. Ital. Sci. Vet., 45, 285, 1991.

In fish which reach fast a large size, the growth occurs both by hypertrophy and by a marked hyperplasia. In contrast, in *Lebistes reticulatus* Peters, a fish which does not exceed 6 cm in length, the post-larval growth of lateral muscle is due to hypertrophy of muscle fibres alone.

Veggetti A.: Differenziamento ed accrescimento del muscolo laterale di Teleostei oggetto di acquacoltura. *The lateral muscle differentiation and growth in Teleosts interesting the aquaculture*. Tavola Rotonda "Le Scienze veterinarie nella produzione e nel controllo igienico-sanitario e di qualità dei prodotti della pesca e dell'acquacoltura". Atti Soc. Ital. Sci. Vet., 45, 67, 1991; Laguna, (5), 38, 1991.

Veggetti A.: Differenziamento ed accrescimento del muscolo laterale di teleostei oggetto di acquacoltura. *Differentiation and growth of the lateral muscle in Teleostei subjected to aquaculture*.

A report of the results got by the research-team, leaded by the Author, about how differentiation and growth of lateral muscle show themselves in many species of Mugilidi, in *Anguilla anguilla* and in *Dicentrarchus labrax*.

Veggetti A., Maestrini N.: L'opera dei Congressi nazionali dei Veterinari in ordine alle proposte di legge sulla sanità pubblica e alla applicazione delle norme della legge 22 dicembre 1888. *The work of Veterinary National Congresses with regard to the bills about public health and to the pursuance of the law 22nd December 1888*. Atti Giornate studi storici della Veterinaria, 125, 1991.

The parliamentary itinerary of the first Italian public health law, passed in 1888, was followed with real interest by the whole veterinary professional class which endeavoured very much to entertain the politicians and the public opinion about the impelling problems of the national veterinary service. The Authors make a report on the several suggestions, generally evaded by the law, put forward by the national congresses of the professional class.

Veggetti A., Maestrini N.: La Veterinaria al dibattito parlamentare sulla legge Crispi-Pagliani del 1888. *The Veterinary at the parliamentary debate over the law Crispi-Pagliani of 1888*. Atti Giornate studi storici della Veterinaria, 141, 1991.

In 1888 there was a long and troubled parliamentary debate which led to the approval of the first Italian public health law. The Authors have taken off and made comments upon the parliamentary speeches about the veterinary service.

1992

Bortolami R., Scapolo P.A., Clavenzani P., Callegari E.: Modalità dell'innervazione sensitiva dei fusi dei muscoli oculari estrinseci del suino. *Modalities of sensory innervation of the extraocular muscle spindles in the pig*. Atti del Convegno Nazionale della Società Italiana di Anatomia, 46, 50, S. Margherita Ligure, 4-7 ottobre 1992.

Our preliminary results show that the primary sensory nerve fiber terminates on just one intrafusal muscle fiber, which is the largest one and, according to our previous histochemical results, the only bag fiber present in this spindles. The secondary sensory nerve fibers innervate all the other intrafusal muscle fibers.

Domeneghini C., Straini-Pannelli R., Veggetti A.: *A carbohydrate histochemical study of teleost oesophageal and gastric mucosa.* Atti Soc. Ital. Sci. Vet., 46, 589, 1992.

We have used some classical histochemical technique for general demonstration of mucoproteins as well as some specific ones for sialomucins and for sugar belonging to complex carbohydrates. The results obtained in two teleosts which live in different habitats (*Ictalurus melas* and *Sparus aurata*) are noteworthy; they evidence some inter- and intraspecific differences as to the presence and localization of carbohydrates in the oesophagus and gastric mucosa.

Lalatta Costerbosa G., Barazzoni A.M., Clavenzani P., Petrosino G., Callegari E., Bortolami R.: *High incidence of multiple-bag fiber muscle spindles in the articularis humeris muscle of the horse.* Anat. Rec., 232, 378, 1992.

Lalatta Costerbosa G., Barazzoni A.M., Clavenzani P., Petrosino G., Callegari E.: *Histochemical study of muscle spindles of articularis humeri muscle in the horse.* Atti Soc. Ital. Sci. Vet., 44, 279, 1990.

Lalatta Costerbosa G., Barazzoni A.M., Clavenzani P., Callegari E.: *Histochemical profile of articularis humeri muscle in the horse.* Boll. Soc. Ital. Biol. Sper., 66, 767, 1990.

The articularis humeri muscle of the horse is richly endowed with neuromuscular spindles. The spindles, which are generally located in the thick connective septa, can be observed either uniformly distributed or clustered in groups of 4 or 5. The intrafusal fibers, identified histochemically by their myosin ATPase activity, are bag₁, bag₂, and chain fibers. Most of the spindles shows 3 or more bag fibers, and bag₁ are more numerous than bag₂ fibers. Some spindles appear to be tandem spindles.

Lalatta Costerbosa G., Barazzoni A.M., Clavenzani P., Scapolo P.A., Petrosino G.: *Sternotrachealis muscle of the duck as a model of hormone-dependent muscle.* Atti Soc. Ital. Sci. Vet., 46, 447, 1992.

Lalatta Costerbosa G., Barazzoni A.M., Lucchi M.L., Petrosino G.: *Influenza del trattamento ormonale su un muscolo con manifesto dimorfismo sessuale. Hormonal influence on a sexually dimorphic muscle.* Atti del Convegno Nazionale della Società Italiana di Anatomia, 46, 152, S. Margherita Ligure, 4-7 ottobre 1992.

The sternotrachealis muscle shows a clear sexual dimorphism in the Anseriformes. In order to verify if such dimorphism could be related to the sex hormones, young female of white Pekin ducks have been treated with testosterone for one month. In all the treated females the sternotrachealis muscle presented histochemical characteristics similar to those of the same muscle in the adult male.

Mascarello F., Rowleron A., Veggetti A.: *Sviluppo larvale e post-larvale del muscolo laterale di Sparus aurata (L.) (Pisces, Teleostei). Larval and post-larval development of the Sparus aurata lateral muscle.* Atti del Convegno Nazionale della Società Italiana di Anatomia, 46, 168, 1992.

Veggetti A.: *Veterinaria al femminile. "Possono le signore laurearsi in Medicina Veterinaria?". Veterinary in the feminine. "Can ladies take a degree in Veterinary Medicine?"* Obiettivi e Documenti Veterinari, 13(1), 53, 1992.

Veggetti A.: Veterinaria al femminile. Chi erano le prime laureate. *Veterinary in the feminine. Who were the first female graduate.* Obiettivi e Documenti Veterinari, 13(7/8), 66, 1992.

The first article deals with the long fight that the English woman Aleen Cust, one of the first female graduates in Veterinary Medicine of the United Kingdom, had to put up since 1894 to vindicate her right to practise the profession. The second article deals with the first women who took the degree. They met with a hard way to join the professional world and had much more difficulties than the first female graduates in human medicine. The leadership belongs Stefania Kraszewska, from Eastern Europe, who took the degree at the Veterinary School of Zurigo in 1889.

Veggetti A., Falaschini A.: "Anatomia, Fisiologia, Zoognostica", *Anatomy, Physiology, Zoognostics.* Edagricole, Bologna 1992.

Text book of 338 pages, richly illustrated, for the students of the Technical School for Agriculture.

Veggetti A., Scapolo P.A., Mascarello F.: *Preliminary observations on the motor innervation of the skeletal muscle in teleosts.* Atti Soc. Ital. Sci. Vet., 46, 581, 1992.

Histochemical and ultrastructural studies on the skeletal musculature in nine species of teleosts have shown that fast and slow muscle fibres usually are multiply innervated. On the other hand the fast muscle fibres of the eel and cat-fish have a single endplate laying at their myoseptal ends in the white lateral muscle or in the muscle fibre middle region in the pink lateral muscle and in non-myomeric musculature. Both types of neuromuscular junction do not have synaptic clefts and the endplate region contains dense-cored vesicles in addition to clear vesicles.

1993

Bortolami R., D'Alessandro R., Manni E.: *The origin of pain in "ischemic-diabetic" third-nerve palsy.* Arch. Neurol., 50, 795, 1993.

The ischemic-diabetic acute third-nerve palsy is described to be accompanied by severe pain around the eye and forehead. Since with previous researches we have shown that the oculomotor nerve contains a number of trigeminal sensory fibers involved in the transport of pain signals arising from the superior eyelid and conjunctiva, it is reasonable to hypothesize that ischemic damage of trigeminal fibers contained in the oculomotor nerve is the origin of pain in ischemic-diabetic third-nerve palsy.

Bortolami R., Lucchi M.L., Callegari E., Lalatta Costerbosa G., Barazzoni A.M., Clavenzani P., Petrosino G.: *Localization of motoneurons innervating the extraocular muscles of the sheep by retrograde fluorescent tracers.* Arch. Ital. Biol., 131, 117, 1993.

Lalatta Costerbosa G., Petrosino G.: Localizzazione dei motoneuroni che innervano i muscoli oculari estrinseci dell'agnello. *Distribution of motoneurons innervating extraocular muscles in the lamb.* Atti Soc. Ital. Sci. Vet., 42, 147, 1988.

Retrograde transport of the fluorescent tracers Fast Blue, Evans blue, Diamidino yellow dihydrochloride, and Propidium iodide was used to determine the location of the motoneurons innervating the extraocular muscles of the sheep. An extensive superposition among the motor pools of the oculomotor nucleus (ON) has been observed. In the rostral third of the ON, a considerable merging occurs between obliquus ventralis and rectus medialis motoneurons and also between rectus ventralis and rectus medialis motoneurons. In the middle third of the ON, rectus dorsalis and levator palpebrae superioris motoneurons are intermingled with each other, and also with obliquus ventralis motoneurons dorsally and with rectus medialis motoneurons ventrally. The rostral portion of the trochlear nucleus overlaps with the caudal pole of the ON. The motoneurons innervating the obliquus dorsalis muscle are mainly contralateral with few ipsilateral exceptions.

Cozzi B., Veggetti A.: *Claude Bourgelat and the promotion of Veterinary studies in the Republic of Venice.* Abs. 26th International Congress History of Veterinary Medicine, Utrecht, 26, 1993.

A *Collegium Zoojatricum Patavinum* based on the example of the French veterinary schools was established by decree of the Doge of Venice on September 9th, 1773. This was due to the intense efforts of the Agricultural Academies of the Republic of Venice. In this context, we can well include the correspondence between the physician Jacopo Odoardi and Claude Bourgelat. Among several letters, we choose to present the one written from Paris on April 27th, 1772. In these Bourgelat replied, among other things, that study is not sufficient for the education of a skillful veterinarian, but that practice under the guidance of a teacher is also required.

Domeneghini C., Straini Pannelli R., Veggetti A.: *Gut carbohydrates of the Sparus aurata (Pisces, Teleostei) at different ages.* Proceedings of the 25th National Congress of the Italian Society of Histochemistry in: European Journal of Histochemistry, 37S, 1993, 27.

The gut of adult *Sparus aurata*, aged one-three years, as well as various larval stages characterized by different diets were examined in its various tracts, from pharynx to rectum. In adult animals mucous cells of pharynx and oesophagus mucosal layer produce neutral, sulphated and non-sulphated glycoconjugates, whereas sulphated glycoconjugates lack in gastric mucosa. Mucous cells of various intestinal tracts seem to produce acidic glycoconjugates only. In larval stages the most important difference as to adult is the lacking of non-sulphated glycoconjugates in gastric mucosa.

Domeneghini C., Straini Pannelli R., Veggetti A.: *Gut glycoconjugates in Anguilla anguilla: a study on their histochemical properties including lectin affinity.* Atti Soc. Ital. Sci. Vet., 47, 175, 1993.

The gut of *Anguilla anguilla* secrete acid and neutral glycoconjugates; these two secretory components are variously mixed in different tracts. The acid glycoconjugates comprehend sialo- mucins: they contain above all sialic acid which is 0-acylated in C7, less frequently in C8. Sulpho-mucins are only present in glycoconjugates secreted by pharynx-oesophagus and by distal gut. By the use of biotinylated lectins the Authors have demonstrated the presence of various glucidic residues in the gut complex carbohydrates.

Lalatta Costerbosa G., Barazzoni A.M., Scapolo P.A., Clavenzani P., Petrosino G.: *Aspects of the postnatal development in the sternotrachealis muscle of the duck.* Atti Soc. Ital. Sci. Vet., 47, 141, 1993.

Lalatta Costerbosa G., Barazzoni A.M., Scapolo P.A., Clavenzani P., Petrosino G., Berardinelli P., Chiochetti R.: Indagine istochimica sul muscolo sternotracheale dell'anatra durante lo sviluppo postnatale e in seguito a trattamento ormonale. *Histochemical investigation on the sternotrachealis muscle of the duck during postnatal development and after hormone administration.* Atti Accad. Sci. Ist. Bologna serie XIV, Tomo XI, 111, 1993-1994.

The aim of the investigation was to verify the time of appearance of the sexual dimorphism in the sternotrachealis muscle of the Pekin duck during the postnatal period. To this purpose the muscle was studied by the techniques for the histochemical demonstration of myosin ATPase activity and NADH-tetrazolium reductase in ducks of different ages starting from postnatal day 1. It results that the sexual dimorphism concerning both the percent distribution and the areas of the muscle fibers becomes noticeable at 90 days.

Veggetti A.: Note di storia della Medicina veterinaria. *History notes of veterinary medicine.* Notiziario Ordine Medici Veterinari della Provincia di Bergamo, numero unico, ottobre 1993, 161.

The interest in history of veterinary medicine, leaving the classical Authors out of consideration, revives in Italy with Antonio Zanon who, with promoting purposes, in 1770 sends to press in Venice the "Essay on the history of the Veterinary Medicine", universally acknowledged as the first Italian work about this matter in the modern age. The same objects were pursued by Giovan Battista Ercolani, the most important among the specialists of this science history, an effectual way to ransom finally the Veterinary from the plague of empiricism.

Veggetti A., Mascarello F., Rowlerson A., Candia-Carnevali D.: *Muscle growth and myosin isoform transitions during post natal development of Poecilia reticulata.* Abst. XXI European Muscle Congress on Muscle Contraction and Cell Motility, Bielefeld, 1992 in: J. Muscle Res. Cell Motil., 14, 253, 1993.

Veggetti A., Mascarello F., Rowlerson A., Candia-Carnevali D.: *Muscle growth and myosin isoform transitions during post natal development of Poecilia reticulata.* Abst. XXI European Muscle Congress on Muscle Contraction and Cell Motility, Bielefeld, 1992 in: J. Muscle Res. Cell Motil., 14, 253, 1993.

At birth the lateral muscle consists of two layers containing developmental isoforms of myosin. In deep layers fibres the developmental myosin is replaced by the adult fast-white form soon after birth. In the superficial monolayer fibre the myosin present at birth (J1) is replaced within 3 days by another (J2). In some fibres J2 is retained in the adult, but in others it is slowly replaced by the adult slow-red muscle isoform. The pink muscle develops during the first month and consists of an outer, middle and inner layer. A morphometric analysis showed that growth of the white muscle occurs principally by hypertrophy. No satellite cells or myoblasts were found in the white muscle, except in the far epaxial and hypaxial regions and only in the first 10 days.

1994

Bortolami R.: Duplice modalità di entrata di afferenze primarie trigeminali e spinali. *Two modalities of entry of trigeminal and spinal primary afferences.* Atti Accademia Peloritana dei Pericolanti Vol. LXXXI. Anno Acc. CCLXVI, Messina, 19, 1994.

We have demonstrated that trigeminal primary afferents can enter the brainstem through the oculomotor nerve and synapse, at the level of substantia gelatinosa layer of the nucleus caudalis trigemini, on other trigeminal primary afferents entering the pons as root fibers of the trigeminal nerve. Analogously, the primary afferent fibers that reach the substantia gelatinosa of the spinal cord entering from the ventral roots have the same synaptic organization of the trigeminal primary fibers that enter the brainstem through the oculomotor nerve.

Clavenzani P., Scapolo P.A., Callegari E., Barazzoni A.M., Petrosino G., Lucchi M.L., Bortolami R.: *Motoneuron organization of the muscles of the spinal accessory complex of the sheep investigated with the fluorescent retrograde tracer technique.* J. Anat., 184, 381, 1994.

Clavenzani P., Scapolo P.A., Callegari E.: Osservazioni sperimentali sul nervo accessorio della pecora. *Experimental observations on the accessory nerve of the sheep.* Atti Accad. Sci. Ist. Bologna, serie XIV, tomo VIII, 121, 1990/91.

Clavenzani P., Scapolo P.A., Petrosino G., Lucchi M.L., Callegari E.: Sulla partecipazione di nervi spinali cervicali alla innervazione del territorio muscolare del ramo esterno del nervo accessorio. *Cervical spinal nerves take part in the innervation of the muscle territory supplied by the accessory nerve.* Atti del Convegno Nazionale della Società Italiana di Anatomia, Alghero, 45, 15, 1991.

Retrograde transport of the fluorescent tracers Diamidino Yellow dihydrochloride and Fast Blue was used to determine the location of the spinal nucleus of the accessory nerve in the sheep. We also considered whether in this species the sternocephalic, brachiocephalic, omotraversarius and trapezius muscles, i.e. the muscles of the spinal accessory complex, are supplied by more than one population of motoneurons. The spinal accessory nucleus extends as a single column of neurons from C1 to C7 spinal cord segments and occupies a lateral position within the ventral horn. The most rostral portion of this column is located dorsolaterally, whereas the remaining portion from C2 to C7 occupies a ventrolateral position. At C1 and C4 levels the nucleus also possesses some cells with a medial location. All the muscles of the spinal accessory complex receive their motor innervation both from the spinal accessory nucleus and from motoneurons forming the cervical spinal nerves. A double motor innervation of these muscles is thus present in the sheep.

Mascarello F., Rowlerson A., Veggetti A.: *Hyperplasia of lateral muscle during normal growth of the sea-bream, Sparus aurata.* Abs. XXII European Muscle Congress, Gwat 1993, in: J. Muscle Res. Cell Motil., 15, 189, 1994.

In the lateral muscle of sea-bream, only a superficial monolayer (SM) and fast-white fibres (FW) were present at hatching. The numbers of FW increased from hatching to 60 days and during this period the principal site of new fibre formation in the far epaxial portions. Hyperplasia in this zone ceased between 45-60 days. A minor hyperplastic zone

for FW lay just deep to the SM layer. Hyperplastic process also contributed to the increase in numbers of slow-red fibres (first detected at six days) and pink fibres (present from about 45 days).

Pettorossi V.E., Bortolami R., Della Torre G., Brunetti O.: *Effect of capsaicin in the motor nerve.* *Exper. Neurol.*, 128, 284, 1994.

The injection of capsaicin into the lateral gastrocnemius (LG) muscle of the rat induced an immediate and sustained reduction in the Delta and C components of the compound action potential (CAP) of the LG motor nerve. Conversely, the drug did not immediately affect the CAP wave belonging to fast-conducting fibers or the motor responses to LG nerve stimulation. It seems that capsaicin only affects the group III and IV afferents of LG nerve. However, a week after the injection the capsaicin also altered the motor responses, as shown by the threshold enhancement and amplitude reduction of the muscle twitch and by the decrease of the A alfa-beta CAP components. This late motor impairment was attributed to a central depression following a reduction of capsaicin-sensitive neuron input into the CNS. However, this motor effect was transient since the LG nerve regained the preinjection excitability level in a week and the muscle twitch amplitude reached the control value in a month.

Veggetti A.: I Musei della Facoltà. *The Faculty museums.* "La Facoltà di Medicina Veterinaria dell'Università degli Studi di Bologna", Bologna, 67, 1994.

A presentation of the museum patrimony kept at the Faculty of Veterinary Medicine of Bologna. This patrimony includes, besides the two famous museums of Normal Anatomy and Pathologic Anatomy, also two interesting collections of surgical and obstetrical instruments of the 18th century.

Zoccoli G., Lalatta Costerbosa G., Bach V., Andreoli E., Cianci T., Lenzi P., Franzini C.: *Muscle blood flow during the sleep-wake cycle in rat.* *Journal of Sleep Research*, 3, suppl. 1, 283, 1994.

Zoccoli G., Lalatta Costerbosa G., Bach V., Andreoli E., Cianci T., Lenzi P., Franzini C.: *Muscle blood flow during sleep in rat.* *Pfluegers Arch. Eur. J. Physiol.*, 6-8 aprile 1993.

Muscle circulation during the sleep-wake cycle (Wakefulness, W; Synchronized sleep, SS; Desynchronized sleep, DS) was studied in male rats. With radioactive microspheres blood flow (BF) was measured in 19 muscles of histochemically identified fibre composition (Slow-twitch oxidative, SO; Fast-twitch oxidative-glycolytic, FOG; Fast-twitch glycolytic, FG). Multiple linear regression analysis showed a statistically significant relationship between BF values and the three fibre types. This relationship did not significantly differ between W and SS. In DS muscle BF showed a statistically significant decrease significant for SO fibres only. The results indicate that muscle BF changes paralleling muscle atonia in DS primarily involve the fibre type population responsible for the maintenance of posture.

1995

Andreoli E., Zoccoli G., Lucchi M.L., Cianci T., Lenzi P., Franzini C.: *Absence of brain capillary reserve in the awake spontaneously hypertensive rat (SHR).* Abst. The Meeting of European Neuroscience, Amsterdam, 1995. Eur. J. Neurosci., Suppl. 8, 72, 1995.

The present study aims to assess the existence of a brain capillary reserve in spontaneously hypertensive rat (SHR). Brain capillary perfusion was evaluated with a fluorescent marker injected into the femoral vein over 40s during a quiet, unstressed waking condition assessed by polygraphic recordings (EEG; EMG; blood pressure and heart rate); arterial gas pressures were also monitored. Sections of cortex, diencephalon, pons, medulla, cerebellum cut on a cryostat were photographed twice, under fluorescent light and after staining for alkaline phosphatase (identifying the anatomical capillary bed); the two series of pictures were then compared with an image analyser. The high relatively uniform percentages of perfused capillary in the different brain regions indicate that in basal conditions during wakefulness the quota of unperfused brain capillaries (capillary reserve) is functionally negligible in the SHR.

Barazzoni A.M., Clavenzani P., Petrosino G., Brunetti O., Bortolami R.: Osservazioni preliminari sull'effetto della capsaicina sulla composizione istochimica del capo laterale del muscolo gastrocnemio del ratto adulto. *Preliminary observations on the capsaicin effect on the histochemical characteristics of the lateral gastrocnemius muscle of the adult rat.* Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

Brunetti O., Della Torre G., Pettorossi V.E., Bortolami R., Barazzoni A. M.: Ruolo esercitato dalle afferenze muscolari di III e IV gruppo sul trofismo muscolare. *III and IV group muscle afferences play a role on muscle trophic regulation.* Atti del 4° Congresso Nazionale di Riabilitazione Neurologica, Pisa, 49, 1995.

The fiber type composition of the lateral gastrocnemius muscle of the adult rat has been investigated after injection of capsaicin into the muscle itself. Utilizing the techniques for the histochemical demonstration of myosin ATPase activity and NADH-tetrazolium reductase, it has been evidenced that the treated muscle presented an increase in the number of type I fibers if compared to untreated control muscles.

Berardinelli P., Zurzolo M., Clavenzani P., Martelli A., Scapolo P.A.: *The effects of pregnancy on fibre types of the rectus abdominis muscle of the sheep.* Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

Scapolo P.A., Zurzolo M., Berardinelli P., Clavenzani P., Martelli A.: *Histochemical characteristics and fibre sizes in the rectus abdominis muscle of sheep correlated with pregnancy.* Atti del Congresso Nazionale della Società Italiana di Anatomia, Bari, Ital. I. Anat. Embryol. S100, 55, 1995.

The present study was undertaken to investigate the effects of pregnancy simulation on muscle fibre types of rectus abdominis muscle of the sheep. Samples of rectus abdominis muscle were taken from sheep through the course of pregnancy and from nonpregnant control females. Muscle fibre types were identified by myosin-ATPase staining, after pretreatment in alkali or acid buffers. The percentage and the equivalent diameter of

each fibre types were determined. Changes were noted through the course of the experiment.

Della Torre G., Lucchi M.L., Brunetti O., Pettorossi V.E. Clavenzani P., Bortolami R.: *Spinal projection of capsaicin sensitive afferent fibers from extraocular muscles of the rat.* Atti del Congresso Nazionale della Società Italiana di Anatomia, Bari, Ital. J. Ana. Embriol., S100, 18, 1995.

Lucchi M.L., Della Torre G., Pettorossi V.E., Bortolami R.: *Capsaicin-sensitive afferents from the extraocular muscles of the rat.* Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

After injection of capsaicin in the extraocular muscles (EOM), degenerating unmyelinated axons and terminals were found in the subnucleus caudalis trigemini (SCT). Most degenerating terminals were the central bouton of the synaptic glomeruli which characterize the rat SCT; furthermore some degenerating peripheral terminals (V2), presynaptic to normal C were present. Since in our previous research, C were degenerated after trigeminal rhizotomy, while V2 showed dense degeneration only after cutting the oculomotor nerve (ON), we conclude that capsaicin-sensitive trigeminal afferents from EOM enter the central nervous system, not only by trigeminal root, but also via ON. These latter make axo-axonic synapses on other trigeminal afferents to exert an afferent control of sensory input.

Mascarello F., Domeneghini C., Radaelli G., Arrighi S., Veggetti A.: *Presence of neuromodulatory substances in the cholinergic nervous fibers of skeletal muscle of teleosts: histochemical and immunohistochemical study.* Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

Presence of chemical messengers other than acetylcholine has been investigated in the skeletal muscle of *Sparus aurata* and *Anguilla anguilla*. These substances are known to exert a neuromodulatory action in the cholinergic nervous fibers of mammals. Cryostat sections of epiaxial, ipoaxial and *adductor mandibulae* muscles have been treated to evidence the AChE and NO synthase enzymes. Other sections were used for immunohistochemistry employing rhodaminated antibodies against excitatory or inhibitory peptides, such as CGRP, Substance P, VIP. Results show noteworthy differences in the two examined species and were compared to other vertebrates, in particular mammals.

Mascarello F., Rowlerson A., Radaelli G., Scapolo P.A., Veggetti A.: *Differentiation and growth of muscle in the fish Sparus aurata (L.): I. Myosin expression and organisation of fibre types in lateral muscle from hatching to adult.* J. Muscle Res. Cell Motil., 6, 213, 1995.

Post-hatching development of lateral muscle of *Sparus aurata* was examined histochemically (mATPase), immunohistochemically using myosin isoform-specific antibodies, and ultrastructurally. The order of appearance of fibre types (red, white and pink) and their myosin composition are discussed and compared to muscle fibre type development in higher vertebrates.

Radaelli, G., Rowlerson A., Mascarello F., Veggetti A.: *Identification of miogenic zones in Sparus aurata by incorporation of 5-bromo-deoxyuridine (BrdU).* Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

Myogenic zones of lateral muscle in sea-bream were examined from hatching to juvenile stages by *in vivo* incorporation of BrdU into DNA. BrdU was administered to larvae and fry for 1 up to 8 nights by adding it to the sea water. BrdU concentration ranged from 1mg/ml to 0.05mg/ml. Some myoblasts were BrdU labelled, as shown by immunohistochemical and immunogold staining. Most of the labelled nuclei were found in myogenic zones which corresponded to those previously identified ultrastructurally and morphometrically. This BrdU labelling method will be used to obtain a quantitative estimate of hyperplastic growth.

Rowlerson A., Mascarello F., Radaelli G., Veggetti A.: *Differentiation and growth of muscle in the fish Sparus aurata (L.): II. Hyperplastic and hypertrophic growth of lateral muscle from hatching to adult.* J. Muscle Res. Res. Cell Motil., 16, 223, 1995.

Growth of the lateral muscle (larvae aged 0-46 days; fry aged 60-150 days; juvenile with 2.57-218 g body weight; adult male and female with 0.6 and 2.8 Kg body weight) was studied morphometrically to identify and quantify muscle fibre hyperplasia and hypertrophy, and *in vivo* nuclear labelling with 5-bromo-deoxyuridine to identify areas of myoblast proliferation. Muscle fibre types were identified principally by myosin ATPase histochemistry and immunostaining, and labelled nuclei were identified at EM by immunostaining with a specific monoclonal antibody. Mechanisms giving rise to these different growth processes in fish muscle are discussed, and compared with muscle development in higher vertebrates.

Veggetti A.: L'insegnamento della medicina veterinaria in Italia dalla fondazione delle Scuole allo stato unitario. *The veterinary medicine teaching in Italy from the Schools foundation to the unitarium State.* Atti Convegno di Storia della Medicina Veterinaria, Correggio 1995, 23.

The development of the veterinary medicine teaching in Italy before the Unity of the county, leaving from the school regulations in force during the 18th century in the *Collegium Zootaticum* of Padova and in the University of Bologna.

Veggetti A.: Le grandi idee che negli ultimi centocinquanta'anni hanno informato l'anatomia veterinaria e le prospettive. *The great ideas that, in the last one hundred and fifty years, have pervaded the veterinary anatomy and the prospects for this science.* Obiettivi e Documenti Veterinari, 16(9), 13, 1995.

The main importance of the anatomy in the professional development of veterinary doctors has been always acknowledged in the Veterinary Schools since the time of their foundation, in the 18th century. The subject of this teaching, which at the beginning was got just from macroscopic observations, became more and more different in the 19th century as the microscope took place. In 1891, as by Boselli's law enacted, histology was kept apart from anatomy. Actually the programme of studies gives more importance to

the comparative method by introducing some teachings addressed to the morphology of animal species not considered, in the past, as subjects of veterinary interest.

Veggetti A., Rowlerson A.: La muscolatura scheletrica dei pesci teleostei. *The skeletal muscle of Teleostei*. "Argomenti di Idrobiologia e Acquacoltura" (a cura di Carpenè E., Isani G., Serra R.). Bologna 1995, 87.

Veggetti A., Rowlerson A.: Differenziamento ed accrescimento del muscolo laterale. *Differentiation and growth of the lateral muscle*. Ibidem, 103.

The first chapter explains the structural organisation of the lateral muscle, the morpho-functional and ultrastructural characters of the fibres of its three components red, pink and white and their histoimmune histochemical peculiarity. The second chapter explains the differentiation of the various larval isoforms of myosin in the adult isoform and the hyperplastic and hypertrophic modalities in the larval and post-larval growth of the skeletal muscle.

Zoccoli G., Lucchi M.L., Andreoli E., Cianci T., Bach V., Lenzi P., Franzini C.: *Effect of sleep on brain blood flow and capillary circulation*. Abst. 13th Congress European Sleep Research Society. Sleep Research 24 A, 100, 1995.

Zoccoli G., Lucchi M.L., Andreoli E., Bach V., Cianci T., Lenzi P., Franzini C.: *Brain capillary perfusion during sleep in rat*. Abst. 46° Congr. Naz. Soc. Ital. Fisiol., Ischia, 1994. Pfluegers Arch. Eur. J. Physiol., 430(5), 50, 1995.

Zoccoli G., Lucchi M.L., Bach V., Cianci T., Lenzi P., Franzini C.: *Brain capillary perfusion in the barbiturate-anaesthetized rat*. Abst. 46th Annual General Congress of Soc. Ital. Fisiol. (Pavia). Pfluegers Arch. Eur. J. Physiol., 424, 67, 1993.

Lenzi P., Lucchi M.L., Zoccoli G., Bach V., Cianci T., Franzini C.: *Brain capillary perfusion during sleep in rat*. Abst. 12th Congress European Sleep Research Society: Journal of Sleep Research, 3, suppl. 1, 283, 1994.

Zoccoli G., Lucchi M.L., Andreoli E., Bach V., Cianci T., Lenzi P., Franzini C.: *Level of vigilance and brain capillary perfusion in rat*. Abst. 17th Annual Meeting of European Neuroscience Association, Vienna 1994.

The studies aimed to assess in the rat whether changes in brain capillary perfusion occur at different vigilance levels (anaesthesia, AN; quite wakefulness, QW; quite sleep, QS; active sleep, AS) characterised by different values of Cerebral Blood Flow (CBF). Brain capillary perfusion was evaluated with a fluorescent marker injected over 40s into the femoral vein of the rats during the above mentioned behavioural conditions. In order to identify the anatomical and perfused capillary network, cryostat sections of medulla, cerebellum, pons, thalamus, and cortex were photographed twice, under fluorescent light and after staining for alkaline phosphatase. The two series of pictures were then compared with an image analyzer. A high relatively uniform perfusion percentage in all the behavioural conditions in the different brain regions indicates that the marked changes in CBF are not paralleled by corresponding changes in capillary perfusion.

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1988

Bacci M.L., Galeati G., Mattioli M.: Aspetti della cellulo-dipendenza dell'oozita di maiale durante la maturazione. *Aspects of cell-dependent maturation in pig oocyte*. Atti Soc. Ital. Sci. Vet., 42, 191, 1988.

There is evidence that the oocyte can mature only if coupled with follicle somatic cells. In order to investigate the reasons for this dependence the following experiments were carried out: a) pig oocytes were denuded of cumulus mass at different stages of the maturation, b) zona free oocytes were matured on monolayer of granulosa cells or of kidney fibroblasts. Intercellular coupling was measured by using radioactive tracers. The ability of oocytes to decondense penetrated sperm and form male pronuclei was taken as index of maturation. Follicle somatic cells turned out essential during most of the maturation. They represent a preferential way of access to the ooplasm for several metabolites. This effect however is not tissue specific since also kidney fibroblasts can support oocyte maturation.

Cairolì F., Calcini E., Tamanini C.: Attività ovarica in bovine limousine dopo stimolazioni ormonali diverse durante il post-partum. *Endocrine profiles in post-partum beef cows subjected to different hormonal stimulations*. 1° Meeting Nazionale su: "Studio dell'efficienza riproduttiva degli animali di interesse zootecnico", Bergamo, 49, 1988.

Fifteen post-partum beef cows were treated with progesterone-release intravaginal devices (PRID) for 11 days; the animals were then divided into three groups. The first group was given 500 I.U. PMSG 48h before PRID removal; the second group was given 1000 I.U. PMSG 48h before PRID removal and 500 I.U. PMSG + 1500 I.U. HCG at PRID removal while the last group was administered with 500 I.U. PMSG, 225 I.U. LH + 225 I.U. FSH and 225 I.U. LH + 225 I.U. FSH 48, 24 and 12h before PRID removal, respectively, with 1000 I.U. HCG + 500 I.U. PMSG at PRID removal and with 1500 I.U. HCG 18h and 16 days after PRID removal. All the animals were bled prior to, at and after PRID removal; P4, 17 β -E2 and LH concentrations were determined by RIA. The hormonal profiles showed that the treatment was ineffective to induce a luteal activity in first group cows; the animals of the second group exhibited, on the contrary, a certain follicular responsiveness which was followed by a short luteal phase. Cows of the last group showed hormonal profiles typical of an ovulation followed by a normal luteal phase.

Chiesa F.: Biotecnologie riproduttive nella specie bovina. *Reproductive biotechnologies in cattle*. Atti della Conferenza Internazionale Sanità e Produzione bovina nel Mediterraneo, 429, 1988.

Recent technologies involving gamete and embryo manipulations may prove able to in-

crease the reproductive efficiency of cattle. Developing technologies able to sex the sperm as well as to assess fertilizing capacity of bull semen will markedly improve the efficiency of artificial insemination. The embryo-transfer procedures will also benefit from availability of homologous DNA recombinant derived gonadotrophins, sexing of the embryos, in vitro culture of embryos and embryo-manipulations (cellular and nuclear transplantation, embryo-derived stem cells). The possibility of producing transgenic cattle will be greatly enhanced as soon as maturation and fertilization in vitro of bovine oocytes will provide high quantities of exactly timed embryos. Further researches are required for the understanding of the mechanism controlling oogenesis and embryogenesis which is a prerequisite for the optimization of these techniques.

Chiesa F.: Il controllo endocrino della galattopoiesi nella bovina. Significato fisiologico della somatotropina. *Endocrine control of milk secretion in cow. Physiological significance of somatotropin*. Obiettivi e Documenti Veterinari, 12, 27, 1988.

The udder metabolic priority during lactation is mainly controlled by GH. GH in fact supports lipolytic and gluconeogenic processes, reduces sensitivity of tissues to insulin, increases metabolites availability for milk synthesis, increases mammary gland blood flow and finally facilitates biosynthetic process in the udder by means of somatomedins. The administration of bovine GH induces an increase in milk production without modifying its composition.

Chiesa F.: L'ormone somatotropo: incrementi sulle performances del suino. *Influence of GH on the growth performance of the pig*. Sel. Vet., 29, 687, 1988.

The Author discusses the influence of chronic administration of GH on the growth performances of the pigs. Parenteral chronic administration of GH causes: 1) increased food conversion; 2) increased lean fat ratio; 3) increased levels of glucose, NEFA and triglycerids. These effects are probably dependent on the preferential partition of available energy towards the muscular tissue caused by GH.

Gaiani R.: Variazioni plasmatiche di alcuni steroidi sessuali durante il primo anno di vita nella capra maschio. *Plasma variations of some androgens during the first year of life in male goat*. Atti Soc. Ital. Sci. Vet., 42, 297, 1988.

The research consisted of two trials. In the first, plasma variations of some androgens (testosterone: T and androstenedione: A) and precursors (dehydroepiandrosterone: DHA and sulphoconjugate form: DHAS) were studied in relation to the attainment of puberty in male kids. Wide hormonal variations, especially for T and DHAS, were observed during the first breeding season, although they differed from those recorded in adults. In the second trial adult and young goats were castrated during the breeding season. After surgery the plasma levels of T, A, DHA and DHAS were reduced to 0.3; 23; 36; 12% and 24; 69; 68; 70% of precastration values in bucks and kids respectively. These results indicated that besides testis, other endocrine tissues, such as adrenal glands, are involved in the biosynthesis of these steroids, particularly in kids.

Galeati G., Modina S., Lauria A., Seren E.: Effetto delle cellule somatiche follicolari sulla penetrabilità di oociti di maiale maturati in vitro. *Effect of follicle somatic cells on the penetrability of pig oocytes matured in vitro.* Atti Soc. Ital. Sci. Vet., 42, 195, 1988.

As previous researches have shown that follicle somatic cells influence the penetrability of pig oocytes, this research was designed to investigate the mechanism through which such an influence is exerted on the egg. Pig oocytes were cultured with the extroverted follicle and, at different stages of maturation, they were denuded of cumulus masses. After maturation the oocytes were fertilized in vitro. Only oocytes remaining connected to the somatic cells for the whole maturation acquired a normal penetrability. Cumulus cells resulted capable of maintaining egg penetrability by acting at the plasma membrane level. Since cortical granule, tend to migrate towards the oolemma and undergo exocytosis as soon as the oocytes are denuded, the effect of follicle somatic cells on eggs penetrability is likely to depend on their ability to prevent a premature cortical granule reaction.

Mattioli M., Galeati G., Bacci M.L., Seren E.: Male pronucleus formation depends on soluble factors produced by follicle somatic cells during pig oocyte maturation. 11th Int. Congr. Anim. Reprod. Artif. Ins., Dublino, 343, 1988.

The influence of follicle somatic tissue was investigated. Cumulus-enclosed pig oocytes were cultured for 44h in control medium (modified TCM-199) or in follicle-conditioned medium, and the intercellular coupling was studied by measuring ³H-uridine uptake. In control medium the intercellular cooperation started to decline immediately, and at 24-32h the uncoupling was almost complete. By contrast, in follicle conditioned medium, it remained at high levels until 24-32h. Oocytes cultured in conditioned medium were characterized by a 45 kd protein band, while those maturing in control medium were identifiable by a marked 56 kd band. In addition, only oocytes matured in conditioned medium could consistently decondense spermatozoa and form male pronuclei.

Mattioli M., Galeati G., Seren E.: Control of LH and PRL secretion during lactational anestrus in the pig. 11th Int. Congr. Anim. Reprod. Artif. Ins., Dublino, 44, 1988.

This research was designed to investigate which stimuli control the endocrine patterns in lactating sows. Suckling suppressed LH secretion and stimulated PRL secretion in all animals. After piglets removal PRL quickly dropped to baseline and after a 90 min delay LH pulsatility reappeared. When piglets were kept in the vicinity of the mother but prevented from suckling, the changes in LH and PRL secretion were not so evident suggesting that if suckling is the major stimulus responsible for the endocrine picture in lactating sows other stimuli deriving from the presence of the piglets contribute to control LH and PRL secretion during lactation.

Mattioli M., Galeati G., Bacci M.L., Seren E.: Follicular factors influence oocyte fertilizability by modulating the intercellular cooperation between cumulus cells and oocyte. *Gamete Res.*, 21, 223, 1988.

Mattioli M., Galeati G., Seren E.: Effect of follicle somatic cells during pig oocyte maturation on egg penetrability and male pronucleus formation. *Gamete Res.* 20, 177, 1988.

The effect of follicle somatic cells on the maturation and preparation of the oocytes for fertilization was investigated. After IVF oocytes matured in the presence of follicle cells showed a higher rate of fertilization than recorded in cumulus oocytes (80% vs 47%) and also a higher average number of sperm (3.77/egg vs 1.42/egg). This difference was also recorded when follicle and cumulus oocytes were freed from the zona before IVF, suggesting that, at least in part, the effect of follicle was exerted on plasma membrane. A further effect of the follicular tissue was on cytoplasmic maturation: only follicular oocytes were capable of consistently promoting male pronucleus formation. Moreover the authors suggest that the observed effect of the follicle is mediated by soluble factors that, however, cannot influence the oocyte without some direct cell-oocyte contact.

Motta M.: Sistema automatico computerizzato per la raccolta ed elaborazione dei dati di analisi radioimmunologica. *A computerized automatic system for collection and calculations of RIA data.* Atti Soc. Ital. Sci. Vet., 42, 369, 1988.

A general apparatus for automatic detection and mathematical analysis of data from Radioimmunoassay (RIA) is here described. The radioactive counting rates of plasma samples tagged with a radioactive isotope are directly sent to a Personal Computer and stored on floppy disks. The data are successively submitted to a first screening by means of a common program of electronic sheets working under MS-DOS. An original mathematical method for plotting the standard curve and evaluate the sample hormone content with errors is applied to the screened data. The totality of input-output data are finally stored on disks for the final memorization.

Tamanini C., Motta M., Prandi A., Chiesa F.: *Circannual variations of plasma prolactin levels in the goat.* 11th Int. Congr. Anim. Reprod. Artif. Ins., Dublino, 418, 1988.

Prandi A., Motta M., Chiesa F., Tamanini C.: *Circannual rhythm of plasma prolactin concentration in the goat.* Animal. Reproduction Sci., 17, 85, 1988.

The aim of this experiment was to investigate the variations of prolactin plasma levels in goats throughout the year as related to photoperiod, ambient temperature and reproductive status. Prolactin concentration was measured on samples collected from fifty goats every 3-5 days for 14 months; during the same period, the mean ambient temperature was recorded every day. PRL plasma levels were very low (<30 ng/ml) from november to march and increased to higher values from march to may; the highest values (300-400 ng/ml) were observed during the summer period. In the next months the PRL levels fell to the lowest values, closing the annual cycle. High PRL plasma concentrations were associated with the anestrus season, low PRL levels with the breeding season. Fluctuations in the mean temperature values were accompanied by correspondent fluctuations of PRL plasma levels: high temperature values were associated with high PRL plasma levels. No relationships were observed between PRL plasma concentrations and pregnancy or lactational anestrus.

Seren E., Barbieri V.: Il controllo della funzione riproduttiva nella scrofa. Aspetti endocrini e biotecnologici. *Control of reproductive function in the sow. Endocrine and biotechnological aspects.* Riv. Suincolt., 8, 13, 1988.

The Authors review the different factors (genetic, nutrition, management) which influence the reproductive efficiency in the pig through its reproductive causes. The importance of available reproductive biotechnologies (A.I., E.T.) together with those which will startly be available is also considered.

Seren E., Mattioli M., De Rensis F., Conte F.: *Influence of high environmental temperature on LH and cortisol secretion in ovariectomized sows.* 10th IPVS Congress, Rio de Janeiro-Brazil, 277, 1988.

Seren E., Mattioli M., De Rensis F.: *Effect of high environmental temperature on LH and cortisol secretion in ovariectomized sows.* 11th Int. Congr. Anim. Reprod. Artif. Ins., Dublino, 417, 1988.

In order to investigate if the reduced reproductive efficiency observed in the pig during the summer depends on the high temperatures, ovariectomized sows were exposed to temperatures of 22°C or 35°C and plasma levels of LH and cortisol were measured. High environmental temperature (35°C) caused a significant ($P < 0.01$) drop of cortisol plasma levels and a reduced ($P < 0.01$) adrenal sensitivity to ACTH stimulation (20 and 100 I.U. i.v.). LH release in response to doses of 2.5 and 20 µg GnRH/sow was not affected by temperature in any sows except one, where LH levels after both doses of GnRH were lower at 35°C than at 22°C. Intramuscular administration of estradiol benzoate (10 µg/Kg) caused an LH peak of lower amplitude in sows at 35°C than at 22°C. Moreover at 35°C this peak was delayed.

Seren E., Mattioli M.: *L'ipofertilità estiva nella specie suina: cause e possibili rimedi.* *Summer infertility in the sow.* Sel. Vet., 29, 763, 1988.

Although the pig has traditionally been regarded as a poliestrus, our recent investigation have demonstrated a clear tendency of this animal to undergo anestrous periods during the summer. The reproductive efficiency drops particularly during the months of June-September in the northern hemisphere or in december-february in the southern one. Evidence has been provided pointing to photoperiod as a possible stimulus responsible for this situation although the high temperatures characterizing the summer of some countries are likely to play the major role in causing this summer infertility. Finally the incidence of this infertility shows wide variations from farm to farm and from year to year.

Seren E.: *Fattori condizionanti l'efficienza riproduttiva della scrofa.* *Factors conditioned the reproductive efficiency of sow.* 1° Meeting Naz.le "Studio della efficienza riproduttiva degli animali di interesse zootecnico", Bergamo, 15, 1988.

The reproductive efficiency of sows is conditioned by factors like breed, climate, season, the presence or the absence of the male, management, nutrition and genetic selection. The Author reviews the most important non infectious conditions that can influence reproductive efficiency of sow.

Seren E.: *Prospettive delle biotecnologie applicate alla riproduzione animale.* *Applied reproductive biotechnologies.* Giornale di Agricoltura, 1988.

The aim of applied reproductive biotechnologies is to improve the reproductive efficiency of farm animals. This goal has already been achieved when A.I. and embryo transfer were used on a large scale particularly in cattle for genetic improvement. As far as the future is concerned, new technologies such as embryo and sperm sexing will shortly be available. Finally production of transgenic animals, possibly involving the use of embryo stem cells, will represent a major contribution for the improvement of animal productivity.

Tattini A., Mattioli M.: Induzione di estri fertili mediante somministrazione di PMSG e HCG a scrofette e a scrofe in anestro. *Induction of fertile estrouses by a PMSG/HCG treatment in anestrus gilts and sows.* Sel. Vet., 29, 351, 1988.

The Authors tested the effectiveness of PMSG/HCG based treatment in inducing fertile estruses in anestrus gilts or sows. 105 gilts with delayed attainment of puberty and 133 anestrus postweaned sows were treated with 1250 I.U. PMSG and with 750 I.U. HCG 56 hours later. The animals were artificially inseminated at the onset of oestrous and, in any case, 40 hours after HCG 90.5% of treated gilts were inseminated and 65.2% of these farrowed. Similarly 90.9% of treated sows were inseminated and 81.8% of these farrowed. Therefore the treatment proved useful to solve those situations of anestrus in gilts and sows which, most probably, depend on an inadequate gonadotropic support.

1989

Arav A., Bacci M.L.: Volume changes of pig oocytes after exposure to different cryoprotectants. 26th Annual Meeting Soc. for Cryobiology, Cryo 89, Charleston, 1989.

Arav A., Bacci M.L.: Comportamento osmotico e modificazioni morfofunzionali in oociti di maiale trattati con diversi crioprotettori per la vitrificazione. *Osmotic behaviour and morphofunctional changes induced by different cryoprotectants used for vitrification.* Atti Soc. Ital. Sci. Vet., 43, 175, 1989.

So far pig embryo freezing has not been successfully achieved. Recently vitrification has been shown to be a promising cryopreservation technique. Since the use of high concentrations of cryoprotectants is the prerequisite for vitrification we studied the osmotic behaviour and the morphofunctional changes induced by high concentrations of glycerol, propandiol and dimethyl sulfoxide (DMSO). Pig oocytes were used as a model for these studies. The results of these experiments indicate that: a) propandiol and DMSO, separately or mixed, have a higher permeability than glycerol; b) propandiol has a low toxic effect when compared to DMSO or glycerol; c) the use of sucrose limits the toxic effects of cryoprotectants; d) exposure to ipertonic solutions of sucrose or propandiol does not affect the intercellular coupling between cumulus cells and oocyte. By contrast vitrification uncouples these two cellular compartments.

Bonomi A., Quarantelli A., Sabbioni A., Superchi P., Bosticco A., Chiesa F., Gaiani R.: Contributo allo studio dell'influenza esercitata dalla metionina protetta, impiegata nel ruolo di supplemento alimentare, sull'efficienza produttiva e riproduttiva nelle bovine da latte. *The effects of protected methionine, as supplement, on productive and reproductive efficiency of dairy cows.* Riv. Soc. It. Sci. Aliment., 18, (4), 273, 1989.

The Authors refer the use of protected methionine, as supplement, at the dose of 40g head/day (equivalent to 16g of active material) during 90 (2nd, 3rd, and 4th month of lactation) or 270 days (from 2nd to 10th month of lactation) on health status and productive and reproductive efficiency of dairy cows were evaluated. In a trial on 80 Italian Friesian dairy cows, they show that added protected methionine apart from the length of the treatment, is able to enhance the health status of cattle (reduction of about 75% of the most common diseases), fertility (resp. 1.40 and 1.61 services per conception vs 1.95 and 2.20) and milk production (resp. +5% and +3.6%). Milk quality and cheesemaking were not affected by the treatment.

Chiesa F.: Somatotropina e salute animale. *Somatotropins and safety in target animal*. 8° Congresso della Società Italiana di Tossicologia, Bologna, maggio 1989.

The Author investigates if the metabolic, cardiovascular, mammary and growing effects of bovine somatotropin (BST) may have negative side effects on the animal's health and particularly on the reproductive efficiency and on the progeny. The cows repeatedly treated with BST (three consecutive lactations) at the preconized doses, starting 80 days post partum, showed mild side reactions. The subcutaneous injections cause local reactions which are rapidly resolved. BST is capable of stimulating a weak antibody response. Despite the production of low levels of antibodies there have been no adverse health reactions associated with this immune response. Calf health, growth, the subsequent development and fertility of progeny were unaffected by the treatment. By contrast the chronic overdosing of BST as well as starting the treatment earlier than 80 days post partum result in an increased incidence of clinical mastitis and some metabolic disorders leading to an increase of the partum to conception interval.

Gaiani R., Formigoni A., Chiesa F.: Adattamenti endocrini e metabolici della bovina dall'asciutta all'innesco della lattazione. *Hormonal and metabolic changes in relation with dry period and early lactation in dairy cows*. Atti Soc. Ital. Sci. Vet., 43, 433, 1989.

The plasma levels of bGH, bPRL, IGF-1, T3, T4 and insulin were measured by RIA in 13 high-yielding dairy cows in late lactation (6th and 7th month of gestation), in dry period, before parturition and at 10 and 30 days of lactation. The levels of some blood metabolites (cholesterol, glucose, NEFA, triglycerides, urea) were also measured in the same period by using enzymatic assay techniques. There is a clear interaction between physiological status and hormone concentrations: the levels of insulin and thyroid hormones decrease from the dry period to parturition while bGH, bPRL and IGF-1 sharply rise at parturition. The levels of blood metabolites were also significantly influenced by the different physiological conditions.

Galeati G., Bacci M.L., Mattioli M.: Trapianto nucleare mediante elettrofusione e studio delle interazioni nucleo-citoplasma nell'oocita di maiale. *Nuclear transplantation and study of the nucleus-cytoplasm interaction in pig oocytes*. Atti Soc. Ital. Sci. Vet., 43, 169, 1989.

The Authors developed a technique for nuclear transplantation in pig oocytes in order to investigate the interaction between nucleus and cytoplasm. Nuclei from immature oocytes and from blastomers of 4-8 cell embryos were aspirated and the caryoplast injected

ted under the zona pellucida of oocytes at different stages of maturation. The oocytes were fused with the caryoplast by high frequency electric oscillation followed by 1-2 50 volts 0.3 msec pulses. After fusion meiotic maturation, protein synthesis patterns and RNA synthesis were evaluated. The results of these experiments indicate that: a) the cytoplasm controls meiotic progression; b) the cytoplasmic maturation is not strictly regulated by the nucleus; c) the cytoplasm can program nuclear transcription.

Mattioli M., Bacci M.L., Seren E.: Potenzialità di sviluppo embrionale di oociti di maiale maturati e fecondati *in vitro*. *Developmental competence of pig oocytes matured and fertilized in vitro*. Atti Soc. Ital. Sci. Vet., 42, 199, 1988.

Mattioli M., Bacci M.L., Galeati G., Seren E.: *Developmental competence of pig oocytes matured and fertilized in vitro*. Theriogenology, 31, 1201, 1989.

This work was undertaken to evaluate the developmental competence of pig oocytes matured and fertilized *in vitro*. After exposure to capacitated boar sperm, 78% of the oocytes were penetrated and 47% of these were monospermic. 266 out of 681 oocytes reached the 2-4 cell stage 48h after IVF. These embryos were surgically transferred in the oviducts of 12 synchronized recipient gilts. Four day later 211 (79%) embryos were recovered by uterine flushing. 40.7% of these had reached the blastocyst stage and 20% the morula stage. In a final experiment, four out of eight gilts which had received 40 to 50 two to four cell embryos, were diagnosed pregnant 30 and 37d after *in vitro* fertilization. One sow farrowed nine live piglets and one stillborn, two pregnancies were in progress, while one sow returned to estrus 47d after *in vitro* fertilization. These results demonstrate that pig oocytes matured and fertilized *in vitro* can develop to the blastocyst stage and establish a normal pregnancy resulting in the birth of live piglets.

Mattioli M., Galeati G., Bacci M.L.: *Pig oocyte maturation: an electrophysiological study*. In: "Fertilization in Mammals" Eds: B.D. Bavister, J. Cummins, E.R.S. Roldan, Serono Symposia U.S.A., 420, 1990.

Mattioli M., Cappannari C., Galeati G.: Variazione del potenziale di membrana dell'oocita di maiale durante la maturazione. Effetto delle gonadotropine. *Pig oocyte membrane potential throughout maturation. Effect of gonadotropins*. Atti Soc. Ital. Sci. Vet., 43, 165, 1989.

The Authors investigated the effect of follicle somatic cells on pig oocyte membrane potential during maturation. The potential of cumulus enclosed oocytes (CEO) and denuded oocytes (DO) was -42.5 ± 0.51 mV and -30.9 ± 0.43 mV respectively. Exposure to LH depolarized CEO potential without affecting DO potential. FSH reduced the depolarizing effect of LH.

Mattioli M., Seren E.: Temperatura ambiente e riproduzione nella specie suina. *Environmental temperature and reproductive performance in sow*. Convegno su: "Riproduzione nella specie suina", Eds. Fondazione Iniziative Zooprofilattiche e Zootecniche, Brescia, 167, 1989.

The Authors studied the effects of high environmental temperature on the reproductive performance in sows. The influence of temperature is discussed in relation to the different phases of reproductive career, from ovulation through pregnancy up to parturition.

Mattioli M.: Maturazione e fecondazione *in vitro* dell'ovocita. *Pig oocyte maturation and fertilization*. 2° Meeting Naz.le su: "Studio dell'efficienza riproduttiva degli animali di interesse zootecnico", Bergamo, 11, 1989.

In vitro maturation and *in vitro* fertilization of mammalian oocytes have been reviewed by the Author in their practical and technical aspects. The knowledge of these physiological processes has been used for biotechnological applications.

Polisca A., Mangili V., Gaiani R., Chiacchiarini P., Monaci M.: Osservazione di casi di sindrome femminilizzante nel cane maschio a diversa eziologia. *Study of different cases of feminizing syndrome due to different causes in the male dog*. Atti Soc. Ital. Sci. Vet., 43, 1989.

The AA. describe three cases of feminizing syndrome in the male dog due to hypothyroidism and Sertoli cell tumor. The animals showed dermatopathy, increase of the mammary gland volume, decrease of sexual attraction for females and behavioural abnormalities. The syndrome was diagnosed on the basis of clinical data and by the determination of the plasma level of: Testosterone, Progesterone, 17 β -Estradiol, T3, T4. Furthermore the AA. conclude that the laboratory hormonal assays are necessary to diagnose primary non testicular endocrinopathies. The latter were pointed out by the anatomico-histopathological results of thyroid gland and of the testicles.

Seren E.: Aspetti endocrini della funzione riproduttiva nella scrofa. *Endocrine reproductive physiology in the sow*. Sel. Vet., 30, 127, 1989.

The Author described the hormonal patterns which characterize the attainment of puberty, oestrous cycle, pregnancy, parturition and lactation in the pig.

Tattini A., Camporesi A., Mattioli M.: Variazioni stagionali della concentrazione plasmatica del progesterone e del cortisolo nella scrofa gravida. *Seasonal variations of progesterone and cortisol plasma levels in pregnant sows*. Sel. Vet., 30, 311, 1989.

The seasonal variations of cortisol and progesterone plasma levels were studied in pregnant sows at day 30 and 60 of gestation. Both progesterone and cortisol were influenced by the season showing low levels during the months of July-August and September. This impaired ovarian steroidogenesis could be responsible for the increased incidence of pregnancy losses occurring during summer. The Authors discuss the possible effect of low cortisol levels on corpus luteum function.

Vigo D., Mattioli M., Maffeo G., Seren E.: Modificazioni dell'attività miocinetica uterina in scrofette puberi a seguito del trattamento con feromoni. *Modification of the uterine motility in puberal gilts after treatment with pheromones*. Atti della Società Italiana di Patologia e Allevamento dei Suini (SIPAS), 1703, 1989.

The reproductive efficiency in the sow is characterized also by the effect of boar salivary pheromones. Those hormones are able to induce an oxytocin release in the sow and an

increased speed of semen in uterus during insemination. In this research has been studied the modification of the uterine motility in puberal gilts after treatment with pheromones (5- α -androst-16-en-3-one: Sex odor aerosol, Intervet).

1990

Arav A., Bacci M.L., Rubinsky B.: *The effect of volume, cooling rate and composition on vitrification of two cell mouse embryos and pig oocytes.* Congress Cryobiology, Binghamton, 1990.

Arav A., Bacci M.L., Rubinsky B.: Identificazione di parametri idonei alla vitrificazione di oociti di maiale e di embrioni di topo. *The effect of volume, cooling rate and composition of two cell mouse embryos and pig oocytes.* Atti Soc. Ital. Sci. Vet., 44, 187, 1990.

The probability of vitrification is a function of several thermodynamic parameters, which include solution composition, thermal history (cooling rates) and volume. The probability for ice crystal nucleation decreases with an increase in cooling rates, an increase in solute concentration and with a decrease in volume. The limiting conditions for achieving vitrification are related to a) the highest cooling rate that can be achieved experimentally, b) the highest solution concentration that can be tolerated by the cell and c) the smallest volume that can be physically achieved. A systematic study was performed using a directional solidification stage attached to a cryomicroscope to determine the optimal values of cooling rate, composition and volume for the preservation of two cell mouse embryos and pig oocytes. Experimental results were obtained for different solutions of propylene glycol, between 15% w/v and 35% w/v, different volumes (droplets with a volume ranging between 0.1-1 μ l) and cooling rates to 17000°C/min.

Arav A., Rubinsky B., Bacci M.L., Seren E.: Crioconservazione di oociti immaturi di maiale mediante vitrificazione. *Vitrification of immature pig oocytes.* Atti della Società Italiana di Patologia e Allevamento dei Suini (SIPAS), Mantova, 1990.

Arav A., Bacci M.L., Rubinsky B.: *Vitrification of immature pig oocytes.* 11th IPVS Congress, Lausanne (Switzerland), 479, 1990.

The Authors describe the vitrification of pig oocytes by using a cryomicroscope which enables to continuously monitor the process. This allows to set cooling and warming rates suitable to prevent ice crystal formation throughout the whole vitrification process with a low concentration of cryoprotectant in order to limit any toxic effect.

Arav A., Rubinsky B.: *Fracture formation and devitrification during preservation of pig oocytes.* Congress Cryobiology, Binghamton, 1990.

Fracture formation and devitrification may occur during warming of vitrified biological material and may have detrimental effects on the viability of this material. A new experimental technique was developed to study the process of fracture formation. The technique uses a directional solidification stage, which facilitates controlled cooling and warming of solutions under light microscopy. Experiments with physiological solution and different concentrations of cryoprotectants, such as propylene glycol and glycerol have generated visual microscopic evidence of the formation of fractures during warming. The

experimental studies also show that devitrification occurs many times near the fracture, and appears to be related to the energy released during fracture formation. Analytical studies demonstrate that the magnitude of stresses causing fractures is proportional to the dimension of the sample, and suggest that the probability of fractures forming could be decreased by reducing the size of the samples.

Galeati G., Mattioli M., Bacci M.L., Seren E.: *Effect of LH and FSH on pig oocyte maturation in vitro.* J. Reprod. Fertil., Abstract Series N. 5, ab. 70, 1990.

Bacci M.L., Barboni B., Shehu D.: Effetto dell'LH e dell'FSH sulla maturazione *in vitro* dell'oocita di maiale. *Effect of LH and FSH on pig oocyte maturation in vitro.* Atti Soc. Ital. Sci. Vet., 44, 175, 1990.

In order to investigate the effect of LH and FSH on pig oocyte maturation the following parameters were studied: a) meiotic maturation; b) cytoplasmatic maturation; c) the degree of heterologous coupling between cumulus cells and oocyte. Despite of the marked cumuli expansion induced by gonadotropins, the heterologous coupling between somatic cells and oocytes was not influenced by LH or FSH. After 30h of culture 76% of the oocytes matured without hormones were at the GV stage while this proportion was reduced to 20% by FSH and to 24% by LH. After 44h of culture the percentage of oocytes reaching the MII stage was 35% in controls, 76% in the presence of LH and 86% in the presence of FSH. The percentage of oocytes capable of sustaining male pronucleus formation was similar in controls (48%) and FSH treated oocytes (44%) while it was markedly increased by the addition of LH (72%).

Barboni B., Mattioli M., Galeati G., Parmeggiani A.: Ormone luteinizzante: identificazione di un nuovo meccanismo d'azione a livello di membrana citoplasmatica delle cellule della granulosa. *Luteinizing hormone: description of a novel mechanism of action exerted at the plasma membrane levels of granulosa cells.* 3° Meeting Nazionale su: "Studio dell'efficienza riproduttiva degli animali di interesse zootecnico", Bergamo, 117, 1990.

The Authors studied the influence of LH on transmembrane currents recorded in granulosa cells by the patch clamp technique. The whole cell configuration was used with granulosa cells isolated from the cumuli oophori of healthy non atretic follicles. Depolarizing steps elicited an outward delayed non saturating K current of 300-500 pA of amplitude. External perfusion with LH (1 µg/ml) inhibited or suppressed this current in 3-5 min. The K current was not dependent on intracellular Ca but was inhibited or suppressed in 2-4 min by db cAMP (5 mM). These data indicate that LH can influence the ionic environment of granulosa cells by inactivating specific K channel.

Chiesa F.: Endocrinologia del post-partum nella bovina da latte. *Endocrine aspects of the post-partum in dairy cows.* 3° Meeting Nazionale su: "Studio dell'efficienza riproduttiva degli animali di interesse zootecnico", Bergamo, 11, 1990.

The post-partum anestrus in dairy cows is characterized by irregular estrous cycles, by suppressed or not well identifiable estrous behaviour and by prolonged uterine involution. Most likely this condition of anestrus depends on the fact that the first estrous cycle is not preceded by a normal luteal phase. Hypophyseal LH content is in fact markedly

reduced in the post-partum period. The ability to synthesize LH is gradually restored under combined influence of hypothalamic GnRH and ovarian estrogens. The short life span of the corpus luteum in the first cycle post-partum is probably dependent on an increased sensitivity of luteal cells to the action of PGF-2 α . The reduced plasma concentrations of insulin and IGF-I which characterize the two months following parturition in high-yielding dairy cows might cause an abnormal corpus luteum formation which results in an inadequate function.

Chiesa F.: I promotori di performances. *Growth promoters*. Atti Soc. Ital. Sci. Vet., 44, 61, 1990.

In the present review the Author describes the new practical approaches to animal production allowed by the DNA recombinant synthesis of peptide hormones. With these hormones is possible to improve the growth rates of beef animals and also to modify the distribution of fat and meat. The hormones involved are GH, GHRH, TRH and IGF-I.

Franchini A., Bertuzzi S., Gaiani R., Manfreda G., Franciosi C.: Effetto del periodo di somministrazione di alte dosi di vitamina E nella dieta sulla risposta immunitaria del tacchino. *Length and time of administration of high doses of vitamin E and immune response in turkeys*. Zootecnica International, 27, 1990.

The high dietary dose of vitamin E is able to increase the antibody response to viral antigen as the vitamin E decreased the production of prostaglandins. Furthermore vitamin E exerts a chronobiological action on the immunocompetent system of birds especially in the first few weeks of life, when the cells of white series are in the phase of the active multiplication and colonization of the organism.

Gaiani R., Formigoni A., Bonardi S., Grasselli F., Soflai Sohee M.: Le concentrazioni plasmatiche della prolattina come segnale di stress nella bovina. *Effect of stress on the prolactin and cortisol plasma levels in cows*. Atti Soc. Ital. Sci. Vet., 44, 405, 1990.

The plasma levels of cortisol and prolactin were measured by RIA in 8 lactating Friesian cows. Blood samples were collected at 15min intervals for 10h. Plasma levels of cortisol and bPRL increased after various stresses (insertion of cannula, handling, etc.). When jugular venous cannula was inserted at the beginning of blood sampling we found that bPRL levels were 5-50 times higher than basal levels. This hormone reached basal levels in 1-2h, on the contrary the insertion of cannula the day before sampling did not affect plasma levels of bPRL. In two cows, particularly restless, we found basal plasma levels of PRL higher than in other cows. This fact suggests that plasma bPRL changes may represent an index of uncomfortable environment as well as of individual reactivity.

Galeati G., Mattioli M., Cappannari C.: Attività di trascrizione e traduzione nel controllo del ciclo cellulare dell'oocita. *On transcriptional and translational requirements during pig oocyte maturation*. Atti Soc. Ital. Sci. Vet., 44, 163, 1990.

During oocyte maturation the alternating appearance of a maturation promoting factor

(MPF) is required for the correct meiotic progression. With the present paper the transcriptional and translational requirements involved in the production of MPF were studied. Pig oocytes were matured with extroverted follicle and treated with cycloheximide, a protein synthesis inhibitor, or α amanitin, an inhibitor of RNA polymerase, at different stages of maturation. Protein synthesis is required for both the rises in MPF activity necessary to bring the oocytes to the MII stages. Inhibition of the first MPF peak by cycloheximide completely prevented GVBD. When the second peak was inhibited a premature chromosome decondensation and female pronucleus formation took place. Amanitin markedly impaired meiotic progression but its effect is probably exerted on the somatic cells rather than on the oocytes.

Mattioli M., Barboni B., Bacci M.L., Seren E.: *Maturation of pig oocytes: observations on membrane potential.* Biol. Reprod., 43, 318, 1990.

The Authors describe the membrane potential changes of pig oocytes during maturation. The results indicate that both LH and FSH can influence the membrane potential of follicle somatic cells and consequently that of the oocyte. The electrical coupling between somatic cells and oocyte may represent a means by which the gonadotropin message is passed to the germinal cell by the somatic compartment.

Mattioli M., Barboni B., De Felice L.: *Calcium and potassium currents in swine granulosa cells.* J. Reprod. Fertil., Abstract Series N. 5, abs. 98, 1990.

Mattioli M., Barboni B.: Identificazione di correnti di calcio e di potassio in cellule della granulosa di follicoli di maiale. *Calcium and potassium currents in swine granulosa cells.* Atti Soc. Ital. Sci. Vet., 44, 169, 1990.

The whole cell recording technique was used to investigate electrical properties of pig granulosa cells (GC). Recording was carried out immediately after collection or after 24 and 48h of culture. In response to 500 msec depolarizing pulses from a -80 mV holding potential, GC exhibited an inward, rapidly activating, fully inactivating Ca-current. The maximum amplitude of this current was induced by depolarization from -30mV to 0mV. After depolarization >10 mV an outward, slowly activating, non inactivating K-current was recorded. This current was substituted by a transient, rapidly inactivating current as the culture progressed. The same transient outward current was recorded in luteal cells.

Bacci M.L., Galeati G., Mattioli M., Moretti M.: Valutazione del potere fecondante del seme di verro mediante test di penetrazione della zona pellucida. *Use of stored zonae pellucidae for the assessment of the fertilizing capacity of boar sperm.* Atti della Società Italiana di Patologia e Allevamento dei Suini (SIPAS), Mantova, 1990.

Mattioli M., Galeati G., Moretti M.: *Use of stored zonae pellucidae for the assessment of the fertilizing capacity of boar sperm.* 11th IPVS Congress, Lausanne (Switzerland), 478, 1990.

An *in vitro* bioassay was devised for the evaluation of the fertilizing ability of boar semen. It was first investigated whether maturation of the oocytes is required for sperm passage through the zona pellucida in an IVF system. The incidence of zona penetration and

entry into the vitellus were similar in immature and *in vitro* matured oocytes. A test for the assessment of boar sperm fertilizing capacity can therefore be performed by using immature oocytes. Finally the zona pellucida of immature salt stored (1-30 days) oocytes completely retained its ability to bind spermatozoa and to be penetrated by them. We conclude that immature salt-stored pig oocytes can be used to accurately quantitate sperm fertilizing capacity. The availability of a large number of stable and homogeneous zonae will make it possible to devise a sperm bioassay on large scale.

Mattioli M.: *Cell to cell communication in the cumulus-oocyte complex and cytoplasmic maturation in pig oocytes.* International Symposium on Morphological Science, Nancy-France, 1990.

In this paper the Author discusses results obtained by him and others on the mechanism controlling the degree of intercellular cooperation between oocyte and somatic cells during maturation and on the influence that this interaction exerts, particularly on the cytoplasmic maturation of the oocyte. The discussion concerns mainly pig oocyte which, on account of its particularly long maturation time, seems to be a model where the supportive and instructional contribution of the somatic cells is particularly important.

Rubinsky B, Arav A., Mattioli M., Devries A.L.: *The effect of antifreeze glycopeptides on membrane potential changes at hypothermic temperatures.* Biochem. Biophys. Res. Commun., 173, 1369, 1990.

The research on antifreeze glycopeptides (AFGPs) from Antarctic and Arctic fishes has focused primarily on their interaction with ice crystals. This study reports results of experiments in which pig oocytes, known to be sensitive to hypothermic temperatures, were exposed to 4°C for various periods of time, in solutions of different molecular weight AFGPs from Antarctic nototheniid fishes. The membrane potential was measured across the oolemma following hypothermic exposure. The results show that a physiological combination of the different molecular weight AFGPs protects the structural integrity of the oolemma and inhibits ion leakage across the oolemma at hypothermic temperatures. The results also show that the hypothermic protection is nonlinearly dependent on concentration and that separately, the different molecular weight glycopeptides do not stop ion leakage even at very high concentration. The protection of membranes at hypothermic temperatures is a new property of AFGPs which was not known prior to our work.

Formigoni A., Parmeggiani A., Mattioli M., Seren E.: *Influenza di alcune componenti della dieta sulla secrezione di LH in scrofette prepuberi. Effect of nutrients on LH secretion in prepubertal gilts.* Atti della Società Italiana di Patologia e Allevamento dei Suini (SIPAS), Mantova, 1990.

Seren E., Formigoni A., Mattioli M.: *Effect of nutrient availability on LH secretion in prepubertal gilts.* 11th IPVS Congress, Lausanne (Switzerland), 433, 1990.

The Authors studied the patterns of LH secretion in prepubertal gilts (about 80 kg) fed to appetite (7500 Kcal ME/d) or on a restricted diet (2800 Kcal ME/d). Blood sampling was carried out at 15 min intervals for 10-12h per day through a chronic catheter inserted

in the jugular vein. Feed restriction suppressed the pulsatile secretion of LH which reinitiated again after realimentation to appetite. The i.v. infusion of glucose or aminoacids for 12h during the restriction period partially restored the pulsatile secretion of LH. The Authors discuss the results taking into account also the changes in insulin, glucose, urea, NEFA and total protein levels induced by feed restriction.

1991

Arav A., Bacci M.L., Shehu D., Mattioli M.: *Successful vitrification of immature bovine oocytes: osmotic and toxic effects of permeating and non-permeating cryoprotectants.* J. Reprod. Fertil., Abstract Series N.7, abs. 97, 1991.

The effect of osmotic stresses was evaluated by exposing bovine oocytes to permeating (propylen glycol, PG, dimethyl sulfoxide, or glycerol, 40% w/v) or non permeating (0.1-1 M sucrose or trehalose) cryoprotectants (CPA). Exposure was carried out either step wise or in a single step at room temperature. Volume changes were evaluated over 90 min period, measuring the cross section of oocytes. Cell viability was tested by evaluating the ability to undergo normal maturation and fertilization *in vitro*. The results of these trials indicate that bovine oocytes are particularly resistant to shrinkage and one step exposure to non-permeating CPA 0.5M sucrose or trehalose with reduction to 50% of the isotonic volume, did not significantly impair the viability of the oocytes. For these data PG appear to be the CPA of choice. Oocytes vitrified as previously described with a combination of PG and trehalose underwent normal fertilization in 52% of the cases.

Arav A., Rubinsky B., Devries A.: *Cryoprotection by antifreeze glycoproteins from antarctic fish.* Journal of Cryobiology, 28, 234, 1991.

Antifreeze glycoproteins (AFGPs) isolated from the blood of antarctic nototheniid fish protect immature pig oocytes when cooled to cryogenic temperatures. In the presence of 40 mg/ml AFGPs and 17.5% v/v propylene glycol, 2.5% glycerol, 20% fetal calf serum and 0.05 M sucrose in Dulbecco's phosphate buffered saline, 24.5% of the oocytes underwent normal maturation after apparent vitrification. In the absence of AFGP, no survival was observed using the same cooling regime, and cryopreserving solution. Trypan blue exclusion and morphological examinations suggest that protection in the presence of the AFGPs involves an interaction with the membrane. In the presence of AFGPs in 82% of the rapidly cooled and apparently vitrified oocytes, the oolemma was intact and the cell had a normal morphology. In the absence of AFGPs, the cellular morphology appeared abnormal and the oolemma was disrupted in all the oocytes.

Arav A., Rubinsky B., Mattioli M., Shehu D., Barboni S., Seren E.: *Protection of pig and bovine oocyte membrane in hypothermic temperatures by antifreeze glycoproteins isolated from antarctic fish.* European Developmental Biology Congress, Jerusalem — Israel, 1991.

Recently we described a new property of antifreeze glycoproteins (AFGPs) isolated from the blood of the antarctic fish. We saw that AFGPs protect the membrane of the oocytes at cryogenic (-196°C) and low (+4°C) temperatures. This membrane stabilization appears to result directly from the interaction between AFGPs and the cell membrane. In

the absence of AFGPs the membrane potential of pig oocytes dropped rapidly following exposure to +4°C for 24 h and none of the tested oocytes retained a normal potential. By contrast, when AFGPs were included in the incubation buffer in physiological concentration, approximately 70% of the oocytes retained a normal one. This suggests that the protective effect of these glycoproteins is likely to be associated with their ability to inhibit ion leakage. In another series of experiments, bovine oocytes were exposed to low temperature (+4°C) for 24h in the presence of AFGPs. Even in these oocytes AFGPs could preserve the integrity of the oolemma in about 80% of them as evaluated by morphological examination, Trypan Blue exclusion test and FDA staining. Based on these observations, on the chemical structure of the AFGPs and on the dose-dependent protection we believe that AFGPs interact with membrane binding to available sites, probably to the hydrophilic site of the membrane proteins.

Arav A., Rubinsky B., Mattioli M., Shehu D.: Possibilità applicative di una proteina antifreeze nelle tecniche di crioconservazione. *The cryoprotective effect of antifreeze glycoprotein.* Atti Soc. Ital. Sci. Vet., 45, 467, 1991.

Antifreeze glycoproteins (AFGP) isolated from the blood of nototheniid antarctic fishes depress the freezing point of their blood and allow them to live in -2°C. In this paper we show that the use of AFGP in concentration of 40 mg/ml in the vitrification solution allowed the survival of 25% of pig oocytes after vitrification while none developed without AFGP. The protective effect is likely to be exerted on the membrane since the molecular weights of these AFGP are too high (30000 Kd) to pass through the cell membrane. Microscopic observation showed that the oolemma in 82% of the oocytes cooled rapidly to LN₂ temperature in the presence of AFGP remained intact even if meiotic activity was arrested. It is well known that pig oocytes are very sensitive to hypothermic conditions and the membrane function already disappear at 10°C. In the presence of more than 1 mg/ml AFGP approximately 70% of the oocytes exposed to 4°C for 24 hours retained a normal potential without ion leakage. The protection of membranes from hypothermia is a new property of AFGP which was not known prior to our work.

Bacci M.L., Galeati G., Accorsi P.A., Rolla G.: Effetto dell'HCG sull'accrescimento follicolare di scrofette prepuberi e scrofe in anestro da lattazione. *HCG induced follicular growth in prepubertal gilts and lactating sows.* Atti Soc. Ital. Sci. Vet., 45, 553, 1991.

Prepubertal gilts and lactating sows known to be characterized by the absence of follicular growth, were treated with HCG according to the following schedules: A) 100 IU HCG in the morning plus 100 IU HCG in the afternoon followed by 100 IU the day after; B) 200 IU HCG followed by 100 IU on the 2nd and 3rd; C) 300 IU PMSG + 200 IU HCG; D) 300 IU PMSG + 200 IU HCG followed by 100 IU HCG on the 2nd and 3rd day of the treatment. Follicular growth and maturation were evaluated either by measuring estradiol plasma levels throughout the treatment and by assessing the sensitivity of the follicles to an ovulatory dose of HCG (750 IU) given on the 4th day. Treatment B and D stimulated follicular growth and ovulation was achieved in all gilts and sows with high dose of HCG. Treatment C caused follicular growth up to preovulatory stage in gilts while in lactating sows, after an initial wave of development, the follicles stopped growing and ovulation could not be induced by high dose of HCG. Treatment A was less

efficient to bring the follicles to the preovulatory stage. These data demonstrate that LH alone can induce follicular growth. Once follicular growth has started, gonadotropin support is required, particularly in sows, to sustain maturation up to the preovulatory stage.

Bacci M.L., Galeati G., Mattioli M., Boni R., Seren E.: *In vitro maturation and in vitro fertilization of buffalo oocytes.* Third World Buffalo Congress, Bulgaria, 599, 1991.

Buffalo oocytes were collected from follicles 2-8 mm in diameter and co-cultured with granulosa cells in suspension. After 27 hours of culture the oocytes were either fixed in acetic alcohol for microscopic examination or exposed to capacitated buffalo bull sperm. Frozen buffalo semen was thawed in a 37°C bath and after two centrifugations was incubated with heparin for 15 min. The capacitation technique was first tested by *in vitro* fertilization of bovine oocytes matured *in vitro*. 66% of the buffalo oocytes fixed for the microscopic examination were at metaphase II stage at the end of the maturation period. Capacitated buffalo spermatozoa fertilized 76.5% of the bovine oocytes and these oocytes sustained the formation of normal male pronuclei in 84.6% of the cases. When buffalo oocytes were exposed to capacitated buffalo semen the fertilisation rate did not exceed 60% and resulted in a high percentage of polyspermic eggs (75%).

Barboni B., Mattioli M., Bacci M.L., Seren E.: *Influence of luteinizing hormone on potassium conductance in swine granulosa cells. Role of intracellular calcium.* J. Reprod. Fertil., Abstract Series N. 7, abs. 13, 1991.

Membrane currents of pig granulosa cells (GC), harvested from healthy follicles 3 to 5 mm in diameter, were studied by the patch clamp technique in the whole cell configuration. GC, stimulated by depolarizing steps from an holding potential of -45 mV to +60 mV, exhibited an outward non inactivating current ranging between 200 and 500 pA. This current is carried by K channels as indicated by a tail current reverse potential between -90 mV and -100 mV and by the absence of the current when the KCl in the pipette solution was replaced by the CsCl. When LH was added to the recording solution, the outward current progressively decreased in a dose dependent way ranging from 210 sec with 0.02 mM LH to 80 sec with 2 mM LH. When GC were preincubated with 25 mM TMB 8, an inhibitor of intracellular calcium mobilization, the outward K current was completely insensitive to LH. The inhibitory influence of LH on K conductance was not prevented or removed by perfusing the cells with Ca free solution. The LH signal transduction is mediated by an increase in intracellular Ca mobilized from intracellular stores.

Campanile G., Shehu D., Esposito L., Di Palo R., Montemurro N., Zicarelli L., Terzano G.M., Borghese A.: *Onset of ovarian activity in italian buffalo heifers.* Third World Buffalo Congress, Bulgaria, 666, 1991.

The trial was carried out on 90 Italian buffalo heifers, subdivided on 3 farms. Half of each group were reared in the presence of vasectomized bull to verify male effect on the onset of puberty. Progesterone levels were determined by RIA and ovarian structures were tested by rectal examination every ten days beginning from one year of age. No bull

effect was recorded. Genotype and feeding levels in each farm influenced body weight. More increase in body weight were found in heifers bred on farm C. The dynamics of ovarian development suggest that follicular waves are valuable (in 75% of animals) at 501 days of age, but higher progesterone levels appeared later, at 555 days of age. On the contrary higher progesterone levels were noted in heifers without appreciable corpus luteum or without regular cycle activity. Only 8 heifers (7 on farm C) began regular cycle activity at 555 days of age as preliminar results.

Chiesa F., Gaiani R., Formigoni A., Accorsi P.A.: Modificazioni del quadro endocrino e metabolico in bovine da latte ad elevata potenzialità produttiva durante l'asciutta e la lattazione. *Hormonal and metabolic variations in high-yielding dairy cows during dry period and lactation.* Arch. Vet. Ital., 42(4), 157, 1991.

The plasma levels of bGH, insulin (INS), T3, T4, bPRL, IGF-1 and some metabolites (glucose, cholesterol, HBA, NEFA, triglycerides and urea) were determined in 13 high-yielding Friesian dairy cows, monthly from dry period to the 9th month of lactation. The milk production and composition were also evaluated and energy and protein balances were calculated. During the dry period, because of low amount of energy given to the animals, we found a decrease in plasma levels of INS, T3, glucose, urea and cholesterol while NEFA and triglycerides increased. Around calving there was a marked increase of bGH, IGF-1, bPRL, NEFA and a decrease of T4 and INS levels: these variations were probably due to the onset of secretory activity of mammary glands. During early lactation, characterized by negative energy and protein balances, IGF-1 and triglycerides levels decreased and the other hormones and metabolites remained like at parturition. As lactation proceeded and the energy and protein balances became positive, we found increasing plasma levels of IGF-1, T3, T4, glucose, cholesterol, triglycerides and decreasing levels of bGH. The INS plasma levels reached high concentrations only after the 7th month of lactation when milk yield decreased. The bPRL plasma levels showed a rapid increase during the last 2 days before calving; thereafter the imponent variations of bPRL were positively correlated with ambient temperature and daylight time. In conclusion some hormones were primarily related to metabolic status (IGF-1) or milk production (INS), while other hormones, like b-GH, T3 and T4, were controlled by both these factors.

Galeati G., Modena S., Lauria A., Mattioli M.: Follicle somatic cells influence pig oocyte penetrability and cortical granule distribution. *Mol. Reprod. Dev.*, 29, 40, 1991.

The influence of somatic cells on oocyte penetrability was studied during *in vitro* maturation. Four experiments were carried out. In the first, pig oocytes were fertilized *in vitro* immediately after collection (immature oocytes, IM) or after being cultured for 44h with cumulus cells connected to the whole wall of the extroverted follicle (follicle oocytes, FO) or without cumulus cells (denuded oocytes, DO). In FO and IM, 12 hr after insemination, the sperm were equally distributed between zona and ooplasm; in DO, the majority of the sperm were located in the zona. In the second experiment, zona pellucidae of FO and DO, obtained after 44h of culture, were incubated with a sperm suspension to evaluate the zona binding. The different number of sperm found on the zona pellucida of FO or DO did not achieve statistical significance. In the third experiment, FO and DO were denuded of their zona after maturation and then fertilized *in vitro*. The

number of sperm recorded in the ooplasm of zona-free FO was significantly higher than that recorded in zona-free DO. In the last experiment the influence of somatic cells on the distribution of cortical granules was evaluated. Pig oocytes were denuded at different stages of culture and, after completion of maturation, processed for electron microscopy. The removal of somatic cells at 5-20h of culture resulted in a premature migration of cortical granules underneath the oolemma. An increase of exocytotic events was also recorded. These data demonstrate that the presence of cumulus cells during maturation is fundamental for the pig oocyte to maintain its penetrability.

Grasselli F., Gaiani R., Quaranta A., Tamanini C.: Variazioni stagionali dei livelli ematici di testosterone, estrone solfato e PRL nel becco. *Seasonal variations of testosterone, estrone sulphate and PRL plasma levels in the male goat*. Atti Soc. Ital. Sci. Vet., 45, 517, 1991.

The aim of this work was to determine the circannual profiles of testosterone, estrone sulphate (E1S) and PRL plasma levels in the male goat, the possible relationship between the fluctuations of PRL plasma concentrations and environmental temperature. We tried also to examine the influence of an 'acute' stress condition upon PRL plasma levels. No significant differences were observed between the two breeds of male goats. Testosterone, E1S and PRL plasma concentrations showed marked circannual variations, being lower during winter-early spring (March) and higher during summer (July). A positive correlation was observed between PRL plasma levels and environmental temperature. The concentrations of PRL seems to be influenced by the conditions associated with the cannula insertion before bleeding, handling procedures and restraint of the animals. Our results document the circannual variations of the reproductive hormones, as well as a close relationship between these fluctuations and the environmental temperature.

Mattioli M., Bacci M.L., Galeati G., Parmeggiani A.: Effetto dell'ormone luteinizzante sulle caratteristiche biofisiche della membrana delle cellule della granulosa: ruolo del calcio intracellulare. *LH induced calcium elevation inhibits calcium conductance in swine granulosa cells*. Atti Soc. Ital. Sci. Vet., 45, 431, 1991.

The Authors studied the effect of LH on membrane currents and cytoplasmic free calcium in swine granulosa cells. LH markedly inhibited the delayed potassium outward current. The effect was time and dose dependent with maximum inhibition achieved in 30-180 sec with doses of 50 and 1 $\mu\text{g/ml}$ respectively. The LH effect was mimicked by the addition of ionomycin and removed by perfusing the cells with EGTA. The inhibitory effect of LH was independent of extracellular calcium but completely prevented by treating the cells with TMB-8 (a putative inhibitor of intracellular calcium mobilization). The measurement of intracellular Ca confirmed that LH increase intracellular calcium. The rise in calcium can be divided in two distinct phases: the first, transient, come from intracellular stores, the second, sustained, is derived from extracellular liquid. The Authors discuss the possible relationship between cytoplasmic free calcium and membrane electrical properties.

Mattioli M., Bacci M.L., Galeati G., Seren E.: Effects of LH and FSH on the maturation of pig oocytes in vitro. *Theriogenology*, 36, 95, 1991.

This research was designed to investigate the effects of LH and FSH (50 ng/ml) on pig oocyte maturation *in vitro*. Despite the marked cumuli expansion induced by gonadotropins, uridine uptake was not influenced by LH or FSH. By contrast, choline uptake in LH-treated oocytes was significantly higher than in FSH-treated or control. Gonadotropins accelerated meiotic progression, and after 30 hours of culture, the percentage of oocytes at the germinal vesicle stage was significantly lower in LH and FSH treated oocytes than in control oocytes. After 44 hours of culture, the percentage of oocytes reaching the MII stage was significantly higher in the presence of gonadotropins. The percentage of oocytes capable of sustaining male pronucleus formation was similar in the control and FSH-treated oocytes, while it was markedly increased by the addition of LH. The data reported indicate that *in vitro* pig oocytes tend to undergo meiotic maturation even in the absence of hormones. However, in our *in vitro* system, LH and FSH accelerated and facilitated meiotic progression, and LH selectively improved cytoplasmic maturation which is required to promote the formation of a male pronucleus.

Mattioli M., Barboni B., Seren E.: *Luteinizing hormone inhibits potassium conductance in swine granulosa cell.* J. Endocrinol., 129 supplement, abs. 195, 1991.

In previous experiments we have shown that LH can depolarize the membrane potential of swine granulosa cells (GC) and, as a consequence, that of the oocyte electrically coupled with these cells. It was also shown that GC can display different kind of potassium currents if adequately stimulated. Since changes in K conductance could explain the depolarizing effect of LH, the present research was designed to investigate the influence of this gonadotropin on the membrane currents of swine GC. GC stimulated by depolarizing steps from an holding potential of -40 mV to +60 mV displayed an outward potassium current (IK) with a reversal potential between -100 and -90 mV. IK had a delayed-rectifier kinetics and over a 1 sec pulse its maximum amplitude ranged between 100 and 500 pA. After recording for 3 min, the cells were perfused with recording solution (RS) containing 1 µg/ml of pig LH. The outward K current started to decrease 1 min after the perfusion, being reduced to about 20% of the initial amplitude after 4 min. 50% inhibition was reached after 2 min of perfusion. Similar inhibition was achieved by perfusing cells with dibutyl cAMP (1-10 mM). In this case 50% inhibition was reached in 1.30 min (5 mM cAMP). The effect of cAMP was clearly dose dependent and an almost complete suppression of the outward current was obtained with 10 mM cAMP in 1-2 min. GC perfused with control RS displayed unchanged outward K current for at least 10 min. These findings demonstrate for the first time a direct influence of LH on the bioelectrical properties of GC.

Mattioli M., Barboni B., Seren E.: *Luteinizing hormone inhibits potassium outward currents in swine granulosa cells by intracellular calcium mobilization.* Endocrinology, 129, 2740, 1991.

Potassium currents of swine granulosa cells were studied using the patch clamp technique in the whole cell configuration. Granulosa cells stepped to positive potentials (+60 mV) from -40 mV holding potential exhibit a slowly activating, noninactivating outward potassium current. Tail current reverse potential (between -90 and -100 mV) and the current inhibition brought about by the replacement of KCl with CsCl in the pipette solution indicate that this current is carried by K ions. LH was found to significantly

reduce the amplitude of this current. The effect was dose and time dependent. Similar inhibition (20-30% of the initial current) was reached with doses of 1-50 $\mu\text{g/ml}$, but in times proportionally shorter as the dose increased (50% inhibition was reached in 170-180 and 30-40 sec with 1 and 50 $\mu\text{g LH/ml}$, respectively). Much longer and variable times (3-10 min) were required with lower doses (0.2 $\mu\text{g/ml}$). The effect of LH was independent of extracellular Ca, while preexposure of cells to TMB-8, an inhibitor of intracellular Ca mobilization, completely prevented the effect of LH. Outward currents after LH treatment could be completely restored by perfusing the cells with ionomycin in Ca-free medium to facilitate calcium efflux from the cells. The present studies indicate that LH modifies the bioelectrical properties of swine granulosa cells. This effect is mediated by an elevation of intracellular calcium, probably mobilized from intracellular stores.

Mattioli M., Galeati G., Bacci M.L., Barboni B.: *Changes in maturation promoting activity in the cytoplasm of pig oocytes throughout maturation.* Mol. Reprod. Dev., 30, 119, 1991.

Maturation-promoting factor (MPF) was examined in maturing pig oocytes by electrofusing them with germinal vesicle (GV) oocytes. During the *in vitro* maturation of cumulus-enclosed oocytes, a first sharp rise in MPF was seen between 26 and 29h of culture (MI stage); MPF declined after 32h (AI-TI stages) and again reached high levels at 35h, where it remained for the rest of maturation. Denuded oocytes showed a similar behaviour, but MPF appeared 9h earlier and the rise, due to the asynchronous maturation of these oocytes, was not as sharp as in cumulus enclosed oocytes. Intact GV were observed after 44h of culture when cycloheximide was added at 26h, and chromosome decondensation and pronuclear formation were observed when the drug was added at 32h. α -amanitin, an RNA polymerase inhibitor, could completely inhibit the maturation of cumulus-enclosed oocytes, but denuded oocytes were insensitive to this treatment. Enucleated oocytes exhibited an increase in MPF after 24h of culture, and low levels of this factor were seen after 40h of maturation. These data indicate that both rises in MPF require active protein synthesis, whereas transcription is not necessary for the resumption of meiotic cycle. Nuclear activity may be required for the second rise in MPF.

Mattioli M., Galeati G., Cappannari C., Parmeggiani A. *HCG induced follicular growth and ovulation in prepubertal gilts.* J. Reprod. Fertil., Abstract Series N. 7, abs. 105, 1991.

The use of PMSG-HCG in combination or sequentially is widely used to induce ovulation in the pig. Many researches have however pointed out the LH pulse frequency and amplitude as the limiting factor for follicular growth and situations of anestrus such as lactation are essentially characterized by low LH pulse frequency whereas FSH secretion is not substantially altered. The present research was therefore designed to test the possibility of inducing follicular growth and ovulation in the pig by using only LH. Groups of 4 gilts were assigned to the following treatments: a) 100 IU HCG at 8 am and at 5 pm on day 1, 100 IU at 8 am on day 2, followed by 500 IU at 5 pm on day 3; b) 200 IU at 8 am on day 1, 100 IU at 12 am on day 2, followed by 500 IU at 12 am on day 3; c) 200 IU at 8 am on day 1, 100 IU at 12 am on day 2, 100 IU at 12 am on day 3 and 500 IU at 8 am of the 4th day; d) saline injected subcutaneously with the time schedule of treatment c. 55 to 60 h after the last HCG injection the gilts were sacrificed and the utero-ovarian tracts collected. The average number of ovulation per gilt was 21 ± 1.83 , 35.25 ± 2.29 , 30.25 ± 4.63 and 0 in group a, b, c and d respectively. The number of unovulated large ($>10\text{mm}$) follicles per gilt was 5.50 ± 1.04 , 1 ± 0.41 , 0.50 ± 0.29 in treatments a, b, c re-

spectively. Behavioural estrus in the presence of a mature boar was of normal length and duration in treatment b and c, while it was barely detectable in 3 out of 4 gilts of group a. The data here presented indicate that follicular growth and ovulation can successfully be induced by using HCG alone.

Padovani B., Gaiani R., Grasselli F., Tamanini C.: Caratteristiche della secrezione di LH in cavalle trattate con GnRH in diverse fasi riproduttive. *Characteristics of LH secretion in mares treated with GnRH in different reproductive stages*. Atti Soc. Ital. Sci. Vet., 45, 543, 1991.

We aimed to determine the secretion patterns of LH in cycling and anestrus mares prior to and during an infusion with GnRH. Before the treatment the mean LH concentrations observed in estrous mare varied between 10 and 12 ng/ml, while in diestrus were around 1.5 ng/ml. We did not observe pulsatile secretion of LH. GnRH induced an LH increase: in an estrous mare we observed an acute LH response with the highest levels within a few hours. Thereafter LH serum concentrations decreased. Similar responses were observed during the diestrus period, too. In the anestrus mare LH values increased slightly persisting almost the same for the whole period. These results suggest that GnRH induced LH response observed in estrus is possibly due to an exhaustion of the pituitary. During the seasonal anestrus the moderate response confirms that the pituitary is still sensitive to GnRH. Therefore the scarce LH concentrations during the anestrus season is likely due to a reduced synthesis and release of GnRH from hypothalamus.

Piva G., Masoero F., Chiesa F., Gaiani R., Fiorentini L.: Interferenza dell'arginina sui livelli ematici di somatotropo e di insulina in vacche da latte. *Interference of intravenous infusion of L-arginine on haematic levels of growth hormone and insuline in dairy cows*. Atti Congr. Naz. Assoc. Sci. Prod. Anim. (ASPA), 9, 201, 1991

L-Arginine and a mix of Lysine, Methionine and Threonine, were administered intravenously by rapid infusion into 3 non pregnant Holstein cows in 3 trials carried out 60, 190, and 220 days post partum. L-Arginine was infused at 0.1 and 0.22 g/kg b.w. and AA mix at 0.1 g/kg b.w. (lysine 0.047, methionine 0.02 and threonine 0.027 g/kg b.w.). Blood was sampled via jugular cannula at 07.00 and every 15 minutes during the 4 hours after infusion. Arginine and the AA mix did not determine significant effects on GH plasma levels but some individual responses were evident. All treatments evoked evident ($P < 0.05$) increments in plasma Insuline concentration, 60 minutes after infusion. Arginine and AA mix significantly (rank test) modified the plasma AA profile increasing ornitine and Argine and decreasing Isoleucine, Leucine, Istidine, and Phenylalanine levels.

Rubinsky B., Arav A., Devries A.L.: Cryopreservation of oocytes using directional cooling and antifreeze glycoproteins. *Cryo-Letters*, 12, 93, 1991.

A new technique and a simple apparatus were developed for cooling and warming cells rapidly, under controlled thermal conditions. The technique, which uses theca concept of directional cooling, was evaluated through analytical studies and experiments with immature pig oocytes. During attempts to develop optimal protocols for preservation of pig

oocytes by vitrification, it was discovered that antifreeze glycoproteins (AFGPs) from antarctic nototheniid fishes have special cryoprotective properties and dramatically improve the survival and the morphological integrity of pig oocytes rapidly cooled to cryogenic temperatures.

Rubinsky B., Arav A., Fletcher G. L.: *Hypothermic protection — A fundamental property of "Antifreeze" proteins.* Biochem. Biophys. Res. Commun., 180, 566, 1991.

For the last two decades fish antifreeze proteins have been considered to function exclusively in conferring freezing resistance to fish by binding to ice crystals and thereby depressing blood plasma-freezing points non-colligatively. We reported here the discovery of a second fundamental property of antifreeze proteins: the ability to protect cells and their membranes from hypothermic damage. Experiments were carried out exposing immature bovine oocytes to 4°C for 24 h in the presence of type I alanine-rich alpha helical antifreeze polypeptides (AFG) from winter flounder, type II cysteine-rich AFP from sea raven or type III AFP from ocean pout. The presence of AFP in the incubation medium resulted in an approximate four fold increase in the number of oocytes retaining an intact oolemma and a three fold increase in the number of oocytes able to undergo *in vitro* maturation. None of the control oocytes could be fertilized, whereas, of those incubated in AFP, the percentage which developed normally following fertilization was comparable to that observed for fresh oocytes. These results indicate that cold-sensitive mammalian cells can be rendered cold-tolerant through the addition of antifreeze proteins.

Rubinsky B., Arav A., Mattioli M., Barboni B., Devries A.L.: *Hypothermic protection of cells and membranes by antifreeze glycoproteins from antarctic fish.* Journal of Cryobiology, 1991.

Antifreeze glycoproteins (AFGPs) isolated from the blood of antarctic fish enhance the survival of porcine and bovine oocytes exposed to hypothermic temperatures (4°C). Protection appears to result from an interaction between the AFGPs and the cell membrane. In pig oocytes, which are known to be extremely sensitive to hypothermic temperatures, membrane potentials disappear following 24 hours exposure to 4°C. In the presence of AFGPs, approximately 70% of the pig oocytes exposed to 4°C for 24 hours retained a normal membrane potential. The protective effect of the AFGPs is a function of concentration and reaches saturation with 1mg/ml. Morphological examination showed that the oolemma retained its integrity in about 80% of the pig oocytes cooled to 4°C in the presence of AFGP, while none had an intact oolemma when cooled without AFGP. Bovine oocytes were also cooled to 4°C for 24 hours in the presence of AFGP and approximately 40% of these underwent normal fertilization, while none did the same after cooling without AFGP. These results suggest that the AFGPs interact with cell membranes resulting in maintenance of membrane function which is necessary for the oocytes to mature and undergo normal fertilization.

Seren E., Formigoni A., Parmeggiani A., Mattioli M.: *Effect of nutrient availability on LH secretion in prepubertal gilts and lactating sows.* International symposium on nuclear and related techniques in animal production and health. IAEA, Vienna-Austria, 114, 1991.

The present research was designed to describe the pulsatile secretion of LH in prepubertal gilts and lactating sows fed on different diets. In the first experiment 4 Large White gilts fed to appetite (7500 M.E./d) or on restricted diet (2800 M.E./d) were bled at 15 min interval for 24h (respectively 4th, 7th and 20th day from the beginning of the restricted diet, the day of refeeding and 5 day later). Feed restriction suppressed the pulsatile secretion of LH, while refeeding restore LH pulsatile secretion. In the second experiment 4 lactating sows were used. Blood samples were collected at 15 min interval for 12h on day 21-23-25-28 and 29 after parturition. Two sows were supplied with 9500 M.E./d throughout lactation whereas the other two animals, beginning from day 22 of lactation, were supplied with 17100 M.E./d. Weaning was carried out 29 days after parturition. Lactating sows fed a low energy diet were characterized by a low frequency of LH pulsatile secretion. The pulse frequency increased after feeding, on 25-28th day of post-partum, in sows fed with high energy diet: average 1.25 pulse/12h, compared to 0.25 pulse/12h observed in sows fed on low energy diet. The influence of energy intake was even marked at weaning when pulse frequency sharply increased (4 pulse/12h) on sows fed on the high energy diet, on the contrary in restricted animals no significant change in the LH episodic secretion was recorded. These data confirmed that energy intake and reproductive efficiency are closely related in prepubertal gilts and lactating sows.

Seren E., Parmeggiani A., Campanile G., Esposito L., Barile V.L., Montemurro N.: *Luteinizing hormone secretion associated with puberty in buffalo heifers.* Third World Buffalo Congress, Bulgaria, 660, 1991.

Six italian buffalo heifers 12-13 months old were bled once a month for 24 hours at 15 min intervals from May to December. Three heifers were kept in the presence of the bull while the other three animals were prevented from having any form of contact with the male. LH plasma levels were measured by validated RIA; ovarian activity was monitored every 10 days both by measuring plasma progesterone levels and by rectal palpation. The ovarian activity in the 3 heifers reared with the bull initiated after 454, 506 and 529 days respectively with a body weight of 353, 318 and 392 Kg. One of the three heifers kept in the absence of the bull did not show any sign of ovarian activity during the experimental period whereas the remaining two exhibited the first estrous cycle after 476 and 511 days of age with an average weight of 363 and 358 Kg. LH pulsatile secretion during the months preceding the first ovulation showed wide individual variations: from 0 pulses/24h to 6 pulses/24h. Mean pulse frequency was 2,3 pulses/24h. Pulse amplitude also showed wide variations ranging between 2 and 12 ng/ml. We did not observe any evident increase in LH pulse frequency as puberty approached. Only in the heifer bled at 23 days before puberty a substantial increase of LH pulse frequency was recorded. On the contrary the LH baseline levels significantly increased as ovarian activity approached. The pulsatile secretion of LH did not seem to be affected by the presence of the bull. After the onset of puberty LH pulsatile frequency was inversely related to progesterone plasma levels.

Shehu D., Arav A., Rubinsky B.: *L'effetto di una proteina antifreeze sulla sopravvivenza di ovociti bovini conservati a condizioni ipotermiche. The effect of antifreeze glycoprotein on the survival of immature bovine oocytes exposed to hypothermic conditions.* Atti Soc. Ital. Sci. Vet., 45, 473, 1991.

Immature bovine oocytes are very sensitive to low temperatures and lose their viability when exposed to temperatures below 10°C. This study was designed to test the effect of AFGPs (glycoproteins with antifreeze properties isolated from the blood of nototheniid antarctic fishes) on the viability of bovine oocytes maintained in hypothermic conditions. Immature bovine oocytes were kept in PBS supplemented with 20 mg/ml AFGP for 24 hours. The integrity of oolemma was determined in some of the oocytes using three different tests: morphological, fluorescein diacetate (FDA) staining, and trypan blue (TB) exclusion. These tests showed that 80-90% of the oocytes retained an intact membrane. Moreover, 64% of the oocytes matured *in vitro* reached the Metaphase II stage, and 48% underwent normal *in vitro* maturation and fertilization. On the contrary, only 23% of the oocytes cooled without AFGP reached the MII phase and none of them were fertilized. It is quite clear that AFGP enhance the survival of the oocytes protecting them from hypothermic damages. This is a dose-dependent effect and reaches saturation at 20 mg/ml. Probably AFGP interact with the proteins of the membrane causing the preservation of its functions.

Terzano G.M., Barile V.L., Annicchiarico G., Parmeggiani A., Esposito L.: Pubertà e mantenimento dell'attività ciclica ovarica in bufale (*bubalus bubalis*) di razza mediterranea. *Puberty and maintenance of cyclic ovarian activity in the mediterranean buffalo* (*bubalus bubalis*). *Atti Soc. Ital. Sci. Vet.*, 45, 567, 1991.

The trial was carried out on 30 buffalo heifers, bred in open feed-lots, half reared with vasectomized bull to verify the male effect on the onset of puberty. Progesterone plasma levels were measured by RIA and ovarian structures were tested by rectal palpation every ten days beginning from one year of age. Before about 15 months any heifer showed cyclic activity. At about 18 months 40% of control heifers showed high progesterone levels, indicating functional corpora lutea.

1992

Accorsi P.A., Gaiani R., Formigoni A.: Correlazioni tra quadro endocrino-metabolico e produttività in bovine lattifere ad elevata produzione. *Milk production in high yielding dairy cows compared to hormonal and metabolic status*. *Atti Soc. Ital. Sci. Vet.*, 46, 91, 1992.

This study was conducted to verify the existence of a correlation between slight variations of milk production and hormonal and metabolic parameters. A group of high yielding Friesian dairy cows were studied from the onset until the 4th month of lactation; the milk production and the composition were evaluated. The plasma level of GH, T3, T4, IGF-1, PRL and insulin and of glucose, cholesterol, HBA, NEFA, triglycerides and urea were determined. The analysis of variance, performed among three slightly different levels of milk production, showed significant differences in plasma levels of insulin, T3, glucose and cholesterol.

Arav A., Rubinsky B., Shehu D., Fletcher G.L.: *Cryopreservation of semen, oocytes and embryos by directional solidification and vitrification with antifreeze glycoproteins*. Workshop Marly le Roy-France, Aprile 1992.

A new system using microprocessor control and a new technique of directional cooling was used for the controlled cryopreservation of cells. This apparatus has the ability to control independently the temperature gradients and the change of phase interface velocity. We report finding from experiments with spermatozoa. For the same cooling rate, the survival of the spermatozoa increases with the increase in freezing interface velocity. Using the same apparatus we report a new technique, entitled the minimum drop size technique, to vitrify under controlled and repeatable conditions. In addition we demonstrate that the various antifreeze proteins can improve dramatically the viability of oocytes and embryos preserved by the directional cooling technique and vitrification. The protective effect of the antifreeze proteins can be attributed to their ability to interact with and protect cell membranes at reduced temperatures and to their ability to modify the course of freezing in aqueous solutions.

Arav A., Shehu D.: *Fallopian tubes of cold stressed mouse protect embryos from hypothermic injury.* 12th Int. Congr. Anim. Prod., Holland, 3, 1387, 1992.

The ability of cold stressed mouse Fallopian tubes to protect mouse embryos and immature bovine oocytes was studied. Two-cell mouse embryos and immature bovine oocytes were stored inside cold stressed or control tubes for 24 and 48 hours at 4°C. 87% and 28% of 2-cell mouse embryos reached the blastocyst stage *in vitro* after storage for 48h in cold stressed and control tubes respectively. Similarly, the proportion of viable bovine oocytes after storage was markedly increased when cold stressed tubes were used (70% vs. 10%, $P < 0.01$). These data demonstrate that cold stressed tubes exert a protective effect against chilling injury in both mouse embryos and immature bovine oocytes.

Arav A.: *Vitrification of oocytes and embryos.* In: "Embryonic Development and Manipulation in Animal Production". Eds. Lauria A. e Gandolfi F., Portland Press, London, 2, 255, 1992.

The vitrification method consists of cooling a cell suspension to liquid-nitrogen temperature without the formation of ice crystals. This procedure seems to overcome all problems concerning the slow-freezing method. However, there are still a lot of problems that should be addressed before practical cryopreservation can be achieved. The most important limiting factor in vitrification is the high cryoprotectant concentration. The requested concentrations are so high that their osmotic or toxic effects are considerable. The directional cooling stage can assure an accurate control of the vitrification process as well as the very high cooling and warming rates (10000 K/min) that can be reached. We have developed a new method for vitrifying oocytes and embryos called minimum drop size (MDS) technique. Cooling and warming oocytes and embryos very rapidly (1750 K/min) in small drops (0.06 ml) containing a low concentration of cryoprotectant solution resulted in apparent vitrification; however, the viability of pig oocytes, pig embryos and mouse embryos was compromised. The addition of 'anti-freeze' glycoproteins, isolated from antarctic fishes, resulted in a dramatic increase in the survival rate of oocytes and embryos.

Bacci M.L., Davalli P., Forni M., Corti A.: Ornitina ed adenosilmetionina decarbossilasi: andamento durante l'accrescimento follicolare nel maiale. *Ornithine and adenosilmethio-*

nine decarboxylase activity: modification during the follicular growth in the pig. Atti Soc. Ital. Sci. Vet., 46, 237, 1992.

In order to investigate the polyamines role in the follicular growth, the activities of ornithine and adenosilmethionine decarboxylase (ODC and AdoMetDC), known to be the limiting enzyme for polyamines synthesis, were monitored in the somatic compartment of the follicle. Thirty four prepubertal gilts were injected with 1250 I.U. of PMSG and, 60h later, with 750 I.U. of HCG. Groups of two gilts were ovariectomized at prefixed times. The granulosa cells were mechanically separated from the theca layers and the two different tissue were immediately frozen. The enzyme activities were assayed in crude extract by measuring the release of $^{14}\text{CO}_2$ from carboxyl-labelled ornithine or adenosilmethionine. The enzyme activities were expressed as pmoles $^{14}\text{CO}_2$ released/mg protein/30 or 60 min (ODC or AdoMetDC respectively). The ODC and AdoMetDC levels observed were positively related with the follicular growth showing, after the PMSG administration, a progressive increase. These activities peaked 5-9h after HCG administration to return near basal levels.

Barboni B., Galeati G., Shehu D., Mattioli M.: Ruolo dell'AMPc nel controllo della maturazione meiotica della cellula uovo. *Involvement of cAMP in the control of oocyte maturation.* Atti Soc. Ital. Sci. Vet., 46, 251, 1992.

The involvement of cAMP in the control of pig oocyte maturation *in vivo* and *in vitro* has been investigated. After triggering oocyte maturation *in vivo* with an HCG based treatment, the intracellular level of cAMP showed a dramatic and transient rise. After 24h the levels were again basal. Similar transient rise in the level of cAMP was recorded in oocyte maturing *in vitro* with LH. In this case the increase was, however, of shorter duration with basal levels recorded after 12h of culture. The influence of cAMP on oocyte maturation was evaluated by exposing the oocytes to 1) db-cAMP, 2) LH, 3) an inhibitor of phosphodiesterase. The results of this research suggest that: a) the meiotic arrest is unlikely to be maintained by the low levels of cAMP found before maturation b) high levels of cAMP throughout maturation maintain meiotic arrest but transient increases promote meiotic maturation, c) the increase in cAMP content recorded in gonadotropin-induced maturation is probably confined to the first 10-20h of maturation by the activation of phosphodiesterase.

Barboni B., Mattioli M., Seren E.: *Meiotic competence of growing oocytes fused with enucleated fully grown oocytes.* 12th Int. Congr. Anim. Prod., Holland, 1, 306, 1992.

Growing bovine oocytes, (40-60 μm in diameter), were electrofused with fully grown enucleated bovine oocytes to test whether meiotic incompetence of growing oocytes depends on inadequate cytoplasm maturation. The reconstituted oocytes resumed meiotic maturation and sustained male pronucleus formation after *in vitro* fertilization.

Davalli P., Bacci M.L., Forni M., Corti A., Seren E.: *Ornithine decarboxylase activity in follicular granulosa and theca cells after gonadotropin treatment of prepubertal gilts.* Atti della Società Italiana di Biochimica (SIB), Montegrotto Terme, PD, 2 Giugno 1992.

It has been firmly established now that polyamines are required for normal and pathological cell growth. This prompted us to study whether they play a role in the proliferation-degeneration sequence to which the ovarian follicles undergo during the various phases of the estrous cycle under the action of gonadotropins. Thus, we measured ornithine decarboxylase (ODC) activity separately in follicular theca and granulosa cells from ovaries of prepubertal gilts treated with gonadotropins. After treatment with PMSG a progressive increase in the enzyme activity was detected in granulosa cells, reaching 4-fold over the control after 60 h. In theca cells the activity of the decarboxylase was unaffected by PMSG during the same time interval. In animals receiving HCG after 60h of PMSG treatment, a further marked increase of the granulosa enzyme activity occurred 5h later, reaching 7-fold over the value attained with PMSG at 60h. Nine hours after HCG administration ODC activity was back to the latter value and continued to decrease thereafter. In theca cells ODC was stimulated by HCG even more than in granulosa cells.

Galeati G., Bacci M.L., Barboni B., Accorsi P.A.: Controllo dell' accrescimento follicolare in scrofette sottoposte a castrazione ormonale. *Control of gonadotropin secretion in hormonal castrated sows.* Atti Soc. Ital. Sci. Vet., 46, 233, 1992.

This research was designed to test the possibility of inducing follicular growth in sows treated twice daily with 1.5 mg of LH-RH agonist for 20 days. Beginning from the 15th day, sows were submitted to the following treatments: A) 200 I.U. HCG every 24h for six days; B) 1250 I.U. PMSG on 15th and 18th day; C) 1250 I.U. PMSG on 15th and 18th day followed by 200 I.U. every day between the 15th and 20th day. Control animals were treated for all the experimental period with the LH-RH agonist. Follicular growth was evaluated either by measuring estradiol plasma levels throughout the treatment or by morphological examination of the ovaries. Treatment A did not induce any follicular growth, while treatment C caused a marked follicular development up to the preovulatory stage. Treatment B was less effective to bring the follicles to the preovulatory stage. These data demonstrate that in hormonal castrated sows only a combined treatment of PMSG+HCG can sustain follicular growth.

Grasselli F., Gaiani R., Tamanini C.: Seasonal variation in the reproductive hormones of male goats. *Acta Endocrinol.*, 126, 271, 1992.

The aim of this work was to study the circannual plasma profiles of LH, PRL, testosterone (T) and estrone sulfate (E1S) in different periods of the year and to characterize the possible variations in LH and PRL release patterns. We also tried to verify a possible relationship between plasma PRL fluctuations and ambient temperature and the influence of an acute stress condition on levels of plasma PRL. Sex steroids and PRL showed marked circannual variations, with the highest levels during the summer (July) and the lowest during the winter-early spring (March). The concentrations of plasma LH did not indicate significant seasonal variations. A positive relationship was observed between plasma levels of PRL and E1S and ambient temperature. The patterns of LH release seemed to change depending on season, but this was not an obvious and common feature. The hormone concentrations for plasma PRL profiles seemed to be influenced by an acute stress condition, with the more marked variations when the plasma levels of PRL were low.

Mattioli M., Barboni B., DeFelice L.J.: *Gap junctional communication in early swine embryos.* 12th Int. Congr. Anim. Prod., Holland, 3, 1258, 1992.

Mattioli C., Cappannari C., Seren E.: Comunicazione intracellulare nelle prime fasi di sviluppo dell'embrione di maiale. *Gap junctional communication in early swine embryos.* Atti Soc. Ital. Sci. Vet., 46, 247, 1992.

The Authors studied cell to cell communication in early swine embryos collected 2-8 days after fertilization. Blastomers did not show any functional communication until the compact morula stage was reached. At this stage, all the blastomers were electrically coupled independently from their position. When blastomers isolated from these embryos were reaggregated, intercellular communication was re-established in 30-60 min. Assembly of functional communication depends on an active protein synthesis and seems involved in the process of compaction.

Mattioli M., Galeati G., Barboni B., Cappannari C., Seren E.: *cAMP in pig oocytes: effects on meiotic resumption and intracellular levels throughout maturation in vivo and in vitro.* J. Reprod. Fertil., Abstract. Series N. 9, abs. 93, 1992.

Pig cumulus enclosed oocytes were exposed to dibutyryl cyclic AMP (db-cAMP), isobutyl methyl xanthine (IBMX, 0.2 mM) and LH (50 ng/ml). After 40h of culture with 0.2, 0.5, 1 and 5mM db-cAMP 6, 50, 92 and 98% of the oocytes showed an intact germinal vesicle (GV). When db-cAMP (1 mM) was maintained only during the first 20 hours, the percentage of oocytes undergoing germinal vesicle breakdown (GVBD) by 30h of culture was similar to controls. Addition of db-cAMP after 20h of culture prevented GVBD. Inhibition of phosphodiesterase activity by IBMX slightly increased the frequency of GV oocytes after 40h of culture. Its effect was enhanced when it was used in combination with sub-liminal doses (0.2 mM) of db-cAMP (GV=98%) or with LH (GV=100%). In order to investigate whether cAMP acts before or after MPF formation, MII oocytes fused with GV oocytes were treated with 1 mM db-cAMP. After 3h of culture all reconstituted oocytes (11/11) had two metaphase plates. The levels of cAMP were measured in oocytes maturing *in vitro* or *in vivo*. The results of these experiments indicate that: a) cAMP can effectively inhibit meiotic resumption, b) its influence is exerted shortly before GVBD but proximally to MPF production-activation, c) the intracellular levels of cAMP before maturation are low, similar to those recorded at about the time of GVBD (24h). Cyclic AMP is therefore unlikely to be involved in the maintenance of meiotic arrest in pig oocytes whereas its increase induced by LH may take part in the timing of meiotic progression.

Mattioli M.: *Biology of oocyte maturation.* In: "Embryonic Development and Manipulation in Animal Production". Eds. Lauria A. e Gandolfi F., Portland Press, London, 2, 17, 1992.

Oocyte maturation and its control is described in light of the data obtained from experiments conducted both *in vivo* and *in vitro*. The first condition examined is the acquisition of meiotic competence. This competence is probably dependent on the accumulation of specific factors in the cytoplasm, although the appearance of channels on the oolemma may also play a role. Competent oocytes do not resume meiosis in the absence of gonadotropin stimulation and somatic cells are responsible for this condition. Somatic cells

probably exert this effect by sending inhibitory signals to the oocyte. The levels of cAMP, putative inhibitor, are dependent both on cell-oocyte transfer and on the oocyte phosphodiesterase activity. This inhibition is removed by peak levels of luteinizing hormone (LH). Cumulus-oocyte uncoupling or transformation of the influence of somatic cells from inhibitory to excitatory are the hypothesized means by which LH triggers maturation. Meiosis progression following the LH surge is regulated by the cyclic appearance of maturation promoting factor in the ooplasm. During maturation other changes take place in the cytoplasm which prepare the oocyte for fertilization.

Parmeggiani A., Seren E., Esposito L., Borghese A., Di Palo R., Terzano G.M.: *Plasma levels of melatonin in buffalo cows.* Proceedings of the International Symposium Prospects of buffalo production in the Mediterranean and the Middle Est, Doki, Cairo, 62, 401, 1992.

Parmeggiani A., Zicarelli L., Mongiorgi S., Esposito L., Barile V.L., Terzano G.M.: Modificazioni della concentrazione plasmatica della melatonina in manze e bufale durante diversi periodi dell'anno. *Annual changes of melatonin plasma levels in heifers and buffalo cows.* Atti Soc. Ital. Sci. Vet., 46, 377, 1992.

Plasma levels of melatonin in 24 mediterranean buffalo cows and heifers breed in Italy were studied. The animals were bled for one day at two hour intervals in different periods of the year. Plasma concentration of melatonin was measured by RIA. Melatonin was consistently seen to increase (up to 60 pg/ml) during the night and the levels reached were influenced by season. During the daylight plasma levels of melatonin ranged between 5 and 10 pg/ml. These results suggest that the buffalo may be considered a photosensitive species and melatonin represents a light-dark transduction signal.

Rubinsky B., Arav A., Devries A.L.: *The cryoprotective effect of antifreeze glycopeptides from antarctic fishes.* Cryobiology, 29, 69, 1992.

Special biological antifreezes from some polar fishes have been shown to adsorb to specific faces of ice crystals and inhibit crystal growth. Vitrification in the presence of antifreezes therefore may help enhance postvitrification viability of cells and tissues. We report here that the addition of fish antifreeze glycopeptides (AFGPs) to vitrifying solutions increases post-thaw viability in cultured immature pig oocytes and two-cell stage embryos of mice and pigs after rapid cooling to cryogenic temperatures. Without AFGPs or with addition of antifreeze peptides (AFPs), the particular vitrifying solution and cooling/warming/culturing regime used in this study produced zero viability. In the presence of the AFGPs (40 mg/ml) survival of pig oocytes and embryos was increased to about 25% and that of mouse embryos to 82%. The absence of protective effect by AFPs suggests that protection by the AFGPs is unrelated to their common antifreeze property, i.e. inhibition of ice crystal growth, but probably results from interaction with and stabilization of the cell membranes unique to the AFGPs.

Rubinsky B., Mattioli M., Arav A., Barboni B., Fletcher G.L.: *Inhibition of Ca²⁺ and K⁺ currents by antifreeze proteins.* Am. J. Physiol., 262, R542, 1992.

For the last two decades, the research on fish antifreeze proteins has focussed exclusively

on their ability to depress noncolligatively blood plasma freezing points, presumably by binding to ice crystals. We report evidence that antifreeze polypeptides from the winter flounder (*Pseudopleuronectes americanus*) have another special property, the ability to block ion channels. In experiments with porcine granulosa cells we show, using the patch-clamp technique in the whole cell configuration, that these proteins suppress effectively calcium and potassium currents. The results of dose-response studies indicate a protein-protein interaction mechanism.

Seren E., Parmeggiani A., Campanile G., Di Palo R., Montemurro N., Barile V.L.: Modificazioni endocrine durante il ciclo estrale nella bufala. *Periostrous endocrine changes in italian buffaloes*. Atti Soc. Ital. Sci. Vet., 46, 365, 1992.

Seren E., Parmeggiani A., Zicarelli L., Montemurro N., Pacelli C., Terzano G.M.: *Periostrous endocrine changes in italian buffaloes*. Proceedings of the International Symposium Prospects of buffalo production in the Mediterranean and the Middle Est, Doki, Cairo, 62, 393, 1992.

The variations of progesterone, oestrogens, PGFM, PRL, LH and FSH during the spontaneous oestrous cycle of 5 italian buffaloes were studied. The animals were synchronized with PGF-2 α . From day 15-17 of the oestrous cycle the animals were bled every 3-6-12-24 hours for 21 days. Dynamic ovarian changes were monitored throughout the experimental period by transrectal palpation and ultrasonography. The concentration of progesterone dropped before oestrus and ovulation, at the same time peak levels of PGFM were recorded. High pulses of PGFM were then found until luteolysis was completed. After the progesterone drop, oestradiol progressively increased then triggering LH and FSH ovulatory peak. PRL values occasionally increased at the time of luteolysis and during oestrus as well as ovulation even if this pattern was not observed in all the animals.

Shehu D., Arav A.: L'effetto di un fattore antistress prodotto dall'ovidotto di topo sulla sopravvivenza di embrioni ed oociti conservati a temperatura 4°C. *Fallopian tubes of cold stressed mouse protect oocytes and embryos from hypothermic injury*. Atti Soc. Ital. Sci. Vet., 46, 255, 1992.

The ability of cold stressed mouse Fallopian tubes to protect mouse embryos and immature bovine oocytes was studied. Two-cell mouse embryos and immature bovine oocytes were stored inside cold stressed or control tubes for 24 and 48 hours at 4°C. The culture of 2-cell mouse embryos after 48 hours of hypothermy yielded 87% and 2% blastocysts from conditioned and control tubes respectively. The viability of bovine oocytes stored inside cold stressed tubes was 83% after 24 hours and 70% after 48 hours of cold exposure. On the contrary, oocytes of control tubes showed a lower survival as only 31% and 10% of them was viable at the end of 24 and 48 hours of exposure at 4°C. These results show that cold stressed tubes can acquire the ability to protect both mouse embryos and immature bovine oocytes from hypothermic injury. Similar results were obtained using conditioned oviducts of prepubertal mice or transferring control embryos in cold stressed tubes. This suggests the existence of a protective factor synthesized and secreted from the Fallopian tube in response to cold shock.

Esposito L., Soflai Sohee M., Campanile G., Di Palo R., Annichiarico G., Allegrini S.: Modificazioni ormonali durante il ciclo estrale in bufale con calori silenti e/o anovulatori o con inadeguata fase luteinica. *Endocrine changes during oestrus cycle in buffaloes with silent oestrus or ovarian disorders*. Atti Soc. Ital. Sci. Vet., 46, 371, 1992.

Zicarelli L., Campanile G., Seren E., Borghese A., Parmeggiani A., Barile V.L.: *Periestrus endocrine changes in italian buffaloes with silent oestrus or ovarian disorders*. Proceedings of the International Symposium Prospects of buffalo production in the Mediterranean and the Middle Est, Doki, Cairo, 62, 397, 1992.

The authors have studied the endocrine changes during the oestrus cycle in 4 buffalo cows; 2 of them showing silent oestrus, another anovulatory heat and the last one an inadequate luteal phase. The plasma levels of LH, prolactin, progesterone and oestradiol 17 β were evaluated by RIA. No correlations were found between the concentration of oestradiol 17 β and the absence of oestral behaviour. The ovulatory LH peak was not observed in the animal showing anovulatory heat. Normal values of oestradiol 17 β and LH were found in the cow showing inadequate luteal phase.

1993

Accorsi P.A., Gaiani R., Formigoni A., Soflai Sohee M.: Variazioni endocrine e metaboliche in bovine ad alta produzione alimentate con diverse quantità di concentrati prima e dopo il parto. *Hormonal and metabolic variation in high yielding dairy cows fed with different quantities of concentrate before and after calving*. Atti Soc. Ital. Sci. Vet., 47, 325, 1993.

Thirty two high yielding Italian Friesian dairy cows, during their last month of the dry period were used. The animals were divided into two groups: group 1 received a daily ration composed by hay and 6 kg of concentrate; group 2 received hay and 2 kg of concentrate. Immediately after calving each group of animals was divided into two other groups: 1A, 1B and 2A, 2B. All the animals were fed with TMR constituted of 50% hay and 50% concentrate. In addition group 1A and 2A received 6 kg of concentrate by self-feeding system. Milk production and plasma levels of GH, insulin, NEFA and glucose were determined weekly during a period of 60 days. The animals of groups 1A and 2A showed higher milk production than those of groups 1B and 2B. GH plasma levels were lower in group 1A and 2A animals, on the contrary in these animals higher levels of insulin were recorded. Glucose plasma levels were different only between 2A and 2B groups. No differences were observed among NEFA plasma levels.

Arav A., Ramsbottom A., Baguisi A., Rubinsky B., Roche J.F., Boland M.P.: *Vitrification of bovine and ovine embryos with the MDS technique and antifreeze proteins*. Congress of Cryobiology, 1993.

Bovine embryos at the morula-early blastocyst stage were successfully preserved by vitrification using the minimum drop size technique (MDS) and antifreeze proteins (AFP). The embryos were first exposed to a solution of 25% VS3, (1.625M glycerol in phosphate buffer saline (PBS)) for 15 min at room temperature (22°C). The embryos were then transferred to a solution of 75% VS3 with either: 1) 40 mg/ml AFP type 1, 2) 40 mg/ml AFP type 3, 3) 40 mg/ml AFGP or 4) 6% w/v BSA. They were kept in these solutions for 2 minutes at room temperature and then placed on a microslide in drops of 0.1 μ l. The

embryos in the drops were cooled with a cooling rate of 4000°C/min to -130°C on a directional stage cryomicroscope (DSC). After 15 min at -130°C, the embryos were warmed on a DSC to 22°C with a rate of 4000°C/min. After thawing the embryos were diluted in 1M sucrose for 1 min and either incubated in 5% CO₂ in air at 39°C for evaluation of developmental rates *in vitro* or directly transferred to recipients *in vivo*. The BSA did not protect the vitrified embryos. The AFP of type 1 was particularly effective in protecting the cryopreserved embryos resulting in an *in vitro* hatching rate of 65%, comparable to that in fresh embryos. While none of the bovine embryos vitrified in 75% VS3 with BSA survived, between 44% to 50% of the embryos preserved with antifreeze proteins developed normally into fetuses.

Arav A., Rubinsky B., Fletcher G., Seren E.: *Cryogenic protection of oocytes with antifreeze protein.* Mol. Reprod. Dev., 36, 488, 1993.

Proteins belonging to a family of compounds known as antifreeze proteins interact with oocytes and protect the oolemma from damage at cryogenic temperatures. Experiments were performed with pig oocytes rapidly cooled to cryogenic temperatures in vitrifying solutions with and without antifreeze proteins. Four different types of antifreeze polypeptides and glycoproteins were tested. The integrity of the oolemma was examined with fluorescein diacetate (FDA) staining and morphological examinations. Results show that the pig oocyte oolemma is a primary site of injury during exposure to low temperatures and that all different proteins have a similar ability to interact with and protect the oolemma. Our results may be important in developing solutions for long-term preservation of oocytes at cryogenic temperatures (cryopreservation).

Arav A., Shehu D., Mattioli M.: *Osmotic and cytotoxic study of vitrification of immature bovine oocytes.* J. Reprod. Fertil., 99, 353, 1993.

Four experiments were conducted to determine the composition of a solution suitable for vitrification of immature bovine oocytes. The osmotic and cytotoxic effect of different concentrations (0, 0.25, 0.5 and 1M) of nonpermeating solutes (sucrose versus trehalose) were examined. In addition, the effect of permeating cryoprotectants such as glycerol, dimethyl sulfoxide, and propylene glycol (40% w/v) on the viability of oocytes was studied to determine the optimal time of exposure and the most suitable cryoprotectant. Exposure of bovine oocytes to trehalose was less harmful than exposure to sucrose ($P < 0.01$), and high normospermic fertilization (70%) was achieved after exposure to 0.25 M trehalose. Propylene glycol was chosen as the cryoprotectant for the vitrification of immature bovine oocytes because of its fast permeating rate and its low cytotoxic effect. The composition of this solution (40% propylene glycol and 0.25M trehalose in PBS containing 4% w/v BSA) appeared to be suitable for vitrification, as the fertilization rate of the vitrified oocytes was 37% (36 of 97).

Bacci M.L., Seren E.: *Produzione di embrioni in vitro. In vitro embryos production.* Atti Congr. Naz. Assoc. Sci. Prod. Anim. (ASPA), Tavola Rotonda: Biotecnologie avanzate e produzione animale, 10, 7, 1993.

The present review aims to summarize the technologies and the problems regarding the

in vitro embryos' production of domestic species like bovine, ovine and swine. In particular the authors described the major points of the whole process that are represented by the *in vitro* capacitation of ejaculated spermatozoa, the *in vitro* maturation of oocytes collected from ovaries of slaughtered animals (IVM), the culture conditions need to obtain the *in vitro* fertilization (IVF), and finally the culture of the embryos until the transfer in foster mother or the final utilization. However the knowledge in biotechnology field has been greatly improved in the last ten years, the results so far obtained, though promising, could not allow a large scale application. In particular in swine there are two major problems that are not yet solved. These problems are the polyspermic fertilization, that is frequently observed in swine but less evident in bovine and ovine, and the adequate cytoplasmic maturation, problem that is common to other species.

Mattioli M., Barboni B., Seren E.: *Influence of progesterone on boar sperms capacitation.* 12th Joint Meeting of British Endocrine Societies, Abs. 201, 1993.

Barboni B., Mattioli M.: *Influenza del progesterone sulla capacitazione del seme suino. Influence of progesterone on boar sperm capacitation.* Atti Soc. Ital. Sci. Vet., 47, 363, 1993.

This research was designed to test the influence of progesterone (P4) on the fertilizing ability of boar semen in an *in vitro* fertilization system. Washed boar sperm was incubated in TCM199 with or without P4 (2 µg/ml) for 2 or 4h. *In vitro* matured oocytes were then added to the sperm suspension. Due to the high incidence of polyspermy which characterizes the fertilization *in vitro* of pig oocytes the mean number of spermatozoa/oocyte was used to judge sperm fertilizing ability. P4 significantly increased the fertilizing ability of boar semen incubated under capacitating conditions for 2h or 4h. By contrast sperm fertilizing ability was not improved by the addition of P4 after incubation for capacitation, thus indicating an influence of the steroid on capacitation rather than on fertilization. The chlortetracycline (CTC) test was also used to confirm the influence of P4 on the capacitation process. The test revealed that P4 accelerates the acquisition of the fluorescent capacitated pattern (fluorescence in the post acrosomal region). Maximum difference was recorded after 2h of incubation when the capacitated pattern was present in 45% of P4 treated sperm compared to 24% recorded in the control. These data suggest that the rise in P4 occurring in the oviduct around the time of ovulation may play a physiological important role in the processes that prepare the sperm for fertilization.

Castellani Ceresa L., Mattioli M., Radaelli G., Barboni B., Brivio M.F.: *Actin polymerization in boar spermatozoa: fertilization is reduced with use of cytochalasin D.* Mol. Reprod. Dev., 36, 203, 1993.

The aggregational state of actin in boar spermatozoa after capacitation and the acrosome reaction has been examined by several methods. *In vitro* fertilization (IVF) experiments were conducted in the presence and absence of cytochalasin D (CD) to evaluate the role of actin polymerization in the events of fertilization. The fertilizing capacity was very high in controls, but, when CD (an inhibitor of the polymerization of actin) was added to the capacitation medium, there was a marked decrease in the fertilizing capacity of the boar spermatozoa. There was a further decrease when CD was present during both capacitation and fertilization processes. In addition to the IVF tests, biochemical and immunoelectron microscopic methods were used to analyze the state of aggregation of actin in boar spermatozoa after capacitation, and the acrosome reaction. By immunoelectron

microscopy with a phalloidin probe, there were no gold particles, indicating the presence of F-actin on boar sperm heads capacitated and acrosome-reacted in media containing CD. By sodium dodecyl sulfate-polyacrylamide gel electrophoresis there were differences in NP-40 solubility, reflecting actin polymerization, between CD-treated and untreated sperm. These results suggest that actin polymerizes during capacitation and the acrosome reaction and that this polymerization is essential to the fertilization process.

Di Palo R., Parmeggiani A., Campanile G., Zicarelli L.: Stima del valore della ripetibilità dei livelli plasmatici di melatonina in bufale allevate in Italia. *Repeatability of melatonin plasma levels in buffaloes bred in Italy*. Atti Soc. Ital. Sci. Vet., 47, 331, 1993.

Plasma variations of melatonin pattern were evaluated during the two equinoxes and the two solstices, by sampling, at 2, 4 and 6 hours from sunset 15 buffaloes bred in 4 farms located in Campania. Melatonin patterns showed significative higher increases in buffaloes with higher seasonal reproductive trend. The repeatability melatonin plasma levels at 2 hours from sunset turned out to be 0.574. Repeatability values at 4 and 6 hours from sunset were 0.271 and 0.320 respectively. A discriminant function calculated within the seasons would have recognized the spring as the best seasons in which melatonin pattern was able to characterize the seasonality of the subjects.

Forni M., Bacci M.L., Marinelli M.: Apoptosi: suo ruolo nel processo della luteolisi. *Involvement of apoptosis in the luteolysis process*. Atti Soc. Ital. Sci. Vet., 47, 343, 1993.

The regression of the corpus luteum, both functionally and structurally, is essential for the normal ovarian cyclicity. Recent researches suggest that apoptosis can be involved in the luteolysis in cattle. The present research was designed to confirm this hypothesis as far as luteolysis in pig is concerned. The biochemical characterization of apoptosis was performed by the determination of the cleavage of genomic DNA into oligonucleosomal length fragments (185 bp each — ladder pattern). Furthermore we tested the opportunity of using the RT-PCR technique for a semiquantitative determination of the bovine clusterin messenger RNA.

Forni M., Bacci M.L., Shehu D., Galeati G.: Produzione *in vitro* di embrioni bovini sessati. *In vitro production of sexed bovine embryos*. 5° Meeting Nazionale: "Studio dell'efficienza riproduttiva degli animali di interesse zootecnico", Bergamo, 95, 1993.

Bovine follicular oocytes with surrounding intact, unexpandend cumulus recovered by mincing of ovaries tissue were matured and fertilized *in vitro*. Early embryos (two to four cells) were transferred to the bovine oviductal epithelial cell coculture and to the isolated mouse oviduct organ culture system. The overall rate of development to the blastocyst stage after 5-6 days of culture was respectively 15 and 27%. Part of the embryos (morula stage) was biopsied and sexed by PCR (Polimerase Chain Reaction). The accuracy of sexing was 94%.

Gaiani R.: Fattori neuroendocrini e resistenza alle malattie diffuse del pollame. *Neuroendocrine factors and resistance to the illness in the fowl*. Rivista di Avicoltura, 5, 27, 1993.

The Author presents a review about the effects of stress on the resistance to the illness in the fowl. There are concise anatomical and physiological notes regarding hypothalamus, hypophysis, surrenal glands and main linfoid organs of the fowl. The relationship between neuroendocrine factors and immunity defence mechanisms is described. The results of experiments of various authors indicating that managerial techniques could act as stressful factors, like handling, temperature, transport, etc, are referred.

Galeati G., Cappannari C., Seren E.: Meccanismo di trasduzione dell'ormone luteinizante nella cellula uovo di maiale. *Transduction mechanism for LH in pig oocytes*. Atti Soc. Ital. Sci. Vet., 47, 369, 1993.

This research was designed to investigate whether the production of cAMP in pig oocytes is controlled by follicle somatic cells. The Authors observed a transient rise in cAMP levels in oocytes (surrounded or not by cumulus cells) co-cultured *in vitro* with everted follicles in the presence of LH. In order to define which compartment of the follicle is involved in the stimulation of cAMP production in the oocyte, denuded oocytes were cultured with 3 different types of follicle somatic cells: granulosa cells, theca cells and cumulus cells. In the presence of LH, granulosa cells were the most active in stimulating cAMP production. Also the granulosa cells harvested from large follicles (6-7mm), exhibited an evident ability to stimulate cAMP accumulation in the oocyte. This influence progressively decrease as the diameter of the follicle was reduced. The stimulating effect of the granulosa cells (in the presence of LH) was temporary; in fact these cells lost their ability after 24h of culture with LH. The results of this research suggest that the increased levels of cAMP depend on the stimulation of the adenylate cyclase of the oocytes brought about by follicle somatic cells (mainly granulosa cells) exposed to LH.

Lulli V., Sperandio S., Bacci M.L., Forni M., Spadafora C., Lavitrano M.: Trasformazione genetica mediata da spermatozoi. *Sperm-mediated DNA transfer*. Atti del Congresso SIBBM (Società Italiana Biofisica e Biologia Molecolare), 30, 291, 1993.

Ejaculated sperm cells from both bovine and swine animals were used as vectors for transferring different plasmid DNAs into eggs during *in vitro* fertilization for bovine and *in vivo* fertilization for swine. PCR screening of hundreds of blastocysts showed that transformed embryos were obtained in both species, with varying efficiencies (0-20%) depending on the plasmid used.

Mattioli M., Barboni B., DeFelice L.J.: Calcium and potassium currents in porcine granulosa cells maintained in follicular or monolayer tissue culture. *J. Membr. Biol.*, 134, 75, 1993.

We studied membrane currents in granulosa cells (GC), immediately after collection or after variable culture time in the everted follicle wall or in the monolayer. GC in both systems express an inward calcium current (I_{Ca}) with T-type kinetics and voltage dependence. GC in the everted-follicle culture express an outward potassium current (I_K) kinetics, which remains unchanged during three days in culture. I_K has delayed-rectifier kinetics, but is insensitive to TEA, 4-AP and apamine. GC in monolayer culture develop a new, inactivating delayed-rectifier potassium current (I_{nK}), which progressively dominates as cells advance from day one to day three in culture. A similar I_{nK} was recorded in

large luteal cells. A possible link between luteinization and the appearance of I_{nK} is hypothesized.

Mattioli M., Barboni B., Parmeggiani A.: Controllo endocrino della maturazione della cellula uovo di *Oryzias Latipes*. *Endocrine control of oocyte maturation in Oryzias Latipes*. Atti Soc. Ital. Sci. Vet., 47, 375, 1993.

A series of experiments were carried out to define the endocrine control of oocyte maturation in *Oryzias Latipes*. *In vivo* oocyte maturation resumes 8-6h before spawning. Similar resumption of meiosis can be triggered *in vitro* either by LH or progestins. *In vitro* experiments demonstrated that somatic cells of the follicle are required for LH to induce maturation and that a strict relationship exists between follicle size and meiotic competence of the oocyte.

Mattioli M., Galeati G., Bacci M.L., Barboni B., Forni M., Shehu D., Seren E.: Produzione *in vitro* di embrioni bovini e suini. *In vitro production of bovine and swine embryos*. Atti della 1^a Conferenza Internazionale su: Stato dell'Arte delle Ricerche Italiane nel Settore delle Biotecnologie Applicate alle Scienze Veterinarie e Zootecniche, 35, 119, 1993.

New technology for the production of embryos *in vitro* has recently been developed on the basis of the increasing knowledge of the processes governing gamete maturation and their interaction. Oocyte maturation in the presence of follicle somatic cells exposed to gonadotropins has markedly increased the developmental competence of oocytes obtained from slaughtered animals. As far as IVF is concerned, some parameters such as incubation temperature, pH, time of gamete coculture and sperm concentration must be precisely defined. The identification of techniques suitable for the selection of sperm (gradient centrifugation, culture on oviductal cell monolayer) is an important step for improving quality and quantity of embryos produced *in vitro*.

Mattioli M., Galeati G., Barboni B., Seren E.: *Cyclic AMP production in vitro and in vivo by pig oocytes after HCG/LH stimulation*. J. Reprod. Fertil., Fourth International Conference on Pig Reproduction, Columbia, Missouri, May 24-26, 1993.

Intracellular levels of cAMP were measured in pig oocytes during the maturation *in vivo* and *in vitro*. The mechanisms involved in the modulation of adenosine cyclic monophosphate levels were then investigated in a successive series of experiments *in vitro*. The results of the work demonstrate that the levels of cAMP increase transiently in oocytes maturing both *in vivo* and *in vitro*. Granulosa cells, but not theca or cumulus cells, under the influence of LH seem to stimulate the production of cAMP by the oocyte. The influence of dibutyl-cAMP on meiotic progression suggests that the transient rise in cAMP may take part in the LH-induced resumption of meiosis.

Borghese A., Barile V.L., Terzano G.M., Pilla A.M., Parmeggiani A.: *Melatonin trend during seasons in heifers and buffalo cows*. 4th World Buffalo Congress, Sao Paulo-Brasil, 528, 1994.

Parmeggiani A., Di Palo R., Zicarelli L., Campanile G., Esposito L., Seren E., Accorsi

P.A., Soflai S.M.: Melatonina e stagionalità riproduttiva della bufala. *Melatonin and seasonality trend of reproduction in buffalo cow*. Atti del Seminario: Miglioramento dell'efficienza produttiva e riproduttiva nella specie bufalina, 39, 1993.

Parmeggiani A., Campanile G., Di Palo R., Accorsi P.A., Zicarelli L.: Melatonina e stagionalità riproduttiva nella bufala. *Melatonin and seasonal trends in buffalo reproduction*. 5° Meeting Nazionale: "Studio dell'efficienza riproduttiva degli animali di interesse zootecnico", Bergamo, 131, 1993.

Plasma levels of melatonin in mediterranean buffalo cows breed in Italy were studied. The animals were bled in different periods of the year: winter, spring, summer and autumn in natural daylight conditions. Plasma concentration of melatonin was measured by validated radioimmunoassay. Melatonin shows high levels during the night and the persistence of these levels is clearly related to the photoperiod. These secretory patterns were not observed in all the animals; in fact we found different modifications of plasma melatonin depending upon the different seasonal behaviour of the animals.

Pease G.R., Rubinsky B., Wong S.T.S., Roos M.S., Gilbert J.C, Arav A.: *An integrated probe for magnetic resonance imaging monitored skin cryosurgery*. Review of Cryobiology, 1993.

Cryosurgery of the skin is a common treatment for both benign and malignant skin cancers. Monitoring of the cryolesion during cryosurgery either without instrumentation or using thermocouples may be inaccurate because of the heterogeneous nature of tissue. We describe an integrated cryoprobe and magnetic resonance imaging probe which we use to obtain high resolution MR images of skin and subcutaneous muscle at 12 second intervals during cryosurgery.

Ramsbottom G., Arav A., Baguisi A., Rubinsky B., Roche J.F., Boland M.P.: *Hypothermic preservation of ovine embryos with antifreeze proteins*. Congress of Cryobiology, 1993.

Ovine embryo at the morula-early blastocyst stage were exposed to different concentration of antifreeze proteins of Type I and Type III (0, 1, 10 mg/ml), in PBS. For each experiment 20 embryos were placed in 100 μ l droplets of the different solutions, transferred to eppendorf vials and stored for 4 days at 4°C. The survival of the embryos was determined by their ability to hatch after 72h of culture. The survival of embryos in solutions without antifreeze proteins was 66% of controls. The control hatching rate was 71%. The survival of embryos preserved in solution containing 1 mg/ml or 10 mg/ml AFP of type III was 80% and 63% relative to controls, respectively. For embryos in solutions containing 1 mg/ml or 10 mg/ml AFP of type I, the survivals relative to controls was 103% and 84.5% respectively. These experiments show that antifreeze proteins have the general ability to improve survival of embryos during hypothermia. A concentration of 1 mg/ml AFP of type I seems optimal for ovine embryos.

Shehu D., Arav A., Spinaci M.: Effetto protettivo dell'ovidotto di topo sottoposto ad abbassamento della temperatura sulla sopravvivenza degli oociti immaturi di maiale. *Protective effect of cold stressed mouse oviducts*. Atti Soc. Ital. Sci. Vet., 47, 381, 1993.

Shehu D., Arav A., Mattioli M., Stefanelli E., Seren E.: *Protective effect of cold stressed mouse oviducts*. Congress of Cryobiology, 1993.

The expression of cold induced proteins has been reported either in ectothermic animals (insects, fishes, reptiles) or in mammals. Hypothermic protection is a recently discovered property of some of these naturally occurring proteins. We examined whether cold stressed mouse oviducts can produce factors with similar AFP properties. To this aim ice was placed on the lumbar region in the correspondence of oviductal tract of anaesthetized Swiss mice. Body temperature was allowed to drop at 21°C. This temperature was maintained for 10 min and then the animals were rewarmed to normal body temperature. The same procedure was repeated after 24 hours. The tubes were isolated within 4 hours from the second cold shock and immature pig oocytes that are very sensitive to low temperatures were introduced inside. Both oocytes and tubes were stored for 24 hours at 4°C. The results show that cold stressed mouse tubes can induce cold tolerance on pig immature oocytes. The nature and the mechanism of this effect are to be better clarified.

1994

Accorsi P.A., Gaiani R., Chiesa F., Formigoni A.: *Lactation influence on reproductive activity in dairy cows.* J. Reprod. Fertil., Abstract Series N. 14, Abs. 46, 1994.

Endocrine and metabolic patterns in milking and non milking Italian Friesian cows were investigated. Twenty high yielding cows were divided in two homogeneous groups immediately after parturition; 10 cows were regularly milked while the remaining 10 cows were dried. Blood samples were collected every 15 min for 10 hours at 8, 16, 23, 30, 37 and 51 days after parturition. The following analysis were carried out: bGH, prolactin, cortisol, insulin, IGF-1, T3, T4, glucose, NEFA, cholesterol, triglyceride, urea, 17 β -oestradiol, P4, and LH. Energy balance was negative in milking group during the first month of lactation, whilst it was always positive in the other group. Fat corrected milk yield was 31.4 ± 2.82 Kg/d. Insulin and glucose plasma concentration were significantly lower in milking cows. Cortisol, T3, NEFA, cholesterol and urea were higher ($P < 0.05$). bGH, prolactin, IGF-1, and triglycerides did not show any differences. LH pulses frequency, 17 β -oestradiol and P4 plasma concentration suggested an earlier resumption of the ovarian and hypothalamic activity in milking cows. Our results indicate that negative energy balance was not the only factor responsible in the resumption of reproductive activity.

Accorsi P.A., Gaiani R., Mongiorgi S., Chiesa F.: *Variazioni del bGH, insulina, glucosio e NEFA in bovine in lattazione e con lattazione impedita. Levels of bGH, insulin, glucose and NEFA in lactating and non-lactating dairy cows during 50 days after calving.* Atti Soc. Ital. Sci. Vet., 48, 1994 (in press).

Twenty high yielding Friesian dairy cows, immediately after parturition were divided into two groups: cows of the first group (LAT) were milked normally whilst cows of the second group were not milked after parturition (NOLAT). The plasma levels of GH, insulin, glucose, NEFA and milk production and composition were evaluated; the energy (EB) and protein balances (PB) were also calculated during 50 days after calving. The cows LAT were always in positive PB whilst they returned to positive EB only after 30 days of lactation; the group NOLAT were always in positive EB and PB. The plasma levels of insulin and glucose were significantly lower and those of NEFA higher in cows LAT than in those NOLAT. No differences between GH plasma levels of both groups were observed.

Arav A., Rubinsky B., Seren E., Roche J.F., Boland M.P.: *The role of thermal hysteresis proteins during cryopreservation of oocytes and embryos.* Theriogenology, 41, 107, 1994.

Recent studies on the short -and long-term preservation of oocytes and embryos show that certain proteins known as thermal hysteresis proteins (THPs) or antifreeze proteins (AFPs), can interact with the cell membrane and protect oocytes and embryos during exposure to cryogenic temperatures (-130°C to -196°C) and hypothermic (4°C) temperatures. The cryoprotective function is dependent on the concentration and type of THP used. During vitrification more than 40 mg/ml of such THPs is required; however, for successful cryopreservation using slow freezing or for short-term hypothermic storage (1-4 days), optimal concentrations are in the range of 0.1-1 mg/ml, depending on the type of THPs used. The ability of the THPs to interact with and stabilize the vitrification solution and the cell membrane, which is one of the primary sites of damage during cryopreservation, provides new opportunities for the cryopreservation of human and animal gametes.

Avallone L., Parmeggiani A., Esposito L., Campanile G.: *Correlation between prolactin, T3 and T4 levels in buffalo heifers during the whole year.* Fourth World Buffalo Congress, Sao Paulo-Brasil, 1994.

The levels of PRL, T3 and T4 in 19 heifers have been valued by RIA method during a whole year. The results showed that: a) in the November-April period, T3 and T4 levels progressively increased and PRL levels were positively correlated both to T3 ($r=0.327$; $P < 0.005$) and T4 ($r=0.345$; $P < 0.003$) levels; b) in the May-July period, T3 and T4 levels decreased but PRL levels increased and a negative correlation ($P < 0.05$) between PRL and T3 was found; c) no relation was found among the 3 considered hormones in the August-October period. The conceiving took place when the heifers were 2-years old both in the March-April period, in presence of high T3 and T4 and low PRL levels, and in the May-July period, in presence of low T3 and T4 levels and high PRL levels. In conclusion, no relation was found, at least in buffalo heifers, between reproductive activity and plasma levels of these hormones.

Bacci M.L., Forni M., Alzuet L.: *Valutazione dello stato di regressione dei corpi lutei di scrofa in gestazione mediante analisi della cinetica del processo apoptotico e della sintesi di progesterone.* *Evaluation of corpora lutea regression in pregnant sows by kinetic analysis of apoptosis and progesterone synthesis.* Atti Soc. Ital. Sci. Vet., 48, 1994 (in press).

The present work was conducted to determine the beginning of the apoptotic process in regressing corpora lutea comparing to the fall of progesterone (P4) circulating levels. Twelve pregnant sows (35-40 days of pregnancy) were ovariectomized by twos at 0, 6, 12, 24, 48 and 72 hours following the i.m. injection of 75 mg/sow of Cloprostenol. Corpora lutea were immediately collected and treated to assess the presence of oligonucleosomal fragmentation of genomic DNA, the total content of DNA and the luteal content of progesterone. Blood samples were collected to evaluate the circulating levels of progesterone. Plasma and tissue P4 returned to basal levels at 3-6 hours post injection respectively, though the first sign of DNA fragmentation appeared 24 hours post treatment.

Bacci M.L.: *Aspects of in vitro maturation and fertilization of oocytes in pig.* 7th International Meeting on Animal Reproduction, Murcia-Spain, 21, 1994.

The present review aims to summarize the technologies and the problems regarding the *in vitro* embryos' production of swine. In particular the author discussed the major points of the whole process that are represented by the oocyte maturation and male pronucleus formation, the oocyte maturation and penetrability and polyspermy and finally the sperm capacitation and fertilization *in vitro*. In swine IVM and IVF there are two major problems that are not yet solved. These problems are the polyspermic fertilization and the inadequate cytoplasmic maturation.

Borghese A., Seren E., Zicarelli L.: Nuove acquisizioni nel campo della riproduzione dei bufali. *News in buffalo reproduction.* Agricoltura e Ricerca, 153, 143, 1994.

The results of Agriculture Ministry Research Project on reproduction in Buffalo species are summarized concerning with following topics: puberty and maintaining of cycle ovarian activity; oestrous detection to improve artificial insemination efficiency; postpartum anoestrous; seasonality in relation with photoperiod and melatonin secretion; oestrous induction in acyclic buffaloes.

Borghese A., Terzano G.M., Barile V.L., Annichiarico G., Allegrini S., Seren E., Parmegiani A.: Pubertà e mantenimento dell'attività ciclica ovarica nella bufala. *Onset of puberty and cyclic ovarian activity in Buffalo heifers.* Atti del Seminario: Miglioramento dell'efficienza produttiva e riproduttiva nella specie bufalina, Bella (PZ), 1, 1993.

Borghese A., Terzano G.M., Barile V.L., Annichiarico G., Allegrini S., Zicarelli L., Montemurro N., Pacelli C., Campanile G., Esposito L., Di Palo R., Boni R., Seren E., Parmegiani A.: Pubertà e mantenimento dell'attività ciclica ovarica nella bufala. *Onset of puberty and cyclic ovarian activity in Buffalo heifers.* Agricoltura e Ricerca, 153, 5, 1994.

The trial was carried out on 120 Italian Mediterranean buffalo heifers one year old, equally subdivided in four farms and in two groups: vasectomized bull exposed (BE) and not exposed (NE). The heifers for one year were weighed each month, visited every 10 days by rectal palpation to test uterus horns, cervix, ovaries and bled every 10 days to detect plasma progesterone level (P4). The heifers medium age and weight at the first high P4 ($>1,5$ ng/ml) were 575 days and 359 kg while at the cyclic ovarian activity they were 623 days and 390 kg respectively. Puberty age and weight and cyclic ovarian activity were affected by different farm conditions for genotypes, breeding and nutrition, in particular by feeding levels that improve body growth and sexual maturity: particularly in Tormancina farm the best conditions were realized (100% of heifers cyclic at 20 months and at 421 kg), while in Jemma farm only 7 heifers attained puberty and conceived. Generally bull exposure negatively affected the onset of puberty. The prepubertal period was linked with decreasing photoperiod with more precocious puberty in heifers born before or during autumn. Many ovarian disorders (luteal cysts, persistent corpora lutea, irregular cycles etc.) were found affecting onset or cyclic ovarian activity and conceiving.

Faccioli G., Forni M., Bizzi L.: *Further characteristics of antiviral factors (AVFs) produced by virus-infected plants.* Phytopathol. Mediterr., 33, 17, 1994.

Antiviral factors (AVFs) extracted from various plants infected by different viruses using HCP, and partially purified by DEAE-column chromatography, were active in the system *Chenopodium amaranticolor*/TNV. Crude AVFs preparations electrophoresed on denaturing 5-15% gels (SDS-PAGE) showed band patterns normally differing from those of crude preparations of buffer-rubbed plants. The AVFs of *C. amaranticolor* gave two peaks of antiviral activity when electrophoresed on 7.5% non denaturing gels, showing that probably more than one molecular species or polymeric forms were present. AVFs showed several characteristics similar to those of interferons. Furthermore, AVFs was inhibiting TNV protein synthesis in a reticulocyte lysate system. Spray applications of AVFs on plants 30 min after virus inoculation significantly inhibited virus infections.

Forni M., Lalatta Costerbosa G., Barazzoni A.M., Bacci M.L.: Valutazione dello stato di regressione dei corpi lutei di scrofa in gestazione mediante determinazione in situ dell'apoptosi e indagini morfologiche. *Evaluation of corpora lutea regression in pregnant sows by morphological and in situ determination of apoptosis*. Atti Soc. Ital. Sci. Vet., 48, 1994 (in press).

The present work was carried out to evaluate changes induced in corpora lutea of pregnant sows by luteolytic process. Changes were observed at molecular and morphological levels. Nine pregnant sows (35-40 days of pregnancy) were ovariectomized, three each time, at 0, 12 and 48 hours following the i.m. injection of 75 mg/sow of Cloprostenol. Corpora lutea were isolated and fixed: a) in liquid nitrogen, to identify, on cryostat section, the presence of genomic DNA fragmentation (ApopTag Kit — Oncor); b) by immersion in paraformaldehyde and glutaraldehyde in order to investigate the structural aspects of apoptosis. The results show that apoptosis takes place in corpus luteum; the phenomenon is detectable with the *in situ* procedure 12hr after the luteolytic stimulus.

Gaiani R., Accorsi P.A., Soflai Sohee M., Chiesa F.: Concentrazioni degli ormoni tiroidei nel plasma, nel colostro e nel latte della bovina. *Thyroid hormones in plasma, colostrum and milk of dairy cows*. Atti Soc. Ital. Sci. Vet., 48, 1994 (in press).

The levels of total (T3) and free (fT3) triiodothyronine and total (T4) and free (fT4) thyroxine were measured in plasma, colostrum and milk of high-yielding Friesian dairy cows. Blood and milk samples were collected at calving and at 5, 15, 30, 60, 90, 120 days of lactation. Plasma levels of both total and free form of the thyroid hormones slightly increased as lactation proceeded. These hormones showed an opposite pattern in milk. T3 and fT3 concentrations were 3-times higher in colostrum than in plasma, but from day 15 of lactation both T3 and fT3 progressively decreased to reach 5-3 times lower levels in milk than those in plasma. T4 and fT4 levels were lower in first colostrum than in plasma, and even decreased in milk to undetectable values.

Galeati G., Accorsi P.A., Spinaci M., Mattioli M., Seren E.: *Ovarian response to LH and FSH in gilts chronically treated with gonadotropin-releasing hormone agonist*. Proceedings of the 13th IPVS Congress, Bangkok-Thailand, 405, 1994.

This research was designed to test the possibility of inducing follicular growth in prepubertal gilts chronically treated with a gonadotrophin-releasing hormone (GnRH). Treat-

ment with the agonist produced after one week a sustained suppression of the plasma concentration of FSH, abolished the pulsatile release of LH and prevented follicular development beyond 2.5 mm diameter. After 15 days of agonist treatment, groups of 4 sows were submitted, for six days, to the following treatments: A) infusion with porcine FSH; B) infusion with pFSH as in group A and after two days from the beginning of this treatment, sows were also treated with hourly pulses of porcine LH; C) treatment with hourly pulses of pLH; D) infusion with saline. Follicular growth was evaluated either by measuring estradiol plasma levels throughout the treatment or by morphological examination of the ovaries. Treatment A and C did not induce any follicular growth (follicles <2 mm in diameter; estradiol-17 β <3 pg/ml) while the treatment B stimulated a marked follicular development up to the preovulatory stage. These data demonstrate that in the absence of endogenous gonadotropins neither FSH or LH alone could restore follicular growth. By contrast a combined treatment of FSH and LH can sustain follicular growth.

Galeati G., Spinaci M., Forni M., Shehu D.: *Fertilization of bovine oocytes and early embryo development in mouse oviducts maintained in organ culture.* Proceedings of the First Integrated European Conference on: "Progress in embryo technology and genetic engineering in cattle and sheep breeding", Krakov-Poland, 199, 1994.

The present study was carried out to assess whether it was possible to obtain both fertilization of pig oocytes and early embryo development in isolated mouse oviduct maintained in organ culture. Five matured pig oocytes in small amounts of fertilization medium were transferred into the ampulla of each oviduct obtained from immature female CBA/B6 mice that had been superovulated. Then 1 μ l of semen was added and the oviducts were placed on the membrane of a Transwell plate over 1 ml of CZB medium. Two experiments were performed. In Experiment 1, oocytes were fixed and stained for assessment of fertilization or cultured for five days after which they were stained and their nuclei counted as a measure of cell number. In Experiment 2, embryos were cultured to the blastocyst stage and some were biopsied and sexed by PCR (Polimerase Chain Reaction). In Experiment 2 the rate of embryos that reached the blastocysts stage after seven days of culture was 24% and the removal of few blastomers did not alter developmental potential *in vitro*. In conclusion it is clear that the environment of the mouse oviduct can support fertilization and growth of bovine oocytes to the morula and early blastocyst stages.

Galeati G., Spinaci M., Seren E.: *Cyclic AMP concentration in pig and bovine oocytes during maturation in vitro: a comparative study.* J. Reprod. Fertil., Abstract Series N. 14, abs. 60, 1994.

Pig and bovine oocytes were cultured in the presence of gonadotropins and the cyclic AMP concentration in the oocyte was measured. The mean content of cAMP in bovine cumulus oocytes was 0.93 ± 0.08 fmol per oocyte at the beginning of the culture. Only in the presence of FSH a rise in cAMP up to 22.95 ± 2.91 fmol per oocyte was recorded after 2h of culture. The amount of cAMP then progressively reduces and after 6h of culture it was again at basal value until the end of maturation. There was no significant change in the amount of cAMP in the oocytes cultured with LH. Denuded oocytes showed constant low amounts throughout maturation regardless of the presence or absence of gonadotropins in the tissue culture medium. Similarly the cAMP concentration

rose in pig oocyte if the oocytes, surrounded or not by cumulus cells, were cocultured with the follicle wall in the presence of LH while FSH did not have any effect. The results demonstrate that: a) the patterns of cAMP changes are similar throughout the maturation in bovine and pig oocytes even if the increase in the concentration of the nucleotide could be obtained with different gonadotropin; b) the increased levels of cAMP in pig oocyte depend on the stimulation of the adenylate cyclase of the oocytes brought about by follicle somatic cells exposed to LH; c) bovine oocytes was unable to synthesize cAMP and derived it by transmission from the surrounding cumulus cells through gap junctions.

Galeati G., Spinaci M.: Livelli di AMP ciclico durante la maturazione *in vitro* dell'ocita di bovino. *Cyclic AMP levels during in vitro maturation of bovine oocytes*. Atti Soc. Ital. Sci. Vet., 48, 1994 (in press).

Intracellular concentrations of cAMP were measured in cumulus enclosed bovine oocytes and in denuded oocytes in different period of *in vitro* maturation in the presence of either LH or FSH or without hormones. Only FSH induced a transient rise in cAMP concentrations of cumulus enclosed oocytes. This increase was completed within the first 6h of culture. There is evidence that cAMP increases the number and the permeability of gap junctions. Therefore we investigated the degree of coupling between cumulus cells and oocyte in different periods of maturation, in the presence of either LH or FSH by measuring the ³H-uridine uptake in oocytes. After 3-4 hours of culture both LH and FSH treated oocytes started to show a progressive reduction in uridine uptake. After 9 hours of culture FSH only was able to maintain an efficient coupling between cumulus cells and oocyte.

Galeati G.: *Oocyte reaction to penetrating sperm*. Zygote, 2, 355, 1994.

Before fertilization the egg is metabolically quiescent and its nucleus is arrested at metaphase of the second meiosis. After sperm-egg fusion, the arrested nucleus resumes meiosis, and then changes into the female pronucleus. Such a sequence of morphological and biochemical events is called activation. The initial responses of the egg to activation by the sperm include cortical granule exocytosis and resumption of meiosis. The present review aims to summarize available results obtained by us and by others on the oocyte reaction to penetrating sperm and particularly the effects on male pronucleus formation.

Mattioli M., Galeati G., Barboni B., Seren E.: *Concentration of cyclic AMP during the maturation of pig oocytes in vivo and in vitro*. J. Reprod. Fertil., 100, 403, 1994.

Intracellular concentrations of cyclic AMP (cAMP) were measured in pig oocytes maturing *in vivo* or *in vitro*. Maturation *in vivo* was induced with hCG administrated to gilts treated with PMSG. Although PMSG did not affect cAMP concentrations, hCG induced a transient rise. Similarly, the cAMP concentration rose in oocytes maturing *in vitro* if the oocytes were cocultured with the follicle wall in the presence of LH. The same increase in cAMP was obtained when denuded oocytes were co-cultured with mural granulosa cells. Theca cells exhibited only a moderate activity, while cumulus cells were totally ineffective. In the presence of FSH, cAMP production by the oocyte was unaffected by

any type of follicle cell. The role of cAMP in the control of oocyte maturation was investigated using dibutyryl cAMP. The presence of dibutyryl-cAMP prevented the resumption of meiosis in a dose-dependent manner, but when it was present during the first 12 h of culture only, meiotic progression was accelerated. The results demonstrate that (i) cAMP concentrations increase transiently in oocytes before the resumption of meiosis; (ii) increased concentrations of cAMP depend on the stimulation of oocyte adenylyl cyclase, possibly by a soluble factor produced by follicle cells exposed to LH; (iii) the increase in cAMP is probably confined to the first 10-20 h of maturation owing to the progressive reduction of the stimulating influence of LH-treated somatic cells; and (iv) a high concentration of cAMP throughout maturation maintains meiotic arrest and a transient increase may facilitate meiosis.

Parmeggiani A., Bini P.P., Carcangiu V., Lai E., Floris B., Nuvole P.: Livelli plasmatici di melatonina in pecore sarde trattate con un impianto sottocutaneo dello stesso ormone. *Melatonin plasma levels in sardinian ewes treated with a subcutaneous implant of the same hormone.* Atti Soc. Ital. Sci. Vet., 48, 1994 (in press).

The use of exogenous melatonin to improve the reproductive efficiency of sheep has produced contrasting results so far. To verify the melatonin plasma levels in subjects treated with this hormone, 3 groups each of 5 Sardinian ewes were formed. On 26 April the ewes in group 2 had 1 subcutaneous implant of melatonin (18 mg), those in group 3 had 2 implants (36 mg), while group 1 was kept as control (0 mg). During the observations, which lasted 10 weeks, jugular blood samples were taken weekly at 12.00 and 24.00 hours to measure the melatonin plasma levels by radioimmunoassay. After implantation, a significant increase in blood melatonin was observed, particularly group 3 at 12.00 hours. At 24.00 hours, the increase, although evident, showed weekly non-significant differences between the two treated groups and the controls. Nevertheless, mean melatonin levels in both treated groups were statistically higher than in the controls, both at 12.00 and 24.00 hours. These results indicate that the interactions between endogenous and exogenous melatonin must be investigated further.

Parmeggiani A., Carcangiu V., Bini P.P., Lai E., Floris B., Seren E., Nuvoli P.: Comportamento circannuale della melatonina plasmatica negli ovini di razza sarda allevati a fotoperiodo naturale. *Circannual blood melatonin concentrations in sardinian sheep in natural photoperiod.* 6° Meeting Nazionale: Studio della efficienza riproduttiva degli animali di interesse zootecnico, Bergamo, 75, 1994.

For a calendar year, blood melatonin levels were studied by radioimmunoassay in 8 Sardinian sheep (5 females and 3 males), reared under conditions of natural photoperiod (41° N). All animals showed high levels of melatonin during the dark period and the longer persistence of these levels was clearly related to the short days. However, the highest levels of melatonin were obtained during the period of lengthening days (spring — summer). Our results support the hypothesis that the neuroendocrine-reproductive axis is mainly affected by the duration of nocturnal secretion of melatonin.

Parmeggiani A., Di Palo R., Zicarelli L., Campanile G., Esposito L., Seren E., Accorsi P.A., Soffai S.M.: Melatonina e stagionalità riproduttiva della bufala. *Melatonin and seasonality trend of reproduction in buffalo cow.* Agricoltura e Ricerca, 153, 41, 1994.

Plasma variations of melatonin pattern were evaluated during the two equinoxes and the two solstices in 11 buffaloes bred in 3 farms located in Campania, which animals were characterized by a clear tendency to a seasonal reproduction trend, and 4 buffaloes bred in one more farm which subjects delivered exclusively in the spring-summer period. The buffaloes in the first 3 farm were divided in two groups according to their delivery season: spring (Type 1) and autumn-winter (Type 2). Moreover plasma levels of melatonin were studied in 69 buffaloes bred in 6 farms in three of which the most part of the animals delivered in autumn. Melatonin showed high levels during the night and the persistence of this levels was clearly related to the photoperiod. These secretory patterns were not observed in all the animals; in fact we found different modifications of plasma melatonin levels depending upon the different seasonal behaviour of the animals. Plasma level of melatonin at +2 h from sunset was different between Type 1 and Type 2 buffaloes. The repeatability of this value turned out to be 0.574. Repeatability values at 4 and 6 h from sunset were 0.271 and 0.320 respectively. A discriminant function calculated on the whole data and within the season would have recognized the spring as the best season in which melatonin pattern was able to characterize the seasonality of the subjects.

Rubinsky B., Arav A., Hong J.S., Lee C. Y.: *Freezing of mammalian livers with glycerol and antifreeze proteins.* Biochem. Biophys. Res. Commun., 22, 732, 1994.

We have tested a protocol that uses a new cryoprotective solution for preserving mammalian livers in a frozen state. This protocol is based upon our studies on the mechanisms that freeze-tolerant animals use to survive freezing in nature. The cryoprotective solution contains glycerol and antifreeze proteins, both of which are found in freeze tolerant animals. Whole rat livers were frozen to -3°C , maintained at that temperature for 6 hours and then warmed to 37°C . Post thawing bile production and microscopic analysis of tissue slices were used to verify liver function and tissue morphology. We conclude that antifreeze proteins used in the concentrations chosen here have a protective effect on the whole liver during freezing.

Seren E., Bacci M.L.: *Biotechnology and animal reproduction.* Atti del 29° Simposio Internazionale di Zootecnia, Milano, G.F. Greppi & G. Enne Eds., Elsevier Publishers, 21, 1994.

The authors described the new biotechnologies on animal reproduction. In the last twenty years, studies in biotechnology fields have expanded to improve the productive and reproductive possibilities of domestic species. At present the purpose of the bio-medical research programme is to develop an entirely new series of uses of domestic animals. The success of these programmes depends upon a reliable source of eggs, appropriate technologies of *in vitro* maturation and fertilization, to produce large numbers of viable embryos, and *in vitro* culture of embryos, as well as the appropriate DNA construction.

Seren E., Parmeggiani A., Mongiorgi S., Zicarelli L., Montemurro N., Pacelli C., Campanile G., Esposito L., Di Palo R., Borghese A., Barile V.L., Terzano G.M., Annicchiarico G., Allegrini S.: *Modificazioni endocrine durante il ciclo estrale nella bufala. Periestrous endocrine changes in italian buffaloes.* Agricoltura e Ricerca, 153, 17, 1994.

Progesterone, oestrogens, PGFM, PRL, LH and FSH variations during the spontaneous oestrous cycle of 24 Italian buffaloes reared in central Italy were studied in different periods of the year. From day 15-17 of the oestrous cycle the animals were bled every 3-6-12-24 hours depending on the phase of the cycle, for 21 days. Dynamic ovarian changes were monitored throughout the experimental period by transrectal palpation and ecography. The peri-estrous endocrine changes observed did not show clear difference throughout the year and are comprehensively similar to those recorded in the cow. Oestrous behaviour was recorded in only 37.5% of buffaloes; the duration averaged 32.7 hours, 62.5% of heats were silent and false heats were 16.6%. The mean interval between beginning of behavioural oestrus and ovulation was 54.6 hours whereas the mean interval between LH peak and ovulation was 35.5 hours. 33.3% of the buffaloes showed two ovulations.

Sperandio S., Lulli V., Bacci M.L., Forni M., Maione B., Francolini M., Lavitrano M., Spadafora C.: Spermatozoi come vettori di DNA esogeno per la produzione di animali transgenici. *Sperm as exogenous DNA vectors for transgenic animal production*. Atti del Congresso SIBBM (Società Italiana Biofisica e Biologia Molecolare), 21, 1994.

Ejaculated sperm cells from both bovine and swine animals were used as vectors for transferring different plasmid DNAs into eggs during *in vitro* fertilization for bovine and *in vivo* fertilization for swine. PCR screening of many hundreds of blastocysts showed that transformed embryos were obtained in both species. Southern blot analysis of DNAs extracted from blastocysts obtained with pSV2CAT showed DNA complementary to this plasmid that appeared to be rearranged. This process appears to be conducted in the sperm cells.

Spinaci M., Galeati G., Parmeggiani A., Cappannari C.: Effetto dell'LH e dell'FSH sull'accrescimento follicolare di scrofette prepuberi sottoposte a castrazione ormonale. *Follicular development induced by LH and FSH in gilts chronically treated with gonadotropin-releasing hormone agonist*. Atti Soc. Ital. Sci. Vet., 48, 1994 (in press).

This research was designed to test the possibility of inducing follicular growth in prepubertal gilts chronically treated with a GnRH agonist (Enantone Depot, Takeda-Japan) throughout gonadotropin administration. On the 15th day after the agonist treatment, groups of 4 sows were submitted, for 6 days, to the following treatments: A) continuous infusion with porcine FSH (40 µg LER-2005-2/hour); B) infusion with pFSH as in group A and after two days from the beginning of this treatment, sows were also treated with hourly pulses of porcine LH (40 µg LER-2006); C) infusion, as in group A, associated with pulses of pLH (40 µg) every 4h; D) treatment with hourly pulses of LH (40 µg); E) infusion with saline (control). Follicular growth was evaluated both by measuring estradiol plasma levels throughout the treatment and by morphological examination of the ovaries. Treatment A, C and D did not induce any follicular growth (follicles <2mm in diameter; estradiol 17β <3pg/ml) while the treatment B stimulated a marked follicular development up to the preovulatory stage (follicles 6-7 mm in diameter; estradiol 17β <10 pg/ml). These data demonstrate that only a combined treatment with FSH and hourly pulses of LH can induce follicular growth.

Stefanelli E., Arav A., Seren E.: Sensibilità al raffreddamento della membrana plasmatica di oociti bovini in funzione del grado di maturazione. *Cooling sensitivity of plasma membrane of bovine oocytes at different stage of maturation*. Atti Soc. Ital. Sci. Vet., 48, 1994 (in press).

The present research was carried out to evaluate the sensitivity of bovine oocyte plasma membrane during cooling, in order to individuate the critical temperature of cryopreservation of oocytes as a function of their maturation stage. According to recent studies which demonstrated that the oolemma of bovine oocytes shows a lipid phase transition at 17°C at the germinal vesicle (GV) stage and at 13°C at the MII stage, we investigated oocyte cooling sensitivity by exposing them to different temperatures (26, 15, 4°C for 15 min) and evaluating their membrane integrity after warming. GV oocytes did not show any significant difference to the control when cooled at 26°C but presented a marked hypothermic sensitivity at 15°C and 4°C, while MII oocytes showed a decreased viability only at 4°C. These results show that when oocytes are cooled the damages to the plasma membrane occur during the lipid phase transition which represents the critical step of the cryopreservation process and varies as a function of the maturation stage of the single cells. The addition of membrane stabilizers to the cooling solution increased oocyte survival after hypothermic exposure only when carried out at a temperature above the lipid phase transition.

1995

Accorsi P.A., Gaiani R., Formigoni A., Chiesa F.: Influenza della lattazione sull'assetto endocrino-metabolico e sulla ripresa dell'attività ovarica dopo il parto nelle bovine da latte ad elevato potenziale produttivo. Nota I — Modificazioni del quadro endocrino-metabolico durante i 50 giorni seguenti il parto. *Influence of lactation on endocrine-metabolic status and on ovarian activity after calving in high yielding dairy cows. 1. Endocrine and metabolic changes during 50 days after calving*. Zootec. Nutr. Anim., 21(3), 135, 1995.

Endocrine-metabolic conditions after calving in 20 high yielding Italian Friesian dairy cows divided in two homogeneous groups were compared. Cows of the first group were milked twice a day (LAT), whereas in the other group the lactation was inhibited (NOLAT). Blood samples were taken at -9, 8, 16, 23, 30, 37 and 51 days from calving. The plasma concentrations of the following parameters were determined: GH, PRL, cortisol (CORT), insulin (INS), IGF-1, T4, T3, glucose, NEFA, cholesterol, triglycerides and urea. In NOLAT cows the concentrations of INS were always significantly higher than in LAT cows as from the first week after calving. By contrast the levels of CORT and T3 were significantly lower in NOLAT cow as from the second or the third week. The plasma concentrations of GH, IGF-1, PRL and T4 did not show any significant differences. In NOLAT cows the concentration of glucose was significantly higher from the first week onwards while the following were significantly lower than in LAT cows: NEFA as from the first week cholesterol and urea as from the second week. No difference was observed in triglycerides plasma levels. The results obtained indicate that the changes in metabolic and endocrine status of the cow during lactation are related to both the secretory activity of the mammary gland and the conditions of nutritional deficit. We suppose that the activity of the mammary gland leads to a reduction in glycemia control by INS and an increase in plasma concentrations of T3. The increase in CORT on the other hand could be related to metabolic conditions. These variations in part justify the high

plasma levels of NEFA, cholesterol and urea in LAT cows. The plasma concentrations of GH and PRL do not appear to be influenced either by the secretory activity of the mammary gland or by the metabolic conditions of the cows after calving. In fact the plasma concentrations of these hormones remained at the levels already reached before calving, at the time of preparation of the mammary gland, regardless of subsequent lactation or its inhibition.

Accorsi P.A., Gaiani R., Formigoni A., Chiesa F.: Influenza della lattazione sull'assetto endocrino-metabolico e sulla ripresa dell'attività ovarica dopo il parto nelle bovine da latte ad elevato potenziale produttivo. Nota II — Caratteristiche della ripresa dell'attività endocrina ipofisaria ed ovarica durante i 50 giorni seguenti il parto. *Influence of lactation on endocrine-metabolic status and on ovarian activity after calving in high yielding dairy cows. 2. Resumption of pituitary and ovarian activity during 50 days after calving.* Zootec. Nutr. Anim., 21(4), 201, 1995.

We aimed to determine the characteristics of the resumption of pituitary and ovarian activity after calving. Twenty high yielding Italian Friesian dairy cows, were divided after calving in two homogeneous groups: the cows of one group were milked twice a day (LAT), whereas in the other group lactation was inhibited (NOLAT). In LAT cows an increase in mean plasma concentrations of E2 was observed as lactation proceeded whereas in NOLAT cows they remained similar to those of the first week after calving. Beginning from the third week the plasma concentrations of E2 are significantly higher in LAT ($P < 0.05$) than in NOLAT cows. The number of E2 peaks was significantly higher in LAT ($P < 0.05$) than in NOLAT cows only at 30 day of lactation. In animals of both groups the mean plasma concentrations of LH showed a progressive increase, reaching their highest values at 30 and 37 days after calving. The pulse frequency of LH was significantly higher in the LAT group ($P < 0.05$ and $P < 0.01$) as from 16 days after calving. In LAT cows the plasma levels of P4 indicate luteal activity as from the 16 day after calving, whereas in NOLAT cows this activity was detected only 23 days after calving. The authors suppose that the mammary gland during the secretory phase plays an important and facilitating role on the resumption of pituitary and ovarian endocrinal activity after calving.

Accorsi P.A., Prandi A., Gaiani R., Shkreta L., Castellani G.: Concentrazioni plasmatiche di IGF-1, IGFBP-2 e IGFBP-3 in bovine in lattazione e con lattazione impedita. *Plasma levels of IGF-1, IGFBP-2 and IGFBP-3 in lactating and non-lactating Friesian dairy cows.* Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

Sixteen high yielding Friesian dairy cows, immediately after parturition, were divided in two homogeneous groups. The cows of one group were milked twice a day (LAT), whereas in the other group lactation was inhibited (NOLAT). The plasma concentrations of IGF-1, IGFBP-2 and IGFBP-3 were determined weekly during the first two months of lactation. The plasma concentrations of IGFBP-3 in LAT cows were significantly lower than those of NOLAT group. On the contrary the IGFBP-2 plasma concentrations were higher in LAT than in NOLAT cows. No difference in IGF-1 plasma levels was observed between the two groups.

Bacci M.L., Faroni D., Lalatta Costerbosa G., Barazzoni A.M., Forni M.: Correlazione tra ischemia ovarica ed apoptosi del tessuto luteinico. *Correlation between ovary ischemia and apoptosis in luteal tissue*. Atti Soc. Ital. Sci Vet., 49, 1995 (in press).

We intended to ascertain if a transient ischemia of the ovary could induce apoptosis in luteal tissue. Twelve gilts have been synchronised with eCG and hCG. The ischemic stress has been conducted on only one ovary by means of binding the vascular stump, maintaining the other ovary like control. At the tenth day of the cycle beginning from the ovulation, reputed 40 hours after the treatment with hCG, the gilts have been anaesthetised and, for by a laparotomy, a tight binding has been applied to one ovary for 10, 20, 30 or 60 min. To the term, the binding has been removed, allowing the reperfusion of the organ. After 24 hours of reperfusion we performed the ovariectomies to collect corpora lutea (CL). Only CL deriving from the 5 animals treated with 60 min of transient ischemia showed positivity of apoptosis either by means of biochemical proofs (appearance of the DNA fragmentation) or by means of the *in situ* technique (spread positivity).

Bacci M.L., Forni M., Castellani G., Seren E.: Particular location of early evidences of apoptosis in the regressing corpora lutea of swine. *J. Reprod. Fertil., Abstract Series N. 16, Abs. 73, 1995.*

Since the lifespan of corpus luteum (CL) is finely regulated by hormones, it is reasonable to assume that the physical regression of this temporary endocrine gland may take place via apoptosis. The focus of our study has been the luteolysis induced by prostaglandin analogue in corpora lutea of pregnant sows (40 days of pregnancy). We determined the beginning of the apoptotic process in comparison to the fall of progesterone (P4) levels. Twenty-one pregnant sows were ovariectomized in groups of three at 0, 3, 6, 12, 24, 48 and 72hr following the i.m. injection of 75 mg/sow of Cloprostenol (Dalmazin-Fatro, Italy). In order to investigate apoptosis at cellular level an *in situ* approach was undertaken. The characterisation of apoptosis was performed by determining the cleavage of genomic DNA into oligonucleosomal length fragments (180 bp each). Briefly in cryostat sections residues of digoxigenin-11-dUTP were catalytically added to the 3'-OH ends of DNA by terminal deoxynucleotidyltransferase (TdT). The incorporate residues were recognised by antidigoxigenin antibody carrying fluorescein (ApopTag — Oncor). The first signs of oligonucleosome fragmentation were detected in CL collected 3-6hr after Cloprostenol. At this time moreover the fluorescence was localised inside some large vessels and in adjacent stromal tissue but never in luteal cells. In conclusion, functional and structural luteolysis appeared to be quite coincident and stromal and vascular structures showed higher sensitivity to cloprostenol as compared to luteal cells.

Barboni M., Mattioli M., Seren E.: Influence of progesterone on boar sperm capacitation. *J. Endocrinol.*, 144, 1318, 1995.

This research investigates the effect of progesterone (P4) on boar sperm capacitation. Ejaculated spermatozoa were washed and incubated under capacitating conditions with or without P4. At different times of incubation samples of sperm were exposed to solubilized zonae pellucidae (ZP) and the degree of capacitation was evaluated by the incidence of zona-induced acrosome reaction (AR). The status of the acrosome was studied by using an FITC conjugated lectin (*Pisum sativum* agglutinin; FITC-PSA). The effect of

P4 on the fertilizing ability of semen was then evaluated in an *in vitro* fertilization system by exposing *in vitro* matured oocytes to sperm preincubated for 2 or 4 h with or without P4, under capacitating conditions. PSA staining showed that P4 does not affect the incidence of spontaneous AR. By contrast, spermatozoa incubated with P4 showed a higher percentage of AR than controls after the exposure to solubilized ZP. This enhanced reactivity to ZP suggests a direct effect of P4 on sperm capacitation. The *in vitro* fertilization assay were consistent with these results demonstrating a higher fertilizing ability in sperm preincubated with P4 than in controls, while the steroid was without effect when added only during the fertilization step. These results demonstrate that P4 improves the fertilizing ability of boar semen essentially by facilitating the process of capacitation.

Bini P.P., Parmeggiani A., Carcangiu V., Floris R., Soflai Sohee M., Nuvoli P.: Effetto della metencefalina, del Damme (FK33-824) e della β -endorfina sul rilascio di GH nelle pecore. *Effect of methionine enkephalin, Damme (FK33-824) and β -endorphin on GH release in ewes.* Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

Three dry and 3 lactating Sardinian ewes, cannulated into the jugular veins, received i.v. 2 ml of NaCl 0.9% and, after 1 - 2 - 3 weeks, 250 μ g of DAMME, 1 mg of methionine enkephalin and 250 μ g of β -endorphin, diluted in saline, respectively. Blood samples were collected at 15 min intervals 1h before and 2h after each administration. Radioimmunoassay showed an increase in GH blood concentration of all subjects after administration of DAMME and methionine enkephalin in lactating subjects only, whereas GH level was not influenced by β -endorphin. The results confirm that, also in the sheep, the enkephalins favour GH release through δ opioid receptors.

Borghese A., Barile V.L., Terzano G.M., Pilla A.M., Parmeggiani A.: Andamento della melatonina ematica nelle 4 stagioni in manze e bufale adulte. *Melatonin trend during seasons in heifers and buffalo cows.* Bubalus Bubalis, 1, 61, 1995.

Melatonin values measurements every two hours for 24 hours at equinoxes and at solstices were effected in 16 buffalo cows and in 16 buffalo heifers in natural daylight conditions in order to better understand melatonin role in hypothalamus — pituitary — ovarian axis processing. Blood melatonin level was less than 10 pg/ml during the day, while it was 30-100 pg/ml during the night, showing remarkable differences among seasons and between cows and heifers: particularly in March the buffalo cows showed in the night very higher values than heifers. Strong effect was due to individual factor.

Terzano G.M., Barile V.L., Mongiorgi S., Borghese A.: Effetto di differenti livelli alimentari sulla pubertà in bufale di razza mediterranea. *Feeding levels effects on onset of puberty in buffalo heifers of mediterranean breed.* Atti Soc. Ital. Sci. Vet., 47, 1803, 1993.

Borghese A., Terzano G.M., Barile V.L., Parmeggiani A.: *Season and feeding level effects on onset of puberty in buffalo heifers.* Fourth World Buffalo Congress, Sao Paulo-Brasil, 525, 1994.

Borghese A., Terzano G.M., Barile V.L., Parmeggiani.: *Season and feeding level effects on onset of puberty in buffalo heifers.* Atti Congr. Naz. Assoc. Sci. Prod. Anim. (ASPA), 11, 83, 1995.

The trial was carried out on 24 Italian buffalo heifers, housed in open feed-lots in Tormancina hilly farm, near Rome, 42° latitude North. The 9 months old heifers were fed 2 diets according to standard requirements to realize daily gains respectively 450g (low diet group) and 650g (high diet group). The animals of low and high diets had the same initial weight and age. The animals were weighed monthly and were tested every ten days by rectal palpation. Blood samples were collected at 10 days intervals and plasma progesterone was assayed by RIA; animals were considered to have achieved puberty when plasma progesterone levels exceeded 1.5 ng/ml. Feeding level significantly ($P < 0.05$) affected daily gain. The high group fed heifers achieved puberty at 24.5 months of age, one month before the animals of low group and 23 Kg heavier. The onset of cyclic ovarian activity was influenced by decreasing photoperiod with highest concentration in Autumn. Nine heifers, born from December 1990 to May 1991, achieved puberty from October 1992 to February 1993 (614 d in high diet group; 686 d in low group); 15 heifers, born after May until December 1991, did not achieve puberty until the favorable season of the following year. Overall data confirmed the feeding levels effects on growth, body and sexual development and on onset of puberty. The age of puberty is confirmed to be affected by season of birth.

Carcangiu V., Bini P.P., Govoni N., Floris B., Nuvoli P.: Effetto della β -endorfina, della metencefalina e del damme (FK33-824) sul rilascio di PRL nelle pecore. *Effect of β -endorphin, methionine enkephalin damme (FK33-824) on PRL release in ewes.* Atti Soc. Ital. Sci Vet., 49, 1995 (in press).

Three dry and 3 lactating Sardinian ewes, cannulated into the jugular veins, received i.v. 2 ml of NaCl 0.9% and, after 1 - 2 - 3 weeks, 250 μ g of DAMME, 1 mg of methionine enkephalin and 250 μ g of β -endorphin, diluted in saline, respectively. Blood samples were collected at 15 min intervals 1h before and 2h after each administration. Radioimmunoassay showed a significant increase in PRL blood concentration after administration of β -endorphin ($P < 0.01$) and DAMME ($P < 0.02$), whereas PRL level was not influenced by methionine enkephalin. The results confirm that, also in the sheep, receptors favour opioid modulation of PRL.

Carcangiu V., Bini P.P., Parmeggiani A., Lai E., Marongiu M.L., Floris B., Nuvoli P., Mongiorgi S.: Effetto del naloxone sul rilascio di LH durante il ciclo ovarico nella pecora. *Effect of naloxone on LH release during the oestrous cycle in the sheep.* Atti del 6° Meeting nazionale Studio della efficienza riproduttiva degli animali di interesse zootecnico, 69, 1995.

In Autumn, in order to verify opioid influence on LH release, 5 ewes were synchronized by intravaginal sponges containing 40 mg of fluorogestone acetate. After 14 days, when the sponges were removed, the subjects received i.m. 250 IU of PMSG. Each ewe, cannulated into the jugular vein, received i.v. 1 mg/Kg of naloxone HCl, diluted in saline, 8 days after introduction of the sponges (induced luteal phase): the experiment was repeated 30 hours (follicular phase) and 8 days (natural luteal phase) after sponge removal. Blood samples were collected at 15 min intervals 1h before and 2h after naloxone administration. Radioimmunoassay showed an increase in LH as a response to the opioid antagonist during the luteal phases only, particularly significant when progesterone levels were high, whereas the increase in the mean level of LH during the follicular phase was related to positive feedback of oestrogens.

Carcangiu V., Bini P.P., Parmeggiani A., Floris B., Seren E., Nuvoli P.: Effetto della β -endorfina esogena sul livello ematico di PRL e GH di pecore in asciutta e in lattazione. *Effect of exogenous β -endorphin on blood level of PRL and GH in dry and lactating ewes.* Arch. Vet. Ital., 46, 1995 (in press).

Three dry and 3 lactating Sardinian ewes, cannulated into the left jugular vein, received i.v. 2 ml of NaCl 0.9% and, after 3 weeks, 250 μ g/animal of β -endorphin, diluted in saline. Blood samples were collected at 15 min intervals 1h before and 2h after both administrations. Radioimmunoassay showed a significant increase in PRL concentration in the treated subjects only ($P < 0.01$), whereas GH concentration was not influenced by the treatment. These results suggest that β -endorphin, also in the sheep, is involved principally in PRL secretion as a dopamine antagonist, while it is less involved in GH modulation.

Faccioli G., Rosner A., Forni M.: Use of the polymerase chain reaction to clone the potato leafroll virus coat protein gene directly from the total RNA of infected plants. *Potato Research*, 38, 211, 1995.

The potato leafroll virus (PLRV) coat protein (CP) gene was directly cloned from the total RNA extracted from virus-infected plants. First strand cDNA synthesis was not necessarily specific; it was equally efficient using either random or CP-specific primers. The viral sequence encoding the coat protein was specifically amplified from the total population of cDNA molecules by polymerase chain reaction (PCR), using specific primers bordering the CP gene. The unique amplified product thus obtained was cloned blunt-end into the pT7T318U plasmid vector, and the authenticity of the cloned gene verified by sequence analysis. This cloning strategy obviates the need for virus purification. Sequence comparison of the CP gene of the Italian isolate and those of five other PLRV isolates revealed a close similarity to the three European and the Canadian isolates, and a more distant relationship with the Australian one.

Forni M., Bacci M.L., Marioni E., Faroni D., Seren E.: Apoptosis in regressing corpora lutea of pregnant sows. *Atti 1° Congresso Nazionale Biotecnologia*, 264, 1995.

Apoptosis has been shown to occur in hormonally regulated tissue when the supportive hormone has been eliminated. It is reasonable to assume that the physical regression of the corpus luteum may take place via apoptosis. Focus of our study has been the luteolysis of corpora lutea of pregnant sows. We determined the beginning of the apoptotic process in comparison to the fall of progesterone levels. To investigate apoptosis at cellular level an *in situ* approach was undertaken. In cryostatic sections residues of digoxigenin were catalytically added to the 3'-OH ends of DNA by TdT. The incorporate digoxigenin-11-dUTP were recognized by antidigoxigenin antibody carrying a fluorophore; with this technique is possible to revealed the presence of numerous cells undergoing DNA fragmentation at 6h. In conclusion, since plasma and tissue P4 returned to basal levels at 3-6h post injection the structural luteolysis appear relatively delayed respect to the functional ones.

Forni M., Faroni D., Marioni E., Bacci M. L.: Clusterin mRNA expression in swine apoptotic corpora lutea. *Atti 2° incontro di studi sulla morte cellulare*, 6, 1995.

The fundamental role of apoptosis in the luteolytic process is now well recognized. Recently we have studied this phenomenon in cyclic and pregnant corpora lutea in swine. Since clusterin mRNA synthesis has been shown to be positively correlated with apoptosis in many cell systems, we tested this hypothesis in our model of tissue regression. We selected a set of PCR primers. Then we performed RT-PCR on mRNA extracted from corpora lutea of pregnant sows 0, 6, 12, 24, 48 and 72 hours after a luteolytic stimulus. The analysis was normalized on the results obtained in a similar RT-PCR performed utilizing a set of primers designed for the beta actin; the mRNA for the clusterin was maximally expressed at 48h from the stimulus, and correlated with the maximum of the densitometric reading of DNA lower than 21 Kb extracted from luteal cells. In conclusion the highest levels of clusterin mRNA appear correlable with the complete onset of apoptosis.

Forni M., Marioni E., Faroni D., Bacci M.L.: Opposta regolazione di due diversi RNA messengeri nel corpo luteo di scrofe gravide sotto lo stimolo di un analogo della prostaglandina. *Two mRNA species undergo opposite regulation by prostaglandin analog in corpora lutea of pregnant sows.* Atti Soc. Ital. Sci Vet., 49, 1995, (in press).

Structural luteolysis occurs in gravidic corpora lutea of swine by apoptosis. We previously reported the kinetics of this process that is relatively delayed respect to the functional luteolysis. More recently we investigated, by RT-PCR, the expression of the mRNAs for clusterin and luteinizing hormone receptor, two proteins involved respectively in apoptosis and in corpus luteum growth. The analysis was performed on mRNA extracted from corpora lutea of pregnant sows at 0, 6, 12, 24, 48 and 72h from the luteolytic stimulus. The densitometric reading of amplified DNA shows a negative correlation between the two mRNAs and the two species appear to be inversely regulated by prostaglandin in the CL. No evidence of interdependence is available but the difference in expression of the two genes may control the switch between tissutal homeostasis and tissutal regression.

Galeati G., Forni M., Bacci M.L., Spinaci M., Seren E.: *Gonadotropins and insuline-like growth factor I suppress apoptosis in cultured pig follicles.* 30th Symposium of Reproduction and Animal Breeding: Advances and Strategy, 265, 1995.

The fundamental role of somatic cells on the process of oocyte maturation *in vitro* is now well recognized. Our previous studies performed in pig, as observed in other species, have shown that the addition of gonadotropins, particularly LH, enhances the developmental competence of *in vitro* matured oocytes. Since hypophysectomy has been shown to result in follicular atresia, we have undertaken this research to investigate whether gonadotropins prevent follicle cell apoptosis as the underlying cell process of atresia. As growth factors have been shown to prevent apoptosis in many cell systems, we also tested the hypothesis that IGF, a growth factor produced locally after LH/FSH stimulation, may be involved in mediating the effect of gonadotropins. A spontaneous increase in apoptotic DNA fragmentation occurred after 24h of culture in the absence of hormones, whereas treatment with LH or FSH suppressed follicular apoptosis in a dose dependent manner, with 1 μ g/ml causing maximal suppression. Like gonadotropins, treatment with IGF-I (1 μ g/ml) also suppressed the spontaneous onset of apoptosis compared with follicles cultured without IGF-I. In conclusion the present study demonstrates that both gonadotropins and IGF-I act as follicle survival factors *in vitro* by suppressing apoptotic

DNA fragmentation. Other Authors have shown that treatment of pig granulosa cells with gonadotropins stimulate IGF-I secretion. These combined data suggest that endogenously produced IGF-I may mediate, at least partially, the suppression of apoptosis in follicular cells cultured in the presence of gonadotropins.

Galeati G., Forni M., Spinaci M., Seren E.: *Cyclic AMP secretion mediated suppression of apoptosis in cultured pig follicles.* J. Reprod. Fertil., Abstract Series N. 16, Abs. 74, 1995.

Apoptosis has been suggested to be the underlying mechanism of ovarian follicular atresia. We have previously shown that gonadotropins and IGF-I can inhibit apoptotic cell death in granulosa cells of cultured pig follicles. The aims of this study were: 1) to determine whether pig follicular cells respond *in vitro* to FSH and LH by secreting cAMP, and 2) to define relationships between the occurrence of granulosa cell apoptosis and cAMP secretion by follicle cells challenged with FSH or LH. Pig follicles were everted and cultured in the absence or presence of LH or FSH. *Experiment 1:* 0, 2, 4, 8, 12, 24, 48h after the beginning of the culture, 20 μ l of culture medium were collected and frozen to -20°C until assayed for cAMP. *Experiment 2:* in order to examine a dose dependent effect of cAMP levels in the culture medium on granulosa cells apoptotic DNA fragmentation, follicles were cultured for 24h in absence or in presence of increasing amounts (0.5, 2.5, 5 mM) of cAMP. Cellular DNA was isolated, size fractionated by agarose gel electrophoresis and stained with ethidium bromide. Both LH and FSH stimulated a transient rise of cAMP. Peak levels were observed after 8h and returned to basal values after 24h. Like gonadotropins, treatment with cAMP suppressed follicular apoptosis in a dose dependent manner with 5 mM causing maximal suppression. These data suggest that cAMP secretion might contribute to the antiapoptotic effect of gonadotropins.

Parmeggiani A., Galeati G., Spinaci M., Govoni N., Formigoni A.: *Influenza del livello nutritivo sulla secrezione pulsatile dell'LH in scrofette prepuberi.* *Effect of energy intake on pulsatile LH secretion in prepubertal gilts.* Atti Soc. Ital. Sci Vet., 49, 1995 (in press).

The Authors studied the patterns of LH secretion in 12 prepubertal gilts fed on a restricted diet and then realimentated with either starch or lipid. NEFA, urea, glicemia and insulin levels have been also evaluated. All the animals underwent 2 weeks of restricted feeding [1.5 Kg of pressed beet pulp silage (21% S.S.) and 0.4 Kg of fish meal (2200 Kcal M.E./day)] and then were randomly allocated to one of the 3 groups fed as follow: the group A received the restricted diet and beet pulp silage *ad libitum*; the groups B and C received the restricted diet supplemented, at the same energy level (8000 Kcal M.E./day), respectively with either maize starch or soy. A similar pulsatile secretion was induced by the two different energy sources. Our result suggest that LH pulsatile secretion seems to be influenced by energy supply instead of energy sources.

Seren E., Parmeggiani A., Campanile G.: *The control of ovulation in italian buffalo.* 30th Symposium of Reproduction and Animal Breeding: Advances and Strategy, 265, 1995.

The importance of buffalo breeding is rapidly growing in Italy, mainly because of the economic benefits deriving from milk production. However one of the major factors

limiting a more efficient utilization of these animals is their low reproductive efficiency. In recent years considerable attention has been focussed on reproductive endocrinology as a means for identifying specific problems and for adopting measures aimed to optimize reproductive efficiency. In this paper are summarized studies made on endocrine profiles, estrous behaviour during estrous cycle in buffalo cows reared in Italy. As concerns seasonal trend of reproduction we investigated if melatonin could acts as a trasductional signal of photoperiod in this species. The profile of E2, P4, PGFM, LH, FSH and PRL observed in buffalo cows are very similar to those recorded in cows in general: the low reproductive efficiency does not seem to be linked to endocrine patterns. Behavioural and clinical signs of heat were not easily detected. The interval between the onset of estrus and ovulation was not by any means constant: thus to achieve high fertility rates it is necessary to carry out an accurate and frequent observation of estrous symptoms. Plasma concentration of melatonin in buffaloes is closely related to light-dark conditions. Our data suggest a relationship between seasonal reproductive trend and circadian and circannual changes in melatonin concentration.

Shkreta L., Accorsi P. A., Gaiani R., Chiesa F.: *Influence of IGF-1 and insulin on [14C]acetate incorporation into lipids by bovine mammary tissue in vitro.* J. Reprod. Fert., Abstract Series N. 16, Abs 36, 1995.

This work aimed to investigate the effect of IGF-1 and/or insulin and other hormones on incorporation of [14C]acetate into lipids by mammary explants from non-pregnant cows of mid lactation. Mammary explants were cultured for 48 h in TCM199 (NH) or in hormone supplemented media. The levels of [14C]acetate incorporation by explants incubated in NH were used as control. IGF-1, individually or combined, was observed to induce a dose-dependent effect on acetate incorporation by mammary tissue. Effect of insulin alone on stimulating acetate incorporation has been also evidenced, but an important increase of this effect was evidenced during its combination with C+PRL. Anyhow IGF-1, like insulin, has demonstrated to be a potent factor in stimulating acetate incorporation into lipids by mammary tissue explants and a synergetic effect of these two hormones is evidenced.

Shkreta L., Accorsi P.A., Gabai G., Cappannari C., Gaiani R.: *Influenza dell'insulina sulla sintesi di acidi grassi in colture di tessuto mammario bovino in vitro. Effects of insulin on fatty acids synthesis by explants of bovine mammary tissue in vitro.* Atti Soc. Ital. Sci. Vet., 49, 1995, (in press).

Mammary tissue explants of cows in mid lactation were cultured for a period of 48, 72 and 120 hours. Three types of treatments were used: medium (M199) without hormones (NH), medium with increasing levels of insulin (INS) and medium with constant amounts of cortisol + prolactin where increasing amounts of insulin were added (CPI). Vital explants of mammary tissue were observed even after 120 hours of culturing, in spite of the presence of hormones in medium. However, a significant reduction of fatty acid synthesis was noticed after the first 48 hours of incubation. The incorporation of [14C]acetate in the explants cultured in INS medium was always higher than in explants cultured in NH medium and resulted to be directly proportional with the doses of insulin. Culturing of mammary tissue in CPI medium has evidenced a higher rhythm of incorporation of [14C]acetate than that observed in the explants cultured in INS medium.

**DIPARTIMENTO DI MORFOFISIOLOGIA VETERINARIA
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1988

Barasa A., Bellardi S., Monge F., Baroni E., Monetti P.G.: Lo sviluppo embrionale del fagiano. *Embryonic development of the pheasant*. Rivista di Avicoltura, 57(12), 73, 1988.

The development of pheasant (*Phasianus colchicus*) embryos was studied from the beginning of incubation to the hatch. By means of direct observation of the external morphology, integrated by micro-and macro-photographs, 46 stages of development were determined, using the development stages proposed by Hamburger and Hamilton for the chick embryos, with appropriate corrections.

Benassi M.C., Berardelli C.: L'alimentazione della starna (*Perdix perdix*) in natura. *The feeding of the wild gray partridge*. Rivista di Avicoltura, 57(5), 41, 1988.

From bibliographical research it resulted that the partridge chick is almost exclusively insectivorous until the third week of life, whereas later vegetable feeds become more important, constituting nearly all of the adult's diet. The alimentary resources and, consequently, the animal's diet, appear strictly related to the changes that have taken place in the agrarian environment.

Formigoni A., Pacchioli M.T., Parisini P., Pignatelli P.: L'impiego di oligoelementi legati ad aminoacidi nell'alimentazione della vacca da latte ad alta produzione. *Use of trace elements bonded to aminoacids in the feeding of high-yielding dairy cows*. Zootec. Nutr. Anim., 14(1), 79, 1988.

This research aimed to assess the effect of trace elements linked to aminoacids in the feed of high-yielding dairy cows. A total of 34 Fresian cows were divided into 2 experimental groups (A and B). The first group was fed 13.3 g/head/day of a product containing iron, zinc, copper and iodine bonded to aminoacids added to a ration suitable to meet the animals' requirements in trace elements. The performance of the animals was followed during the first 200 days of lactation. The results show that the use of trace elements bonded to aminoacids did not change the overall milk production, though it did significantly increase the pH ($P < .01$) of the milk and it improved, though not to a statistically significant extent, the reproductive performance as there was both a reduction in the calving-conception period and a reduction in the number of service.

Formigoni A., Pacchioli M.T., Parisini P.: L'impiego di insilati nell'alimentazione del suino pesante. Nota I: Performance d'allevamento. *Use of ensiled forages on heavy pig nutrition. Note III: Breeding performances*. Atti Soc. Ital. Sci. Vet., 42, 1195, 1988.

Three groups, each containing 42 pigs, were compared. The groups were fed, from 30 to

130 kg live weight, 100% concentrate (A), 50% concentrate and 50% maize silage on dry matter basis (B) and 50% concentrate and 50% beet pulp silage on dry matter (C). The results show a significant decrease in growth rate and a worsening of the feed efficiency in the animals feed silage.

Laffi R., Marchetti S., Baudichau A., Marchetti M.: Impiego della metionina idrossianalogo (HMB) nei mangimi per volatili. *Methionine hydroxy analog (HMB) in poultry feeds*. Obiettivi e Documenti Veterinari, 9(4), 53, 1988.

Dispersive degree and oligomeric content of the methionine hydroxy analog (HMB) in liquid form (Alimet) has been estimated in poultry feeds. Experimental data, analyzing HMB by HPLC before and after hydrolysis, showed: 1) good distribution of the compound in 90% of the valued feeds; 2) a partial depolymerization process of oligomeric forms of hydroxy analog in the Alimet when it is mixed in feeds.

Laffi R., Marchetti S., Marchetti M.: *Normal-phase liquid Chromatographic determination of menadione in animal feeds*. J. Assoc. Off. Anal. Chem., 71(4), 826, 1988.

A simple method is presented for determination of menadione in vitamin premixes and feedstuffs by normal-phase liquid chromatography (LC). Vitamin K3 is extracted and converted to free menadione, which can be determined directly by LC analysis. Peak area or height is measured at 251 nm, and menadione is quantitated by comparison with the working standard. Menadione can be estimated with a detection limit of 2.5 ppm. Recoveries for premixes ranged from 97.3 to 98.3% and for feedstuffs from 93.7 to 96.8%. The method allows the assay of all commercial K3 compounds in pure or stabilized form and is applicable to a wide variety of feeds and premixes.

Lambertini L., Benassi M.C., Zaghini G.: Caratteristiche qualitative della carcassa di coniglio: prime osservazioni sperimentali. *Qualitative characteristics of the rabbit carcass: preliminary contribution*. Atti Soc. Ital. Sci. Vet., 42, 1335, 1988.

The aim of the trial was to contribute to the knowledge of the rabbit carcass. The degree of correlation between the numerous parameters regarding slaughter data, carcass dissection and muscle, bone and fat composition was determined. These results seem to identify some elements which provided an objective evaluation of the qualitative characteristics of the rabbit carcass.

Lambertini L., Zaghini G.: Il coniglio angora: aspetti morfo-funzionali. *The angora rabbit: morphology and productive aspects*. Riv. Coniglicolt., 25(10), 49, 1988.

In this review, the Authors describe the morphologic characteristics of the angora rabbit and delineate the qualitative and quantitative aspects of angora wool production.

Marchetti M., Laffi R., Marchetti S., Mordenti A.: Il Carbadox negli integratori e nei mangimi: recenti acquisizioni. *Carbadox in supplements and feeds: recent acquisitions*. Obiettivi e Documenti Veterinari, 9, 49, 1988.

The use of carbadox and olaquinox in feeds and supplements for pigs is reviewed. Of 105 samples of a supplement with 10% carbadox used in Italy differences between declared content and values estimated by high resolution liquid chromatography were less than 10% in 90.5% of samples. In 9.5% differences were slightly greater. In 90 samples of loose or pelleted complete feed with 50 mg/kg active principle, differences between declared and estimated values were less than 10% in only 28.8% of samples. In 71.2% of samples differences were from 1.166% greater to 91% less than declared values.

Monetti P.G., Benassi M.C., Berardelli C., Gubellini M.: Ovodeposizione autunnale indotta nella starna. *Induction of an autumnal cycle of egg production in the grey partridge*. Atti Soc. Ital. Sci. Vet., 42, 187, 1988.

Using a suitable light programme, an attempt was made to induce a second cycle of egg-laying in the grey partridge which had already laid regularly in the physiological period. The percentage of pairs producing, the level of fecundity and egg quality were clearly lower than those observed in the normal egg-laying period. However, each of the 53 pairs which laid (85% of total) produced 15.8 eggs and 5.2 live and healthy chicks in 9 weeks.

Monetti P.G., Benassi M.C., Berardelli C., Gubellini M.: Effetto del tenore proteico della dieta sull'efficienza riproduttiva della starna. *Effect of dietary protein level on the reproductive efficiency of the gray partridge*. Zootec. Nutr. Anim., 14, 437, 1988.

The aim of these research was to verify the expedience of feeding gray partridges reared in cage during the reproductive season by employing diets with higher protein percentage compared to the ones used in previous researches. Sixty-three pairs were given concentrate with different protein levels: 21, 24, 27%. The protein level induced changes, sometimes significant, in various parameters: egg production, feed efficiency, egg fertility and hatchability and embryo mortality. The partridges fed with the intermediate protein level ratio were favoured, leading to the greatest chick production. The Authors thus conclude that the birds should receive feed containing 24% crude protein.

Mordenti A., Marchetti S., Marchetti M., Laffi R.: Indagine sull'Olaquinox negli integratori e nei mangimi zootecnici. *Investigation on olaquinox in supplements and mixed feeds for animals*. Obiettivi e Documenti Veterinari, 9, 53, 1988.

Content of the growth promotant, olaquinox, estimated by high performance liquid chromatography, in 20 samples of feed supplements corresponded closely with declared content (10%). In most of 51 samples of dried and pelleted mixed feeds there was a marked discrepancy between actual and declared content. Dust production by olaquinox was above legal limits in 80% of supplements and 74% of mixed feeds. There was no relation between dust production characteristics of feeds and type of supplement used in their preparation.

Mordenti A., Nocetti M., Mutinelli F.: Impiego di insilati nell'alimentazione del suino pesante: Nota II. Qualità delle carcasse e delle carni. *The utilisation of silage in heavy pig nutrition. II. Meat and carcass quality*. Atti Soc. Ital. Sci. Vet., 42, 1199, 1988.

In order to assess the influence of corn silage or pressed beet pulp on carcass and meat quality many measurements were executed after slaughtering on 36 pigs: silage feeding improved carcass leanness and technological meat quality, but decreased daily gain and feed efficiency.

Mordenti A.: Alimentazione: mezzo efficace per migliorare la qualità delle carni suine. *Nutrition: an efficient method for improving the quality of pigmeat.* Prax. Vet., 9, 18, 1988.

Changes in the criteria for evaluating the quality of carcasses in pigs and their relation to the method of feeding and type of feed used are discussed.

Mutinelli F., Formigoni A.: L'impiego di insilati nell'alimentazione del suino pesante. Nota III: Riflessi sulla patologia gastrica. *Use of ensiled forages on heavy pig nutrition. Note III: Effects on gastric pathology.* Atti Soc. Ital. Sci. Vet., 42, 1203, 1988.

Three lots, for a total of 62 heavy pigs have been examined at slaughter: control group (27 animals); group A fed a diet containing maize silage (16 animals); group B fed a diet containing pressed - beet pulp (19 animals). Heavy pigs fed the diet in trial showed no lesions in the pars oesophagea of the stomach. Hyperparakeratosis and erosions of the pars oesophagea of the stomach occurred in the control group. Instead erosive and ulcerative lesions of the glandular area of the stomach showed little incidence in all the 3 groups. Catarrhal gastritis was a common feature of all the examined pigs.

Pacchioli M.T., Nocetti M., Scipioni R.: Effetti di un lisato vegetale nell'alimentazione del suinetto. *Effects of a plant lysate in piglets feeding.* Atti Soc. Ital. Sci. Vet., 42, 1207, 1988.

In this trial the effects of using plant lysate on growth performance and on hindgut microbial counts in piglets were evaluated. The plant lysate favourably affected feed efficiency and intestinal microflora in a statistically significant manner.

Parisini P., Scipioni R., Volpelli L. A.: L'impiego di lisati vegetali nella produzione del suino pesante. *The administration of a plant lysate to heavy pigs.* Sel. Vet., 39 (1 bis), 325, 1988.

The trial was carried out on 40 pigs from 36 to 150 kg lw. The results relevant to the growth performances showed a higher daily weight gain for the treated group in the whole trial. Feed conversion also was favourably affected. At the slaughtering no valuable modifications of the ratio lean /fatty cuts was observed.

Rizzi L., Cavani C., Manfredini M.: Digeribilità *in vivo* delle buccette di soia. *In vivo digestibility of soybean hulls.* Atti Soc. Ital. Sci. Vet., 42, 1265, 1988.

In this trial the *in vivo* digestibility and nutritive value of soybean hulls, a by-product of soyabean processing, were determined. In spite of the considerable content of cell walls,

the digestibility of main nutrients was high, except for the crude protein. These results are associate with low lignin: cellulose ratio that allows a good nutritional available of cellulose. The results indicate that soyabean hulls can be utilized as a valuable source of energy for ruminants.

Scipioni R., Della Casa G.: Aspetti nutrizionali e tecnici dell'alimentazione del suinetto. *Nutritional and technical aspects in piglets feeding*. Riv. Suinicolt., 29(3), 37 1988.

In addition to more traditional strategies against growth lowering, morbidity and mortality in piglets, the problems concerning the use of soybean oil meal in pre-starter feed and the nutritional ipersensitivity are particularly discussed.

Scipioni R., Formigoni A., Nocetti M.: L'impiego di *Lactobacillus acidophilus* in diete per suinetti, *The use of Lactobacillus acidophilus in diets for piglets*. Atti 14° Meeting Annuale della Società Italiana di Patologia e Allevamento degli Ovini e dei Caprini (SIPAS), Sel. Vet., 19, 325, 1988.

The research was performed on 36 castrated male piglets divided into 3 groups: basal diet (A); basal diet + *Lactobacillus acidophilus* (B) and basal diets + antibiotics (C). No statistically significant difference between the productive traits was observed, but weight gain and feed conversion were more favourable in the groups C in comparison with other groups. The microbes counts were lower in the faeces of piglets belonging to the group C.

Scipioni R.: Innovazioni tecnologiche nell'alimentazione dei giovani suini. *New trends in feeding youg pigs*. Sel. Vet., 29, 721, 1988.

The problems involved in swine breeding from birth to 3-4 weeks after weaning are due to social, environmental, physiological, nutritional and technical factors, excluding the infection ones. Non-antibacterial strategies, some traditional and some more recent are described and discussed.

1989

Benassi M.C., Berardelli C., Monetti P.G.: Impiego di proteine di diversa origine nell'alimentazione della starna in deposizione. *Use of different protein sources in the gray partridge feeding*. Atti Soc. Ital. Sci. Vet., 43, 1695, 1989.

The aim of this research was to verify the expedience of feeding gray partridges reared in cage during the reproductive season by employing diets containing only plant proteins. The comparison diet, with the same protein level (24%), contained also animal meals. It seems to positively influence egg-laying (+11.4%) and feed conversion index (18.3%), negatively egg weight ($P < 0.01$), egg fertility (7.0%) and embryo mortality (+94.7%). No significant effect was found about the number of chicks produced by partridges fed on the two diets (11.2 vs 11.5).

Cavani C., Marchetti S., Laffi R.: Indagine sul contenuto di alcuni principi attivi in mangimi completi per conigli. *Investigation on vitamin and additive contents in commercial feeds for rabbits*. Atti Soc. Ital. Sci. Vet., 43, 1649, 1989.

The aim of this investigation was to examine feed additive content in rabbit mixed feed and to verify its concordance with the national legislation with regard to preparation and trade. A set of samples collected at national level was analysed for some vitamins and drugs (Carbadox, Olaquinox, furans and sulfonamides). The results showed significant differences between declared and found values regarding vitamin A (-36.3%; $P < 0.05$), E (+62.9%; $P < 0.01$), B1 (+31.7%; $P < 0.01$), B2 (+31.6%; $P < 0.01$), B6 (+29.2%; $P < 0.01$), PP (+27.4%; $P < 0.01$); Panthotenic acid (+17.9%; $P < 0.01$). The presence of illicit drugs was also noted.

Formigoni A., Lorenzi M., Stirpe M.L.: Possibilità di miglioramento dell'efficienza riproduttiva di bovine di razza frisona mediante la determinazione del progesterone nel latte con kit rapido. *Possibility to improve Friesian cow reproductive efficiency with milk progesterone assay fast kit*. II Meeting Nazionale su Studio della Efficienza riproduttiva degli animali di interesse zootecnico, Bergamo 24/11/1989, 127, 1989.

Progesterone levels were monitored in dairy cows at 21-22 days after first insemination and 12, 21-22 days after second insemination. The number of days open was reduced by the use of this test (49 treated cows = 30.4 days open vs 32 control cows = 41.4 days open).

Formigoni A., Mongiorgi S., Seren E.: Influenza dell'apporto nutritivo sulla secrezione di LH in scrofe prepuberi. *Effect of nutrient availability on LH secretion in prepuberal gilts*. Atti Soc. Ital. Sci. Vet., 43, 159, 1989.

The Authors studied the patterns of LH secretion in prepuberal gilts (about 75 kg) fed to appetite (7500 Kcal.EM/d) or on a restricted diet (2800 Kcal.EM/d). Feed restriction suppressed the pulsatile secretion of LH which reinitiated again after realimentation to appetite. The lack of response to Naloxone suggests that the effects of restricted diet are not mediated by opioids.

Laffi R., Marchetti S.: Effetto della pellettatura sulla stabilità delle vitamine K3, C e B1. *Effect of pelleting on the vitamins K3, C and B1 stability*. Atti Soc. Ital. Sci. Vet., 43, 1661, 1989.

The purpose of this research is to verify the immediate and the long term consequence of different pelleting technologies on the vitamins K3, C and B1 stability in complete feeds. The results showed no heavy losses of the three vitamins owing to pelleting. However in all the tested experimental conditions higher losses were observed in the pelleted feed as regards meal feed in the long term period.

Laffi R., Tossani N., Marchetti S.: Effetto della pellettatura sulla stabilità della vitamina B1 presente negli integratori oligo-vitaminici. *Effect of pelleting on the stability of vitamin B1 in multivitamin-mineral premix*. Riv. Suinicolt., 30(7/8), 49, 1989.

It has been studied in premix for zootechnic use the immediate and in the long run effects of pelleting on the stability of vitamin B1 employed either as hydrochloride form or as menadione bisulphite adduct. The results showed: 1) better stability of adduct in comparison with hydrochloride form. 2) losses of no importance in both vitamin forms during and on account of pelleting.

Laffi R., Tossani N., Marchetti S.: Ricerche sulla stabilità della vitamina K3 nei mangimi composti. *Recent investigation on vitamin K3 stability in animal feeds.* Riv. Suinicolt., 30(5), 69, 1989.

It has been studied the stability of vitamin K3 as menadione sodium bisulphite and as menadione bisulphite- thiamine and menadione bisulphite-nicotinamide adducts. It has also been evaluated immediate and in six-month-time losses of the three vitamins forms due to pelleting. The results confirm better stability of adducts in comparison with menadione sodium bisulphite in feeds as meal and as pellet.

Laffi R., Tossani N., Marchetti S.: Stabilità della vitamina B1 nei mangimi composti. *Researches on vitamin B1 stability in animal feeds.* Riv. Suinicolt., 30 (4), 121, 1989.

It has been studied the stability of vitamin B1 in feeds as hydrochloride and as menadione bisulphite adduct. It has also been evaluated immediate and in six-month-time losses of the two vitamins forms due to pelleting. In feeds the vitamin as adduct shows better stability in comparison with the hydrochloride form. Pelleting does not cause immediate losses in both vitamin forms but in the long term determines degradation increasing of hydrochloride form in comparison with the adduct form.

Lambertini L., Benassi M.C., Zaghini G.: Ricerche sulle caratteristiche qualitative della carcassa di coniglio. *Researches on the rabbit carcass composition.* 8° Congr. Naz. Assoc. Sci. Prod. Anim. (ASPA), 23, 1989.

The aim of this trial was to find some elements in order to contribute to the knowledge of the rabbit carcass quality. A hundred and fifty-five rabbits (78 males and 77 females), twelve weeks old, genetically alike, were weighed before the slaughter. The weight of the skin, of the alimentary tract, as well as that of the warm and cold carcass was also recorded. Their heads, liver, kidneys, perirenal and scapular fat were separated from the carcass; then it was dissected into seven cuts. Measurements on the whole carcass and on some cuts were also carried out. Each of these cuts was weighed and completely dissected to obtain muscle, bone and fat components. Furthermore, the degree of correlation between all the recorded parameters and muscle, bone, fat elements and muscle/bone ratio of the carcass was calculated. Also, the effects of the sex and live weight were evaluated. These results seem to show some interesting elements to provide an evaluation of the rabbit carcass quality.

Lambertini L., Zaghini G., Galassi S., Benassi M.C.: La bentonite sodica nell'allevamento del coniglio in accrescimento: prestazioni produttive ed effetti sul digerente. *Sodium bentonite in growing rabbit feed: animal performance and effects on the digestive tract.* Riv. Coniglicolt., 26(3), 51, 1989.

The aim of this research was to find further elements in order to consider the influence of bentonite in the feeding of fattening rabbits. The performances (average daily gain, feed intake, feed to gain ratio and slaughter data), the carcass quality and some characteristics of the caecal contents were also observed. The bentonite did not affect the weight gain of the animals; it did not produce directly an increase in feed intake or a worse feed efficiency. Furthermore the carcass quality was unchanged, although the bentonite determined an increase in chilling shrink and a reduction of the perirenal fat. The content of ash and water in the caecum of treated rabbits was higher; furthermore the bentonite determined considerable changes in the macromineral concentration (increase in Mg, K and Na; decrease in Ca) and in their solubility (especially for K and Ca) in caecal contents.

Monetti P.G., Benassi M.C., Berardelli C., Gubellini M.: Ricerche sull'induzione di un ciclo di deposizione autunno-invernale nella starna. *Research on the induction of an autumnal cycle of egg production in the gray partridge*. Rivista di Avicoltura, 58(1), 33, 1989.

Using a suitable light programme, photorefractoriness was terminated and a second cycle of egg-laying was induced in grey partridges which had already laid regularly in the physiological period. The percentage of pairs producing, the level of fecundity and egg quality (weight, fertility and hatchability) were clearly lower than those observed in the normal egg-laying period (April-July). However, each of the 53 pairs which laid (85.5% of total) produced 15.8 eggs and 5.2 live and healthy chicks in 9 weeks.

Monetti P.G.: Lisina per scrofe in lattazione. *Lysine for lactating sows*. Summa, 6(2), 83, 1989.

The results of a French experiment are being critically reviewed regarding lysine requirements of lactating sows and the percentage of this amino acid in feed according to the daily intake.

Mordenti A., Aumaitre A.: *Probiotics and new aspects of growth promoters in pig production*. Production of pig meat in Mediterranean countries. Proceedings of the Belgrade Seminar, April 1986, 165, 1989.

The use of auxinic antibiotics, amino acids and peptides and lactic bacteria as growth promoters in pig production is reviewed.

Mordenti A., Parisini P., Scipioni R., Formigoni A.: Performance zootecniche da somministrazione di lisati proteici a bovine da latte ad alta produzione. *Effect of feeding protein lysates to high yielding dairy cows on performance*. Obiettivi e Documenti Veterinari, 10, 17, 1989.

For 200 days, 2 groups of 17 Friesian dairy cows, mean milk yield 32.45 and 32.77 litres daily, were given diets to cover maintenance and a daily milk yield of 19 kg with supplementary feed 1 kg/2.2 kg milk above this amount without or with proteolysate, obtained by chemical hydrolysis, 8 g daily. The proteolysate had free amino acids 90, peptides 10

and branched-chain amino acids 20%. From the 2nd to 3rd week milk yield was greater in cows given proteolysate. Peak yield was 1 week earlier and total milk production 5% greater in the treated group. The lactation curve was more persistent with a yield 8% greater than in controls on the 200th day after calving. Milk quality was not different between groups. The interval between calving and oestrus was 41 and 47 days and between calving and conception 142 and 131 days, respectively.

Mordenti A., Scipioni R.: Influenza dell'alimentazione sulla qualità della carne suina. *Effect of nutrition on meat quality in pigs*. Riv. Suinicolt., 30, 13, 1989.

The effect of nutritional factors including the quality and method of administration of feed and the type of basic ingredients and additives used on carcass and meat quality in pigs are reviewed.

Mordenti A.: *Feed additives in pig nutrition*. Vet. en Praxis, 3, 87, 1989.

In the light of specific literature, the effect and the hygienical aspects of growth-promoters employment are discussed. It is concluded that specific and non-adsorbed growth promoters do not cause any particular risks. Whereas, there are some problems relating to copper-salts used and there are some doubts about metabolism repartitioning agents, whose use is actually forbidden.

Mordenti A.: *Probiotics and new aspects of growth promoters in pig nutrition*. Options méditerranéennes: the production of pig meat in mediterranean Countries CEC/CIHEAM — March, 1989.

After having examined growth-promoters evolution in swine nutrition, the Author discusses some problems about probiotics use in animal production. He proposes, on the basis of his own results, the administration of growth-promoters together with protein hydrolysates in pigs and other animals of zootechnical interest.

Pacchioli M.T., Parisini P.: Effetti della somministrazione a suinetti di diete ipoproteiche integrate con aminoacidi di produzione industriale. *Synthetic aminoacids supplementation of low protein diets for piglets*. Riv. Suinicolt., 30(4), 115, 1989.

The aim of this research was to evaluate the possibility of reducing the usual protein levels in the diets for piglets with the addition of synthetic amino acids. The diets contained different amounts of lysine and threonine/lysine ratio. The differences were not statistically significant but groups with higher threonine/lysine ratio showed better performance.

Pacchioli M.T., Scipioni R., Volpelli L.A.: Influenza del momento produttivo sulla digeribilità degli alimenti nelle scrofe. *Influence of the pregnancy on the digestibility of nutrients in sows and gilts*. Zootec. Nutr.Anim., 15, 446, 1989.

Eight multiparous sows and eight gilts, Landrace x Large White, were divided into two homogeneous groups (pregnant or not). The apparent digestibility of the nutrient were evaluated with a natural indicator (acid-insoluble ash). The results obtained show an improvement of digestibility with the pregnancy, statistically significant only for energy and for ADF. The statistical analysis shows a clearer effect of the pregnancy in the gilts than in the multiparous sows.

Rizzi L., Panciroli A.: La fibra nell'alimentazione dei ruminanti. *Fiber in ruminant nutrition*. Obiettivi e Documenti Veterinari, 17, 1989.

This review aims to give synthetic knowledge about physical and chemical characteristics and function role of fiber in ruminant nutrition. Cell wall degradation and utilization are subjected to several factors, not completely known. It seems necessary to search into analytical techniques of the fiber constituents determination and into rumen function and microflora.

Rizzi L.: Tecnologia e nutrizione. *Feed processing technology and nutrition*. Summa, 6(2), 91, 1989.

Several physical and chemical processing methods improve nutritive value of feedstuffs for pigs. The digestible energy content of simple and compounded swine feeds is variable and depends on the effects of processing, but usually it is improved for 4-15%. Sometimes it is possible to have a destruction of some vitamins and a reduced availability of some amino acids, as lysine and tryptophan.

Scipioni R., Biavati B., Volpelli L.A., Marchetti M.: Pool di aminoacidi naturali e di sintesi nella nutrizione del suinetto, *Natural and synthetic pooled aminoacids in piglets nutrition*. Zootec. Nutr. Anim., 15, 321, 1989.

The effects of synthetic pooled aa. and of the same aa. obtained through chemical-enzymatic lysis of animal proteins were compared. The research was carried out on 12 piglets from weaning to 25 kg lw. The results confirm the trend observed in previous researches with an added increase of vit. B2, B6 and panthotenic acid in the caecum. No valuable difference between the two pooled aa. was observed.

Scipioni R., Mordenti A.: Rapporti tra nutrizione e riproduzione, *Connection between nutrition and reproductive traits*, Atti Convegno Riproduzione nella specie suina, Ed. Fondazione Iniziative Zooprofilattiche e Zootecniche, Brescia, 26, 127, 1989.

The connection between energy intake, quantity and quality of protein, free aminoacids supply, lipids intake, additives, flushing and the reproductive traits of the sows are described and discussed on the basis of the relevant literature and of specific researches.

Scipioni R., Parisini P., Nocetti M., Rizzi L.: Valori ematici di riferimento in suini in accrescimento- ingrasso. *Blood reference values in growing-finishing pigs*. Atti Soc. Ital. Sci. Vet., 43, 1971, 1989.

The research was carried out on 22 pigs. Blood was collected from the jugular vein with venoject, after a fasting of 8 h. Besides the results show an increase of PVC, creatinine, ALT and total cholesterol and a lowering of LDH and hepatic LDH over 90 kg lw; the sex causes differences in the values of urea, cholesterol, AST, ALT and LDH.

Scipioni R.: Svezzamento: problematiche e strategie. *Weaning: problems and strategies*. Summa, 6(2), 85, 1989.

Social, environmental, physiological, nutritional and technical factors affect the performance of suckling or weaning piglets, giving rise to stress, growth reduction, increasing morbidity and mortality. New trends and strategies are discussed.

Volpelli L.A., Formigoni A., Antoci E., Parisini P.: Ricerche *in vitro* sulla conservazione del siero di latte per i suini. *In vitro studies on preservation of whey for pigs*. Sci. Tec. Latt.-Casearia, 40(2), 116, 1989.

Objective of this paper is checking the possibility of controlling whey fermentations. Seven levels of virginiamycin (VM) — 0, 3, 6, 9, 12, 15, 18 p.p.m. — were added to 35 samples of the same whey (starting pH 5.89), stored in thermostat at 37°C. pH, SH acidity and lactic acid level (d- and l-) were measured after 0, 12, 36 and 60 hours. Analyses carried out after 12, 36 and 60 hours pointed out a significant limitation ($P < .01$) of the natural increase of acidity (pH and SH/100) and of lactic ac. level of untreated whey, produced by all levels of VM. In particular, the difference in the values of pH and d-lactic ac. between untreated whey and the average of treated ones appears very interesting after 60 hours of storage: 3.85 vs 5.05 and 10.29 vs 1.77 g/l. It is concluded that, even at low doses, virginiamycin limits acidification of whey.

Zaghini G., Lambertini L., Antonelli A.: Ricerche sull'impiego di sostanze aromatizzanti in mangimi per conigli: effetti sulle preferenze alimentari. *Researches on the use of natural flavours in rabbit feeds*. Atti Soc. Ital. Sci. Vet., 43, 1823, 1989.

The aim of this trial was to evaluate the effects of natural flavours added in feeds for rabbits (60 g/100 kg). Six experimental groups, each one of ten animals, were confronted. A two-choice comparison test was used to evaluate feed preferences. The alimentary choices of the animals were markedly changed. These results were probably due to the interaction between the flavours present in feed components and those which were added.

Zaghini G., Marchetti S., Laffi R.: Qualità dei petfoods: indagini sul contenuto in vitamine A, E, B1. *Petfoods quality: researches on vitamins A, E, B1 contents*. Bollettino dell'Associazione Italiana Veterinari Piccoli Animali (AIVPA), 28(4), 277, 1989.

The vitamin content (A, E, B1) of 67 petfoods (36 for dogs and 31 for cats) was analysed. Vitamin A and E were determined by HPLC and vitamin B1 fluorometrically. The results show considerable variation in levels and furthermore, on the average, the amounts of vitamins are greater than the minimum required for growth. The content of vitamin A

was too high, particularly in canned foods. The majority of examined samples showed a considerable difference between the declared values of vitamin supplements and those actually present.

1990

Benassi M.C., Monetti P.G., Tassinari M.: Influenza del contenuto in lisina della dieta sulle prestazioni riproduttive della starna. *Influence of dietary lysine content on reproductive performances of gray partridges.* Atti Soc. Ital. Sci. Vet., 44, 1603, 1990.

The aim of the research was to study the effects of lysine content in the diets of breeder partridges. Sixty-three pairs of gray partridges, near egg-laying period, were divided into 3 groups and given diets with the same chemical composition and nutritive value but different lysine content: 1.29%, 1.38%, 1.47%. The results have proved that the addition of synthetic lysine to feeds with 24% protein and 1.29% lysine had not significantly changed the reproductive performances nor the number of chicks produced.

Cavani C., Rizzi L., Manfredini M., Bianconi L.: Variabili ematiche in pecore in lattazione alimentate con una dieta tradizionale e a piatto unico. *Blood parameters in lactating ewes fed traditional or complete diets.* Atti Soc. Ital. Sci. Vet., 44, 1451, 1990.

Twenty-four East-Friesian milking ewes, presenting similar stages of lactation, parity, milk production, were divided into two groups. The traditional diet (TD) group received mixed hay and concentrate, while the complete diet (CD) group was fed maize silage, hay and concentrate, distributed with mixer wagon. Blood samples were withdrawn at 1, 6, 10 and 14 weeks. No differences between the groups were found in a large part of blood parameters. Urea levels were higher in TD group during the second period of the trial. Also bulk milk from TD group showed higher values of urea.

Falaschini A.F., D'Arpa L., Rizzi L.: Riflessi sulle tecniche di utilizzazione delle risorse foraggere sulle performance zootecniche. *Effect of the utilization of forages on the zootechnical performances.* Atti Convegno C.R.P.A. Allevamento al pascolo negli ambienti appenninici: risultati di una esperienza di ricerca di cinque anni nell'alta collina romagnola, Bologna, 27 novembre, 1990.

Over four years, two similar areas of Tosco-Romagnolo Appennino were submitted to lasting and rotation pasture with two herds of Romagna, Limousine and Italian Pezzata Rossa (cows and calves). Animals have not utilized completely the pasture because they have left a lot of residue. A lasting pasturage is more advisable than a rotation pasturage, at least under the conditions of this research.

Formigoni A., Parmeggiani A., Bonardi S., Shehu D., Mongiorgi S.: Modificazioni della secrezione pulsatile dell'LH in scrofe sottoposte a diversi regimi alimentari durante la lattazione. *LH pulsatile secretion in lactating sows fed on two feed levels.* Atti Soc. Ital. Sci. Vet., 44, 473, 1990.

The pulsatile LH secretion has been studied in blood samples collected at 15 min. interval for 12 h from 4 primiparous sows 21, 23, 25, 28 and 29 days after parturition. NEFA, urea, glycemia and insulin levels have been also evaluated. The LH pulsatile secretion was inhibited until weaning (29 th day post-partum) in two sows supplied with 10.000 Kcal D.E./day. On the contrary the LH pulsatile secretion progressively increased in the others supplied with 18.000 Kcal D.E./day beginning from the 22th day of lactation. Besides confirming that energy intake and reproductive efficiency are closely related, these endocrine changes proved to be associated with the modifications of the metabolic parameters.

Lambertini L., Benassi M.C., Zaghini G.: Effetto di sesso e peso sulle caratteristiche qualitative della carcassa di coniglio. *Effects of sex and live weight on the rabbit carcass quality.* Riv. Coniglicolt., 27(4), 33, 1990.

A hundred and sixty rabbits (80 males and 80 females), genetically alike to N.Z.W. breed, were divided into four classes of weight. The animals were slaughtered at 84 ± 7 days of age. The weight of the skin, of the alimentary tract and of the hot and cold carcass was also recorded. Their head, liver, kidneys, perirenal and scapular fat were separated from the carcass which was later dissected into eight cuts. Measurements on the whole carcass and on some cuts were also carried out. Each one of these cuts was weighed and completely dissected to obtain muscle, bone and fat components. In the muscle of loin and left hind leg, the fat content was determined. The slaughter weight did not affect the dressing percentage but modified the measurement of the carcass and the percentage of the scapular and perirenal fat. Moreover, with the exception of hind legs, the ratio of the cuts and their muscle, bone and fat percentage did not vary. The dressing percentage of the males was greater than the females and their cuts and carcasses were more fleshy. The tissutal components of the cuts, if referred to the whole carcass, were modified by the sex and the live weight.

Lambertini L., Zaghini G., Benassi M.C.: Ricerche sulla qualità della carcassa di conigli ibridi commerciali. *Researches on carcass quality of rabbit for commercial production.* Atti Soc. Ital. Sci. Vet., 44, 1661, 1990.

The aim of this trial was to study the traits at slaughter and those of the rabbit carcass composition. A hundred and thirty nine commercial rabbits (74 males and 65 females) were slaughtered at 75, 85 and 95 days of age. Also, the weight of the skin, of the alimentary tract and of the hot and cold carcass was recorded. The head, the liver, the kidneys, the perirenal and scapular fat were separated from the carcass, which was later dissected into three portions (anterior, medium and posterior). Finally, each of these was deboned. The results show some differences among the rabbits slaughtered according to the age.

Lambertini L., Zaghini G., Dammacco D.: Risultati acquisiti con l'impiego di *Bacillus subtilis* in mangimi per conigli. *Results obtained by Bacillus subtilis added to rabbit feed.* Riv. Coniglicolt., 27(5), 29, 1990.

Some days before the delivery, thirty pregnant does were homogeneously divided into

two experimental groups. At the weaning, a hundred and twenty rabbits were randomly chosen from the litters of two groups of does. The does and the fattening rabbits were fed with the same commercial pelleted diet with or without probiotic (spores of *Bacillus subtilis* — $9.8 \cdot 10^5/g$). The average daily gain, the feed intake, the feed to gain ratio and the health of the fattening animals were recorded. The rabbits which died during the trial underwent necroscopic examination. The treatment did not affect the performances and the health of the rabbits; moreover there were no differences in mortality among experimental groups. The use of spores of *B. subtilis* into feed for rabbits does not show a remarkable effect as growth promoter.

Lambertini L., Zaghini G., Dammacco D.: Risultati ottenuti con l'impiego di sostanze aromatizzanti in mangimi per conigli. *Results obtained by flavours added to rabbit feed.* Riv. Coniglicolt., 27(11), 37, 1990.

The study was carried out using 96 rabbits with an average initial live weight of 985 g. The animals were divided into 4 groups of 24 each. The experimental plan foresaw the use, for each of them, of feed different in aromatic characteristics. Particularly we added three flavouring agents in proportion of 60g/100Kg. From the results we can infer the absence of significant effects due to treatment on the considered parameters.

Monetti P.G., Benassi M.C., Berardelli C.: *Researches on the reproduction of the gray partridge reared in captivity.* Proceedings of the 8th European Poultry Conference, 752, 1990.

Researches were carried out on the gray partridges (*Perdix perdix*) in an attempt: i) to establish the optimum level of protein of diets for breeders; ii) to verify the possibility of inducing two cycles of egg-laying in the same year. Results from these trials suggest: i) that it is possible to make use of diets with lower protein levels (16-16.5%) if scarcely productive animals are bred, but it is necessary to use high levels protein feeds (24-25%) with very productive animals; it is also possible to feed those animals with diets containing only plant proteins; ii) that, using a suitable light regime, photorefractoriness can be terminated and a second cycle of egg-laying in gray partridges which had already laid regularly in the physiological period can be induced.

Mordenti A., Piva A.: Insilati, alimenti a rischio. *Silage and associated risks.* Obiettivi e Documenti Veterinari, 11, 9, 1990.

Risk factors associated with the use of ensiled forages are reviewed. The use of silages may exert negative effects on animals, animal products, and eventually in humans. The relationships between silage and listeriosis, silage and botulism were addressed as well as the risk of mycotoxin contamination.

Mordenti A., Puppo S., Terramoccia A., Martillotti F.: *Physical treatments as cause of lag time in rumen degradability kinetics of dietary proteins.* VI Jour. Rech. Alim. Nutr. Herbiv., Paris-Grignon, 21-22 marzo. 1990.

The study was realized with 9 proteinic feeds of different nature and origin to determine the rumen degradation rate detectable by degradability kinetics. On the basis of the results the Authors concluded that treated proteinic feeds compared to untreated ones are less degraded and that higher amount of dietary protein escape to rumen degradation. The physical treatments are not only useful for a good storage but also for an improvement of protein utilisation in feeding of ruminants.

Mordenti A.: La copertura dei fabbisogni della vacca in lattazione con le tecniche moderne di scelta e somministrazione degli alimenti. *Dairy requirements meeting through the newtechnics of feed utilisation.* Prax. Vet., 11(4), 8, 1990.

The Author discusses, besides unifeed utilisation, some other means to improve ingestion capability of dairy cows as: the improvement of forage quality, the grass silage employment, the use of protected lipids and proteins and the possibility of stimulating rumen bacteria by specific nutrient compounds.

Parisini P., Sardi L., Scipioni R., Volpelli L. A.: Impiego di siero di latte naturalmente acidificato nell'alimentazione del suino pesante. *Use of naturally acidified whey in heavy pigs feeding.* Riv. Suinicolt., 3(4), 105, 1990.

The research took aim at studying the use of whey naturally acidified before its administration to the pigs. The presence of VM in the whey significantly reduced the fall of pH and the increase of SH/50 acidity but did not affect the pigs performance. This research points out the possibility of giving whey to the pigs, with or without preserving agents, also 3-4 days after its production.

Parisini P., Scipioni R., Marchetti S., Mordenti A.: Effetti della componente peptidica di un proteolisato nella nutrizione del suinetto. *Effects of the peptides held in a proteolysate in piglet nutrition* Zootec. Nutr. Anim., 15(4), 105, 1990.

The research was carried out to evaluate the biological significance of peptides held in lysate obtained through chemical-enzymatic processing of animal meals. The results show a statistical effect on the development of hind gut-micro flora with both pools. Thus the effects of proteolysate, even if they include free AA. and peptides, could prevalently be ascribed to the free amino acidic portion.

Piva G., Mordenti A.: *Milk quality: the final payoff.* Proceedings-of-Alltech's-Annual-Symposium. No. 6, 135, 1990.

Factors influencing the creaming capacity of milk used to produce Grana cheese in Italy were examined. It was concluded that it was possible to influence this capacity by manipulating fatty acid composition of animal feeds. The characteristics of the fat globules in milk and their tendency to cluster were also said to have an influence on creaming capacity.

Rizzi L., Cavani C., Manfredini M.: Caratteristiche chimiche e valore nutritivo dell'insilato di loietto (*Lolium perenne L.*). *Chemical analysis and nutritive value of Lolium perenne L. silage*. Atti della Società Italiana di Patologia e Allevamento degli Ovini e dei Caprini (S.I.P.A.O.C.), 9, Com. 9.7., 1990.

A trial of voluntary and at maintenance intake, *in vivo* digestibility and nitrogen balance of *Lolium perenne* silage (41% d.m.) was performed on six Suffolk wethers. Feeding level does not influence the digestibility of components and crude protein, NDF and ADF digestibility coefficients are respectively: 53,53 and 50%. The nutritive value is 0.63 Milk F.U. and 0.54 Meat F.U./Kg of d.m..

Rizzi L., D'Arpa L., Trombetta M.F.: Evoluzione delle caratteristiche chimiche e nutritive dei foraggi. *Evolution of chemical and nutritive characteristics of forage*. Atti Convegno C.R.P.A. Allevamento al pascolo negli ambienti appenninici: risultati di una esperienza di ricerca di cinque anni nell'alta collina romagnola, Bologna, 27 novembre, 1990.

In the frame of a research program of five years on the utilisation of marginal areas (hill and mountain) for animal breeding, the Authors have studied the forage characteristics of two areas submitted to lasting and in rotation pasturage. Crude protein content is greater during April, May and October, while crude fiber and NDF have contrary trend. After five years of pasturage, the quality of pasture or grass forage was not been spoilt by calves.

Rizzi L., Marchetti S., Panciroli A.: Determinazione di alcuni minerali in alimenti di impiego zootecnico mediante elettrodi iono-selettivi (ISE). *Determination of some minerals in feed by ion selective electrode (ISE) technology*. Atti Soc. Ital. Sci. Vet., 44, 1575, 1990.

The calcium, potassium sodium and copper content was determined on 23 samples of feeds both by atomic absorption spectrometer and by ion-selective electrode (ISE). The correlation coefficients (r) between the two methods were excellent for the determination of Ca (0.977), Na (0.997) and Cu (0.974) and acceptable for the determination of K (0.968). The regression lines obtained were quite near to the line of equality ($y=x$), which proves that the ISE technology is a valid and inexpensive alternative to the atomic absorption spectrometry for the determination of these minerals.

Scipioni R.: Polpe pressate; usarle con intelligenza. *Ensiled pressed beet pulps: how to use them*. Inform. Zootec., 37(8), 41, 1990.

The use of ensiled pressed beet pulps in sows and in growing-finishing pigs is evaluated by means of the favourable characteristics of their fibre and of the results of researches carried out by the Author and co-workers.

Terramoccia S., Puppo S., Rizzi L., Francia U., Martillotti F.: Investigation using zero time to compute the protein rumen degradability (DT). *Reprod. Nutr. Dev.*, 2, 157, 1990.

Three ways were used to estimate the parameters (a, b, c) of asymptotical curves and the time of rumen degradability (DT) of seven feeds after incubation in the rumen with nylon bag. The zero time was determined either experimentally (incubation in rumen fluid for 1 minute) or graphically. All three procedures can be considered good to estimate the DT, but, when possible, the experimental zero time determination should give better reliability.

Zaghini G., Lambertini L., Dammacco D.: Indagine sulla componente lipidica di *pet-foods*. *Researches on lipid elements in petfoods*. Atti Soc. Ital. Sci. Vet., 44, 1749, 1990.

We have analyzed several canned and dry food for cats in order to get further evaluation elements about petfood quality. Particularly we have examined the lipid content and the fatty acid composition by gaschromatography. The results show a high variability. Furthermore the canned food contains more fat than the dry food (22% vs 10.5% d.m.). On the other hand, the differences regarding both saturated and unsaturated fatty acids are low.

1991

Della Casa G., Mordenti A.: Alimentazione e turbe locomotorie nel suino. *Nutrition and locomotory disorders in pigs*. Sel. Vet., 32 (Suppl. 1), 417, 1991.

Nutritional level, the use of porcine growth hormone (pGH) and beta-adrenergic agents, calcium and phosphorus deficiency or imbalance, and dietary factors that can alter acid-base balance are reviewed as possible causes involved in the onset of leg weakness and osteochondrosis.

Formigoni A., Martelli G., Parisini P., Tassinari M.: Effetti della somministrazione di lipidi di diversa qualità nell'alimentazione della vacca in lattazione. *Effects of different qualities of lipids in lactating cows feeding*. Atti Soc. Ital. Buiatria, 23, 293, 1991.

The aim of the present trial was to evaluate the effect of two different sources of lipids in dairy cows feeding. Two groups of Italian Friesian cows, each constituted of 30 animals, were given 400 g/h/d of soybean oil (A) or 400 g/h/d of hydrogenated fat (B). Individual milk production, fat and protein were controlled every 14 days from the 10th to the 122th day of lactation. Milk production, fat percentage and 4% fat corrected production did not statistically differ between the two experimental groups. Milk protein increased ($P < 0.001$) in cows fed with hydrogenated fat. It is suggested that hydrogenated fats interaction with rumen bacterial activity is weaker than that of polyunsaturated oils.

Formigoni A., Mordenti A., Panciroli A., Parisini P., Piva A.: Influenza esercitata dalla somministrazione di caseina «ruminoprotetta» nell'alimentazione della vacca da latte. *Effect of rumen-protected casein in dairy cows feeding*. Atti 9° Congr. Naz. Assoc. Sci. Prod. Anim., 1, 259, 1991.

The aim of the trial was to evaluate the influence of rumen-protected casein (100g/d/head

of fatty acids enveloped casein) in dairy cows feeding. Casein degradability was determined *in vivo*. 40 Italian Friesian cows were divided into two groups, each constituted of 20 animals in early and in late lactation. Protected casein increased significantly milk production of treated cows ($P < .001$ in early lactation and $P < .01$ in late lactation). Fat and protein percentage did not statistically differ between control and treated animals in both lactation periods.

Formigoni A., Nanni M., Mora R., Ghelfi F., Piva A.: Influenza dell'impiego di caseina ruminoprotetta su alcune caratteristiche casearie del latte. *The influence of the rumen-protected casein on quality of milk for parmigiano-reggiano cheese production*. Atti Soc. Ital. Sci. Vet., 45, 1697, 1991.

The influences of rumen protected casein (as feed supplement for dairy cows) on milk quality for Parmigiano Reggiano cheese production were evaluated. We recorded differences in milk composition (protein and urea percentages were less in casein treated group) and on shrinkage during the cheese maturation (between 12 and 18 months) less for casein group.

Formigoni A., Parmeggiani A., Mattioli M. e Seren E.: Influenza di alcune componenti della dieta sulla secrezione di LH in scrofette impuberi. *Effect of some dietary components on LH secretion in prepuberal gilts*. Sel. Vet., 32(Suppl. 1), 291, 1991.

The Authors studied the patterns of LH secretion in 4 prepuberal gilts (about 80 kg) fed to appetite (7500 kcal ME/d) or on a restricted diet (2800 kcal ME/d). Blood sampling was carried out at 15 min intervals for 10 - 12 h per day through a chronic catheter inserted in the jugular vein. Feed restriction suppressed the pulsatile secretion of LH which reinitiated again after realimentation to appetite. The i.v. infusion of glucose or aminoacids for 12 h during the restriction period partially restored the pulsatile secretion of LH. The Authors discuss the results taking into account also the changes in insulin, glucose, urea, NEFA and total protein induced by feed restriction.

Fusconi G., Piva A.: Il rame nei ruminanti. *Copper in ruminant nutrition*. Obiettivi e Documenti Veterinari, 13, 33, 1991.

The Authors review the copper metabolism in ruminants. Copper interactions with molybdenum and sulphur as well as the main clinical signs due to deficiencies are described. Bovines seem to be particularly sensitive to copper subclinical deficiencies. Ruminant copper unsolubilisation may suggest the use of a rumen protected form.

Lambertini L., Benassi M.C., Zaghini G.: Ricerche sugli elementi di previsione delle componenti tessutali della carcassa di coniglio. *Prediction of the tissue composition of the rabbit carcass*. Riv. Coniglicolt., 28(8), 35, 1991.

In this trial, the possibility to estimate the muscle, bone and fat components of the rabbit carcass was evaluated through the regression equations obtained by the Stepwise method. One hundred and fiftyfive New Zealand White rabbits (78 males and 77 females),

raised on the same farm and fed the same diet, were used. The rabbits, chosen at random, were slaughtered at 11/13 weeks of age. On the slaughter data, those obtained by dissection of the carcass and of the cuts were recorded. Those of the cuts were highly correlated with the tissue composition of the carcass. Therefore, they were suitable to predict the percentage of lean, bone, fat and muscle/bone ratio. For this, some equations were proposed. Nevertheless, the use of these equations seems to be restricted in the experimental field.

Lambertini L., Tassinari M.: Minerali e argille, additivi polivalenti. *Minerals and clays: polyvalent additives*. Inform. Zootec., 38(14), 43, 1991.

In this review, the Authors describe the characteristics of some minerals and clays (zeolite, sepiolite and bentonite) in relation to their use in animal feeding.

Lambertini L., Zaghini G.: Qualità della carcassa: attualità di un problema. *Carcass quality: an actual problem*. Riv. Coniglicolt., 28(3), 35, 1991.

The Authors examine the qualitative characteristics of the rabbit carcass and the variables which can modify them.

Monetti P.G., Benassi M.C., Tassinari M.: Attitudine alla produzione del baby beef di vitelle di razza Frisona Italiana e Bruna. *Baby-beef production from Italian Friesian and Brown female calves*. Atti Soc. Ital. Sci. Vet., 45, 1653, 1991.

Slaughtering parameters and performances of 24 Italian Friesian and 24 Brown breeds female calves have been compared to verify their aptitude for baby-beef production. Results showed higher carcass weight, dressing percentage, better conformation and carcass quality, higher weights of commercial first-class cuts of Brown. No difference between breed have been recorded during the growing period.

Mordenti A., Formigoni A.: Influenza dei fattori ambientali sulla qualità del latte. *Effects of environmental factors on milk quality*. Bianco e Nero, 5, 8, 1991.

Environment is very important to express the maximum potentiality in term of quantity and quality of milk production. Among environmental factors the most important is nutrition. Rumen fermentation is the most effective to determine milk characteristics.

Mordenti A., Martelli G.: Alimentazione zootecnica e qualità della carne suina. *Pig feeding and meat quality*. Atti del Convegno Nazionale La carne suina oggi in Italia: aspetti produttivi, merceologici e nutrizionali, 45, 1991.

The paper reviews the roles of genetics and feeding on pig meat quality. The influence of dietary lipids, copper and vitamin E on fatty acid composition of sub-cutaneous are particularly discussed.

Navarotto P.L., Piva A.: Fotoperiodo e produzione del latte. *Photoperiod and milk production.* Inform. Agr., 24, 27, 1991.

The importance of the photoperiod is very well known in poultry management, but it should also be taken into consideration in dairy production. This paper reviews the latest research about the relationship between milk production and light exposure. Sixteen hours of light with a minimum intensity of hundred lux are reported to have a positive influence (+ 10%) on milk production. The effect of the photoperiod on animal behaviour and hormonal status is also reported.

Parisini P., Accorsi P.A., Sardi L., Scipioni R.: Diverse forme di integrazione oligominerale nell'alimentazione di scrofe in gestazione-lattazione. *Different sources of trace elements as a supplement in pregnant and lactating sows feeding.* Atti 9° Congr. Naz. Assoc. Sci. Prod. Anim., 395, 1991.

The trial was carried out to evaluate the effect of a trace elements aminoacids-linked dietary supplement on reproductive performances of pregnant and lactating sows. The use of aminoacids-linked trace elements, especially when they are associated to trace elements inorganic salts increases, in annual productive performances, sows performances by determining a significant increase of weaned piglets/sow/year

Parisini P., Martelli G., Mordenti A.: Ricerche sull'impiego di diete ipoproteiche integrate con lisina nella produzione del suino pesante. *Low protein diets supplemented with lysine in Italian heavy pig feeding.* Riv. Suinicolt., 32(5), 45, 1991.

The trial has been carried out to evaluate the possibility of replacing part of the dietary protein content with lysine in Italian heavy pig feeding. Low protein diets supplemented with lysine did not impair growing and fattening performances. The carcass shows a trend toward a higher adiposity degree. We agree with the use of Net Energy to satisfy energy requirement of pigs fed low protein diets.

Parisini P., Martelli G.: Indagine su alcune caratteristiche morfologiche e funzionali della razza Bruna. *Morphological and productive traits of the Bruna breed.* Inform. Agr., 22, 37, 1991.

The study has been carried out on 145 Bruna cows belonging to the original European strain or deriving from Brown Swiss cross breed. Morphological and productive traits of these animal are correlated and discussed.

Parisini P., Sardi L., Martelli G., Formigoni A.: Valutazione su alcuni parametri quantitativi di prosciutti durante la stagionatura. *Evaluation of some quantitative and qualitative parameters during seasoning of hams.* Atti Soc. Ital. Sci. Vet., 45, 1975, 1991

We studied the losses of weight of 234 hams during their seasoning period. Hams were divided according to their weight and their fatness. Losses of weight were related to the adiposity degree rather than to the class of weight. Seasoned hams showed an improvement in unsaturated fatty acids percentage and a reduction of the saturated one.

Parisini P., Sardi L., Mordenti A., Martelli G., Panciroli A.: Polpe secche e polpe surpressate nell'alimentazione del suino pesante. *Dried beet pulps and ensiled beet pressed pulps in the feeding of heavy pigs: effects on growth and slaughtering performances.* Riv. Suinicolt., 32(8), 47, 1991.

The research was carried out with the aim to study the effect of beet pulps on growth and slaughter performances and on meat quality of growing-finishing heavy pigs. The use of beet pulps did not induce worsening of the weight gain and of the feed conversion; the meat quality was not affected by the treatments.

Rizzi L., Cavani C., Manfredini M.: Digeribilità *in vivo* della paglia trattata e non trattata con ammoniaca anidra. In vivo *digestibility of soybean straw treated and not treated with anhydrous ammonia.* Atti del 9° Cong. Naz. Assoc. Sci. Prod. Anim., 1991.

Four *in vivo* digestibility trials were carried out on six Suffolk wethers by feeding, at maintenance and ad libitum intake, the following diet based on complementary feed and soybean treated or not treated with anhydrous ammonia. The digestibility coefficients of not treated straw were very similar, in spite of different feeding levels, and nutritive value was similar to those of wheat and barley straw (0.33 Feed Unit for Meat production / Kg d.m. and 0.44 Feed Unit for Milk production). The treated straw showed an increase in N level and a decrease in the percentage of NDF. The highest nutritive level lowered the digestibility of organic matter, when compared to the value found at maintenance. The nutritive value of treated straw was: 0.42 and 0.53 Feed Units for Meat and Milk production respectively.

Rizzi L., Tuzi M., Marchetti S.: Determinazione di Ca, Na e K in differenti tipi di latte mediante elettrodi ione selettivi (ISE). *Determination of Ca, Na and K in different samples of milk by ion selective electrode (ISE) technology.* Atti Soc. Ital. Sci. Vet., 45, 1691, 1991.

The calcium, sodium and potassium content was determined on 18 samples of milk of different origin (cow, ewe and sow) or of variously treated milk by atomic absorption spectrometer and by ion selective electrode (ISE). The correlation coefficients (r) between the two methods for the determination of Ca, Na and K are respectively: 0.990, 0.996 and 0.999. The regression lines obtained are quite near the line of equality ($y=1x$), which proves that the ISE technology for the determination of these minerals is a valid and inexpensive alternative to the atomic absorption spectrometer.

Scipioni R., Marchetti S., Martelli G.: Influenza del trattamento delle feci (metodi di disidratazione e di estrazione dei lipidi) sulla stima della digeribilità nei suini. *Apparent digestibility in the pigs in relation to different methods of drying the faeces and of analysing faecal lipids.* Atti 9° Congr. Naz. Assoc. Sci. Prod. Anim., 105, 1991

This trial was carried out to evaluate the influence of the drying method (freeze drying and forced-air oven drying at 65°C) on swine faeces regarding to the chemical composition and to the apparent digestibility. Lipids percentage was determined by EE or by HCl+ EE method; some of these were analysed by gaschromatography and thin layer chromatography. With references to the drying method, the main differences on the

chemical composition concerned organic matter, gross energy, NDF and (NDF-ADF). The two methods of lipid extraction influenced fat percentage of the freeze dried samples and of the oven dried ones. No qualitative differences in fatty acids were observed.

Scipioni R., Pacchioli M.T., Martelli G., Accorsi P.A.: Impiego di salinomycin in suini in accrescimento. *Use of salinomycin in growing pigs*. Atti Soc. Ital. Sci. Vet., 45, 1895, 1991.

The aim of the trial was to evaluate the effects of salinomycin in growing pigs diets. Data concerning daily weight gain and feed efficiency were collected. Animal receiving salinomycin showed an improvement in daily weight gain. Feed efficiency and feed consumption were slightly improved too.

Scipioni R., Sardi L., Barchi D., Accorsi P.A., Pacchioli M.T.: Elevate quantità di insilati nell'alimentazione del suino pesante: effetti sulle performance di accrescimento e macellazione. *High levels of silage in the feeding of heavy pigs: effects on growth and slaughter performances*. Riv. Suinicolt., 32(7), 71, 1991.

The research was carried out with the aim to study the effects of very high quantities of silage on growth and slaughter performances and on meat quality of growing-finishing heavy pigs. The use of silage induced a significant worsening of the weight gain and of the feed efficiency and a lowering of the backfat thickness, of the dressing percentage and of the fatty cuts percentage. Neither the palability of the diets nor the meat quality was affected by the use of silage.

Tassinari M., Panciroli A., Monetti P.G.: Confronto fra ceppi genetici diversi nella produzione del vitellone leggero tipo baby beef. *A comparison among different cattle genetic types in baby-beef production*. Atti Soc. Ital. Sci. Vet., 45, 1595, 1991.

The aim of this research was to verify the aptitude for baby-beef production of 96 male calves of 4 breeds: Italian Friesian, Canadian Friesian, Brown and Polish Friesian. Performances, slaughtering weight, dressing percentage, carcass quality, commercial first-class cuts weight, *longissimus dorsi* and *semimembranosus* muscles colours were recorded. Tenth rib sample joint composition was also analysed. Results showed that Brown was the best breed both for performance during growing period and for conformation and carcass quality.

Tolomelli B., Laffi R., Marchetti S.: Cromatografia liquida per il dosaggio della vitamina B6 negli alimenti. *Liquid chromatographic assay of vitamin B6 in feeds and foods*. Industrie Aliment., 30, 1055, 1991.

A sensitive and simple method for the determination of vitamin B6 added in feeds and foods by HPLC and fluorimetric detection is described. The method values vitamin B6 vitamers: pyridoxine, pyridoxamine and pyridoxal present naturally in foods. After extraction by acid hydrolysis the vitamers are separated by ion-pair chromatography with reverse phase C18 column and with a mobile phase of methanol:ion-pair reagent. Recoveries of vitamers added to samples were in the range of 83.0 - 98.13%. The method is

more satisfactory than the microbiological procedure because of its simplicity and potentially large number of samples that may be analyzed and provides a powerful tool to routinely quantitative B6 analysis.

1992

Formigoni A., Martelli G., Coppa C., Zocca A.: Nuove modalità di somministrazione di mangimi ai vitelli. *A new form of concentrate administration in calves*. Atti Soc. Ital. Sci. Vet., 46, 1975, 1992.

The aim of the trial was to evaluate the effects of "block concentrate" in veal production. 84 Friesian calves were followed from 68.5 Kg of live weight until 1 month after the weaning. Diets differed in the ratio between traditional and "blocks concentrates". During the trial the worst performances belonged to calves receiving exclusively the blocks concentrates.

Formigoni A., Pacchioli M.T., Parisini P., Sardi L.: Impiego di flavofosfolipol nell'alimentazione della vacca in lattazione: effetti sulle performance produttive e riproduttive. *Use of flavofosfolipol in lactating cows: effects on milk yield and reproductive performances*. Atti Soc. Ital. Buiatria, 24, 171, 1992.

The trial was carried out, in the Parmesan cheese production area, to evaluate the effects of a dietary addition of 100 mg/h/d of flavofosfolipol (FFL) on dairy cows productive and reproductive performances. The experimental design was already discussed in a previous paper. FFL did not induce any effect neither on milk quality nor on its cheese making properties. Microbiological analyses pointed out an improvement of the bacterial content of the milk especially for Lactobacillus and Coli. To this aim 240 cows were utilised and divided into two groups (control group and @Flavofosfolipol one); within the groups 46 animals that completed the whole lactation were chosen. Feed intake and milk yield was daily recorded for each group. Even if FFL did not induce any significative benefit on the whole production it seemed to improve milk quantity during the early lactation (200 days). FFL also allowed a satisfactory feed intake during the summer. FFL, finally, did not influence reproductive performances of cows.

Lambertini L., Benassi M.C., Zaghini G.: Ricontri sulla composizione della carcassa cunicola. *Researches on the rabbit carcass composition*. Atti Soc. Ital. Sci. Vet., 46, 2051, 1992.

The aim of this trial was to evaluate the effect of the slaughter age on the rabbit carcass composition. Sixty commercial rabbit (Hyla), 30 males and 30 females, raised on the same farm and fed the same diet, were slaughtered at 75, 85 and 95 days of age. The slaughter data and the weight of head, skin, alimentary tract, liver, kidneys, scapular and perirenal fat were recorded. The loin and the left hind leg were separated from the carcass and later dissected to obtain lean, bone and fat components. The results show differences among the most observed parameters which are related to the rabbit age.

Lambertini L., Benassi M.C., Zaghini G.: Indagine sulle caratteristiche della componente muscolare nel coniglio. *Research on the rabbit meat composition*. Atti del Convegno Nazionale Parliamo di carni avicole e cunicole, 189, 1992.

The aim of this trial was to evaluate the effect of sex, slaughter age (75 d, 85 d, 95 d) and genetic line (Hyla and Provisal) on some meat qualitative parameters, using 120 rabbits. The chemical composition of the muscles, obtained by dissection of loin and left hind leg, was determined. Moreover, the muscular pH of *L. dorsi* and *B. femoris* was measured on 60 carcasses. The fatty acids composition of the intramuscular fat was also determined on the rabbits slaughtered at 95 days of age. The results show small differences related to the considered variables. Nevertheless, the age seems to affect the pH values and the protein levels.

Mac Pherson A., Formigoni A., Wells E.A.: *A study possible adverse reactions to clostridial vaccination of ewes*. Proc. VIII Int. Conf. Prod. Diseases Farm Animals, 39, Bern, Svizzera 1992.

This study was undertaken to examine the effect of liver dysfunction on susceptibility of ewes to such adverse reactions subsequent to vaccination with a multi-component clostridial-pasteurella vaccine. 34 ewes were divided in 4 groups of 8 or 9 animals each one: control, vaccine, liver stressor (CCl₄) and vaccine and liver stressor. Results suggest vaccination as far before lambing as possible is recommended to minimise risks of toxæmia and/or hypocalcemia.

Marchetti M., Laffi R., Marchetti S.: Residui: cause e rimedi. *Residues: causes and remedies*. Obiettivi e Documenti Veterinari, 13(5), 65, 1992.

The Authors report the results of analyses performed to define the drugs residues in the foods of animal origin. The actions to be carried out, in order to highly limit the residual inconvenience could be well represented by technological modifications of working plants and farmers.

Martelli G., Bruyere D., Vanbelle M.: *Phytase and phytic phosphorus*. Alimentation Anim., 461, 1992.

The effects of vegetable phytase of maize, soybean and wheat bran were studied. Wheat bran showed the highest vegetable enzyme activity. By using the same raw materials were studied the effects of the addition of a microbial phytase deriving from *Aspergillus niger*. P liberation after phytase addition and incubation at 40°C during five hours was shown to be 76%, 91% and 97% of total P for soybean, maize and wheat bran, respectively.

Martelli G., Formigoni A., Marchetti S., Nanni M.: Impiego di Flavofosfolipol nell'alimentazione della vacca in lattazione: effetti sulla qualità del latte. *Use of flavofosfolipol in lactating cows feeding: effects on milk quality*. Atti Soc. Ital. Buiatria, 24, 179, 1992.

The trial was carried out to evaluate the effects of the dietary addition of flavofosfolipol (FFL) on milk quality in the Parmesan Cheese production area. No antibiotic residue was found in milk (by bacterial growth inhibition assay). FFL did not induce any effect either on milk quality and on its cheese making properties. Microbiological analysis pointed out an improvement of the bacterial content of the milk especially for *Lactobacillus* and *Coli*.

Martelli G., Parisini P., Pezzi P., Sardi L.: Indagine zoometrica su bovine di razza Frisone italiana allevate nella Pianura Padana. *Some body measurements of Italian friesian cows bred in Pianura Padana*. Atti Soc. Ital. Sci. Vet., 46, 1975, 1992.

Some body measurements and the value of Mature Cow Equivalent of 406 Italian Friesian cows were collected. Data were compared with values recorded in 1968-1969 deriving from similar cows. The comparison pointed out a productive improvement and a better dairy conformation of the cows.

Monetti P.G., Rizzi L., Benassi M.C., Rizzoli A., Puccella N., Zanni M.L.: Effetto del sesso e dell'età sulle prestazioni produttive e sulla capacità di utilizzazione digestiva degli alimenti nella lepre allevata in cattività. *Influence of sex and age on the productive performance and digestibility of feed in hares reared in captivity*. Zootec. Nutr. Anim., 18, 313, 1992.

The aim of this research was to determine the coefficients of digestibility of the nutrients of a complete feed and productive performance in hares from weaning to 13 months of age. The results showed that the live weight of hares reared in captivity increases up to 9 months of age (approx. 3.5 kg LW) after which it remains practically constant. It seems that age may condition the capacity of digestive use of some nutrients of the feed. In fact, with time the digestibility coefficients of protein and especially of ash fall, showing marked differences between the first and the last weeks of the trial, whereas those of the crude fibre, the NDF and ADF increase up to the 9th month and decrease in the subsequent 3 months. As far as the sex was concerned the females had higher ADC for almost all the nutrients, especially protein, DM, and OM, thus demonstrating enhanced capacity for digestion compared to the males.

Mordenti A., Martelli G.: Le fitasi nell'alimentazione dei suini e del pollame. *Phytases in the feeding of pigs and poultry*. Inform. Agr., 48(38), 33, 1992.

The use of phytase of vegetable or microbial origin to improve the availability of phosphorus and, incidentally, of other nutrients in feeds of plant origin in diets for pigs and poultry is discussed. It is concluded that phytase can be used to replace mineral sources of P with evident ecological and economic advantages.

Mordenti A., Piva A.: *Livestock production in Europe: the role of diet, feed additives and manipulation of metabolism*. Atti del Congresso Biotechnology in the feed industry, Ed. Lyons, 303 Lexington, U.S.A. 1992.

The main strategies of European livestock production were described with particular reference to the use of ideal protein and nutrient balance. As far as the environmental impact of intense animal breeding is concerned the use of a correct amino acid equilibrated protein allows a reduction of excreted nitrogen by 30%. The use of phytase, as feed additive, can result in a reduction of phosphorus excretion by 40%. The use of biotechnological tools can contribute to reduce the environmental impact of animal breeding.

Mordenti A., Rizzitelli N., Cevolani D.: Manuale di alimentazione del suino. *Pig feeding: a technical manual*. Edagricole Bologna. pag 277, 1992.

The Authors describe dietary and utilisation features of swine feeds from a practical point of view. They also present the most common use of the reported feeds

Novelli E., Parisini P., Delbono G., Sardi L., Dazzi G., Campanini G.: Valutazione quantitativa delle caratteristiche merceologiche della coppa. *Evaluation of compositional and qualitative characteristics of coppas (neck)*. Annali della Facoltà di Medicina Veterinaria dell'Università di Parma, 12, 183, 1992.

A research has been conducted on a set of coppas (neck) obtained from a group of 24 heavy pigs. No real difference was observed with regard to the sexes. The results obtained from the lean meat showed a lower water and NaCl concentration and a higher intermuscular fat content as compared with standard Parma ham composition. The results are discussed in relation with organoleptic qualities of seasoned coppas.

Pacchioli M.T., Guidetti R., Martelli G., Mora R., Sardi L.: Impiego di Flavofosfolipol nell'alimentazione della vacca in lattazione: attitudine del latte alla trasformazione in Parmigiano Reggiano. *Use of Flavofosfolipol in dairy cows feeding: effects on Parmesan cheese production*. Atti Soc. Ital. Buiatria, 24, 189, 1992.

406 Parmesan cheeses were analysed in order to establish the possible effects of the antibiotic during the seasoning period. Parmesan cheeses were judged by following the traditional principles and it was chemically analysed too. Flavofosfolipol in the ratio of 100 mg/h/day did not influence seasoning process of Parmesan cheese.

Quaglio G., Olivi C., Tassinari M.: Impiego di compost nell'alimentazione del pollo da carne. *Utilizing compost in the broiler diet*. Atti Soc. Ital. Sci. Vet., 46, 2019, 1992.

Finishing diets for broilers, isocaloric and isoproteic, were supplemented (0; 5; 7.5 and 10%) with compost obtained from poultry manure of layers reared in cages. Neither the zootechnical performance nor slaughtering parameters appeared to be significantly affected by the amount of compost in the diet.

Rizzi L., Panciroli A., Lambertini L.: Influenza dei componenti della dieta sulla composizione corporea di ovini. *Influence of diet components on body composition of lambs*. Atti Soc. Ital. Sci. Vet., 46, 1857, 1992.

The Authors have studied the chemical body composition of Suffolk lambs, divided into 9 groups. The diets were based on a 40% of complementary feed and on a 60% of lucerne hay, wheat straw and sweet potato in different percentage. The results of the trial showed that there are negative associative effects on every parameters in lambs fed potato and straw (30% + 30%). Every association of three feeds made the chemical body composition worse.

Sardi L., Panciroli A., Scipioni R.: Acidi grassi salificati in diete per suinetti. *Calcium salts of fatty acids in piglet diet*. Atti Soc. Ital. Sci. Vet., 46, 1987, 1992.

With the aim to compare three diets each containing different calcium salts of fatty acid and a diet containing lard, 128 piglets were utilised. Daily weight gain was fairly more favourable for the group receiving lard because of a higher feed intake. The composition of fatty acids soaps affected feed efficiency.

Tassinari M., Laffi R., Marchetti M.: Biodisponibilità nel suino delle vitamine K3 e PP presenti nell'addotto menadione nicotinamide bisolfito. *Bioavailability of vitamins K3 and PP present in the adduct menadione nicotinamide bisulphite in swine*. Atti Soc. Ital. Sci. Vet., 46, 1993, 1992.

Bioavailability of vitamins K3 and PP present in adduct menadione nicotinamide bisulphite (MNB) in swine was studied evaluating their plasma levels at various time after administration of feed containing respectively MNB or an equivalent quantity of MSB and nicotinamide. The obtained results show that two vitamins bound in the adduct are absorbed with the same rapidity and intensity of the free forms.

Terramoccia S., Puppo S., Rizzi L., Martillotti F.: *Comparision between in sacco and in vitro protein rumen degradability*. Ann. Zootech., 41, 20, 1992.

A comparision between *in sacco* and *in vitro* determination is useful in order to assess the differences of protein degradability. The asymptotical data of *in sacco* method are always higher than those *in vitro* determinèd; such differences are due to a major number of protein cleavage sites to be attached by protease in the rumen for synergistical action of other enzymes (amylase, cellulase, emicellulose, etc.).

Zaghini G., Ferri D., Dammacco D., Lambertini L.: Indagine sulla qualità dell'acqua utilizzata nell'alimentazione del vitello a carne bianca. *Researches on the water quality in veal production*. Obiettivi e Documenti Veterinari, 12(12), 65, 1992.

The Authors report the results of analyses performed to define some chemical properties of drinking water for veal production, collected in different areas (North-Italy). The obtained values have showed a good quality of these waters used in veal breeding.

1993

Formigoni A., Parisini P., Corradi F., Ashmead H.D.: *The use of amino acid chelates in high production milk cows.* In: *The-roles-of-amino-acid-chelates-in-animal-nutrition.* Noyes Publications; Park Ridge; USA, 170, 1993.

The benefits of using amino acid chelates during supplemental mineral nutrition on reproduction and milk production in dairy cows is discussed.

Formigoni A., Piva A., Huntington J.: *Impiego delle polpe di bietola surpressate insilate nell'alimentazione della bovina da latte. Use of silage made from pressed sugarbeet pulp in the diet of dairy cows.* Inform. Agr., 49(15), 47, 1993.

Pressed sugarbeet pulp, supplying fibre that is readily degradable in the rumen, can, if correctly ensiled, be used to increase the energy concentration in diets for high-yielding dairy cows without incurring the risks associated with excessive intakes of starch-based concentrate. Positive effects on milk yield and milk fat content have been reported.

Formigoni A., Piva A., Huntington J.A., Gramenzi A., Scipioni R.: *Cinetica dell'assorbimento intestinale di fosforo di diverse fonti minerali in suini portatori di carattere portale. Evaluation of phosphorus absorption kinetics in portal catheterized pigs when different salts were supplied.* Atti Soc. Ital. Sci. Vet., 47, 1993.

The aim of this trial was to determine the kinetics of intestinal absorption for different phosphorus salts (monosodium, monocalcium and bicalcium). Two sows with portal catheters were used. Blood was sampled via the catheter at twenty minutes intervals for nine hours. Sampling started one hour pre-feeding. The results showed a marked increase in portal inorganic phosphorus level when diets were integrated with different salts ($P < 0.001$). A marked post-feeding increase in plasma inorganic phosphorus was found only when diets were supplied with a high quantity of phosphorus salts.

Formigoni A., Scipioni R., Sardi L., Mordenti A., Piva A.: *Integrazione con DL-metionina e DL-metionina ruminoprotetta in diete per vacche da latte: effetti nella prima fase produttiva. DL-methionine or rumen protected methionine in dairy cow feeding: effects on early lactation.* Atti 10° Congr. Naz. Assoc. Sci. Prod. Anim., 215, 1993.

30 Italian Friesian cows divided into three experimental groups, were monitored for 197 days of lactation. The first group was the control (A) the second received 10g/d/head of DL-methionine (B) and the third group (C) received the same amount of rumen protected methionine. Cows receiving rumen protected methionine produced more milk (29.0 kg/head/day) than group B (27.5 kg/head/day, $P < 0.05$) and than the control group (27.1 kg/head/day, $P < 0.01$). Milk produced by groups B and C showed a higher ($P < 0.01$) fat content (3.26 and 3.18% respectively) than the control group (3.01%). No significant differences between treatments were observed on milk quality (crude protein, casein, pH, SH acidity, somatic cells content and dry matter).

Huntington J.A., Piva A., Meola E., Formigoni A., Mordenti A.: *Development of an in vitro system to investigate pig hindgut fibre fermentation.* Proceeding of the Royal Agricultural Society of England Congress: Livestock Science into practice, 6 maggio, United Kingdom, 1993.

Pig hindgut fermentation is of increasing interest as the volatile fatty acids produced in the caecum and colon may provide from 5 to 28% of the energy requirements for growing pigs. Increasing the fibre content of the pig diet may also improve intestinal microbial balance, reduce housing stress and at parturition can help to prevent constipation and MMA. Our studies indicated that a combination of batch-culture fermentations and gas production data can provide a simple reliable method of investigating fibre degradation in the pig hindgut. Our studies have also shown that the high pectin content of sugar beet pulp makes it a good source of dietary fibre for inclusion in pig diets (dried or ensiled).

Marchetti M., Laffi R., Marchetti S.: Vitamine negli integratori zootecnici. *Vitamins in premixes.* Obiettivi e Documenti Veterinari, 14(6), 21, 1993.

The aim is to specify the factors that cause degradation of vitamins in premixes. The major factors were indicated, like aggressive agents (micronutrients, choline etc..) and oxidizing agents (heat, humidity, light etc..).

Marchetti S., Rizzi L., Meola E.: Il fornello a microonde e gli elettrodi selettivi nella preparazione e determinazione di alcuni minerali in alimenti semplici. *Microwave digestion and ion selective electrode (ISE) technology in the determination of some minerals in feed.* Atti Soc. Ital. Sci. Vet., 47, 1633, 1993.

The calcium, potassium and sodium content was determined on 15 samples of feed both by atomic absorption spectrometer and by ion selective electrode (ISE). Samples were digested in furnace and in microwave oven. The correlation coefficients (r) between the two methods of preparation for Ca, K and Na were respectively 0.995, 0.980 and 0.995. The correlation coefficients between the atomic absorption spectrometry and ion selective electrode technology were also excellent. The results of this study show that microwave digestion and ISE technology are valid methods for the determination of these minerals.

Martelli G., Formigoni A., Parisini P., Marchetti S., Panciroli A.: Integrazione con DL-metionina e DL-metionina ruminoprotetta di diete per vacche da latte: effetti nella seconda fase produttiva. *DL-methionine or DL-rumenprotected methionine in dairy cow feeding: effects on late lactation.* Atti 10° Cong. Naz. Assoc. Sci. Prod. Anim., 223, 1993.

36 Italian Friesian cows were divided into three groups, each one made up by 12 animals (control group, rumen protected DL methionine and DL methionine). DL methionine determined a significant improvement of milk yield, milk protein and milk fat.

Martelli G., Panciroli A., Meola E.: Effetti del calore e dell'umidità sull'attività fitasica vegetale. *Heat and moisture effects on vegetable phytase activity.* Atti Soc. Ital. Sci. Vet., 47, 1639, 1993.

Vegetable phosphorus availability depends on vegetable phytase activity of feeds. Heat stress occurring during feed processing may reduce vegetable phytase activity. Higher moisture content of feed accounts for higher heat sensibility of vegetable phytase the activity of which is strongly reduced at 80°C.

Martelli G., Sardi L.: Il suino tollera bene gli insilati. *Tolerability of silage in the pig feeding*. Riv. Suinicolt., (7), 41, 1993.

The possibility of the use of high levels (50% dm) of silage (maize and pressed beet pulps) in Italian heavy pigs feeding is discussed. Silage impaires neither health status of animals nor their productive performances.

Masoero F., Rossi F., Piva A., Bensi G., Fiorentini L.: Effetto dell'aggiunta di valina sulla degradabilità ruminale della metionina. Prove *in vitro*. *Effect of valine supplementation on rumen degradability of methionine*. In vitro trials. Atti Soc. Ital. Buiatria, 25, 191, 1993.

A trial was conducted to verify the effects of addition of valine (VAL) and valine plus sulphur (VAL+S), to the growth medium, on the degradation of methionine by mixed rumen bacteria. VAL supplementation reduced the degradation of methionine in 3-hour ($P < 0.01$) rather than in 6-hour trials ($P < 0.05$). The degradation of methionine, particularly decreased with the addition of VAL+S, (100% vs 44%) after 3 hours of incubation and (100% vs 67%) in 6-hour trials. The two treatments increased VFA production: VAL 21.5% and VAL+S 18.5%.

Monetti P.G., Tonon F., Tassinari M.: Prime ricerche sull'impiego della lettiera profonda biocondizionata (LPB) nell'allevamento della scrofa in lattazione. *Preliminary investigations on keeping lactating sows on a deep litter system with additives*. Zootec. Nutr. Anim., 19, 261, 1993.

The trial was carried out on 45 sows and their piglets: 15 on litter (LPB group) and 30 in farrowing crates (SPT group). The housing with litter could hold 3 sows plus piglets, in an area of approx. 25 m², and was naturally ventilated with heading only in the nest area set aside for the piglets. The farrowing sheds were the same size and contained five 154 x 250 cm farrowing crates, with the nest area heated with infrared lamp, and a heating and forced-air system. The results showed that deep litter may be successfully used for lactating sows. The results were very similar for the two experimental groups both as regards feed intake for sows and piglets and for piglet growth, whereas the weaning-to-heat interval was shorter in the sows housed on litter. Piglet mortality was higher in the LPB group though this difference was not statistically significant and appeared to be linked to abnormal behaviour of two particular sows rather than to the housing system.

Mordenti A., Piva G., Fleming G.A.: *Animal Nutrition — Environment Interactions, Reduction of Nitrogen, Phosphorus, Heavy Metal and Drug Pollution via Diet Manipulation in: The Production of animal Wastes*. European Conference Mantova, 42, 1993.

The most important pollutants arising from intensive animal production are nitrogen, phosphorus, heavy metal and drugs. The Authors, in 42 pages, review the complex problem and indicate the methods to reduce the environmental pollution via diet manipulation.

Mordenti A., Scipioni R., Parisini P.: Dieta e patologia del digerente. Il controllo del microbismo intestinale e la qualità dei componenti la dieta. *Diet and digestive system diseases. Control of the intestinal microbial flora and the quality of the dietary components.* Sel. Vet., 34, 479, 1993.

The interaction between nutrition and hindgut diseases in intensively reared pigs is only partially understood. Alimentary intoxication plus digestive and nutritional disorders may impair breeding and finishing performance, particularly in young pigs. The type and activity of the microflora present in the hindgut is central to the maintenance of animal health and performance. Therefore, manipulation of the intestinal microflora may help prevent hindgut disfunction. The role of probiotics, fibre and protein level in the diet are crucial aspects of pig production.

Mordenti A.: La digeribilità degli aminoacidi nelle diete per suini. *Digestibility of amino acids in diets for pigs.* Prax. Vet., 14(4), 19, 1993.

The biological methods to evaluate the digestibility of aminoacids in pigs are reviewed.

Parisini P., Accorsi P.A., Pacchioli M.T., Sardi L.: Ulteriori acquisizioni sperimentali sull'integrazione oligominerale di alimenti per scrofe. *Further experimental studies on the integration of trace elements in the sow diet.* Riv. Suincolt., 34(11), 43, 1993.

The aim of the experiment was to study the effect of chelated trace elements on the sow productive performance. Trace elements were included in the diet of 45 sows during pregnancy and lactation over two productive cycles. The number of piglets weaned per sow was found to be highest for the group receiving mineral supplement contained a mixture (1:1) of inorganic and chelated form.

Parisini P., Gaspari F.: Insilati, possono avere un ruolo nella razione. *The role of ensiled feeds in the pig nutrition.* Riv. Suincolt., 34(6), 21, 1993.

The Authors illustrate the different techniques for ensiling feeds and discuss the possibility of the use of silage in pigs' feeding.

Parisini P., Sardi L., Panciroli A., Coppa C.: Effetti della sostituzione con sepiolite (silicato idrato di magnesio) di parte del mangime nell'alimentazione del suino pesante. *Use of sepiolite in the Italian heavy pig feeding.* Atti 10° Congr. Naz. Assoc. Sci. Prod. Anim., 459, 1993.

The aim of the present research was to evaluate the possibility of partially substituting

concentrate with sepiolite in Italian heavy pig feeding. Daily weight gains, feed efficiency and blood parameters did not differ between groups. Animal receiving sepiolite showed a significant trend towards a higher lean meat deposition.

Piva A., Huntington J.A., Pezzi P., Mordenti A.: Impiego dell'insilato di polpe di barbabietola: effetto sull'attività fermentativa nel cieco del suino. *The use of ensiled sugar beet pulp: effects on ceecal fermentation in pigs.* Atti Soc. Ital. Sci. Vet., 47, 1833, 1993.

Four ceecal fistulated sows were used. Two animals received a control diet containing 4.24% crude fibre and the remaining two were fed a diet containing pressed beet pulp silage (PBPS) (20% DM inclusion in the diet) (7.68% fibre). Ceecal liquor was sampled four times a day to measure volatile fatty acids production, ammonia concentration and ceecal pH. Samples were collected regularly over a 2-week period. The ceecal acetic and propionic acids in pigs receiving PBPS were found to be higher as well as total VFA and pH. Lower values were observed for dry matter and ammonia.

Reniero R., Piva A., Morelli L., Bottazzi V., Cocconcetti P.S.: Purification of *Lactobacillus secreted proteins.* Biotechnol. Tech., 7, 401, 1993.

The Authors describe a rapid and reliable one-step method for purification of *Lactobacillus secreted proteins.* With electroendosmotic preparative electrophoresis and a modified synthetic medium the *L. plantarum* aggregation promoting factor, a 32 kDa secreted protein, and the thermostable alpha-amylase of *Bacillus stearothermophilus* cloned in *L. reuteri* were purified. Although the growth rate was reduced, the production of secreted proteins was not affected.

Sardi L., Pacchioli M.T., Salvadori G.: Oli essenziali nella produzione del suino pesante. *Essential oils in the heavy pig production.* Atti Soc. Ital. Sci. Vet., 47, 1993 (in press).

The aim of the trial was to evaluate the effects of the dietary addition of essential oils in Italian heavy pig feeding. Daily weight gains and feed conversion efficiency were not affected by treatments. Essential oils determined fatter carcasses, probably due to a better starch digestibility. Essential oils may represent a way to reduce the energy content of the heavy pig diet.

Scipioni R., Accorsi P.A., Martelli G., Coppa C.: Alimentazione proteica della scrofa: confronto fra tre differenti livelli in gestazione e in lattazione. *Protein nutrition in the sow: a comparison of three protein levels during gestation and lactation.* Atti 10° Congr. Naz. Assoc. Sci. Prod. Anim., 441, 1993.

The trial involved 110 multiparous sows divided into six experimental groups, characterised by different combinations of protein level during pregnancy and lactation. The performances of the sows were observed during a reproductive cycle; data regarding piglets were collected from birth to weaning. The results of this experiment indicate that future sow nutrition may utilise low protein levels upgraded with the necessary amino-acid supplement.

Scipioni R., Barchi D.: Impiego di insilati: rapporti con l'ambiente. *Use of silages: relation to the environment*. Riv. Suincolt., 34(9), 55, 1993.

Researches on the use of pressed beet pulp silage in the feeding of pigs indicates that, in comparison with traditional feeds, it increases faecal weight, digestibility of crude fibre and fibre fractions and nitrogen retention and decreases digestibility of crude protein and water consumption. N in urine, mainly in the form of urea, is decreased; this fact may have a favourable effect on the environment.

Scipioni R., Martelli G., Marchetti S., Parisini P., Piva A.: Nitrogen balance in pigs fed with different amounts of pressed beet pulp silage (PBPS). Atti International Congress on nitrogen flow in pig production and env. consequences, Wageningen (NL) 8-10/6/1993.

Fibre contents of the diet interferes with the digestibility of dietary nutrients, including nitrogen. Four different amount of PBPS were fed to pigs in metabolic cages. PBPS dosage had no statistically significant effect on the retained/ingested nitrogen ratio however a considerable variation in urine/faecal nitrogen ratio was observed. PBPS utilisation is an encouraging way to reduce intensive pig breeding environmental impact in the high productive areas of Northern Italy.

Tassinari M., Corradi A., Cantoni A.M., Monetti P.G.: Impiego di DL-carnitina e di zinco proteinato nell'alimentazione del vitello a carne bianca. Nota 1: *Performance zootecniche e indagini anatomo-patologiche*. The use of DL-carnitine and zinc proteinate in veal calf (white meat) diet. Note 1: *Studies on animal performance and anatomical pathology*. Atti Soc. Ital. Sci. Vet., 47, 1769, 1993.

The effect of supplemented DL-carnitine (3 g/head/d) and zinc proteinate (600 mg/head/d) were studied during the last 3 months of the veal calf rearing cycle. 48 Friesian veal calves were used in this study. Live performance was unaffected by treatment. However, a statistically significant result due to treatment was observed in dressing percentage ($P < 0.05$). Calves receiving zinc proteinate and those on the control diet had a dressing percentage of 60.32% and 58.08% respectively. Histological investigation highlighted some differences in pancreas, liver and kidney in the form of regressive alteration in calves receiving the zinc proteinate and also when this supplement was fed associate with DL-carnitine.

Ubaldi A., Fusari A., Tassinari M., Berlese L.: Impiego di DL-carnitina e di zinco proteinato nell'alimentazione del vitello a carne bianca. Nota 2: *Indagini ematochimiche*. DL-carnitine and zinc proteinate in veal diet. Note 2: *metabolic investigations*. Atti Soc. Ital. Sci. Vet., 47, 1773, 1993.

A study on metabolic responses in veal calves treated per os with Zn-proteinate (600 mg/day) and DL-carnitine (3 g/day), alone or in association, has been carried out. The biochemical parameters examined, have been chosen on the basis of their role as marker in the energetic metabolism and in the ions balance. The results obtained showed some significant differences in the serum levels of lipids and ions (Na, Zn, Pi).

Zaghini G., Marchetti S., Gramenzi A.: Indagine sulle caratteristiche nutrizionali di alimenti utilizzati in dietetica felina. *Survey on the diet characteristics of commercial cat foods*. Atti 10° Congr. Naz. Assoc. Sci. Prod. Anim., 147, 1993.

Within a program of research, aimed at defining the nutritional profile of petfoods, we analysed 38 complete commercial foods for cats of different types. Water, crude protein, ether extract, crude fibre, ash and mineral contents were determined. The results showed large differences in nutrient content among the diets used in clinical nutrition and between these and all-purpose foods; the greatest variation was found in the measurements of the protein, fat and mineral content. The trace element content of the foods was found to be variable but higher than minimum cats requirements.

Zaghini G., Panciroli A., Gramenzi A.: Apporto in taurina degli alimenti industriali per gatti. *Taurine amount in proprietary catfoods*. Atti Soc. Ital. Sci. Vet., 47, 2137, 1993.

With respect to the importance of taurine in cat nutrition, the quality of proprietary catfoods was investigated. 133 products were acquired, consisting of 112 canned (10 of which usually used in clinical nutrition) and 21 dry. Taurine and dry matter were determined in all products. Canned products were found to contain higher levels of taurine than dry ones. Tuna based catfoods contained the highest levels of taurine. Taurine levels varied considerably between different diets, but basal nutritional requirements were met by most products. The mean taurine amount in products used in cat clinical nutrition did not differ from the other proprietary catfoods.

1994

Falascini A.F., Scipioni R.: Alimentazione e miglioramento dell'efficienza riproduttiva. *Feeding and improving reproductive efficiency in the sow*. Riv. Suinicolt., 35(10), 25, 1994.

Some researches performed by the Authors and co-workers about this subject are synthetically reported: chelation of trace mineral and protein levels of 14% in pregnancy and of 17% in lactation gives the best results, but also a reduction of the protein level to 11% in pregnancy and to 14% or 11% with free aminoacids in lactation gives comparable results.

Formigoni A., Anfossi P., Meola E., Piva A., Scipioni R.: Influenza della microincapsulazione sui processi di assorbimento nel suino. *Effect of microencapsulation with long chain fatty acids on absorption processes in swine*. Atti Soc. Ital. Sci. Vet., 48, 1994 (in press).

The effect of microencapsulation with long chain fatty acids on the absorption and bioavailability of nutrients was studied using sulfamethazine as a marker. 4 swine (mean weight 120 kg) with a chronic catheter in the jugular vein were given microencapsulated or free drug (1 g/animal) with feed at a two weeks interval. The plasma concentration-time data of sulfamethazine obtained by HPLC showed that microencapsulation did not modify the peak values ($C_{max} = 19.7 \pm 4.4 \mu\text{g/ml}$ e $19.6 \pm 5.6 \mu\text{g/ml}$ for microencapsulated or free drug, respectively) and the bioavailability of the drug ($AUC = 970 \pm 202 \mu\text{g/ml}\cdot\text{h}$ vs $959 \pm 355 \mu\text{g/ml}\cdot\text{h}$). Moreover the times of peak detection and the absorption half-lives were significantly longer ($t_{max} = 14.0 \pm 4.0 \text{ h}$ vs $8.5 \pm 1.9 \text{ h}$; $t_{1/2abs} = 6.2 \pm 1.6 \text{ h}$ vs 2.1 ± 0.5

h). The microencapsulation is advantageous from a technological point of view (better dispersion, lower contamination, etc.), and also does not play adverse effects on the absorption and bioavailability.

Formigoni A., Mordenti A.: Pregi e difetti degli insilati. *Advantages and disadvantages of ensiled forages*. Inform. Zootec., 41(10), 20, 1994.

In dairy cow nutrition the use of ensilaged as conservation method for the forages is very interesting under technical, economic, biologic and sanitary point of view. Quality of silage and methods of administration are the most important aspect to achieve the best results. Several errors in technique of ensiling may cause harmful processes of fermentation. In these cases it is likely to have the problems by toxic substances in ensiled forages and consequently metabolic disease may occur in dairy cattle (i.g. lameness, ketosis and reproductive failures).

Formigoni A.: Impiego di polpe surpressate ed insilate nell'alimentazione della bovina da latte. *The use of pressed beet pulp silage in dairy cow feeding*. Agronomica, 5(4), 30, 1994.

In order to study the effects of pressed beet pulp silage on dairy cow nutrition, 90 Italian Friesian cows were used. The animals were divided, a month after calving, into two groups comparable for mean number of calving, daily milk production, fat and protein percentage. The control group (45 cows) was fed with corn silage and corn meal, whereas the treated group (45 cows) received 20kg/h/d of pressed beet pulps. Total mixed ration supplied to all cows was balanced for dry matter, crude protein and non-structural carbohydrates. Every four weeks daily milk yield was recorded; fat and protein percentage and somatic cell contents were determined. Milk production and milk quality resulted similar between groups during all the trial.

Lambertini L., Benassi M.C., Zaghini G.: Ricerche sulla composizione della carcassa cunicola: influenza del sesso, del tipo genetico e dell'età di macellazione. *Research on the rabbit carcass composition: effect of sex, genetics and age*. Riv. Coniglicolt., 30(3), 33, 1994.

In this research, one hundred and twenty hybrid rabbits (Hyla and Provisal), 60 males and 60 females, were slaughtered at 75, 85 and 95 days of age. The weight of the skin, of the digestive tract, of the hot and cold carcass was recorded. The liver, kidneys, perirenal and scapular fat were separated from the carcass which was dissected to obtain the loin and left hind leg. These cuts, after weighing, were completely dissected to separate muscle, bone and fat components. The carcass composition and the muscle to bone ratio were estimated through regression equations. The sex did not affect any of the evaluated parameters. The Hyla rabbit carcasses were longer and heavier than the Provisal rabbit ones, but the dressing percentage did not differ. The slaughter data and the tissue composition of the carcass were markedly affected by age. The dressing percentage and the muscle to bone ratio increased with slaughter age ($P < .01$).

Marchesini L., Rizzi L., Panciroli A., Gramenzi A.: Caratteristiche delle frazioni azotate di diete per bovine da latte ad elevata produzione: indagine preliminare. *Nitrogen frac-*

tions in high yield dairy cows feeding: preliminary report. *Atti Soc. Ital. Sci. Vet.*, 48, 1994 (in press).

This research was carried out on 4 dairy farms. Italian Friesian cows were fed different kind of silage in total mixed ration. Milk yield and composition were recorded. Chemical composition and nitrogen fractions of every raw material and total mixed ration were analyzed. This report provides preliminary information about the application of the Cornell Net Carbohydrate Protein System in the feeding management of Italian dairy farms.

Marchetti M., Laffi R., Marchetti S., Tassinari M.: Ricerche sulla biodisponibilità per il suino delle vitamine K3 e PP presenti nell'addotto menadione bisolfito-nicotinamide. *Studies on bioavailability for pig of menadione and nicotinamide present in menadione bisulfite-nicotinamide adduct.* *Riv. Suincolt.*, 35(3), 75, 1994.

It has been studied the bioavailability for the pig of menadione and nicotinamide present in menadione bisulfite-nicotinamide adduct determining plasma levels of two vitamins into animals given feeds containing the adduct or equivalent amount of free vitamins. The results obtained do not show any significant differences between vitamin levels of animals receiving the adduct and those receiving menadione sodium bisulfite and nicotinamide; therefore two vitamins combined into adduct offer the same bioavailability of vitamin in free form.

Marchetti M., Laffi R., Tossani N., Marchetti S.: Sepiolite nei mangimi. Interazioni tra sepiolite, vitamine ed oligoelementi. *Studies on the interaction between sepiolite and vitamins and trace-minerals present in feeds.* *Obiettivi e Documenti Veterinari*, 15(10), 43, 1994.

In a feed containing 2% or 4% of sepiolite the possible interference of this material on quantitative assay of vitamins and trace-minerals has been evaluated. The results obtained show that such levels of sepiolite do not impede a satisfactory analytical recovery of these nutrients, mostly after sample enzymatic treatment which we can compare to the digestive process in animals. These data therefore let us think that sepiolite does not interfere with the utilization *in vivo* of vitamins and trace-minerals present in feed.

Marchetti M., Tassinari M., Marchetti S.: Ricerche sulla tollerabilità da parte del suino del menadione bisolfito-nicotinamide somministrato con il mangime. *Studies on the safety for menadione bisulfite-nicotinamide adduct for the pig.* *Riv. Suincolt.*, 35(5), 67, 1994.

It has been studied the safety for menadione bisulfite-nicotinamide adduct for the pig determining body weight gain, feed intake and blood levels of hemoglobin and bilirubin and transaminase activities in animals' feed, for 28 days, containing various amounts of adduct. The results obtained do not show significant differences of the considered parameters between animals feed control diet and those feed diets with adduct.

Marchetti S., Laffi R., Marchetti M.: Sepiolite negli integratori zootecnici. Interazioni tra la sepiolite, vitamine ed oligoelementi. *Interaction between sepiolite and vitamins and tra-*

ce-minerals present in zootechnic premixes. Obiettivi e Documenti Veterinari, 15(9), 55, 1994.

The possible interference of sepiolite on the quantitative determination of vitamins and trace-minerals in premixes containing this material as a support has been studied. The results obtained show that sepiolite does not impede the quantitative recovery of fat-soluble vitamins, of vitamins B2, B12, of pantothenic acid and of choline whereas it impedes that of vitamins B1, B6, PP, of folic acid and of biotin. The interactions between sepiolite and these vitamins are very strong; in fact they could not be removed by the autoclaving of samples in presence of acids or alkali. As for trace-elements the presence of sepiolite seems not to affect significantly the quantitative assay since the mineralization required by the analytical method is able to remove its possible interactions between sepiolite.

Martelli G., Ricci G., Salvadori G., Pacchioli M.T.: *Influenza delle tecnologie di allevamento sulle prestazioni produttive del suinetto. Effects of feeding and housing on piglets performances.* Atti Soc. Ital. Sci. Vet., 48, 1994 (in press).

The trial compared two different types of piglets' breeding: the traditional way (group "A") and a technique consisting in wet feeding and breeding of weaned piglets in the farrowing crate, especially adapted (group "B"). No differences were observed concerning piglets mortality. Over the whole trial animal belonging to group "B" show a significant improvement (+18%) of daily weight gain and a slight worsening of the feed conversion rate.

Masoero F., Fiorentini L., Rossi F., Piva A.: *Determination of nitrogen intestinal digestibility in ruminants.* Anim. Feed Sci. Technol., 48, 253, 1994.

Two procedures used to estimate post-abomasal availability of feedstuff proteins in ruminants were compared: nitrogen disappearance from intestinal nylon bags, and true intestinal digestibility. Dietary amino acid supplies and digestibilities were also evaluated. 3 Italian Holstein cows with rumen and duodenal fistulae were fed at energy level 1.7 times maintenance. Of the 29 protein feeds tested, 19 had intestinal digestibilities of over 90%: 17 of these were of vegetable origin and 2 were of animal origin. Nylon bag intestinal protein disappearances were 90% for only 11 feeds. 18 feeds did not show any differences between procedures, while intestinal digestibility seemed to be superior to protein disappearance in 10 raw materials (the opposite result was obtained in only one feed). Amino acid intestinal digestibilities corresponded to source protein composition.

Monetti P.G., Tonon F.: *Impiego della lettiera profonda biocondizionata per le scrofe in allattamento. Housing on deep litter of lactating sows.* Riv. Suincolt., 35(4), 35, 1994.

Utilising their previous experimental data, demonstrating that deep litter may be successfully used for lactating sows, the Authors demonstrate that this system lower the production costs of the piglet of 30 kg live weight.

Montoneri E., Rizzi G., Rizzi A., Mordenti A., Bauli A., Rilofatti M., Pellegrini L.: *Hydrolysis of tanner wastes to protein meal for animal feedstuffs: a process and product evaluation.* J. Chem. Tech., Biotechnol., 59, 91, 1994.

A nutrition bioassay was carried out to study the influence of dietary substitution of soybean meal with protein solid wastes from tanneries. The results show that degradation of serine, proline, arginine and threonine occurs during collagen hydrolysis and that only the threonine concentration in the products falls below dietary requirements.

Mordenti A., Formigoni A.: Tecniche innovative di ruminoprotezione delle sostanze azotate: sintesi di risultanze sperimentali nella vacca da latte. *Experimental results on new rumen-protection techniques.* Convegno su Biotecnologie e Produzione del latte, Torino, 3-4 novembre 1994.

Efficacy of feeding with microencapsulated (with long chain fatty acid envelopes) casein and methionine supplementation in dairy cows were discussed. Improvement were observed in both milk yield and milk quality. Hypothesis on action mechanism of these substances involve several processes; these substances probably module homeostatic and endocrine equilibrium involved in milk secretion.

Mordenti A., Parisini P., Martelli G.: *Effect of Exal on pigs productive performances and meat quality.* Anaporc, 15(135), 69, 1994.

The partial substitution of concentrate with sepiolite in pig feeding does not modify the daily weight gains and feed efficiency. Animals receiving sepiolite showed a significant trend towards higher lean meat deposition.

Mordenti A., Piva G., Della Casa G.: *Nutrition and fat quality in the heavy pig.* Italian Journal of Food Science, 6(2), 1994.

For production of Italian seasoned raw ham (e.g. Parma ham), a higher standard of fat quality is required than for other pork products. In order to produce a high quality raw ham product, the fresh upper hind legs should be covered with a fat layer of reasonable thickness and high quality. Modification of the fatty acids composition of swine adipose tissues using dietary factors is reviewed. Aspects considered include: dietary factors influencing fatty acid composition (energy intake, biotin and copper, dietary fatty acids); dietary manipulations of the fatty acid composition (use of low cost dietary fat during the growing period of the animals and high quality fat during the finishing period, use of partially or fully hydrogenated fats, use of substances able to reduce desaturation of dietary or de novo synthesized C18:0); and fat quality evaluation (GLC, surface fat auto-oxidation, objective colour methods).

Mordenti A., Piva G.: La certificazione dei prodotti alimentari: il caso del latte. *Food certification: the milk instance.* Position paper Workshop CARIPLO, Piacenza, 23-26 marzo. Quaderni Fondazione CARIPLO per la ricerca scientifica. 1, 1994.

The factors affecting milk composition are reviewed in a book of 148 pages.

Notari M.R., Martelli G., Quaglio F.: Alte temperature ambientali e produzione di latte: mappe climatiche dell'Italia Settentrionale. *High temperature and milk yield: climatic maps of Northern Italy*. Inform. Agr., 50(30), 31, 1994.

The Authors illustrate the negative effects of the high environmental temperature on dairy cows productive performances. Under a climatic point of view, areas nearby the city of Bologna are shown to be the less favourable for dairy cows breeding.

Parisini P., Scipioni R., Martelli G., Sardi L.: Polpe di bietola surpressate nell'alimentazione dei suini. *Pressed beet pulp silage in pigs feeding*. Inform. Agr., 50(16), 25, 1994.

Pressed beet pulp silage is an interesting and cheap by-product that can be used in Italian heavy pigs feeding. After our experience its use did not induce any worsening of weight gains and of feed conversion of pigs. Meat quality was not affected by the inclusion of beet pulp in the diet up to a level of 20% dm.

Piva A., Headon D.R.: *Pediocin A, a bacteriocin produced by Pediococcus pentosaceus FBB61*. Microbiology, 140, 697. 1994.

To elucidate its possible role as a food preservative, pediocin A, a bacteriocin produced by *Pediococcus pentosaceus* FBB61 (ATCC 43200), was purified and partially characterized. Purification by dialysis against polyethylene glycol 20 000, butanol extraction, and electroendosmotic preparative electrophoresis led to a 7843-fold increase in specific activity, with 3.9% activity recovered. SDS-PAGE of pediocin A resulted in a single 80 kDa protein band. The antimicrobial compound was sensitive to proteolytic enzymes and heat (10 min at 100 degree C). It exhibited inhibition against species of *Lactobacillus*, *Lactococcus*, *Leuconostoc*, *Pediococcus*, *Staphylococcus*, *Enterococcus*, *Listeria*, and *Clostridium*.

Piva A., Meola E., Panciroli A., Marchetti S., Moschini M.: Studio dei processi fermentativi in suini alimentati con dieta a base di polpe di barbabietola surpressate insilate. *In vivo study of cecal fermentation in swine fed with and without sugar beet pulp silage*. Atti Soc. Ital. Sci. Vet., 48, 1994 (in press).

Cecal fermentative processes were studied in sows fitted with cecal cannula. Pigs were fed once daily with 2 diets providing different levels of fiber fractions (control diet: 3.83%ss FG, 11.66%ss NDF, 5.60%ss ADF vs 8.31%ss FG, 18.78%ss NDF, 11.82%ss ADF: control diet with 20% DM supplied by sugar beet pulp silage). Following 40 days adaptation, cecal liquor was sampled at 2-hour intervals for 24 hours. pH, dry matter, VFAs, ammonia and chromium concentrations were measured. Sugar beet pulp inclusion in the pig feeding resulted in a significant reduction of dry matter content, and ammonia concentration. It also reduced pH fluctuation throughout the day and increased the C2/C3 ratio. The use of Cr-EDTA did not show any difference in term of transit time.

Piva A., Prandini A.: *Heavy pigs production and environment*. Proceeding of: L'aliment porc, par nature, UCAAB, Ploufragan, Francia. 1994.

One of the most famous Italian product is the Parma ham. This typical production is traditionally linked with parmesan cheese. The feeding scheme for Parma ham production is discussed with particular reference to the environmental impact of the heavy pig breeding. The European research project CT 92- 0112, "Reduction of nitrogen supply in pig effluents through a better control of dietary protein supply: technical and economical aspects" is presented.

Prandi A., Falaki M., Corradini C., Sneyers M., Formigoni A., Massart S., Fazzini U., Burny A., Portetelle D., Renaville R.: Marcatori genetici e produzione di latte nelle bovine di razza frisona e pezzata rossa. *Comparison between growth hormone gene and milk proteins gene polymorphism and milk production traits in Holstein-Friesian and Simmental cattle breeds.* Conv. Biotecnol. Produz. Latte, Torino, 3-4/11/1994.

Recently, attempts have been made to identify genetic markers closely linked to quantitative or qualitative traits, especially in milk yields. These observations prompt us to examine the presence of restriction fragment length polymorphism (RFLP) at the GH gene in relationship with milk yield. The purpose of the present study was to confirm in two types of breeds (Holstein-Friesian and Simmental) these preliminary results and to investigate associations between milk production traits and GH gene as well as milk protein polymorphisms in cattle. Blood and milk were sampled from 251 Italian Holstein-Friesian and 279 Simmental cows. The analysis of the data was performed using derivative-free REML. Our results indicated significantly effects of GH and milk protein polymorphism on milk production traits.

Ricci G., Martelli G., Sardi L., Parisini P.: Indagine su alcuni parametri morfo-funzionali di bovine di razza Pezzata rossa. *Some morpho-functional parameters of cows of Italian Pezzata Rossa breed.* Atti Soc. Ital. Sci. Vet., 48, 1994 (in press).

The trial involved 193 cows of Italian Pezzata Rossa breed. Biometrics indexes were calculated and compared to those of two monoaptitude breeds, Italian Friesian and Romagnola; data show dual aptitude specifications of controlled animals.

Rizzi L., Frisenna M., Monetti P.G., Marchesini L.: Determinazione del valore nutritivo del pannello di lino nell'agnello. *Nutritive value of linseed cake in lambs.* Atti Soc. Ital. Sci. Vet., 48, 1994 (in press).

The aim of the experiment, a growing trial carried out on 27 Delle Langhe lambs, was to evaluate the efficiency of utilisation and the associative effects of nine pelleted complete diets based on linseed cake, lucerne hay and wheat straw in different rate. All diets contained 40% of concentrate on dry matter. Animals, receiving diet with 60% cake or diet with 30% cake and 30% hay had better weight gains. Evident associative effects could be detected in some case: with diet containing 30% cake and 30% hay and with diet consisting of 15% cake, 30% straw and 15% hay.

Sardi L., Sarra P.G., Scipioni R., Formigoni A.: Valutazione dell'efficacia di un probiotico sporigeno (*Bacillus subtilis*) in diete per suinetti. *Effects of Bacillus subtilis as a probiotic in piglets diet.* Atti Soc. Ital. Sci. Vet., 48, 1994 (in press).

The aim of this trial was to compare the effects, on piglets productive performances, of a probiotic, *Bacillus subtilis*, and of an antibiotic (Carbadox). Mortality incidence, live weight and feed intake were recorded. The dietary addition of *B. subtilis* determined an improvement of daily weight gain only during the first period. Over the whole trial *B. subtilis* addition was shown to be more profitable on productive performance than Carbadox use.

Zaghini G., Gramenzi A., Lambertini L.: Qualità dell'acqua di bevanda impiegata in produzione animale. *Quality of drinking water in animal production*. Obiettivi e Documenti Veterinari, 14(12), 45, 1994.

The assesment of drinking water quality in animal breeding is often ignored. Besides organoleptic and microbiological features, chemical parameters ought to be defined and respected. This review deals with total dissolved salts content (expecially for clorides and sulfates), nitrates, iron and oligoelements in relation to health and productive performances of several animal species. Pollutants presence with acceptance levels is discussed.

1995

Bergami R., Tolomelli B., Scipioni R., Roversi R., Marchetti M.: Impiego di vitamine protette nell'integrazione degli alimenti zootecnici: studi di biodisponibilità. *Use of protected vitamins in feed supplementation: study on bioavailability*. Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

Vitamins lability, that creates considerable drawback in feed supplementation, can be overcome by the employment of protected forms, more stabilised towards chemical and physical agents like heat, humidity and trace elements. In the present work the bioavailability of vitamin A and PP microencapsulated by a saturated fatty acid film was evaluated in pigs. Preliminary results show that the vitamins administered in protected form are absorbed at the same rate and reach blood levels higher than normal ones.

Ferasin L., Terramocchia S., Bailoni L., Rizzi L., Martillotti F.: *Comparison between in sacco and in vitro estimates of rumen protein degradability*. Zootec. Nutr. Anim., 21 (Suppl.), 121, 1995.

Eleven protein concentrates were used to compare the *in sacco* (IS) with an *in vitro* (IV) enzymatic method for the estimation of rumen protein degradability. The effective degradability values, estimated with passage rates of 2.5 and 8%/h, were higher for the *in situ* than the *in vitro* method. The differences between methods tended to decrease with increasing passage rate. There was a good correlation between the effective degradability values (passage rate = 5%/h) for the two methods ($r = 0.88$, $SEy = 9.28$). The effective degradability values varied widely between feedstuffs with a minimum of 23.5% (maize gluten meal) to a maximum of 83.6% (whole soyabean).

Formigoni A., Martelli G., Parisini P.: Effetti della somministrazione di isoacidi a vacche produttrici di latte destinato alla caseificazione. *Isoacids in dairy cows feeding*. Atti Soc. Ital. Buiatria, 27, 87, 1995.

The trial was carried out, in Parmesan cheese production area, to evaluate the effects of the dietary addition of 86 g/h/d of isoacids on dairy cows productive and reproductive performances and on cheese making aptitude of milk. To this aim 200 Italian Friesian cows were divided into two groups (control group and isoacids one): within these groups 36 (18+18) cows on the early lactation and 28 (14+14) cows over the 100th day of lactation were followed. Milk production and protein and fat content of milk were collected and analysed every two weeks. Cheese making properties and urea content of milk were monthly evaluated. Reproductive performances of cows that calved during the trial were also recorded. Isoacids improved fat corrected milk production (27.8 vs 29.20 kg/d; $P < 0.001$) and fat (3.25 vs 3.53%; $P < 0.001$) and protein (2.92 vs 2.99%; $P < 0.05$) content of the milk produced during the early lactation and reduce urea content ($P < 0.05$) throughout lactation. Isoacids did not influence milk yield and did not influence cheese making aptitude of milk.

Formigoni A., Mordenti A.: La gestione dell'alimentazione nella vacca da latte ad elevata produzione. *Feeding management in high yield dairy cows*. Atti Soc. Ital. Buiatria, 27, 55, 1995.

Animal health and production are strongly related to a correct nutrition programme. In high yield dairy cows a large number of puerperal pathologies can be limited by careful nutritional strategies. A major concern is represented by the low feed intake typical of dairy cows following parturition. The Authors present nutritional and management strategies to control problems from excessive body reserve mobilization and to improve feed intake and efficiency.

Formigoni A., Pezzi P., Mordenti A.: Effetti di diversi rapporti foraggi:concentrati sulla risposta produttiva di bovine da latte. *Forage to concentrate ratio: effect on dairy cows performances*. Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

The study was carried out with 32 high yield dairy cows. Since 20 days before parturition 16 animals were fed 6 kg of concentrate/h/d (group A) whilst the remaining cows (group B) received 2kg/h/d. Following parturition and until 100 days of lactation 8 cows from each group were fed with a diet containing 63% of concentrate on dry matter basis; the other animals received a diet with 50% of concentrate. The quantity of milk was positively affected by the diet containing less forage, that reduced milk fat content. The diet fed before parturition did not affect the milk production.

Formigoni A., Tossani N., Scipioni R., Pezzi P., Marchetti S.: Stabilità di alcune vitamine microincapsulate e non nei mangimi. *Different stability of free vs microencapsulated vitamins in concentrates*. Atti 11° Congr. Naz. Assoc. Sci. Prod. Anim., 241, 1995.

Efficacy of supplementation of microencapsulated vitamin A, B₁, C, E, and K₃ over traditional forms were studied. The level of these vitamins in concentrates kept at 16°C were assayed. Four samples were collected from each concentrate immediately after preparation and later at 45, 90 and 135 days. Each sample was analyzed for vitamin A, B₁, C, E and K₃ contents. The results obtained in concentrates after 135 days showed a lower degradation for microencapsulated A, B₁, C and K₃ vitamins than for their natural

forms while inverse results are observed for vitamin E. Microencapsulation was particularly effective to limit the K₃ and C vitamin degradation.

Frisenna M., Rizzi L., Monetti P.G., Marchesini L.: Effetto dell'associazione tra polpe di barbabietola e fieno di erba medica nell'agnello in accrescimento. *Dried beet pulp and lucerne hay combined in growing lambs*. Atti 11° Congr. Naz. Assoc. Sci. Prod. Anim., 313, 1995.

The objective of this paper was to evaluate the effect of combining dried beet pulp and lucerne hay on the apparent digestibility of 5 complete pelleted diets. The trial was carried out on 34 Sarda male lambs, 50 days old, divided into 5 groups of 6 subjects each. The other 4 lambs were dead before the trial. The results showed that the dried beet pulp associated with lucerne hay (30% and 30%; 45% and 15%) may improve the zootechnical performances and retention of several nutritive principles.

Haouet M.N., Lambertini L., Martino G., Gramenzi A.: *Effect of genetic type, sex and slaughtering age on CoQ10 level and its relationship to other nutritional parameters of rabbit meat*. Comunicazione presentata al 46th Annual Meeting of the European Association for Animal Production, Praga, 1995.

In this paper, the effect of genetic type and sex was studied in *Longissimus dorsi* and hind leg muscles of 60 rabbits slaughtered at different age (75, 85 and 95 d). CoQ₁₀, water, protein, fat, ash, minerals (Ca, Na, K, Mg, Cu, Zn, Fe), fatty acids and hydroxyproline were determined and correlations between CoQ₁₀ and chemical parameters were evaluated. There were no significant differences of CoQ₁₀ levels in relation to considered variables. Values ranged between 28.17 and 30.94 *g/g indicating the possibility of using rabbit meat as an exogenous source of CoQ₁₀. Correlations confirmed the strong relationship between CoQ₁₀ level and cholesterol content.

Lambertini L., Benassi M.C., Zaghini G.: Riscontri su temperatura e perdite di refrigerazione nella carcassa di coniglio. *Researches on temperature and chilling loss of the rabbit carcass*. Riv. Coniglicolt., 31(7/8), 53, 1995.

In this trial the Authors have studied the weight loss and the temperature of the rabbit carcass during the chilling. The carcasses used in this research were obtained from 40 rabbits slaughtered at 75 and 95 days of age. The carcasses were weighed and the lumbar temperature was measured before the introduction in a cooler room (0°C for 24h). These measurements were repeated 30, 60, 120, 240 minutes and 24h after the cooling beginning. The chilling loss in the heaviest carcasses was lower than in the other ones. Moreover, at the beginning of the cooling process, they had a higher temperature which remained higher for quite a long time (2*4h). Also the fat content of the carcass seemed to influence the chilling loss.

Lambertini L., Petrosino G., Lalatta Costerbosa G., Benassi M.C.: Influenza di età e tipo genetico sulle fibre muscolari del coniglio. *Effects of age and genetic line on rabbit muscular fibres*. Atti 11° Congr. Naz. Assoc. Sci. Prod. Anim., 137, 1995.

In this trial, 18 male rabbit carcasses were used to evaluate the istochemical properties and the cross section areas of the fibres in *Biceps femoris*, *Latissimus dorsi* and *Soleus* muscles. The slaughter age did not influence the percentage of the different fibre types; while great differences ($P < .05$) were observed between the two strains. The cross section area of the fibres was increased by the age ($P < .05$).

Lambertini L., Zaghini A., Rizzi L.: Gli alluminosilicati nel controllo dell'aftatossicosi indotta negli ovini. *Diminution of aflatoxin toxicity to growing lambs by dietary supplementation with aluminosilicate*. Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

To evaluate the effectiveness of bentonite added to the diet in preventing the absorption of aflatoxin B₁, 8 wethers were orally administered with this mycotoxin at a daily dose of 0.15 mg/Kg b.w. for 21 days. Four out of them received concomitantly a diet supplemented with bentonite (3%). During the treatment, all the animals were clinically examined and blood samples were obtained at fixed intervals of time, for hematologic (total protein content) and serum biochemical analyses (GOT and GPT activities). At the end of the study, the wethers were euthanatized and liver, kidney, muscle, urine and faeces were collected and checked to measure aflatoxin B₁ levels by HPLC and EIA methods. In all the animals the results confirmed the data observed in a previous research, where the liver was the main organ interested by aflatoxin B₁ residues; significant differences were found when GOT, GPT, total protein, urine and feces were considered.

Marchesini L., Marchetti S., Rizzi L.: Effetti delle microonde sulla granella integrale di soia. *Effect of microwave digestion on integral soybean*. Atti 11° Congr. Naz. Assoc. Sci. Prod. Anim., 247, 1995.

Straw soia bean (variety Coroner) were cooked in microwave (mod. CEM MDS-2000; 630±50 w with thermal probe) at 70°, 90° and 110°C for 10 minutes. The same samples were cooked in oven at the same temperature for 48 hours. Protein, nitrogen fractions, antitrypsin and ureasic activity analyses were determined both on crude soy bean and each cooked sample. The results showed that microwave treatment at 110°C for 10 minutes improved a better inactivation on antitrypsin factor that cooking in oven 110°C for 48 hrs (TIA: 4,67 versus 20,98).

Marchetti M., Marchetti S., Bauce G.: Morfologia dei tessuti di trote (*Oncorhynchus mykiss*) alimentate con diete contenenti elevati livelli di menadione bisolfite-nicotinamide. *Tissue morphology of the rainbow trout (Oncorhynchus mykiss) after administration of menadione bisulfite-nicotinamide*. Rivista Italiana di Acquacoltura, 30, 139, 1995.

Within the framework of research to evaluate the tolerance levels in the trout towards a new form of vitamin K3, menadione bisulfite nicotinamide (MNB), histological examination was carried out on the liver, kidney and spleen of specimens fed diets containing varying quantities of this compound (0, 100, 500 and 2000 mg/kg). The histological picture of these organs in trout fed for 93 days on a diet containing MNB at the highest dosage (2000 mg/kg) did not reveal appreciable differences with respect to that of the organs of control animals. These data confirm the high degree of tolerance of the trout towards MNB, already observed in a preceding work. MNB may thus be used to integrate

feed with a source of vitamin K₃, even in quantities clearly higher than recommended requirements and without side-effects, especially in pathological situations of stress or infectious disease.

Marchetti M., Tassinari M., Bauce G.: *Tolerance of high dietary levels of menadione bisulfite-nicotinamide by rainbow trout, Oncorhynchus mykiss.* *Aquaculture*, 134, 137, 1995.

The tolerance of menadione bisulfite-nicotinamide (MNB) in rainbow trout fed diets supplemented with graded levels (0, 500, 1000 and 2000 mg/kg) of this vitamin K form for 93 days was studied. Weight gain, weight gain/feed ratio and hematological parameters, such as hemoglobin and bilirubin levels, were similar for control and MNB-fed groups. The weight of liver, kidney and spleen as well as the morphological structure of their parenchyma in MNB-fed trout did not show any detectable modifications as compared to the control group. The results indicate that dietary intake of high levels of MNB exerts no adverse effect on production size of rainbow trout. Therefore, based on the good tolerance and better stability of MNB compared to menadione sodium bisulfite (MSB), we suggest that MNB is a suitable source of vitamin K activity for fish feed manufacture.

Marchetti M., Tossani N., Marchetti S.: *Vantaggi dell'impiego di vitamine stabilizzate mediante microincapsulazione nella preparazione degli integratori zootecnici. Utilization of microencapsulated forms of vitamin B₁, C and K₃ in premix manufacture.* *Zootec. Nutr. Anim.*, 21, 25, 1995.

In order to evaluate the advantage coming from utilization, in feed supplementation, of microencapsulated forms of vitamin over traditional ones, we studied the stability of these vitamins in premixes at the following conditions: temperature, 20 °C and 37 °C; moisture degrees, 6% and 12%. The results obtained in premixes after 180 days showed a degradation of all three microencapsulated vitamins significantly lower than that observed for natural forms. Lower differences between two forms have been registered in premixes with 6% moisture ($P < 0.05-0.01$) maintained at 20 °C ($P < 0.01$), while higher differences were noted in premixes with 12% moisture ($P < 0.01$), maintained at 37 °C ($P < 0.01$). In this last case the losses of microencapsulated vitamin B₁ observed after 180 days are more than 50% lower than those of normal forms ($P < 0.01$). The different behaviour of the two forms of vitamin C and K₃ is also evident: for both vitamins the difference between the losses of the microencapsulated forms and the normal forms is very relevant ($P < 0.01$). Thus the preservation of the nutritional value of the feed, and therefore its better utilization, is guaranteed by the greater stability of microencapsulated vitamins.

Marchetti M., Tossani N., Marchetti S.: *Degradazione delle vitamine A, E, B₁, C e K₃ negli integratori zootecnici in funzione del tipo di oligoelementi presenti. Vitamin degradation in premix as a function of the kind of trace-minerals present.* *Zootec. Nutr. Anim.*, 21, 67, 1995.

In order to evaluate the advantage of utilization of mineral chelates over traditional inorganic trace-minerals in the manufacture of vitamin and mineral premixes, the behaviour of some vitamins in premixes maintained at room temperature or at 37 °C and

containing chelates or sulfates was studied. The results obtained showed that the losses of vitamins A, B1, C and K3 in premix with chelates are significantly lower than those observed in premix with sulfates; the differences of losses are still higher when the premix is maintained at 37 °C. On the contrary, no significant difference is observed in degradation of vitamin E. Therefore the employment of chelates for mineral addition of feeds in comparison with inorganic salts presents a twofold advantage: i) the greater bioavailability allows to reduce the amount of minerals and thus their fecal elimination environment pollution; ii) the smaller aggressiveness towards vitamins and other more vulnerable nutrients permits to preserve the biological value of the feed and therefore its better utilization.

Marchetti S., Tossani N., Tassinari M., Marchetti M.: Sepiolite nelle premiscele e nei mangimi medicati. Interazione tra la sepiolite e principi attivi con funzione farmacologica. *Studies on interactions between sepiolite and veterinary drugs present in premixes and feeds*. Obiettivi e Documenti Veterinari, 16(5), 55, 1995.

The possible interference of sepiolite on the quantitative assay in premixes and feeds of some active principles employed for therapy and prophylaxis in zootechnic animals has been studied. The obtained results show that the presence of sepiolite does not impede the analytical recovery of substances studied in premixes when such material is employed as a support. The same is true for medicated feeds integrated with various percentage of sepiolite (1, 2 and 4%) for technological and/or nutritional purpose; this suggests that when these substances ingested with feed are completely bioavailable and therefore able to carry out their pharmacological function.

Martelli G., Parisini P., Sardi L., Ricci G.: Riduzione del tenore proteico della razione per il suino pesante: diverse formulazioni dietetiche. *Low protein diets in italian heavy pig feeding*. Atti 11° Congr. Naz. Assoc. Sci. Prod. Anim., 379, 1995.

Low protein diets represent an useful way to reduce Nitrogen excretion by pigs. In this trial the effects of different low protein diets linked to different Digestible and Net Energy levels are discussed. Low protein diets determine a higher Net Energy availability.

Martelli G., Parisini P., Sardi L., Scipioni R.: Il ruolo delle polpe di bietola surpressate insilate nella alimentazione del suino pesante. *Pressed beet pulps silage in italian heavy pig feeding*. Agronomica, (4), 35, 1995.

The role of pressed beet pulps silage in Italian heavy pig feeding is discussed. This cheap by-product can be successfully used at the level of 17% DM without determining any modification either on animal growing-finishing performances or on meat qualitative parameters. The positive effects of pressed beet pulps on Nitrogen excretion is also illustrated and discussed.

Martelli G., Ricci G., Mora R., Nanni M.: Isoacidi nell'alimentazione della bovina da latte effetti sulla qualità del parmigiano reggiano. *Isoacids in dairy cow feeding: effects on parmesan cheese quality*. Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

Organoleptic and chemical traits of parmesan cheese deriving from milk of isoacids (86 g/head/day) orally treated dairy cows were studied. The dietary addition of isoacids improved the nutritional value of the cheese as demonstrated by the higher amount of free aminoacids and by the lower NaCl content.

Monetti P.G., Sardi L., Frisenna M.: Impiego dei distillers in associazione con fieno e paglia nell'alimentazione dell'agnello in accrescimento. *Associative effects of distillers, lucerne hay and wheat straw in growing lambs feeding*. Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

Associative effects of different percentages of distillers, lucerne hay and wheat straw were studied on 27 Sarda growing lambs. To this aim 9 diets, each containing a concentrate at the ratio of 40% DM, have been formulated. Distillers at the ratio of 60% DM and distillers and wheat straw at the ratio of 30% DM improved feed efficiency. Associative effects were emphasized in diets containing distillers at 30% DM.

Mordenti A., Formigoni A., Pezzi P., Ricci G.: Esperienze sull'impiego di polpe surpressate nel razionamento della vacca in lattazione. *Experiences on the use of pressed beet pulps in dairy cow rations*. Agronomica, 4, 29, 1995.

148 Italian Friesian dairy cows, calving between July 1993 and April 1994, were used for the experiment. The animals were divided, a month after calving, into two groups comparable for mean number of calving, daily milk production, fat and protein percentage. During the trial, 74 cows received 20kg/h/d of pressed beet pulps; the control group was fed with corn silage and corn meal. Every week food intake was recorded and every four weeks milk production, fat, protein percentage and somatic cell contents were determined. The results showed no differences in milk production and milk quality between groups.

Mordenti A., Martelli G.: In principio l'uomo alimentò l'*Aleph*, il toro. *At the beginning man fed Aleph, the beef*. In: L'alimentazione animale nella storia dell'uomo. Edizioni Agricole, 173, 1995.

This chapter describes the history of beef feeding from Cretan civilisation to nowadays. A particular evidence is posed on the transition of the beef from a sacral role to its actual position in rural economy.

Mordenti A., Panciroli A.: Nuovi criteri nell'additivazione dei mangimi: il ruolo di alcuni oligosaccaridi. *New aspects in feed additives: the role of oligosaccharides*. Riv. Zootec. Vet., 23(2), 43, 1995.

A diet not including feed additives today is not possible so it is easy to understand why researchers' and technicians' interest is currently devoted also to growth promoters without pharmacological activity or better to the so called "additives without residues". Such new additives include also mannano- oligosaccharides (MOS) and fructo-oligosaccharides (FOS). In many studies FOS and MOS sowed a better weight gain and feed effi-

ciency in rabbits, piglets and poultry similar to the traditional growth promoters. The FOS in the diet reduce also the presence of undesirable substances as ammonia, indole and skatole in the intestine as shown in rabbits and horses. Therefore the oligosaccharides can be used together with the more traditional growth promoters or can substitute these if it would become necessary because their safety for the animal and human beings has been proved.

Mordenti A., Piva A., Salvadori G.: Efficienza alimentare nel suino all'ingrasso. *Feeding efficacy in fattening pigs*. Riv. Suinicolt., 10, 19, 1995.

The paper reviews the different systems of feed energy evaluation. Protein and aminoacids requirements for fattenings pigs are also illustrated and discussed.

Mordenti A., Sardi L.: Alimentazione dei bovini e qualità della carne. *Beef feeding and meat quality*. Atti Simposio Italo Bavarese Qualità e sicurezza della carne bovina, 21, 1995.

The paper reviews the role of beef feeding on meat quality. The energetic content of the diet, the quality of raw materials and the presence of vitamins (particularly vit. E) are shown to be the major factors affecting meat quality.

Morlacchini M., Moschini M., Piva, A.: La nutrizione energetica dei suini. *Energy nutrition in swine*. Riv. Suinicolt., 5, 29, 1995.

The evaluation of dietary net energy is the most corrected method to evaluate feed energy. The Authors review carbohydrate, protein, and fat digestion physiology. The digestible, metabolizable, and net energy systems are discussed and compared, with special reference to heavy pigs.

Parisini P., Sardi L., Martelli G.: Ulteriori acquisizioni sull'impiego di polpe di bietola surpressate insilate nella produzione del suino pesante. *Recent experiences on pressed beet pulp silage (PBPS) in italian heavy pig feeding*. Atti del Convegno "Impiego delle polpe surpressate insilate nell'alimentazione animale", Verona 10 marzo 1995.

The aim of the present two trials was to investigate the effects of PBPS associated to wet feeding (water or milk whey) and to evaluate the consequences of the partial replacement of cereals (barley) with PBPS. Pressed beet pulp silage at the rate of 10 and of 20% of dietary dm do not influence either breeding and slaughtering performances. PBPS are shown to be economically profitable in both trials.

Pezzi P., Marchetti S., Tossani N., Scipioni R.: Influenza della temperatura sulla stabilità di vitamine libere o microincapsulate in mangimi. *Influence of temperature on free or protected vitamins stability in concentrate feeds*. Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

To evaluate the advantage in concentrate supplementation of microencapsulated vitamin

A, B1, C, E, and K3 over traditional forms, we studied the stability of these vitamins in concentrates kept at 16°C or 31°C. Four samples were collected from each concentrate immediately after preparation and later at 45, 90 and 135 days. Each sample was analysed for vitamin A, B1, C, E and K3 contents. The results obtained in concentrates after 135 days showed a lower degradation for microencapsulated A, B1, C and K3 vitamins than for their natural forms while inverse results are observed for vitamin E. Microencapsulation was particularly effective to limit the K3 and C vitamin degradation. Protection efficacy of micro encapsulation seems to raise with high temperature for vitamin B1.

Piva A., Meola E., Panciroli A.: *Effect of Pediococcus pentosaceus FBB61, pediocin A producer strain, in caecal fermentations.* J. Appl. Bacteriol., 78, 616, 1995.

The objective of this study was to investigate the effect of pediocin A in in vitro caecal fermentations. *Pediococcus pentosaceus* FBB61, pediocin A producer (bac+) and its isogenic mutant (bac-) *Ped. pentosaceus* FBB61-2 were added to fermentation vessels. Pediocin A did not alter the normal activity of caecal microflora. Nevertheless, the presence of pediocin A producer strain reduced proteolysis compared to the mutant strain as indicated by ammonia concentrations ($P < 0.05$), and isobutyric and isovaleric molar proportions ($P < 0.05$).

Piva A., Morelli L., Reniero R., Meola E., Panciroli A.: *Studio della colonizzazione del tratto gastro-intestinale di suini adulti con batteri lattici. Establishment of lactic acid bacteria in heavy pigs.* Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

The establishment of 2 strains of lactic acid bacteria and intestinal fermentation pattern were studied in Italian heavy pigs. The treated group received $1.6 \cdot 10^9$ CFU/d of *Lactobacillus reuteri* and $8 \cdot 10^8$ CFU/d of *L. acidophilus* for 3 weeks. The animals were then sacrificed, the gastro-intestinal tract was removed, and 5 sections were tied (the *pars oesophagea* of the stomach, jejunum, ileum, caecum, and colon). Samples of tissues and liquid contents were collected for plate counts and biochemical analysis. Strain identification by plasmid profiling showed that approx. 80% of lactic acid bacteria adhering to intestinal epithelium were provided with the feed. The addition of lactic acid bacteria tended to reduce pH in the jejunum ($P=0.15$) and caecum ($P=0.14$), lowered ammonia in the jejunum ($P < 0.01$), and propionic acid molar proportion ($P=0.16$), resulting in a reduction of acetate to propionate ratio ($P=0.11$).

Piva A., Panciroli A., Meola E., Formigoni A.: *Role of lactitol in in vitro low or high fiber caecal fermentations.* J. Anim. Sci., 73(1), 180, 1995.

The addition of lactitol (3mmol/L) to enhance swine cecal fermentations was investigated in batch cultures fed low (LF) or high fiber (HF) predigested diets. Four sows were fitted with cecal cannulas for collection of inoculum and fermentations were carried out in a batch culture system that allowed triplicate observations at time 0, 4, 8, and 24 h after the incubations commenced. Lactitol (L) significantly decreased pH and the acetic to propionic acid ratio in the first 8 h of fermentation in both diets ($P < .05$). After culture lag phase gas production increased throughout the 24 h fermentation of the LF+L diet compared to LF, whereas HF+L treatment resulted higher than HF for only

3 h during the log phase ($P < .05$). Following lactitol addition ammonia was reduced by 100% and 84% in LF+L and by 56% and 38% in HF+L at 4 and 8 h ($P < .05$). When lactitol was added LF+L and HF+L had higher short chain fatty acids energy yields by 70 and 40% than LF and in HF diets, respectively ($P < .05$). Lactitol controlled harmful fermentation processes and increased short-chain fatty acids production to a greater extent in low than in high fiber diets, suggesting an improved fermentation low fiber feed carbohydrates and eventually an increased availability of short-chain fatty acids for the host.

Piva A., Roversi R., Panciroli A., Meola E., Gramenzi A., Prandini A.: Influenza della dieta sulla composizione del tuorlo: il ruolo dell'olio di lino. *The use of linseed oil to modify egg yolk composition*. Atti 11° Congr. Naz. Assoc. Sci. Prod. Anim., 107, 1995.

The use of linseed oil in substitution of soybean oil (2.2% in the diet) in laying hens allowed a significant improvement of omega-3 fatty acids of yolk lipid content with a decrease of the omega-6 fatty acids. No differences were found in cholesterol and total lipid yolk contents. There was also a positive effect on egg deposition and weight.

Piva A., Sawadogo M.L., Panciroli A., Meola E., Seve B., Mordenti A.: Influenza del livello di triptofano libero o protetto nell'alimentazione del suinetto. *Efficiency of dietary crystalline tryptophan, free or protected, for protein accretion in piglets*. Atti 11° Congr. Naz. Assoc. Sci. Prod. Anim., 383, 1995.

An experiment was conducted to determine the efficiency of dietary tryptophan retention for protein accretion in the piglet (4 kg live weight). Five tryptophan deficient diets were used for 18 days after weaning. A basal diet contained 23.4% of protein and 0.14% of tryptophan. The four other diets were supplemented by substituting 0.06 and 0.12% of free or protected crystalline tryptophan for maltodextrin in the basal diet. No differences were found between the two crystalline forms for all parameters under study. Equal amounts of all diets were fed by intragastric tube feeding. Daily weight gain ($P < 0.1$), gain per feed ($P < 0.05$), and daily protein retention ($P < 0.01$) increased linearly according to dietary tryptophan. Tryptophan retention also was linearly increased ($P < 0.05$) but net efficiency was maximal (40.1%) with protein-bound tryptophan from the basal diet and decreased linearly according to dietary tryptophan. This important reduction was the result of low marginal efficiencies for crystalline free ($13.4 \pm 4.6\%$) and protected tryptophan ($13.8 \pm 4.8\%$).

Piva G., Galvano F., Pietri A., Piva A.: *Detoxification methods of aflatoxins. A review*. Nutr. Res., 15, 767, 1995.

Detoxification of aflatoxin contaminated foods and feeds is a current problem, as aflatoxins are highly carcinogenic and capable of passing unaltered through metabolic processes and accumulating in tissues. This paper reviews the main chemical detoxification methods and the latest approach to the problem using added sorbents capable of adsorbing aflatoxins.

Piva G., Piva, A.: *Anti-nutritional factors of Datura in Feedstuffs.* Natural Toxins, 3, 238, 1995.

The presence of alkaloids from *Datura* seeds in feed-stuffs may be responsible for chronic and/or subclinical toxic effects; acute poisoning from *Datura* seeds are rare. Pigs are the most sensitive animals to *Datura* poisoning, followed by cattle, horses and chickens. The progressive atropine poisoning in pigs leads to a reduction of feed intake and growth, gastrointestinal motility and secretory activity, extreme mouth dryness, increased respiration and cardiac rate, pupil dilation. Clinical symptoms are partly similar among different species. Toxic effects from *Datura* alkaloids presence in feed showed possible variability of alkaloids content tolerated by pigs. In our recent trials, the threshold limit in pigs (20-60 kg l.w.) was 1.5 mg alkaloids/kg of feed (1.21 mg alkaloids/kg metabolic l.w.).

Prandi A., Motta M., Tondolo A., Fazzini U., Formigoni A.: Valutazione dell'efficienza riproduttiva di bovine di razza F.I. in allevamenti a stabulazione libera e fissa. *Evaluation of reproductive efficiency in Italian Friesian cows housed free stall or tie stall.* Atti 11° Congr. Naz. Assoc. Sci. Prod. Anim., 81, 1995.

In the present study 310 cows, 190 free stall and 120 tie stall, are utilised for two years. Milk samples (every 3-4 days) were collected from 10 to 140 days after calving and oestrus signs were monitored every day from farmers during milking. Results shown better reproductive performance in the cows free stall than the ones tie stall.

Ricci G., Meola E., Panciroli A., Piva A.: Impiego delle polpe di barbabietola surpressate insilate nell'alimentazione della bovina da latte. *The use of pressed beet pulp silage in dairy cow feeding.* Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

148 Italian Friesian dairy cows, calving between July 1993 and April 1994, were used for the experiment. They were bred in free stalls with bunk area. The cows were divided, a month after calving, into two groups comparable for mean number of calving, daily milk production, fat and protein percentage. During the trial, 74 cows received 20kg/h/d of pressed beet pulp silage and the other animals (control group) were fed with corn silage and corn meal. The results showed no differences in milk production and quality between groups.

Rizzi L., Lambertini L., Marchesini L., Gramenzi A.: Effetti dell'aflatossina B1 e di alluminosilicati sulla digeribilità *in vivo* negli agnelli. *Effect of aflatoxin B1 and alluminosilicate on in vivo digestibility in lambs.* Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

16 Sarda male lambs kept in metabolic cages were used to evaluate aflatoxin B1 effects and sequestrant efficacies of alluminosilicate on digestibility. Animals were randomly assigned to the following treatments: T1 — control diet; T2 — control diet + aflatoxin B1; T3 — control diet + 2,5% of alluminosilicates; T4 — the same of T3 + aflatoxin B1. The oral daily administration of aflatoxin was 0,08 mg/kg l.w. for 21 days. Digestibility was improved in animals fed with diet containing additives. Furthermore aflatoxin could have improved digestibility by inducing on liver monooxygenesis. The T4 group showed lower digestibility values than the other treatments because the aflatoxin was absorbed by the alluminosilicates.

Sardi L., Parisini P., Prandini A., Martelli G.: Effetti del livello proteico della dieta e del tipo genetico sulle prestazioni di macellazione del suino pesante italiano. *Effects of dietary protein level and of genotype on Italian heavy pig slaughtering performances*. Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

The effects of traditional and low protein supplemented with aminoacid diets on slaughtering performances were studied using 48 pigs deriving from Landrace x Large White cross bred and Duroc x (Landrace x Large White) cross bred. D x (L x LW) pigs showed better slaughtering performances. Low protein diets supplemented with aminoacid diets do not influenced either carcasses quality and meat composition.

Scipioni R. Martelli G., Sardi L., Roversi R.: Diverse fonti di fosforo nell'alimentazione del suino pesante: prove di bilancio. *Effects of different sources of inorganic phosphates on P balance in the Italian heavy pig*. Atti 11° Congr. Naz. Assoc. Sci. Prod. Anim., 1995.

The effects on P digestibility of three different sources of inorganic P (dicalcium phosphate hydrated, Magnaphoscal and monocalcium phosphate) and of a very low amount of microbial phytase were studied using pigs kept in metabolic crates. Magnaphoscal significantly improved P retention and absorption (ADC 95%). ADC of dicalcium phosphate hydrated and of monocalcium phosphate were found to be 64% and 60% respectively.

Tassinari M., Fusari A., Vignola G., Ubaldi A., Monetti P.G.: Impiego della carnitina nell'alimentazione del vitello "a carne bianca". *The use of carnitine in veal calf feeding*. Atti Soc. Ital. Buiatria, 27, 421, 1995.

The aim of this trial was to evaluate the effect of L and DL carnitine on the performance of veal calf when added to the milk replacer at the dose of 1000 mg/head/day. During the trial, live weights and feed consumption were recorded, and blood samples were drawn; moreover, the slaughtering performances were recorded. The results indicate that L-carnitine positively affect the growth performances, even though not significantly; on the contrary, the DL-carnitine group does not reach the control group. The slaughtering data confirm those in life, either for conformation (R for L-carnitine group in EEC carcass grading versus O for control and DL-groups) or, significantly ($P < 0.05$), for fat deposition. The results of the blood analysis demonstrate that the L-carnitine group had a better utilization of dietary fat and that L-carnitine had a saving action on glucose.

Tassinari M., Vignola G., Monetti P.G.: Impiego di aminoacidi e peptidi nell'alimentazione del vitello "a carne bianca". *The use of amino acids and peptides in veal calf feeding*. Atti Soc. Ital. Buiatria, 27, 79, 1995.

The effect of supplemented amino acids and peptides by chemical synthesis have been studied in 56 Friesian veal calves. Live performance showed higher weight gain (+ 5.7 kg equivalent to 2.5%) in treated animals but no statistical differences were noted. Dressing percentage was similar in both groups, however better conformation was recorded in animals receiving amino acids and peptides (R and O in EEC carcass grading for treated and control group respectively).

Vignola G., Tassinari M., Plodari M., Monetti P.G.: Impiego della granella di mais nell'alimentazione del vitello "a carne bianca". *The use of maize grain in the feeding of the veal calf*. Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

The aim of the trial was to evaluate the effect of maize grain on the performance of veal calf when added to the normal milk based diet and to show the influence of the adjunction length. The trial was carried out on 36 Italian Friesian calves, divided into three homogeneous groups and allocated to one of the three following diets: L130 — basal diet (milk replacers for 130 days); M100 — basal diet + maize grain for the first 100 days of the trial; M128 — basal diet + maize grain for 128 days. During the trial, weight gain, feed consumption and health status were recorded; moreover, the slaughtering performances were recorded. An economic analysis was also made. The results showed that the use of maize grain could be a good option to the only milk replacer based diets. In fact, calves which received the maize grain addition showed better productive and slaughtering performances and the economic analysis showed that the use of maize grain can be profitable.

Zaghini G., Gramenzi A., Marchetti S., Lambertini L.: Indagine sulla qualità nutrizionale di alimenti commerciali per cani. *Survey on nutritional profile of commercial dogfoods*. Bollettino dell'Associazione Italiana Veterinari Piccoli Animali (AIVPA), (3), 129, 1995.

A survey was performed on the nutritional profile of proprietary dog foods. The results obtained show large differences in nutrient content between dry and canned foods. The Authors compare dogfoods with catfoods and talk over the results about mineral and fat contents.

Falaki M., Renaville R., Sneyers M., Prandi A., Formigoni A., Massart S., Corradini C., Burny, A., Portetelle D.: *GH receptor gene taqI RFLP and milk traits in Italian Holstein Friesian and Simmental cattle*
Proceedings of the 87th Meeting of the American Society of Animal Sciences, Orlando (USA), 7/1995.

The presence of restriction fragment length polymorphism (RFLP) in GH gene were examined using the enzyme TaqI and to look for any possible association between this RFLP and milk production traits. Blood samples were collected from 251 Italian Holstein-Friesian and 279 Simmental cows. The results indicated a significant effect of the GH gene polymorphic TaqI restriction fragment on 305 d milk, fat and protein ($P < .05$ and $P < .01$). RFLP might have the ability to provide strong tools for more development in animal breeding.

DIPARTIMENTO DI SANITÀ PUBBLICA VETERINARIA
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1988

Anfossi P., Cocchi R., Giovannini A., Trocchi V., Stracciari G.L., Spagnesi M.: La lepre europea (*Lepus europaeus*) quale indicatore biologico dell'inquinamento ambientale da stannorganici agricoli: approccio metodologico, settori di indagine e primi risultati analitici. *European hare (Lepus europaeus) as a biological indicator for an environmental contamination by agricultural organotin compounds: methodological approach, research fields and preliminary results.* 1° Convegno Nazionale di Biologia della Selvaggina, Bologna Gennaio 1988.

The Authors examine the environmental pollution due to organotin compounds in a study area characterized by widespread sugar beet fields. The European hare (*Lepus europaeus*) was employed as a biological indicator. Inorganic tin occurrence was determined in vegetation and hare samples collected within the span of one year. Correlations detected between positivity percentage for inorganic tin in vegetation and hare samples confirm the role of this herbivore as a biological indicator of tin pollution.

Malvisi J., Lepore R., Cervellati G., Stracciari G.L.: Comportamento farmacocinetico del buflomedil in rapporto ad una diversità di formulazione. *Pharmacokinetic behaviour of buflomedil in relation to different formulation.* Medical Praxis, 9, 1, 1988.

Evaluation of the plasma buflomedil concentrations was carried out after repeating treatments 7 days along, at single oral doses (600 mg/die). Definition of kinetic parameters of the drug related to the different releasing capability of two formulations, Buflan and Buflan R. Though it was the same bioavailability of buflomedil in the 24 h period, Buflan R shows greater uniformity of its blood levels, delayed peak and longer half-life. These results allow to consider Buflan R a slow releasing preparation free of accumulation phenomena.

Marocchio L., Stracciari G.L., Spagnesi M.: Effetti indotti dalla somministrazione di fentin acetato nella dieta della lepre (*Lepus europaeus* Pallas). *Effects induced by dietary administration of triphenyltin acetate in the hare (Lepus europaeus Pallas).* Atti Soc. Ital. Sci. Vet., 42, 915, 1988.

The Authors studied the effects induced by dietary administration of triphenyltin acetate (TPTA) in the hare. Four lots of 6 animals each have been examined: a control group and three groups fed, for 62 days, a pelleted diet containing 25, 50, 100 ppm of TPTA, an organic tin compound used for agricultural purpose. General conditions, weight gain, feed intake and hematochemical values (sGOT, sGPT, LDH, AF, HB, RCB, WBC) showed no alterations. The anatomohistopathological examen evidenced only mild lesions improbably correlated with TPTA.

Stracciari G.L., Rosmini R., Malvisi Stracciari J., Spagnesi M., Zaghini A., Trocchi V., Marocchio L.: Aflatossicosi sperimentale nella lepore (*Lepus europaeus* Pallas, 1778). *European hare (Lepus europaeus Pallas, 1778): experimental aflatoxicosis*. Ric. Biol. Selvaggina, 80, 1, 1988.

The Authors describe the clinical and anatomohistopathological aspects characterizing an aflatoxicosis syndrome experimentally induced in hares (*Lepus europaeus* Pallas) by feeding them for 60 days complete feed in which aflatoxins B1, B2, G1 and G2 were present in two different concentrations. The levels of these mycotoxins detectable in some tissues were also evaluated. Despite the spontaneous deaths of some animals that received diets highly contaminated, the organic decay and decreases in feed intake, the symptomatology and the anatomohistopathological features, did not appear particularly relevant. As to the detection of the various aflatoxin in the examined tissues, the evaluations showed high concentrations in the liver and heart and much lower levels in the kidney and muscle.

Zaghini A., Malvisi J., Bernardini D., Stracciari G.L.: Valutazione del comportamento cinetico del dimetilan nel bovino in fase mono e poligastica. *Evaluation of the kinetic behaviour of dimetilan in mono and polygastric cattle*. Atti Soc. Ital. Sci. Vet., 42, 901, 1988.

The Authors consider the toxic effects and the kinetic parameters established after i.v. and oral administrations of 2.5 mg/kg of dimetilan to mono and polygastric cattle. Results are suggestive of a higher susceptibility of the monogastric cattle, as indicated also by the kinetic behaviour observed in these animals.

1989

Anfossi P., Malvisi J., Stracciari G.L.: Farmaci e mammella: aspetti cinetici. *Drugs and udder: kinetic aspects*. Atti Pfizer, 10, Mantova, Aprile 1989.

In order to elucidate factors conditioning the efficacy of anti-mastitis treatments and the safety of milk and meats, the Authors consider non-ionic passive spread and various behaviour of drugs related to their chemical and physical properties and pH changes. The influence of the protein binding of drugs, pharmaceutical formulation, dosages, physiopathological conditions of the breast on the passage of an antibiotic across biological membrane are also taken into consideration.

Malvisi Stracciari J.: Cinetica ematica e presenza del cefoperazone nel latte dopo somministrazione endomammaria. *Blood concentrations and residues in milk of cephalosporin following intramammary infusion*. Atti Pfizer, 10, Mantova, Aprile 1989.

By HPLC the Author evaluates the absorption, the diffusion in non-treated quarters and the presence time-relating of cephalosporin following intramammary administration of a single dose (250 mg) of the antibiotic in healthy and mastitic cows. The results show the absence of cephalosporin in blood and in milk produced by non-treated quarters and no

significant differences of the elimination pattern between physiological and pathological conditions of mammary glands.

Stracciari G.L., Malvisi J., Anfossi P., Fregnan G.B.: *Pharmacokinetics of Dipyridamole- β -Cyclodextrin Complex in dogs.* *Archs Int. Pharmacodyn. Ther.*, 300, 7, 1989.

Plasma concentrations and urinary and fecal excretion of intact dipyridamole were followed in dogs after oral administration of dipyridamole- β -cyclodextrin complex (dip- β -CD), of commercial dipyridamole and of dipyridamole HCl, according to a crossover design. Dip- β -CD afforded significantly shorter lag-times, higher Cmax, smaller interindividual variations of plasma concentrations and greater urinary excretion than the other two preparations, as a consequence of a better bioavailability of the former one.

Stracciari G.L.: Inquinamento del territorio: la fauna selvatica come dispositivo di monitoraggio. *Environmental contamination: the wildlife as biological indicator.* *Atti Soc. Ital. Sci. Vet.*, 43 45, 1989.

Contamination of our ecosystem is an incontestable fact in relation to various reasons that uphold and increase it. After examining contamination sources carefully, such as road traffic, waste materials, invasive industrialization, fertilizers and pesticides, the Author points out the consequences caused by various chemicals on wildlife and its habitat, relating contaminants to their influence on the whole foodchain. Some directions are also suggested for a correct evaluation of the results obtained by the investigation on wildlife.

Zaghini A., Rosmini R., Stracciari G.L., Biacchessi D., Marocchio L.: Aspetti tossicologici e distributivi del paraquat nel coniglio. *Toxicological and distributive aspects of paraquat in rabbits.* *Acta Toxicol. Ther.*, 10, 357, 1989.

With the object of going deep into the toxicological and distributive behaviour of paraquat in rabbits the Authors examined negative consequences and tissue concentrations of this herbicide following 30 days s.c. administration of 1.5 mg/kg paraquat dichloride (0.37 μ /kg methyl-tritium paraquat). The results strengthen the high resistance of rabbits to pulmonary damages induced by paraquat in other species and show a fairly uniform distribution of this herbicide in the body.

1990

Anfossi P., Malvisi J., Bernardini D., Stracciari G.L.: Quote residuali di febantel e dei suoi metaboliti fenbendazolo, oxfendazolo e sulfossido di febantel nel coniglio. *Residues of febantel and its metabolites fenbendazole, oxfendazole and febantel sulfoxide in rabbit.* *Acta Toxicol. Ther.*, 11, 313, 1990.

The residue levels of febantel and its metabolites fenbendazole, oxfendazole and febantel sulfoxide were determined in liver, kidney and muscle of rabbits dosed orally with 20 mg/kg of the parent compound at the 5th, 10th and 14th day after administration of febantel. The results reveal that while oxfendazole is detectable only in liver limitedly at the 5th day, the other compounds are still time present in all the tissues examined. At the 14th day after administration the concentrations of febantel and its metabolites are under the detection limits.

Anfossi P., Marzocchi F.: Effetto di un'acqua salso-bromo-iodica sulla contrazione indotta da istamina sull'ileo isolato di cavia. *Effect of a salt-bromine-iodic water on istamine-induced contractions of isolated Guinea pig ileum.* Acta Toxicol. Ther., 11, 265, 1990.

The Authors study the antispasmodic effects of a salt-bromine-iodic water on isolated Guinea pig ileum. The results show that the addition (1:1) of this water to Krebs- Henselheit solution produces a reduction of histamine-induced contractions, probably on the basis of the particular ionic composition of mineral water.

Anfossi P., Marzocchi F.: Valutazione delle proprietà espettoranti di un'acqua salso-bromo-iodica. *Expectorant action of a salt-bromine-iodic water.* Acta Toxicol. Ther., 11, 269, 1990.

The Authors evaluate the expectorant action of a salt-bromine-iodium-calcium-magnesium water after single administration with aerosol in the rabbit. The results obtained show that the treatment significantly increases the output of respiratory tract fluid until the 3rd hour of experimentation, and represent a good therapeutic tool on the basis of its high expectorant action.

Anfossi P., Stracciari G.L., Biacchessi D.: Reperimento di micotossine in alcuni sottoprodotti utilizzabili in alimentazione animale. *Occurrence of mycotoxins in by products for animal feeding.* Zootec. Nutr. Anim., 16, 137, 1990.

The Authors used an HPLC method to investigate the qualitative and quantitative occurrence of aflatoxin B1, B2, G1 and G2, ochratoxin A and zearalenone in samples of beet pulp, ensiled maize stovers and condensed molasse stillage, collected in different areas of the Emilia-Romagna region and intended for animal feeding. The results show a relevant occurrence of these compounds in comparison with those described in other feeds by many researchers, and concentrations of ochratoxin A and of zearalenone which may parallel those described as responsible for mycotoxicoses in cattle and swine. However, the levels of all mycotoxins in feed are not significant from a zootechnical point of view.

Anfossi P., Tomasi L., Malvisi J.: Concentrazioni sieriche e tempo di emivita della sulfadossina e del trimethoprim nel coniglio. *Serum concentrations and half-lives of sulfadoxine and trimethoprim in rabbits.* Acta Toxicol. Ther., 11, 289, 1990.

Serum concentrations and half-lives of sulfadoxine and trimethoprim were determined in rabbits after i.m. injections of sulfadoxine at 15 mg/kg in combination with trimethoprim

at 3 mg/kg. The results show a certain variability as to the times of maximum concentrations of the two compounds, i.e. 2 h for sulfadoxine and 5 h for trimethoprim, that on the contrary are characterized by similar half-lives, i.e. 2.98 ± 0.19 h and 3.45 ± 0.17 h.

Anfossi P., Trocchi V., Cocchi R., Giovannini A., Stracciari G.L., Spagnesi M., Rosmini R.: Contaminazione ambientale da stannorganici di uso agricolo e possibile impiego della lepre (*Lepus europaeus* Pallas) per il suo monitoraggio biologico. *Environmental contamination by agricultural organotin compounds: the use of the european hare (Lepus europaeus Pallas) as a biological indicator*. Ric. Biol. Selvaggina, 84, 1, 1990.

The Authors evaluated the consequences caused by environmental contamination with organotin compounds in a study carried out in an agricultural zone (Mezzano, Ferrara). In relation to a dynamic use of organotin compounds, the levels of metallic tin were evaluated in water, plants, and tissue specimens of hares present in the area. The statistical analysis of the correlation between organotin diffusion in this area and the presence of metallic tin in plants and animals is very significant and confirms the use of the hare as a biological indicator through the analysis of liver and kidney specimens.

Anfossi P., Trocchi V., Cocchi R., Giovannini A., Stracciari G.L., Spagnesi M., Rosmini R., Marocchio L.: Comportamento tossicologico e cinetico del fentin acetato nella lepre (*Lepus europaeus* Pallas). *Toxicology and kinetic of triphenyltin acetate in the european hare (Lepus europaeus Pallas)*. Ric. Biol. Selvaggina, 86, 1, 1990.

Some european hares (*Lepus europaeus* Pallas) were given a complete feed which contained triphenyltin acetate in different concentrations. The Authors evaluate the consequences of the treatment and the concentration of metallic tin in various tissues and organs. The results of the study did not indicate any clinic, hematologic, enzymatic, and anatomic-histopathological changes but showed that the concentration of metallic tin in all samples, with the exception of plasma or blood cells, depends on the dose given. So, the results of this experiment show that the hare tolerates contamination of the diet with much higher levels than those reached with fungicidal treatment very well.

Malvisi J., Molteni R., Anfossi P., Cervellati G., Stracciari G.L.: Farmacodinamica dell'acido tauroiodosossicolico nel ratto e nel topo: effetti sulla lipemia, sulla colesterolemia, sulla calcolosi colesterolica e sulla steatosi da dieta ipercolesterolica. *Pharmacodynamic of tauroiodoexicholic acid: effects on lipemia, hypercholesterolemia, frequency of gallstones and steatosis in rats and mice fed with lithogenic diet*. Acta Toxicol. Ther., 11, 205, 1990.

The Authors study the effects of treatment with different doses of THDCA on lipemia hypercholesterolemia, frequency of gallstones and steatosis in rats and mice fed with lithogenic diet. In the animals treated with high doses the frequency of pathologic features is significantly lower than those of untreated controls and always statistically differs from those observed in animals fed with normal diet.

Malvisi J., Zaghini A., Bernardini D., Stracciari G.L.: Comportamento cinetico ed effetti tossici del dimetilan nel vitello in fase mono e poligastica. *Toxicokinetic and toxicological aspects of dimetilan in mono and polygastric cattle*. Acta Toxicol. Ther., 11, 277, 1990.

The toxicity of dimetilan has been determined in mono and polygastric cattle dosed i.v. or orally at 2.5 mg/kg. In the meantime the toxicokinetics of the insecticide and the influence of the different degree of forestomachs development on these parameters have also been evaluated. The results have shown some variations as to relevance, onset and disappearance time of the typical cholinergic symptomatology in both the experimental groups of animals joined with the administration route. Following oral treatment the monogastric cattle have shown a greater sensibility than polygastric one, repartly explainable on the basis of the higher bioavailability that characterizes the kinetic patterns of dimetilan in monogastric animals.

1991

Anfossi P.: Riflessi dei contaminanti ambientali sul patrimonio faunistico. *Consequences of the environmental pollution in wildlife*. Atti del 2° Convegno Nazionale di Biologia della Selvaggina, Ric. Biol. Selvaggina, 29, suppl., 405, 1991.

The special exposure of wildlife to industrial and agricultural pollutants and their indirect (modifications of the environment and of the feed) and direct (acute intoxications) effects, mostly the consequences of a repeated contact with their residues, are reviewed. Immunosuppression, debilitation, induction or inhibition of hepatic MFO activities and interferences on the wildlife reproduction related to the pollutants are discussed. It is pointed out the necessity of studies concerning the impact of field-like residues repeated uptake on wildlife to set the real dangerousness of the pollutants in every species.

Malvisi J., Anfossi P., Zaghini A., Stracciari G.L.: Presenza di ossitetraciclina, neomicina e oleandomicina nel siero e nel latte di bovine trattate per infusione endomammaria. *Serum and milk concentrations of oxytetracycline, neomycin and oleandomycin dosed by intramammary infusion*. Arch. Vet. Ital., 42, 36, 1991.

The Authors investigated at fixed times the serum concentrations of oxytetracycline, neomycin and oleandomycin after a single-dose intramammary infusion of an antimastitic association of the three antibiotics and defined their excretion in the milk produced by treated and untreated quarters. The results clearly show that in both the experimental groups serum levels of neomycin and of oleandomycin are under the limits of detectability 24 h after the treatment, in contrast with a constant presence of oxytetracycline. The evaluations of the milk reveal higher concentrations of the three antibiotics in the production of mastitic cows, an earlier undetectability of oleandomycin independently of physiopathologic conditions of the udder and a transfer into the untreated quarters of light entity for oxytetracycline and neomycin and only a little greater for oleandomycin.

Malvisi J., Molteni R., Anfossi P., Cervellati G., Stracciari G.L.: *Pharmacodynamics of the taurohyodeoxycholic acid: effects on lipemia, cholesterolaemia, frequency of cholesterol-induced gallstones and steatosis in rats and mice fed on a lithogenic diet*. Atti 4th Interscience World Conf. on Inflammation: Antirheumatics, Analgesics, Immunomodulators, abs 135, Geneva, April 15- 18, 1991.

A series of pharmacodynamic test have been carried out in rats and in mice treated with

different regimens of thaurohyodeoxicolic acid to study its effects on lipemia, hypercholesterolemia, gallstones formation and steatosis. The results achieved show that the compound induced a significant dose-dependent decrease of hypercholesterolemia and lipemia and prevented the formation of gallstones after a lithogenic diet. The same is true for steatosis. Statistical analyses shows an high significance level between treated and untreated animals.

1992

Amorena M., De Liguoro M., Adas T., Lucisano A., Montesissa C.: Tossicocinetica dell'Aldicarb somministrato per os ai suini. *Aldicarb toxicokinetics in pigs after oral administration*. Atti Soc. Ital. Sci. Vet., 46, 1321, 1992.

The kinetic profile of aldicarb was evaluated in pigs to compare *in vivo* metabolic transformation to *in vitro* results obtained previously. After per os administration of ALD (1 mg/kg) to 3 female pigs (40 kg m.b.w.), parent compound levels and those of its two major toxic metabolites, aldicarb sulfoxide and aldicarb sulfone were followed in serum by HPLC detection. ALD disappeared rather quickly in serum while ALDSOX was detected within 15 min. and reached its peak level within 2 h following administration, together with the onset of the classic toxic symptoms, due to AchE inhibition. Low levels of ALDSON were detected within 1 h after administration until the end of the experimenta (6 h). Results obtained *in vivo* confirm the quick metabolization undergone by ALD *in vitro* and underline the relevant toxicity of ALDSOX.

Anfossi P., Tomasi L., Cervellati G., Stracciari G.L.: Tossicocinetica del linuron nel coniglio. *Toxicokinetics of linuron in rabbits*. Atti Soc. Ital. Sci. Vet., 46, 1275, 1992.

The Authors evaluate the toxicokinetic behaviour of linuron in rabbits. After i.v. administration at 10 mg/kg linuron is quickly distributed to lipophilic tissues and eliminated with a half-life of 1.95 h. The high clearance value (16.4 ml/kg/min) observed suggests a fast elimination due to different excretion routes or to metabolism. The absorption rate following the oral administration at 400 mg/kg is so rapid that a two compartment open model could be adopted to describe the linuron kinetics. Although a short elimination half life is observed low concentrations of linuron are still detected after 8 h.

De Liguoro M., Donato A., Amorena M., Carli S., Lucisano A., Montesissa C.: *Aldicarb sulfoxidative pathway in rabbits*. Pharmacol. Res., 26, suppl. 1, 199, 1992.

The metabolism of aldicarb (ALD), a carbamate widely used for pest control in several crops, was studied in rabbits to compare *in vivo* kinetic data with *in vitro* metabolic transformation. After the oral administration of 1,5 mg/kg ALD to 10 rabbits a kinetic study was performed and ALD transformations into ALD sulfoxide and sulfone was followed for 24 h in serum. The pesticide was rapidly and extensively metabolized: after only 15 min ALD sulfoxide and sulfone were detected in serum, while the parent compound was no detectable. Toxic symptoms relative to anticholinesterase activity of carbamate were evident after 15 minutes and reach maximum within 45 min. ALD toxicity in rabbit seems to be well related to ALD transformation in ALD sulfoxide, an oxidated

metabolite which is known to retain the same toxicity of ALD as an acetylcholinesterase inhibitor.

Di Lecce R., Anfossi P., Redeghieri A., Cantoni A.M., Cacchioli A., Stracciari G.L., Badino F.: Sull'impiego dei β_2 -agonisti in suini stress-sensibili: aspetti miotipologici, adipocitari e residuali. *Use of β -adrenergic agonists in stress-susceptible pigs: investigations on muscular and adipose tissues and residues*. Atti della Società Italiana di Patologia e Allevamento dei Suini (SIPAS), 19, 89, Parma, 2-3 Aprile 1992.

Anatomopathological and toxicological investigations were performed in stress susceptible pigs treated for 90 days with 1.5 mg/animal/day of salbutamol or clenbuterol in the finishing stage of breeding. Some animals were slaughtered at the end of treatment and others 5 days after treatment suspension. Salbutamol and clenbuterol induced the same decrease in the adipocyte diameter of the perirenal region and lumbar backfat only in the group slaughtered immediately after the treatment while a slight increase in the number of myofibres type II was observed in all the treated pigs at each time of slaughtering. Salbutamol and clenbuterol residues were present only in urine of swine during treatment but not after its suspension. No residues were detectable in plasma, liver, kidney and muscle of the treated animals with or without treatment suspension.

Malvisi J., Zaghini A., Stracciari G.L.: *Carbaryl distribution in rabbit tissues and body fluids*. Vet. Hum. Toxicol., 34, 501, 1992.

After single po administration of ^{14}C - naphthylcarbamate, liquid scintillation assays evaluated the distribution of carbaryl in rabbit serum, liver, kidney, small and large intestine, spleen, heart, muscle of the thigh and lung and its excretion in urine and feces at 2, 4, 6, and 8 h after dosing. At 2 and 8 h radioactivity was not observed in spleen, heart, muscle and lung, while all other tissues had increased values up to 6 h. The main excretory pathway of carbaryl was the kidneys.

Ubaldi A., Fusari A., Conti V., Morlacchini M., Tomasi L., Horn W.: Sull'impiego dei β_2 -agonisti in suini stress-sensibili: comportamento dei parametri biochimico-clinici ed ipotesi metabolico-tossicologiche. *Metabolic and toxicologic effects of β -agonists in stress-susceptible pigs*. Atti della Società Italiana di Patologia e Allevamento dei Suini, 19, 103, Parma, 2-3 Aprile 1992.

Low levels of two different beta-agonists (clenbuterol and salbutamol) were administered for a long time (90 days) to stress-susceptible pigs. The serum levels of the biochemical parameters involved in the lipid, carbohydrate, protein metabolisms and in renal and muscular functions were measured. The results show a significant lipomobilization effect and a modification in the renal and muscular functions. The experiment demonstrated the pharmacologic and toxicologic actions induced by the molecules employed.

Zaghini A., Bernardini D., Stracciari G.L.: Piombemia e cadmiemia nel cane come indici di inquinamento ambientale. *Blood lead and cadmium concentrations of dog as indicators of environmental pollution*. Atti Soc. Ital. Sci. Vet., 46, 1337, 1992.

The Authors report the results obtained measuring serum concentrations of lead and cadmium in blood samples collected from healthy dogs of different breed, recording age, sex, season of the year in which the samples were collected, living behaviour of the animals and the environment by which they came from. Results obtained show the small grade of lead and cadmium contamination of the examined area and how the heavy metal concentrations in blood is significantly influenced by the living area and the time spent in the open area.

1993

Anfossi P., Malvisi J., Catraro N., Bolognini M., Tomasi L., Stracciari G.L.: *Pharmacokinetics of benzydamine in dairy cows following intravenous or intramuscular administration.* Vet. Res. Commun., 17, 313, 1993.

Five lactating cows were given benzydamine hydrochloride by rapid intravenous (0.45 mg/kg) and by intramuscular (0.45 and 1.2 mg/kg) injection in a crossover design. The bioavailability, pharmacokinetic parameters and excretion in milk of benzydamine were evaluated. After i.v. administration, the disposition kinetics of benzydamine was best described using a two compartment open model. Drug disposition and elimination were fast. Benzydamine was widely distributed in the body fluids and tissues and characterized by a high value for body clearance. After i.m. administration the serum concentration-time curves fitted a one-compartment open model. Benzydamine bioavailability was high. An increased intramuscular dose resulted in longer serum persistence of the drug which was also detectable in milk samples collected from both the first and second milking after treatment.

Anfossi P., Roncada P., Stracciari G.L., Montana M., Pasqualucci C., Montesissa C.: *Toxicokinetics and metabolism of linuron in rabbit: in vivo and in vitro studies.* Xenobiotica, 23, 1113, 1993.

The Authors investigate linuron metabolism and kinetic behaviour after oral and i.v. administration to rabbits. After i.v. dosage, linuron distributes quickly and widely to peripheral tissues and it is rapidly eliminated; rapid absorption was also observed after oral administration of the herbicide which undergoes extensive first pass metabolism in the liver. The major metabolites obtained from both *in vivo* (serum samples) and *in vitro* (microsomal fractions incubated with linuron) experiments were identified by HPLC-mass spectrometry as N'-(3,4-dichlorophenyl)-N-methoxyurea, N'-(3,4-dichlorophenyl)-urea, and N'-(6-hydroxy-3,4-dichlorophenyl)-urea. Given the common metabolites reported in the rat and rabbit, and the fact that linuron is a liver enzyme inducer in the rat, it may be possible that linuron also induces the P450 system in the rabbit.

Anfossi P., Roncada P., Tomasi L., Brizzi A., Stracciari G.L.: *Indagine su una presenza di ossitetraclina nel siero e nel latte di bovine trattate per via topica con una formulazione spray.* *Oxytetracycline determination in serum and milk of cows topically treated with a spray formulation.* Atti Soc. Ital. Buiatria, 25, 431, 1993.

The Authors evaluate residual levels of oxytetracycline in blood and milk of cows after

topical treatment of digital dermatitis with a new spray preparation. The assay carried out by HPLC with a limit of detection of about 5 ng/ml always failed to detect oxytetracycline amounts in samples collected at any time.

Anfossi P., Tomasi L., Roncada P., Cervellati G., Predieri P., Cavazzoni R., Stracciari G.L.: Studio di bioequivalenza fra due formulazioni orali di teofillina nel cavallo. *Bioequivalence study of two oral formulations of theophylline in the horse*. Atti Soc. Ital. Sci. Vet., 47, 1547, 1993.

A bioequivalence study was performed in 8 horses to compare two formulations of theophylline, granules and microencapsulated granules. In a cross-over design a single dose of 5 mg/kg was administered orally. For each formulation were determined maximum serum concentration (C_{max}), peak concentration time (T_{max}), mean residence time (MRT), area under the time-concentration curve (AUC), and half life (t_{1/2β}). Statistical analyses performed on the parameters of the two formulations showed no differences except for T_{max} value which was significantly higher after administration of microencapsulated granules. The results obtained showed that the microencapsulation does not modify the bioavailability of the drug. Given that smaller peak concentrations were observed with the microencapsulated granules, this formulation can be considered safer after repeated treatments.

Carli S., Sonzogni R., Villa R., Bignazzi R., Montesissa C.: *Pharmacokinetics profile of sulphamonomethoxine-trimethoprim in horses after intravenous, intramuscular and oral administration*. Res. Vet. Sci., 54, 184, 1993.

The pharmacokinetic profile of a sulphamonomethoxine-trimethoprim (SMM-TMP) combination was investigated in five horses. The combination was administered intravenously, intramuscularly and orally at a constant dose of 20 mg SMM plus 4 mg TMP/kg b.w.. Following intravenous administration both drugs dispersed rapidly. Elimination half-lives for intravenous, intramuscular and oral administration were closely similar, indicating that elimination was independent of administration route. Bioavailability of the drugs in aqueous solution was good.

Klotz U., Stracciari G.L.: *Steady state disposition of 5-aminosalicylic acid following oral dosing*. Arzneimittel-Forsch. Drug Res. 43, 1357, 1993.

In 18 healthy volunteers the steady state disposition of 5-aminosalicylic acid (5-ASA, mesalazine, CAS 89-57-6; 500 mg tid) was evaluated following the last oral dose in form of slow release tablets (Salofalk®) either containing 500 mg or 250 mg 5-ASA. In none of the pharmacokinetic parameters of 5-ASA characterizing bioavailability (e.g. AUC ≈ 6 μg/ml x h; C_{max} ≈ 1.7 μg/ml; T_{max} ≈ 5 h; C_{ssmin} ≈ 0.75 μg/ml; C_{ssav} ≈ 0.75 μg/ml) differences between both forms were observed and the calculated 90% confidence intervals and point estimates indicated bioequivalence. Following the delayed absorption 5-ASA was rapidly eliminated (t_{1/2} = 1.4 ± 0.5 h).

Sonzogni O., Villa R., Montesissa C., Carli S.: Parametri farmacocinetici dell'associazione ampicillina-sulbactam nelle specie bovina ed ovina. *Pharmacokinetic parameters of the*

ampicillin-sulbactam combination in calves and sheeps. Atti Soc. Ital. Sci. Vet., 47, 1271, 1993.

Pharmacokinetics of an ampicillin- sulbactam combination was studied after intravenous and intramuscular administration at 6.6+3.3 mg/kg b.w. to calves and sheep. Significant differences were found between the species as far as ampicillin Cmax, Tmax and bioavailability (calves: 58%; sheep: 99%) it concerns. By contrast, sulbactam showed in both species a similar behaviour and bioavailability values (calves: 99%; sheep: 83%).

Zaghini A., Lambertini L., Rizzi L., Roncada P.: Effetti dell'impiego di diete contenenti bentonite sul controllo dell'aflatossicosi negli ovini in accrescimento. *Effects of a bentonite supplemented diet on prevention of aflatoxicosis in growing lambs*. Atti Soc. Ital. Sci. Vet., 47, 1329, 1993.

The Authors report the results obtained measuring, by HPLC and enzyme-immunoassay methods, the levels of aflatoxin B1 in some biologic materials collected from 8 wethers orally administered with mycotoxin at a daily dose of 0.08 mg/kg b.w. for 21 days. Concomitantly, four out of them received a diet supplemented with a 2.5% mixture of sodium bentonite (80%)-synthetic zeolite (20%). Significant differences ($P < 0.05$) were found only when urine were examined; residues of aflatoxin B1 were found in the liver of the animals eating diet without the adsorbing mixture, in the faeces of all the eight animals, but not in muscle, heart and kidney.

1994

Ceppa L., Novelli A., Dacasto M., Cornaglia E., Roncada P., Nebbia C.: Use of clenbuterol as a partitioning agent in female broiler chickens. Note I. *Effects on hepatic drug metabolism and morphology*. Atti del Congresso Nazionale della Società Italiana di Farmacologia, 27, 83, Torino, 25-29 Settembre 1994.

Clenbuterol is a selective β_2 -adrenergic agonist which has gained importance as an illegal growth promoting agent in food-producing animals. Thirty-six Cobb female broiler chicks, aging about 4 weeks, were fed for 21 days with standard diets containing 0, 1 and 25 ppm clenbuterol. There was a dose-dependent decrease in cytochrome P-450 content, 7-ethoxyresorufin-O-deethylase and benzo[a]pyrene hydroxylase activities. Reduced glutathione contents was increased. All remaining biochemical parameters were unchanged. Microscopically, scattered foci of lymphoid hyperplasia were noted in the liver from treated birds. Mitochondrial swelling as well as cristae fragmentation occurred; vacuolizations of the matrix were not detected. Clenbuterol was detected at ppb levels only in the cytosolic fractions from the highest dosed group.

Dacasto M., Ceppa L., Roncada P., Cerruti Sola S., Nebbia C.: *Effects of clenbuterol on hepatic oxidative and conjugative biotransformations in female broiler chicks*. Europ. Ass. Vet. Pharm. Therap., Proc. 6th Int. Congr., Edinburgh, 7-11 Agosto, 1994.

The use of β -agonists as repartitioning agents in food-producing species including chickens is well documented, but information is limited on the influence of these drugs on

hepatic drug metabolism in avian species. Three groups of female broiler chicks received diet containing 0, 1 and 25 ppm clenbuterol respectively for 21 days. Microsomal and cytosolic fractions were used for assay of several enzymatic activities and clenbuterol residues. The drug appeared to specifically depress EROD and AHH activities in a dose-dependent manner. The increase of the dosage up to 25 ppm resulted in a fall in P-450 content and in an increase of GSH content. Only cytosolic fractions from 25 ppm exposed birds proved to contain measurable concentration of clenbuterol at ppb levels. It is conceivable that the observed monooxygenase inhibition might be at least partially mediated by indirect effects of the β -agonist.

Malvisi J., Della Rocca G., Raspa M., Anfossi P.: Farmacocinetica della sulfametossidiazina nel cavallo. *Pharmacokinetics of sulphamethoxidiazine in the horse*. *Biologia Oggi*, 8, 3, 1994.

Serum concentration of sulphamethoxidiazine are determined by HPLC after a single intravenous administration of the active ingredient at 30 mg/kg b.w. (20% solution) to healthy horses of different breed, sex, age and body weigh. The results show a rapid fall in all the animal treated of the drug serum concentration in the 3rd to 4th hours after treatment, followed by a phase of slow clearance from the circulatory system.

Malvisi J., Giorgetti G., Raspa M., Giuliani A., Tomasi L., Roncada P.: Cinetica tessutale della flumechina nella trota iridea (*Oncorhynchus mykiss*). *Kinetics of flumequine in rainbow trout (Oncorhynchus mykiss) tissue*. *Rivista Italiana Acquacoltura*, 29, 121, 1994.

The behaviour of flumequine concentrations in muscle and liver tissues of the rainbow trout (*Oncorhynchus mykiss*) was studied by HPLC during and after 5-day oral treatment at 12 mg/kg b.w. given as medicated feed. A significant and progressive increase in the quinolone was found in the tissues, the highest concentration being found one day after interruption of treatment. Drug concentrations in liver were always higher than those observed in muscle. Subsequently, flumequine levels progressively fell up to 5 days after interruption of medicated feed, and no drug was detected in tissues 24 hours thereafter.

Montesissa C., Anfossi P., van't Klooster G., Mengelers M.: In vitro oxidative metabolism with cultured goat and cattle hepatocytes. 1st Int. Congr. Europ. Tiss. Culture Soc, Verona, 9-12 October, 1994.

Cultured hepatocytes, isolated from goat and calf livers, were used to investigate the oxidative metabolism of Fenbendazole (an anthelmintic drug widely used in veterinary medicine) and Aldicarb (a carbamate pesticide). The separation and the identification of the metabolites were carried out by HPLC analysis with gradient programs. During 3-h incubation time with goat hepatocytes Aldicarb was almost completely metabolized to the sulfoxide and the sulfone derivatives, whereas incubation with calf hepatocytes only resulted in partial metabolism without any sulfone production. Fenbendazole metabolism occurs at a slower rate: Oxfendazole and Fenbendazole sulfone were produced by cultured cells from both species, the latter being detectable only after a 20-h incubation. Smaller amount of both derivatives were obtained from calf hepatocytes, suggesting for this species a lower metabolic activity.

Montesissa C., Huveneers M.B.M., Hoogenboom L.A.P., Amorena M., De Liguoro M., Lucisano A.: *The oxidative metabolism of aldicarb in pigs: in vivo-in vitro comparison.* Drug Metab. Drug Interact., 11, 2, 1994.

Aldicarb was administered (1 mg/kg b.w.) to four female pigs and the kinetics of its major oxidized metabolites (sulfoxide and sulfone) was followed for 6 hours. The *in vitro* transformations of the carbamate pesticide into these two still active metabolites were also investigated in hepatocytes and in microsomes from pig livers. In all cases, aldicarb was quickly oxidized to the sulfoxide (major metabolite) and only a minor quantity of sulfone was produced. The *in vivo* toxic symptomatology was related to the peak serum concentration of sulfoxide, suggesting that this metabolite is principally responsible for the aldicarb toxicity. Selective *in vitro* inhibition of flavin-containing and cytochrome P-450 monooxygenases confirmed that the former enzymes catalyze mainly sulfoxide production whereas the latter that of sulfone.

Montesissa C., Villa R., Sonzogni O., Belloli C., Carli S.: *Comparative pharmacokinetics of ampicillin-sulbactam combination in calves and sheep.* J. Vet. Pharmacol. Ther., 17, 359, 1994.

The pharmacokinetics of ampicillin and sulbactam administered in combination were studied in calves and sheep. The animals were administered an aqueous solution of ampicillin/sulbactam (2:1, w/w) intravenously and intramuscularly at doses of 13.2 and 6.6 mg.kg⁻¹, respectively. Following *i.v.* administration, the distribution phases were rapid and similar for both drugs in both species, whereas sulbactam in calves and ampicillin in sheep showed a faster elimination rate. After *i.m.* administration both drugs showed peak concentrations higher in calves than in sheep; the peak time of sulbactam was shorter in calves than in sheep. No other significant differences in the pharmacokinetics of the combination were observed between the species after *i.m.* injection.

Nebbia C., Montesissa C., Dacasto M., Ceppa L., Gennaro Soffietti M., Bosia S., Ugazio G.: *In vitro and in vivo interactions of monensin with xenobiotic metabolizing enzymes.* Europ. Ass. Vet. Pharm. Therap., Proc. 6th Int. Congr., Edinburgh, 7-11 Agosto, 1994.

Monensin is still widely employed as both coccidiostatic and growth promoter in food-producing species and its use at recommended dosages is relatively safe. On the other hand, several outbreaks of monensin toxicosis are quoted in the literature and interferences at metabolic level are believed to play a crucial role in the pathogenesis of these toxic syndromes. As a preliminary approach to get more insight into the mechanism(s) underlying these effects, the profile of monensin interactions with xenobiotic metabolizing enzymes was studied using the rat as animal model. Results indicate that the observed marked depression of hepatic xenobiotic metabolism occurring in rats after the *i.p.* dosing with 2.5 mg monensin/kg b.w. for 3 days is most likely the result of cellular toxic mechanism(s) rather than the expression of a specific enzymic damage.

Villa R., Prandin E., Montesissa C., Carli S.: *Serum protein binding of β -lactamine derivatives in farm and domestic animals.* Europ. Ass. Vet. Pharm. Therap., Proc. 6th Int. Congr., Edinburgh, 7-11 Agosto, 1994.

In view of the lack of data on the species-specific binding of drugs used in veterinary practice, we carried out an *in vitro* study to measure the protein binding of a series of β -lactamines used to treat farm and domestic animals in serum from the horse, cow, pig, dog, rabbit and chicken. Results indicate that, except for cefoperazone, the β -lactamines investigated in the present study behave similarly in the animals tested and in man. Therefore no significant modifications of the dosage regimens usually adopted in veterinary practice are necessary for these compounds.

Zaghini A., Baldrati C., Graziani G., Medri G., Stefan F.: Gli uccelli selvatici come possibile bersaglio della contaminazione ambientale. *The wild birds as target of the environmental pollution*. Convegno Nazionale Ecopatologia della Fauna Selvatica, Bologna, 15-17 Dicembre, 1994.

The Authors evaluate the concentrations of some heavy metals as lead, cadmium, mercury and pollutants as pp'DDE (a metabolic product of DDT), total polychlorinated biphenyls (PCBs as Aroclor 1260) and hexachlorobenzene (HCB) in different tissues from various wild birds. The research was a joint project between the Centro Recupero Selvatici S.Marco (Ravenna), USL 35 Veterinary Service and USL 35 Presidio Multizonale di Prevenzione (P.M.P.) - Chemical Section and has been conducted out on 164 wild birds collected between 1992 and 1993 in the neighbourhood of the city of Ravenna. The results show the highest percentage of positiveness for lead and cadmium, followed by mercury, pp'DDE and PCB, with the lowest one for HCB. All the residues of the contaminants tested were below levels reported as toxic for avian fauna, with the exceptions of lead in birds feeding grains and insects.

Zaghini A., Roncada P., Montesissa C.: *Effects of aflatoxin B1 administration on the hepatic MFO activities of male growing lambs*. Atti del Congresso Nazionale della Società Italiana di Farmacologia, 27, 87, Torino, 25-29 Settembre 1994.

Aflatoxin B1 was administered at a daily dose of 0.08 mg/kg b.w., by a gelatin capsule, to 4 male growing lambs (Sarda Breed) weighing about 23 kg, for 21 days; 4 other lambs of the same weight were as control. At the end of the experiment all the animals were euthanatized and samples of liver were immediately collected for the subcellular fraction preparations and the following mixed-function-oxygenase (MFO) activities were measured: NADPH-Cytochrome c Reductase, Ethoxyresorufin-O-deethylase (EROD) and Ethoxycoumarin-O-deethylase (ECOD), as well as Cytochrome P-450 levels. The metabolism of clenbuterol and fenbendazole, was determined in hepatic microsome fractions from treated and control animals. The slight induction of the MFO activities observed in microsomes from treated animals is related with the low levels of Aflatoxin B1 detected in the same livers. The effects of the Aflatoxin B1 treatment seems to enhance the MFO-activities and the veterinary drug metabolism.

Zaghini G., Gramenzi A., Zaghini A.: Indagine sul contenuto in arsenico, fluoro e metalli pesanti (Cd, Hg, Pb) di petfoods. *Contents of arsenic, fluorine and heavy metals in petfoods*. Atti Soc. Ital. Sci. Vet., 48, 1994 (in press).

The Authors report the results obtained measuring, with atomic absorption (AA) spec-

trophotometric methods and gas chromatographic one, the levels of lead (Pb), cadmium (Cd), mercury (Hg), arsenic (As) and fluorine (F) in 50 trade dog and cat canned foods, half of them with fish. The results obtained show a different percentage of positiveness and levels of Pb, Cd, Hg, As and F lower than the tolerances for these elements in feed fixed by the Italian legislation. It is so possible to consider the examined petfoods like a good and hygienic aliments for out pets.

1995

Belloli C., Ceci L., Carli S., Tassi P., Montesissa C., De Natale G., Marcotrigiano G., Ormas P.: Disposition of antimony and aminosidine in dogs after administration separately and together: implications for therapy of leishmaniasis. *Res. Vet. Sci.*, 58, 123, 1995.

The pharmacokinetic behaviour of aminosidine (15 mg/kg) and antimony (25.65 mg/kg as N-methylglucamine antimoniate), administered s.c. either separately or together was studied on four dogs. The results demonstrated that antimony (Sb) did not significantly modify the kinetics of aminosidine (AM) but that the kinetic behaviour of the metal was markedly influenced by the antibiotic. The persistence of high serum concentrations of antimony when it was administered with aminosidine suggests that the therapeutic doses commonly used should be reduced and that the interval between administration should be increased to avoid the metal reaching toxic concentrations.

Malvisi J., Cenci T., Scuota S., Caddeo S., Della Rocca G., Frigeri F., Vitellozzi G., Stracciari G.L.: *A method for verifying the influence of fentin acetate and lindane on the immune response of guinea pigs inoculated with Buck-19 vaccine.* *Acta Toxicol. Ther.*, 16, 8, 1995.

Treatments have been carried out by using an organochlorine insecticide, lindane, and an organotin agricultural fungicide, fentin acetate, both of them administered to guinea-pigs with non-toxic doses. The reliability of a simple experimental model, based on the antibody production induced by Buck-19 and aiming to control the immunodepressive activity of both the substances, has been tested. The results have given no evidence of differences between the treated animals and the controls, which suggests that, at least under the adopted experimental conditions, the selected model is not capable of yielding the immunologic effects of both the examined substances.

Malvisi J., Stracciari G.L.: L'importanza degli antielmintici nell'allevamento zootecnico. *Anthelmintics and animal production*, Obiettivi e Documenti Veterinari., 4, 53, 1995.

Concerning the use of anthelmintic drugs in food producing animals and their impact on the animal performances, a first consideration is done about the economic losses that the helminthiasis (with particular emphasis to those of the gastrointestinal tract and liver) may induce in animal breeding and about the causes which may facilitate their outbreaks. Following a general overview of the main drugs currently used, according to their mode of interference on the present known physiological and biochemical features of parasitic helminths, major attention is moreover payed to some new drug delivery systems enabling a low release of the active principle in order to obtain a long-lasting disease control.

Additionally, the advantages provided by the use of anthelmintic drugs to the farm economy are briefly outlined.

Montesissa C., De Liguoro M., Amorena M., Lucisano A., Carli S.: *In vitro comparison of Aldicarb oxidation in various food-producing animal species.* Vet. Hum. Toxicol., 37, 333, 1995.

Aldicarb (ALD) metabolism was studied *in vitro* using hepatic microsomes from chickens, rabbits, sheep and pigs. Pig microsomes produced the greatest quantity of ALD sulfoxide and the lowest quantity of ALD sulfone, the latter being produced in greater quantities in sheep than in chickens and rabbits. Aldicarb and its metabolites were degraded fastest in rabbit probably by hydrolytic reactions. These *in vitro* results, which are consistent both with the levels of cytochrome P450 found in hepatic microsomes and previous *in vivo* data on ALD kinetics in pigs, rabbits and chickens indicate that preliminary *in vitro* studies can limit the necessary use of animals for drug metabolism experiments.

Roncada P., Tomasi L., Montesissa C., Grossi G., Stracciari G.L., Anfossi P.: *Absorption and dosage of theophylline in the horse after single and repeated administration of a microencapsulated preparation.* Equine Vet. J., 27, 13, 1995.

The kinetics of 2 formulations of theophylline were studied in horses. In an initial cross-over study (Phase I) serum concentration-time curves were determined for granulated and microencapsulated theophylline after a single oral administration (5 mg/kg b.w.t). In Phase II microencapsulated theophylline was administered at 5 mg/kg b.w./12 h for 10 days at feeding time, as in normal clinical practice. Although no significant differences between the 2 preparations were found with respect to the main kinetic parameters, the microencapsulated form was more evenly and completely absorbed from the digestive tract; furthermore, after the repeated treatment, its trough-peak serum concentrations were always within the therapeutic window and no toxic effects were observed in treated animals.

Zaghini A., Anfossi P., Montesissa C.: *Aflatoxin B1 administration at two different dosage levels to growing lambs: effects on hepatic MFO activities.* Riunione Congiunta Monotematica sul Metabolismo degli Xenobiotici, Certosa di Pontignano, Siena, 3-4 Novembre, 1995.

To understand AFB1 hepatotoxicity in target species, two groups of 4 male growing lambs (Sarda breed, 21 kg m.b.w.) were treated daily for 21 days with 0.08 mg/kg (T1) and 0.15 mg/kg b.w. (T2) of AFB1 by a gelatin capsule, respectively. Another group of 4 animals of the same breed and age (21 kg m.b.w.) was as control (C) receiving daily the gelatin capsules without AFB1. Microsome levels of Cytochrome P-450, NADPH-Cytochrome c reductase activity, and as MFO-marker activities, Ethoxyresorufin-O-deethylase (EROD) and Ethoxycoumarin-O-deethylase (ECOD) were measured. Cytochrome P-450 levels, NADPH-Cytochrome c reductase activity as well as the MFO-activities of the animals receiving the lower dosage of AFB1 (T1) were not significantly induced, whereas those from animals receiving the higher dose (T2) were inhibited.

Zaghini A., Della Rocca G., Malvisi J., Stracciari G.L.: Persistenza di sulfametossidiazina in tessuti e latte bovino. *Persistence of sulfamethoxydiazine in cattle tissues and in cow milk*. *Obiettivi e Documenti Veterinari*, 10, 53, 1995.

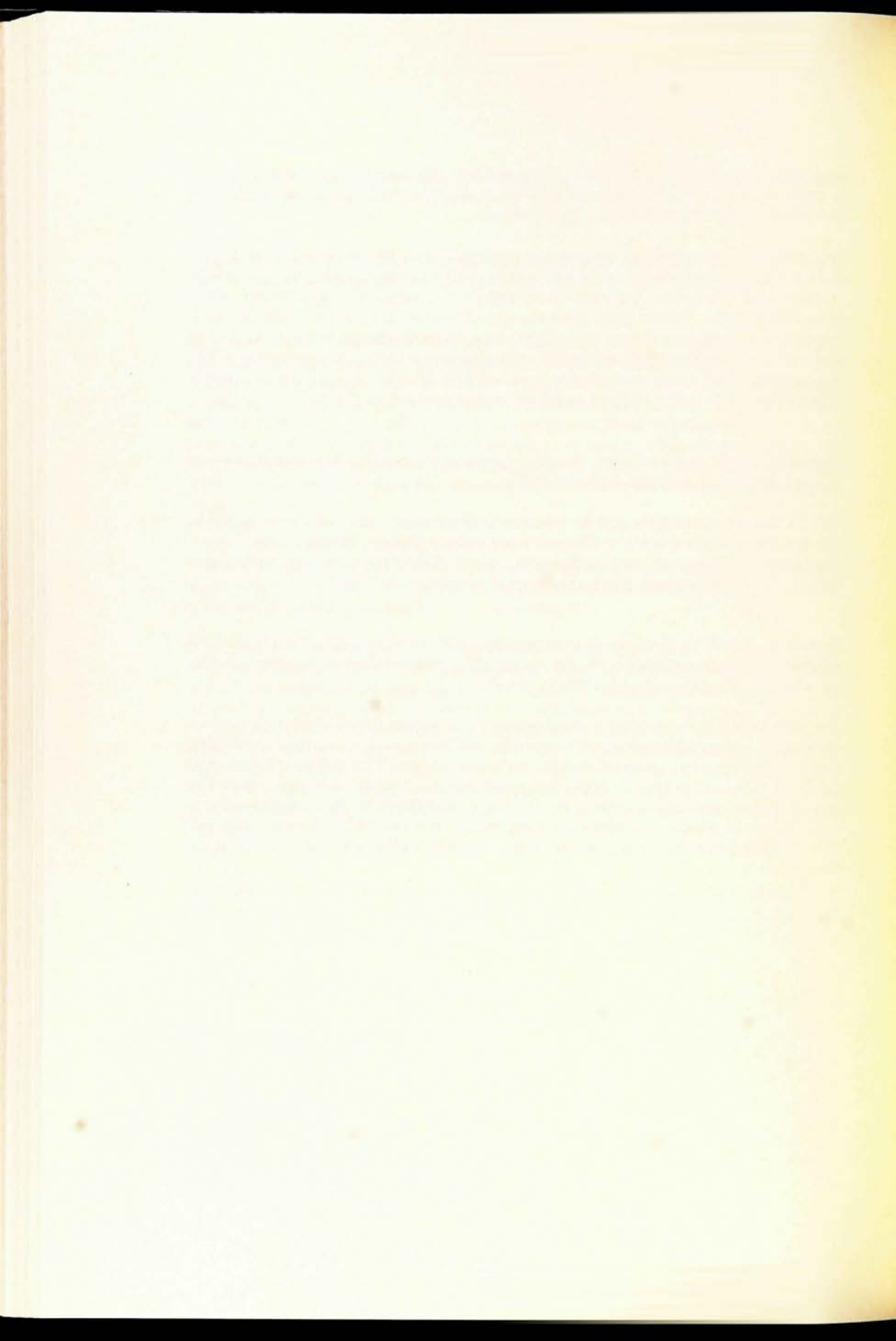
The residence time of sulfamethoxydiazine residues was studied in muscle, liver, kidney and fat of calves after a 5-day i.v. administration of 40 mg of the drug/kg/day, and in milk of dairy cows injected by the same route and for the same time with 30 mg of the sulfonamide/kg/day. Twelve hours after the end of treatment, sulfamethoxydiazine concentrations in liver and kidney were higher than those in muscle and fat. At day 15 post-treatment there were not detectable concentrations in all the tissues examined. The high milk levels of sulfamethoxydiazine found at 12 h after the last injection showed a large decline at 96 h and resulted under the detectable limit at 108 h.

Zaghini A., Lambertini L.: Piante e funghi di interesse veterinario. *Plants and mushrooms of veterinary interest*. CLUEB, Bologna, 1995.

This book sets out to fill the gap for students involved in first years of Veterinary Medicine needing a practical guide to different study matters (Botany, Pharmacology, Toxicology) jointed by a relevant and professional interest. Contents: mycotoxins, toxic larger fungi, toxic and teratogenic plants; plants of pharmacological interest.

Zaghini A., Piccoli L.: Presenza di alcuni contaminanti ambientali (Pb, Cd, Hg, As e F) nel gatto domestico e randagio. *Pb, Cd, Hg, As and F concentrations in domestic and stray cat*. *Atti Soc. Ital. Sci. Vet.*, 49, 1995 (in press).

The Authors report the results obtained measuring, by means atomic absorption spectrophotometry and gaschromatographic methods, the levels of lead, cadmium, mercury, arsenic and fluorine in different organs and tissues collected from domestic and stray cats living in the urban area of Venice and spontaneously dead for unknown causes. The results obtained show slight levels of Pb, Cd, Hg, As and F that are far from lethal doses, a percentage of positiveness higher for some metals than for the other ones, and some differences between the concentrations of the considered elements in the examined tissues.



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1988

Cavani C., Branchetti M., Manfredini M.: Indagine sulle variazioni delle caratteristiche qualitative del latte di pecora conferito ad un caseificio della provincia di Reggio Emilia. *Qualitative characteristics of ewe's milk in a north italian cheese factory*. 7° Congresso Nazionale della Società Italiana di Patologia e Allevamento degli Ovini e dei Caprini (S.I.P.A.O.C.), Viterbo, ottobre 1988, 111.

The objective of this study was to analyse the characteristics of milk of ewes raised in a semi-intensive system in Northern Italy. The delivery amounts were maximum in May and June and minimum in January and February. During the period of maximum production, obviously, there was a reduction in fat and protein content. As a consequence of analysis performed in the cheese factory, we observed an improvement in the bacteriological quality of milk, demonstrated by a considerable reduction in coliforms and anaerobic spore-forming bacteria. This proves that, by stressing the importance of correct hygiene, it is possible to obtain good results even in difficult raising conditions.

Cavani C., Maiani A., Manfredini M., Zarri M.C.: *The use of dehulled grape seed meal in the fattening of rabbits*. Ann. Zootech., 37, 1, 1988.

Two trials were carried out in the same environmental conditions in order to study the effects of grape seed meal (G.S.M.), when added at dosages of 10% and 20% (in substitution of lucerne meal) to the concentrate feed mixture, on the performance and carcass quality of fattening rabbits. I trial: 126 rabbits were divided into 3 groups of 42 subjects each (Control = C; 10% G.S.M. = T1; 20% G.S.M. = T2). Daily gain and feed intake were similar for the 3 groups, while feed efficiency was reduced when G.S.M. was added at 20% level. II trial: 90 rabbits were utilized in the same experimental design as the previous trial. Daily gain, feed intake and feed efficiency were not significantly affected by the level of G.S.M.. Moreover neither trial brought to light significant differences between the groups as regards slaughter data.

Cavani C., Manfredini M., Zarri M.C.: *Distillery effluents as animal feed: the use of condensed beet molasses stillage (CBMS) in the feeding of rabbits*. World Rev. Anim. Prod., 24(1), 59, 1988.

Two trials were carried out in order to study the effects of condensed beet molasses stillage (CBMS) on the performances of fattening rabbits, when added at a dosage of 5% to the concentrate feed mixture. I trial: 100 rabbits were divided into 2 groups, designated as C1 = control and T1 = 5% CBMS partially replacing maize and soyabean meal. Significant differences were found for: final weight, daily weight gain, carcass weight (before and after chilling), dressing percentage and kidney weight, with T1 > C1. II trial: 84 rabbits were divided into 2 groups, designated as C2 = control and T2 = 5% CBMS

replacing the same amount of a commercial concentrate feed mixture. The only significant differences were found for skin and feet as percentage of live weight ($T2 < C2$) and cooler shrink ($C2 \text{ females} > T2$). A dosage of 5% CBMS does not affect performances and carcass traits of the fattening rabbits.

Cavani C., Manfredini M., Zarri M.C.: Utilizzazione zootecnica degli effluenti di distilleria: l'impiego delle borlande di melasso di canna concentrate (BMCC) nella alimentazione dei conigli. *Distillery effluents as animal feed: the use of condensed cane molasses stillage (CCMS) in the feeding of rabbit.* Riv Coniglicolt., 25 (1), 37, 1988.

Eighty-four cross-bred rabbits with a paternal base of New Zealand White were divided into two groups. One of these groups (control) was fed a commercial compound feed, whereas the second (treated) received a diet in which 5% CCMS replaced an equal amount of control feed. The trial started one week after weaning and finished at a slaughter weight of approx. 2.5 kg. The CCMS showed a positive effect on the growth rate and the feed conversion index. The main slaughter parameters, obtained on warm and chilled carcass, and the carcass quality, assessed by subjective examination of the conformation and fattening degree, did not result as being substantially changed by the treatment. CCMS fed at level of 5% may thus be considered as a valid component in feed for rabbit fattening.

Manfredini M., Massari M., Cavani C., Falaschini A.F.: *Carcass characteristics of male Alpine kids slaughtered at different weights.* Small Ruminant Res., 1, 49, 1988.

In order to increase meat yield by changing slaughter weight, a research has been carried out to evaluate variations in dressing percentage, carcass and meat quality and fat composition in male Alpine kids. Sixty-six kids were used: group 1 was slaughtered at the weight of 11.8 ± 0.15 kg, group 2 at 15.7 ± 0.08 kg and group 3 at 19.4 ± 0.22 kg. The most interesting results for (a) the dressing percentage (carcass/empty live weight); (b) the *longissimus dorsi* area and (c) the saturated/unsaturated fatty acid ratio were for groups 1, 2 and 3, respectively: a) 55.30, 57.50 and 56.50%; b) 4.50, 6.16 and 6.55 cm²; c) sternal fat: 0.707, 0.694 and 0.612; inguinal fat: 0.884, 0.826 and 0.728. In order to improve dressing percentage, loin muscle size and the proportion of unsaturated fatty acids in sternal and inguinal fat, slaughter weight of kids should be increased from 8-10 kg to 15-16 kg.

Manfredini M.: Aspetti qualitativi della carne di vitello. *Veal quality traits.* Agricoltura Ricerca, 10(89), 77, 1988.

A description is given of nutritional, organoleptic, technological and hygienic characteristics of veal. A comparison is made between the content of proteins, amino acids, lipids, fatty acids, minerals, vitamins, cholesterol and calories of this meat and that of the other most important farm animals. The factors influencing colour and tenderness of veal are considered and examined in detail. Finally some considerations on the use of additives in animal feeding (especially antibiotics and hormones) and on their effect on meat quality and consumer behaviour are made.

1989

Borghese A., Cosentino E., Manfredini M., Nicastro F., Zezza L.: Metodologia relativa alla macellazione, valutazione e dissezione della carcassa negli ovi-caprini. *Methodological aspects of sheep and goat slaughtering, carcass evaluation and dissection*. Agricoltura e Ricerca, 11 (99-100), 40, 1989.

In order to uniform the measurements made on the topic by Italian researchers, some methods are referred, which have been put forward by A.S.P.A. (Scientific Association of Animal Production). The following aspects are discussed: data collecting at slaughter (body measurements; slaughter techniques and fifth quarter handling and weighing; carcass measurements); cold carcass evaluation; side dissection (jointing procedure and dissection according to the anatomical region). A useful form for data collecting is also provided.

Manfredini M., Cavani C., Zarri M.C.: *Relationship between physico-chemical characteristics and coagulation properties of Massese ewe's milk*. Commission des Communautés européennes, Programme de recherche Agrimed, L'évaluations des ovins et des caprins méditerranéens, 1989, 336.

The following analytical determinations were made on 237 milk samples collected from the morning milking of the same number of Massese breed ewes, farmed in Northern Italy: density, pH, titratable acidity, total solids, fat, total proteins, whey proteins, caseins, somatic cells, coagulation parameters. The simple linear correlation coefficients between the above parameters were calculated. In particular the coagulation parameters were closely correlated with pH. Part of the milk samples (18.1%) did not coagulate within 30'; these samples had a high content of somatic cells and whey protein, with rather low acidity values and would seem to come from ewes with sub-clinical mastitis. The results suggest that the coagulation parameters could be of use when evaluating the suitability of ewe's milk for cheese-making.

Manfredini M., Massari M.: *Small ruminant milk. Technological aspects: storage and processing*. Options Méditerranéennes, Série Séminaires, (6), 191, 1989.

The Authors considered various aspects regarding storage, processing and marketing of milk from small ruminants (sheep and goats), as well as derivatives, in the countries of the Mediterranean region. The advantages of refrigeration are illustrated, emphasising nonetheless the drawbacks of prolonged refrigeration of milk, such as proteolysis and lipolysis, which give rise to reduced cheese yield and deterioration of the organoleptic characteristics of dairy products. The factors which may affect milk quality during transport are described. Lastly, consideration is given to the main problems presented by various techniques for milk processing.

1990

Brusco A., Pallotti G.: Proposta di un archivio automatico per la classificazione e l'approvvigionamento. *A proposal of automatic archives for classification and supplies*. Ingegneria Alimentare, 6(1), 24, 1990.

The possibility of automation in the manufacturing, collection and distribution of food-stuffs through a programme to be used with a digital computer is discussed. The flow-chart of the programme and a sketch of the possible connection between the computer and the terminals are provided. A classification example applied to meat food-stuffs and a typical list in reply to an inquiry via terminal are presented.

Cavani C., Bianconi L., Maiani A., Manfredini M., Stefanon B.: Digeribilità *in vivo* e degradabilità *in situ* di distillers di sorgo concentrati. *In vivo digestibility and in situ degradability of wet sorghum distillers grains*. Zootec. Nutr. Anim., 16, 393, 1990.

Wet sorghum distillers grains (WSDG) deriving from ethanol production were used in 3 *in vivo* digestibility trials and in one *in situ* degradability trial. *In vivo* digestibility was assessed on wethers at maintenance (diet 1) and at *ad libitum* levels (diets 2 and 3); diets consisted of mixed hay, WSDG and maize meal, given in the following daily amounts (kg/head) respectively: 0.6, 1.5, 0 (diet 1); 0.6, 3.0, 0 (diet 2) and 0.6, 3.0, 0.3 (diet 3). In each of the 3 diets the organic matter digestibility coefficients of WSDG resulted rather poor and the digestibility of crude protein appeared very low. The *in situ* degradability trials confirmed the results found in the digestibility trials. The most probable causes of the low nutritional value of WSDG are discussed.

Falaschini A.F., Manfredini M., Massari M.: Tecniche di svezzamento e di ingrasso del capretto. *Weaning and fattening techniques for kids*. Agricoltura e Ricerca, 12 (107), 71, 1990.

Weaning and fattening techniques for kids considering current knowledge developed both in Italy and abroad are discussed. The most significant aspects of young goat breeding have been considered: weaning age, number of meals, protein and fat levels in milk replacers, distribution methods, types of concentrate and quality of hays with respect to ingestion, as well as relationship between hay and concentrates. Regarding kid fattening, the results of feeding trials both using homologous and reconstituted milk are discussed. Furthermore various methods of distribution and the composition of milk replacers are illustrated. Finally, the types of kids produced, light (8-10 kg, milk fed), heavy (15-18 kg, milk fed) and very heavy (25-30 kg, weaned), are presented and the most important parameters are pointed out: daily gain, feed efficiency, dressing percentages and carcass value.

Manfredini M., Borghese A., Catalano L.: Metodologia relativa alla macellazione di equini e alla valutazione e dissezione delle loro carcasse. *Methodological aspects of horse slaughtering, carcass evaluation and dissection*. Agricoltura e Ricerca, 12 (108), 19, 1990.

In order to uniform the measurements made on the topic by Italian researchers, some methods are referred, which have been put forward by A.S.P.A. (Scientific Association of Animal Production). The following aspects are discussed: data collecting at slaughter (body measurements; slaughter techniques and fifth quarter handling and weighing; carcass measurements); cold carcass evaluation; side dissection (fore and hind quarter). Besides a useful form for data collecting, criteria are provided in order to evaluate carcass conformation and degree of fatness.

Manfredini M.: La carne di vitello: il perché di una scelta. *Relationship between veal consumption and health*. Atti del Convegno A.V.I.C.A.B., Calvisano (BS), febbraio 1990.

After having described the most relevant nutritional aspects of meat, with special reference to its content of protein and iron, the Author takes into consideration the relationship between meat consumption and health. The hypotheses according to which meat is responsible for cancer, cardiovascular diseases, gout and obesity are pointed out as unfounded. Veal quality traits are finally discussed.

1991

Cavani C., Bianconi L., Manfredini M., Rizzi L., Zarri M.C.: *Effects of a complete diet on the qualitative characteristics of ewe milk and cheese*. *Small Ruminant Res.*, 5, 273, 1991.

Fifty-seven East-Friesian ewes, raised in permanent housing, were divided into two groups and fed twice a day either a traditional diet (TD) of hay and concentrates, or a complete diet (CD) of maize silage, hay and concentrates from a mixer wagon. There were no significant differences in live weight, daily milk yield and monthly lactation persistence between the two groups. Dry matter feed intake was about 8% higher in the animals receiving the CD. Some qualitative milk characteristics (milk pH, urea nitrogen levels, clostridium spore counts, curd formation rate, cheese yield) were affected by the different feeding. No significant differences were observed in cheese quality during ripening, except clostridial spore content, which was higher in cheese from the CD group. Therefore, CD feeding system may effectively change the traditional form of dairy ewe feeding and management into a more intensive one.

Manfredini M., Badiani A.: Utilizzazione delle borlande di melasso di canna concentrate (BMCC) nell'alimentazione del suino pesante. *The use of condensed cane molasses stillage (CCMS) in heavy pig feeding*. *Eurocarni*, 6(10), 103, 1991.

The results of a trial carried out on 60 Large White x Landrace pigs are reported. The pigs were divided into 2 groups, each made up of 15 castrated males and 15 females. The experimental plan had a control group (C) fed a concentrate with no stillage and a treated group (T) receiving 4% condensed cane molasses stillage (CCMS) instead of an equal quantity of control feed. The live weight of the pigs at the beginning of the trial was approx. 44.5 kg, while the average weight at slaughter was 148 kg. Daily gain and feed efficiency were slightly worse in T than in C. The two groups did not differ significantly for dressing percentage, carcass quality, meat pH, proximate composition of meat, fatty acid composition of backfat.

Novelli E., Campesato E., Campanini G., Dazzi G., Madarena G., Badiani A., Chizzolini R.: Valutazione strumentale della qualità della carne suina. 1. Premessa. *Objective measurements of pork quality*. *Riv. Suinicol.*, 32(2), 39, 1991.

Various techniques for instrumental evaluation of pork quality (pH, light scattering, conductivity, dielectric loss factor and colour) are presented, as they are linked with important technological parameters of pig meat (water holding capacity, protein dena-

turation, membrane integrity), that is with meat — processing suitability. The operating principles of each instrument are reported.

1992

Manfredini M., Badiani A., Nanni N.: *Relationship between dietary fat and quality characteristics of fat and Parma-type ham in heavy pigs.* Italian Journal of Food Science, 4(1), 25, 1992.

A traditional feed (C) and two experimental diets with 20% (T1) and 40% (T2) sweet potatoes replacing maize meal and with the addition of 1, 1.5 and 2% lard, respectively, were fed to three groups of 25 Large White castrated male pigs, each. The influence of diet on fatty acid composition of backfat and intramuscular fat in Parma-type hams and the iodine value of ham subcutaneous fat are discussed. The backfat of pigs fed T1 and T2 diets showed significant increases in saturated fatty acids and a marked decrease in linoleic acid, whereas only linoleic and gondoic acid decreased significantly in intramuscular fat. No alterations of flavour, colour and firmness were found upon ham sensory evaluation in either fat or lean. Even at high levels and with lard added, sweet potatoes did not affect ham eating quality. They indeed improved fat keeping qualities in the ageing process.

Manfredini M., Badiani A., Nanni N.: *Rese di macellazione, sviluppo dei componenti del quinto quarto e caratteristiche quanti-qualitative delle carcasse di puledro e cavallo. Dressing percentages, fifth quarter development and carcass traits in foals and horses.* Agricoltura Ricerca, 14(131), 23, 1992.

A contribution is given to the general knowledge of foals and horses as meat animals, through a comparison between 10 Avelignese and 10 Croatian foals (1 year of age), 10 saddle-horses and 10 Croatian horses (various ages), as regards slaughter performances and carcass characteristics. The dressing percentages did not differ significantly between Avelignese and Croatian foals; the former group had a higher fat percentage and lower contents of meat and bone than the latter. Saddle-horses and Croatian horses performed in the same way as regards dressing percentages and bone content; saddle-horses had a higher meat percentage and lower fat content than Croatian horses. No significant differences were found between Croatian foals and Croatian horses in dressing percentages and bone content. The subjective evaluation of carcass conformation and degree of fatness was supported by the dissection results.

Manfredini M., Tassinari M., Zarri M.C.: *Caratteristiche chimico-fisiche, contenuto in cellule somatiche ed attitudine alla coagulazione di latte individuale di pecore allevate in Emilia-Romagna. Physico-chemical characteristics and coagulation properties of milk from individual ewes.* Sci. Tecn. Latt.-Casearia, 43, 113, 1992.

In order to verify the relationship between physico-chemical characteristics and coagulation properties, 668 individual milk samples, deriving from the morning milking of Sarda, Delle Langhe and Massese ewes farmed in Northern Italy, were analyzed. The average values obtained were within the ranges found in literature, with the single exception of

the ash value, which was lower. The number of somatic cells per ml was found to be the most variable parameter of all; only 71.1% of the samples had less than 500 000 cells/ml, while in 19.5% of the cases the cell content was higher than 1 000 000/ml. Normal coagulation parameters were found in 81.9% of the sample, while the remaining 18.1% had a very slow coagulation or did not coagulate at all. Coagulation parameters were closely correlated with pH, somatic cell content and whey protein content.

Manfredini M.: Caratteristiche nutrizionali delle carni ovine. *Nutritional profile of lamb and mutton*. "Atti del Convegno" La qualità delle carni ovi-caprine italiane nel contesto comunitario, Pisa, 16 ottobre 1992, 81.

The most relevant nutritional aspects of meat, with special reference to its essential amino acids, iron, zinc and B vitamin contents are presented. The chemical composition of raw and cooked lamb and mutton is therefore compared with that of other meats.

Manfredini M.: Il controllo di qualità degli alimenti di origine animale. *Quality control of food of animal origin*. Ristorazione Collettiva, (9), 22, 1992.

The role of Hazard Analysis Critical Control Point (HACCP) as a preventative system for controlling food quality and safety is discussed with reference to foodservice (catering) systems. The need for a control over the raw materials, the process, the environment, personnel, storage and distribution is emphasized. Finally, the results of several Italian surveys concerning organoleptic and nutritional characteristics of food prepared in student cafeterias are reported.

Manfredini M.: Il valore nutrizionale della carne: l'apporto proteico. *Nutritional evaluation of meat: protein*. Eurocarni, 7(2), 79, 1992.

The role of meat as a source of protein and essential amino acids in human nutrition is briefly reviewed.

Manfredini M.: Il valore nutrizionale della carne: l'apporto di ferro. *Nutritional evaluation of meat: iron*. Eurocarni, 7(5), 105, 1992.

The role of meat as a source of heme and non-heme iron in human nutrition is reviewed. Special importance is attached to the superior availability of iron from meat compared to that from vegetables.

Toppino P.M., Drava G., Contarini G., Manfredini M., Emaldi G.C.: Caratteristiche di tipicità del "Formaggio di fossa". *The typical characteristics of "Pit cheese"*. Riv. Soc. It. Sci. Aliment., 21, 389, 1992.

"Pit cheese" is a particular type of Caciotta cheese made either with cow or ewe's milk or a mixture of both milks and ripened for about 100 days in pit dug in the tufa of the area of Sogliano al Rubicone (FO). The ripening environment, anaerobic conditions and con-

stant temperature and humidity give special characteristics to this cheese. In this research Caciotta cheeses produced with different percentages of ewe's milk and ripened under different conditions (industrial store, cave, pit) were compared in order to detect some useful parameters for the characterization of "Pit cheese". Sixty-eight different physico-chemical parameters were determined and results were statistically analysed by multivariate techniques. These analyses contributed to the detection of some typical characteristics of "Pit cheese", which are not affected by both milk composition and production technology.

1993

Badiani A., Manfredini M., Nanni N.: Qualità della carcassa e della carne di puledri lattoni. *Carcass traits and meat quality of foals*. Zootec. Nutr. Anim., 19, 23, 1993.

Slaughter performances, carcass traits and meat quality were assessed on 8 foals, slaughtered at ages between 4 and 7 months. The average live weight at slaughter was 278.1 kg. The dressing percentages were regarded as satisfactory and the carcass chilling loss was modest (1.18%). The fifth quarter as a whole (blood excluded) was 23.84% empty body weight. The carcass conformation and degree of fatness scored favourably. According to the ASPA jointing method, the hindquarter (HQ) was rich in high value entire wholesale cuts (72% HQ, 43% cold side weight or CSW). The figures for the high value cuts in the forequarter (FQ) were 48% FQ and 18% CSW. As regards meat quality, WHC was high (3.47 cm² as total wet surface) and final pH rather low (5.46), although within the normality range. Meat colour proved to be more intense than expected. The *longissimus thoracis* muscle was high in protein (21.63%) and low in fat content (2.11%).

Chizzolini R., Badiani A., Rosa P., Novelli E.: *Objective and sensory evaluation of pork quality: a comparative study*. Proc. 39th International Congress of Meat Science and Technology, Calgary (Canada), August 1-6, 1993, file S4P07.

A study was conducted on the relationship between objective and sensory evaluation of quality parameters of *semimembranosus* and *semitendinosus* muscles in Italian heavy pigs. The results show that meat colour, as evaluated by a team of experts, was best described by the objective parameters L* and Hue angle of the C.I.E. L* a* b* system. Sensory colour was related, at a lower level, with a*, b*, pH_u and pH₁. Superficial exudation of lean was found to be linked with L*, b* and Hue angle, but to a lesser extent when compared with colour. Exudation, by sensory analysis, was better related with sensory colour. Fat firmness, as judged by the panel, had a correlation coefficient of 0.65*** with the measurements made by the Fat Hardness Meter. Fat firmness scores and fat hardness meter readings had a correlation of at least 0.60*** with iodine number.

Chizzolini R., Badiani A., Rosa P., Novelli E., Campanini G., Madarena G.: La misura strumentale della consistenza del grasso suino: relazioni con parametri chimici e sensoriali. *Instrumental measurement of pork fat consistency: relationship with chemical and sensory parameters*. Atti del 1° Congresso Italiano di Scienza e Tecnologia degli Alimenti, Parma, 18-20 ottobre 1993, 440.

A research has been conducted to evaluate the relationship between sensorial evaluation and objective measurement of fat firmness. The firmness of subcutaneous fat has been judged on a spot near to *semitendinosus* muscle on a freshly cut surface such as is routinely obtained with ham trimming at the slaughterhouse. Firmness has been measured with the Fat Hardness Meter and evaluated by a group of previously trained experts. A sample of fat, at the same place, has been collected for iodine measurement. Fat firmness, as judged by the panel, was linked with an average correlation coefficient of 0.671*** with the measurements made by the Fat Hardness Meter. Relationships with iodine number were of the same order for the two evaluation methods but more erratic.

Chizzolini R., Novelli E., Badiani A., Delbono G., Rosa P.: *Objective evaluation of pork quality: result of on-line measurements.* Meat Sci., 34, 79, 1993.

Research has been conducted on objective pork quality evaluation on line in an industrial slaughterhouse. The investigation, which involved more than 5000 pigs, lasted for 12 working days spread over four consecutive weeks between October and November. Measurements performed were Fat-o-Meat'er carcass classification (lean content, fat and muscle thicknesses), cold carcass weight, 24-h pH of *semimembranosus* and *biceps femoris* and 24-h colour of *semimembranosus* muscle. The results show that cold carcass weight and lean content are only slightly related to meat quality as evaluated by pH and colour. Cluster analysis has confirmed the importance of pH and colour parameters, such as L*, a* and Hue angle, for the evaluation of pork quality on line in an industrial context.

Chizzolini R., Novelli E., Badiani A., Rosa P., Delbono G.: *Objective measurements of pork quality: evaluation of various techniques.* Meat Sci., 34, 49, 1993.

Research has been undertaken in which various methods for pork quality evaluation were compared. The measures used were pH, light scattering, conductivity, dielectric loss factor and colour. Colour measurements, especially of the parameters L*, a* and Hue angle, have given interesting information. In fact, meat could be classified by colour intensity (a*, psychometric Chroma), by type of colour (Hue angle) and by exudative phenomena (L*). No marked effects of rearing techniques have been observed, whereas the genetic background appears to influence some colour parameters. Slaughter conditions, on the other hand, could affect markedly all the meat quality parameters measured in this research.

Manfredini M., Badiani A., Nanni N., Chizzolini R.: *Sweet potato chips in heavy pig production.* Livest. Prod. Sci., 35, 329, 1993.

The use of potato chips in heavy pig production was evaluated as regards performance, carcass characteristics and meat quality, using 75 Large White castrated males, divided into 3 groups of 25 subjects each. From an initial average live weight of 42.3 kg to 156.4 kg the groups were fed diets differing in content of maize meal (40%, 20%, 0%) and sweet potato (SP) chips (0%, 20%, 40%). The control group performed slightly better than the treated ones as regards daily gain, feed efficiency and dressing percentage. No differences emerged among groups as regards carcass lean meat content, primal cut

weights, water holding capacity at 45' *p.m.*, pH and meat colour at 45' and 24 h *p.m.* on thigh muscles. Weight losses during (and at the end of) the 12-month processing of Parma-type hams proved to be similar. Chemical composition and sensory evaluation of the aged hams did not reveal differences among the groups.

Manfredini M., Badiani A., Zarri M.C.: *Milk characteristics of Saanen and French Alpine goats reared in Italy.* Atti del 3° Convegno Fe. Me. S. P. Rum., Teramo, 22-23 ottobre 1993, paper 36.

The milk from morning milking of 55 Saanen and 53 French Alpine goats was analysed in order to determine its physico-chemical characteristics. The samples were collected in the first 60 days of lactation from high-yielding animals. The following parameters were determined on each sample: total solids, fat, total protein, whey protein, coagulable protein, ash, density, pH, titratable acidity, somatic cells. The fatty acid composition of the fat was also determined. The milk from the intensively reared Saanen and French Alpine goats is considerably different from that produced by the native breeds traditionally reared in Italy. By comparison with literature data on traditional breeds, Saanen and Alpine milks show a much lower content of total solids, in particular of fat and protein. Some suggestions about the most suitable use of this type of milk are given.

Manfredini M., Badiani A.: *Le carcasse equine — Problemi e proposta di una griglia di classificazione.* *Foal and horse carcasses — A proposal for a classification grid.* *Agricoltura Ricerca*, 15(144), 51, 1993.

The distinctive features of equine carcasses (both foals and horses) were studied during a year-long research in two public slaughterhouses. As a result, a classification grid was set out based on conformation and fatness, both of which accommodate five classes. A set of guidelines and drawings is given to assist in classifying properly. A description of each class, supported by pictures, is provided.

Manfredini M., Fiorentini L., Gatta P.P., Nanni N., Tolomelli B.: *Nutritional profile of horse meat.* Proceedings of the 39th International Congress of Meat Science and Technology, Calgary (Canada), August 1-6, 1993, file S5P14.

Composite muscle samples from the hindquarter of 5 adult horses were analyzed for: proximate composition, fatty acids, cholesterol, amino acids, minerals (Ca, Na, K, P, Mg, Fe, Zn, Cu), vitamins (thiamin, riboflavin, niacin, B₆, B₁₂) and intramuscular collagen. The percentage of intramuscular fat varied from 3.73% to 9.17%, with an average value of 6.78%. The percentage of saturated, monounsaturated and polyunsaturated fatty acids (34, 46 and 19%, *respec.*) should be emphasized as it distinguishes this meat from others. Horse meat is also characterized by a moderate cholesterol content (60 mg/100g). Regarding trace elements, iron and zinc are present in high quantities (3.89 mg/100g and 3.72 mg/100g, *respectively*). The content of B vitamins, above all niacin (5.54 mg/100g), B₆ (0.64 mg/100g) and B₁₂ (2.08 mg/100g) is of particular importance.

Manfredini M., Stipa S., Nanni N., Boattini B.: Variazioni annuali dei principali caratteri qualitativi del latte ovino di massa in alcuni allevamenti dell'Emilia Romagna. *Annual variations in quality of bulk ewe milk in Emilia Romagna herds*. Sci. Tecn. Latt.-Casearia, 44, 407, 1993.

The analyses of 153 bulk ewe milk samples, collected throughout the year from 21 farms in Northern Italy, were performed. Samples were analyzed for: density, titratable acidity, pH, total solids, fat, total proteins, whey proteins, caseins, ash, somatic cell count (SCC), standard plate count, coliforms and coagulating properties. Lower fat contents (min 5.95%) were found in the first stage of lactation, while higher values (max 7.69%) were found at the end of lactation. Protein content had a similar trend. Standard plate count varied from 858 000 to 8 369 000 c.f.u./ml. On a monthly average basis, SCC ranged from 650 000 to about 3 000 000 per ml. About 79% of the samples had good coagulation properties, whereas 7.19% of the samples did not coagulate within 30 min.

1994

Badiani A., Gatta P.P., Nanni N., Manfredini M.: *Carcass traits and selected quality characteristics of raw and cooked meat of ram lambs*. Proc. 40th International Congress of Meat Science and Technology, The Hague (The Netherlands), August 28-September 2, 1994, file S-IVA.48.

Ten unweaned Suffolk ram lambs were utilized to evaluate: a) cooking effect on weight losses of rib-loin and leg and chemical composition of the lean dissected from both cuts; b) cooking effect on *Mm. longissimus thoracis et lumborum* (LTL), *biceps femoris* (BF) and *semimembranosus* (SM) as regards instrumental colour, total and soluble collagen content, Warner-Bratzler (WB) shear value. Dressing percentage, carcass quality, yield of wholesale cuts and quality traits of raw meat (pH, water holding capacity, colour) were also assessed. As for the main results, both evaporative and drip losses were higher in leg than in rib-loin, the most remarkable composition trait in both cuts being the low lipid content. In raw and cooked LTL, BF and SM total collagen content was 3.14 and 4.27, 5.61 and 6.59, 4.33 and 5.50 mg/g fresh tissue, respectively. Upon cooking, a significant increase in WB shear value was noticed in LTL, but neither in BF, nor in SM.

Badiani A., Manfredini M.: La produzione della carne di cavallo. *Horse meat production*. Zootec. Nutr. Anim., 20 (suppl.), 1994.

Horse farming and suitability for meat production are reviewed with reference to literature data as regards: historical development of horse meat consumption, horse meat market in Italy, breeding techniques in Italy and France, grazing behaviour of the horse, growth and development of the foal, conformation of the living animal, dressing percentages, carcass quality (cutability and meat yield), meat quality (ageing and keepability, physical and technological traits).

Gatta P.P., Albonetti S., Manfredini M.: Indagine su alcune caratteristiche bromatologiche della carne e dei prodotti carnei. *Investigation on some bromatologic characteristics of meat and meat products*. Riv. Soc. It. Sci. Aliment., 23, 479, 1994.

Some bromatologic characteristics of meat and meat products usually served in University cafeterias and bars in Bologna were determined as a means of monitoring food quality. The following analyses were performed: fat, collagen and protein on 29 samples; peroxide value on 37 samples; nitrites and nitrates on 75 samples. Fat content and collagen/protein ratio showed a high variability thus leading to a broad variation in nutritional values. Lipid preservation was satisfactory as shown by the peroxide values. Finally, based on the quantity of nitrites and nitrates, the samples analysed pose no hazards for consumer health.

Novelli E., Chizzolini R., Badiani A., Rosa P., Dazzi G., Rotteglia L., Leonelli C.: Esperienze di caratterizzazione qualitativa della carne e del grasso di incroci e ibridi commerciali allevati per suino pesante. *Meat and fat evaluation of crossbred pigs reared for heavy pig production*. Annali della Facoltà di Medicina Veterinaria, Università di Parma, 13, 105, 1994.

A research has been conducted with the aim of evaluating the quality of meat and fat obtained from crossbred pigs belonging to 15 groups differing for genetic background and/or rearing techniques. At the slaughterhouse carcasses have been classified for meat content according to EEC rules. Surface colour at 24h *post mortem* and pH at 45' and 24h *post mortem* have been measured on *semimembranosus* muscle. Samples of subcutaneous dorsal fat have been collected and used for determination of iodine number, water content and triglyceride composition. Results are discussed both for the genetic base and for the relationships between various parameters.

1995

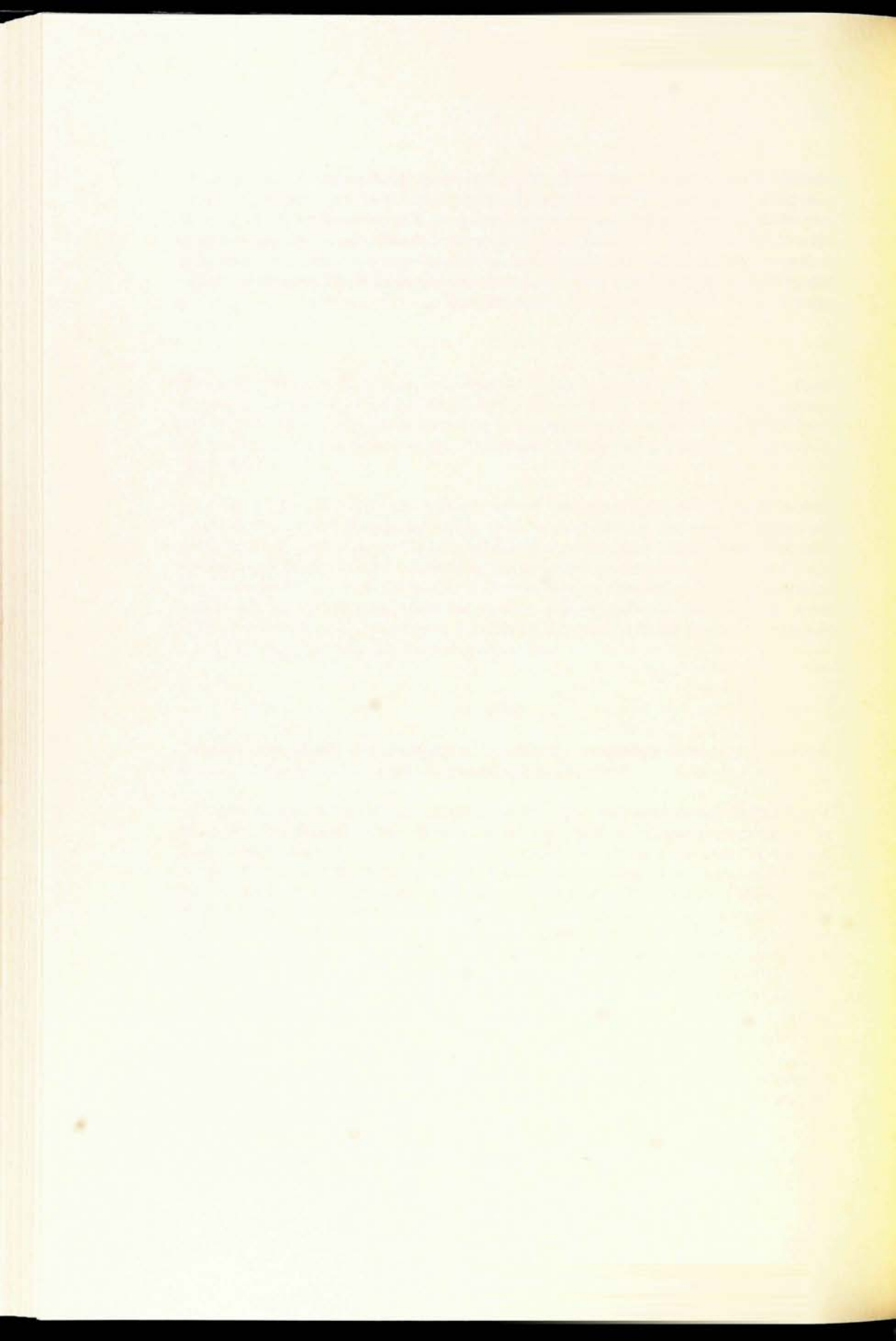
Gatta P.P., Manfredini M., Paparella A., Ruocco G.: *Comparison between two procedures for collagen analysis*. Meat Focus International, 4, 231, 1995.

Collagen has long been considered as one of the most important components of meat, given the considerable effect on both organoleptic and nutritional characteristics. In meat industry there is a need for a quick, simple and cheap procedure for collagen analysis. The aim of this research was to assess the usefulness of the Autoanalyzer method (automatic) in comparison with ISO method (manual). A total of 90 meat and meat product samples were analysed. These samples were divided into four groups: 1) veal chunks (14) and "carpaccio" (11), 2) meat-skewers (9) and sausages (15), 3) minced beef (14) and minced veal (14), 4) corned beef (13). High correlation coefficients have been found between analysis results for groups 1, 3 and 4, while no correlation for group 2. Regarding time and costs of analysis, the Autoanalyzer method is more interesting than the other one when it is necessary to analyse a lot of samples per day, like in the industry.

Manfredini M., Badiani A., Gatta P.P., Nanni N., Stipa S.: *Nutritional profile of sturgeon meat*. Proc. 41st International Congress of Meat Science and Technology, San Antonio (USA), August 20-25, 1995, 52.

Proximate composition and cholesterol content, fatty acid and amino acid profiles, selected mineral and vitamin contents, total and soluble collagen content, purine bases were

determined in the edible portion of 30 cultured sturgeon (10 *Acipenser transmontanus*, 10 *A. naccarii*, 10 *A. baeri*). The rearing and feeding conditions were similar for the 3 species, which were fed commercial pellets for sturgeon. The most important features of cultured sturgeon were a medium fat and cholesterol content, fairly high level of magnesium, zinc and niacin, a high proportion of soluble collagen and a moderate amount of uricogenic purine bases. The fatty acid composition proved to be interesting for the rather high n-3 PUFA content and n-3/n-6 ratio.



**DIPARTIMENTO DI SANITÀ PUBBLICA VETERINARIA
E PATOLOGIA ANIMALE**

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1988

Baldelli R., Martini M.: Indagine sieroepidemiologica sulla toxoplasmosi bovina. *Bovine toxoplasmosis: a seroepidemiological survey in Italy*. Arch. Vet. Ital., 39 (5/6), 193, 1988. Proceedings of the 13th Conference of the World Association for the Advancement of Veterinary Parasitology, Berlin (G.D.R.), August 7-11 1989, 31.

A seroepidemiological survey for bovine toxoplasmosis was carried out in 3 bovine herds in the province of Ravenna, Italy. Five blood samples were collected from 126 animals (50 heifers and 76 calves) over a period of 9 months. Direct agglutination test (DA) and indirect fluorescent antibodies test (IFA), with an anti-IgG conjugate, were performed. At Da all the animals were constantly positive, with a mean antibody titer varying from 1/36 at the first sample collection to 1/77 at the fifth. At IFA the seropositivity for *Toxoplasma gondii* was between 32% and 41%, with mean antibody titers ranging from 1/4 to 1/8, considering all the animals, from 1/38 to 1/57 taking into account only the seropositive. Noteworthy seemed the long period over which seropositivity was observed and the difference both in mean antibody titers and in percentages of seropositivity between heifers and calves (heifers > calves), not due to different risks of infection.

Battelli G.: Malattie del bovino e programmi di profilassi nei paesi dell'area mediterranea: aspetti socio-economici. *Bovine diseases and prophylaxis programmes in the Countries of the Mediterranean: socio-economic aspects*. Atti della Conferenza Internazionale "Sanità e produzione bovina nell'area del Mediterraneo", Bologna 3-5 maggio 1988. Pag. 739.

The socio-economic aspects of bovine diseases (especially infectious and parasitic diseases) in the Countries of the Mediterranean are discussed, with special reference to the production losses, the costs of prophylaxis programmes, and the benefits deriving from these plans. Some examples on these subjects are given. For many Countries few or no data are available and the benefits from the health programmes have to be estimated principally by an epidemiological point of view. The lack of standardization of methods for economic evaluation of the disease-associated losses and control plans, at international level, is pointed out.

Battelli G., Martini M., Poglajen G., Restani R.: Endoparassitosi del bovino: indagini sulla diffusione e valutazione di alcuni fattori di rischio. *Evaluation of some risk factors for bovine parasitoses in Italy*. Obiettivi e Documenti Veterinari, 9 (5), 69, 1988. 12th Conference of World Association for the Advancement of Veterinary Parasitology, Montreal 12-15 august 1987. Abstract No. 21B-1, Pag. 55.

Faecal examination of cattle from northern and central Italy revealed the following prevalences (%): 14.3 (n=1462) for fasciolosis (FA), 12 (n=1166) for dicroceliosis (DI), and 35.8 (m=4369) for g.i. strongylosis (ST). Grazing practice, foreign origin of the animals,

fresh grass feeding seem to be important risk factors. The estimated Relative Risks were ($P < 0.05$): 1) grazing practice: 3.9 for FA, 3.6 for DI and 1.9 for ST; 2) foreign origin: 5.4 for FA, 1.6 for DI and 1.3 for ST; 3) fresh grass feeding: 2.2 for FA, 8.7 for DI (not estimated for ST); 4) grazing practice associated with foreign origin: 10.1 for FA, 5.3 for DI and 2 for ST. Percent of cases in the exposed animals due to grazing practice and foreign origin was 90.1%, 81.2% and 43.7% for FA, DI and ST, respectively.

Battelli G., Tassi P., Poglayen G., Martini M.: Indagini sulle parassitosi dei vitelli importati. *Survey on the parasitoses of calves imported in Italy*. Prog.Vet., 44, 65, 1989. 5th European Multicolloquium of Parasitology, Budapest 4-9 september 1988. Abstract No. F14-2, Pag. 144.

To assess the occurrence of parasitoses in calves imported in Italy, beef-calves, 8-14 months old, from European Countries (mainly France, Germany, and Poland) were examined upon the importation for g.i strongyloses (ST), fasciolosis (FA), mange (MA), and in spring for warble infection (WI). The prevalences (%) were the following: 36.2 (n=4001) for ST; 35.2 (n=799) for FA; 63.2 (n=1148) for WI by *Hypoderma bovis*; and 1.4 (3400) for MA by *Psoroptes* sp. Higher positivities ($P < 0.01$) were observed in calves imported from Countries where the grazing is practiced.

Canegrini G., Poglayen G., Vecchi G.: Segnalazione di *Micipsella numidica* (Seurat, 1917) in Italia. *Report of Micipsella numidica (Seurat, 1917) in Italy*. Parassitologia, 30, 219, 1988.

The first record of *Micipsella numidica* (Seurat, 1917) in Italy is reported. The parasite was collected from the portal vein of two rabbits (*Oryctolagus cuniculus*). Morphological features of the worms (4 females, 3 males and microfilariae from the uterus) are described and compared with those reported for African, European and Asiatic specimens found in hares.

Canestri Trotti G., Fantinati M., Fioravanti M.L.: Aggiornamenti alla fauna ixodologica del Veneto. *Revision of Ixodological Fauna in the Veneto region*. Parassitologia, 30 (suppl. 1), 41, 1988.

The Authors carried out a research on ixodological fauna in Veneto during the years 1980-1988. In order of frequency were found: *Rhipicephalus sanguineus*, *Ixodes ricinus*, *I. hexagonus*, *Argas reflexus*, *A. vespertilionis*. *R. sanguineus* in the provinces of Rovigo, Treviso, Venezia and Vicenza, *I. ricinus* in the provinces of Verona and Vicenza, *A. reflexus* in the provinces of Rovigo and Treviso and *A. vespertilionis* in the province of Vicenza were collected for the first time.

Canestri Trotti G., Fioravanti M.L.: Ticks from Trentino-Alto Adige. Italy. 1st Symposium of European Association of Acarologists, 9-12 August, Graz (Austria), 1988.

172 ticks from nine heavily infected sheep flocks, one human dwelling and from the small collection of K. Hellrigl (Bressanone) were identified. The following species were observed in order of frequency: *Dermacentor marginatus* (124), *Haemaphysalis punctata* (39), *Ixodes hexagonus* (3), *I. ricinus* (3) and *Rhipicephalus sanguineus* (3).

Canestri Trotti G., Pampiglione S., Rivasi F., Venturi L.: Filariasi canine nelle provincie di Modena e Ravenna. *Canine filariasis in the Modena and Ravenna provinces*. Parassitologia, 30 (suppl. 1), 43, 1988.

The Authors studied the prevalence of canine filariasis in some provinces of the Po Valley. Positivities for microfilariae were found in 155 out of 489 examined dogs (31.7%) in the province of Modena and in 69 out of 221 examined dogs (31.2%) in the province of Ravenna.

Capelli G., Baldelli R., Guberti V., Poli A., Corradini L., Poglayen G.: Indagini parassitologiche in cani della provincia di Ferrara. *A parasitological survey in dogs in the Ferrara province (Italy)*. Atti Soc. Ital. Sci. Vet., 42, 923, 1988.

In the period March 1984-Dicember 1985 a parasitological survey was carried out on 109 dogs killed in the Ferrara province (Italy). The intestinal parasites identified were: *Trichuris vulpis* (71%), cestodes (35.3%) (*Dypilidium caninum* 30%, *Taenia pisiformis* 1.3%, not identified tapeworms 4%), *Toxocara canis* (14.5%), *Ancylostoma caninum* (12%). Moreover the necropsy results were compared with the coprological ones in order to assess their reliability. Seventy sera were tested for antibodies to *Leishmania infantum* and *Toxoplasma gondii*: 14 (20%) resulted positive for toxoplasmosis and none for leishmaniosis.

Corni M.G., Trentini M.: *Scapharca inaequalvis* (Burg.) chromosomes. Oebalia, 14, 107, 1988.

The chromosome set of *Scapharca inaequalvis* in both males and females is $n = 19$ and $2n = 38$. The chromosomes are mostly metacentric and submetacentric. No heteropycnotic chromosome results from the analysis of mitotic and meiotic plates.

Macchioni G., Marconcini A., Poglayen G., Capelli G., Agrimi U., Ravaioli C.: Diffusione dei metastrongili nel cinghiale (*Sus scrofa*) in Italia centrale. *Survey on lungworms of wild boars (Sus scrofa) in Central Italy*. Parassitologia, 30, 109, 1988.

A survey was carried out on the lung nematodes of 67 wild boars (*Sus scrofa*) and 3 domestic pigs from Central Italy. Fifty animals (71%) resulted positive. The following parasites were identified: *Metastrongylus pudendotectus* (43 animals), *M. salmi* (27), *M. cunfusus* (23), *M. apri* (10), *M. asymmetricus* (4).

Marini M., Trentini M.: Alcune osservazioni sulla Macrolepidotterofauna dell'Appennino lucchese in relazione ad altre faune appenniniche ed alpine. *Some observations on Lepidoptera of Apennines*. Atti del 15° Congresso Nazionale Italiano di Entomologia, L'Aquila, 665, 1988.

The zoogeographic relationship among Noctuidae populations found in 11 Italian localities is discussed and compared with Noctuidae collected in the Apennines of Lucca (Northern Apennine).

Maroli M., Pampiglione S., Tosti A.: *Cutaneous leishmaniasis in western Sicily (Italy) and preliminary survey of Phlebotomine sandflies (Diptera: Psychodidae)*. *Parassitologia*, 30, 211, 1988.

A survey of Phlebotomine sandflies was carried out in two provinces of western Sicily (Italy), where 65 cases of cutaneous leishmaniasis (CL) had been diagnosed by the Dermatology Department of the University of Palermo, between 1977 and 1987. Eight collecting stations, distributed throughout the CL foci of the Agrigento and Palermo provinces produced a total of 2,410 specimens (12.78% males). Of these, 77.59% were *Phlebotomus perfiliewi*, 12.78% *P. perniciosus*, 0.74% *P. major* and 2.07% *Sergentomyia minuta*. *P. perfiliewi*, the probable vector of CL, was present in 7 out of the 8 collecting stations with very high densities in two localities.

Martini M., Poglajen G., Mancini B.: *Indagini epidemiologiche sulla ascaridiasi del suino. An epidemiological survey on Ascaris suum infection in northern Italy*. *Sel. Vet.*, 29, 981, 1988.

A survey was carried out on swine ascaridiosis in a slaughterhouse in the province of Cremona (Italy) during two years. Among 90000 fattened pigs, 3.2% were found to be positive for *Ascaris suum*. The highest prevalence peak was recorded in autumn (3.7%), the lowest in spring (2.7%). Lacks of recurrent disinfections, of climatization systems, of all-in, all-out policy are related to higher prevalences of the infection.

Morganti L., Tampieri M.P.: *Mastiti ovine e caprine. Ovine and caprine mastitis*. *Inform. Zootec.*, 6, 43, 1988.

The Authors describe the most important mastitis in the ovine and caprine breedings in Italy. The mastitis are an important sanitary problem on this farm; only adequate mass prophylaxis can limit these infections that cause enormous economical damage. Milking hygiene, whether manual or with milking-machine is fundamental. Vaccination is also an effective instrument of prevention.

Pampiglione S., Canestri Trotti G., Del Maschio O.: *Dirofilariosi umana: segnalazione di 3 nuovi casi da Dirofilaria repens nella zona di Mestre. Human dirofilariosis: three new cases of Dirofilaria repens infection in the surroundings of Mestre (northern Italy)*. *Microbiologia Medica*, 3, 63, 1988.

Three new cases of human dirofilariosis, observed in the town of Mestre and its surroundings are described: the first two occurred in women, 24 and 52 years old respectively, localized in the subcutaneous tissue. The third one in a man, 51 years old, was localized in the pharyngeal submucosa. This last localisation is signaled for the first time in Italy.

Pampiglione S., Canestri Trotti G., Rivasi F.: *Quattordici nuovi casi di dirofilariosi umana in Italia. Fourteen new cases of human dirofilariosis in Italy*. *Pathologica*, 80, 293, 1988.

Fourteen new cases of human dirofilariosis are described, from a clinical, histopathological and parasitological point of view: twelve are localized in the subcutaneous tissue in various parts of the body, one is subconjunctival and one is localized in the posterior wall

of the pharynx. General symptoms can be completely absent or scarcely perceived. At most the parasite manifests its presence in the form of a nodule in the subcutaneous layer, sometimes associated with allergic or phlogistic local manifestations. The nodule does not necessarily correspond with the site of inoculation by the vector, demonstrating the possibility that the nematode can migrate in the tissues of the host.

Pampiglione S., Toffoletto F., Canestri Trotti G.: I molluschi di interesse parassitologico-veterinario in Italia. *The molluscs of veterinary parasitological interest in Italy*. Ann. Ist. Super. Sanità, 24, 1, 1988.

The molluscs which have or may have a veterinary parasitological interest in Italy include 100 species belonging to 54 genera which are intermediate hosts of 58 species of helminths (44 trematodes, 2 cestodes and 12 nematodes) parasites of 9 species of domestic mammals (*Bos taurus*, *Canis familiaris*, *Capra hircus*, *Equus asinus*, *E. caballus*, *Felis catus*, *Oryctolagus cuniculus*, *Ovis aries*, *Sus scrofa dom.*) and 6 species of domestic birds (*Anas boschas dom.*, *Anser anser dom.*, *Columba livia dom.*, *Gallus gallus dom.*, *Meleagris gallopavo*, *Numida meleagris*) which are usually considered in veterinary medicine. The economic losses associated with these parasites in Italy amount to some hundreds of billions lire, although today a precise evaluation cannot be made due to the lack of exhaustive data on such parasitic diseases.

Pampiglione S., Vecchi R., Rivasi F.: Adenomesenterite, associata alla presenza di larve di nematode? *Adenomesenteritis, associated with larvae of nematoda?* Pathologica, 80, 303. 1988.

We report the history of a case of chronic adenomesenteritis associated with evidence of bodies attributable to Ascaroidea or Oxyuroidea which cannot be more closely identified because of the partially decayed condition of the bodies themselves, in the adipose tissue of the mesentery. In spite of numerous anti-helminthic treatments the syndrome is still active, with periods of activity (sub-occlusion) alternating with periods of quiescence.

Pampiglione S.: *The appropriate technologies*. Atti della Conferenza Internazionale "Sanità e produzione bovina nel Mediterraneo", Bologna, 3-5 Maggio 1988.

The Author introduces the subject by defining "Appropriate Technologies" and giving a short historical outline. Various examples of appropriate and inappropriate technologies in developing countries are given. The numerous difficulties and obstacles encountered when introducing A.T. to developing Countries are listed. The Author stresses the fundamental concept that the introduction of A.T. to any community in the world implies perfect familiarity with habits, customs, traditions and everything making up the cultural heritage of the community itself.

Pizzino D., Negosanti M., Morganti L., Patrizi A., D'Antuono A., Varotti C.: Efficacia terapeutica del fenticonazolo e controllo dell'attività antifungina *in vitro* paragonata a quella di altri derivati imidazolici. *Therapeutic efficacy of Fenticonazole and in vitro assessment of its antifungal activity in comparison with other Imidazole derivatives*. G. Ital. Dermatol. Venereol., 45, 123, 1988.

Fenticonazole, a new imidazole derivate, showed a marked clinical efficacy in 51 patients with superficial skin mycoses that was confirmed by a good *in vitro* activity as indicated by MIC assays. In the *in vitro* study fenticonazole was as effective as or superior to three other imidazole-derivates. Local and systemic tolerance was good and no case of resistance to fenticonazole was observed in the isolated fungi.

Poglayen G., Capelli G., Roda R., Calvi N., Zanangeli A.: Indagini sulla diffusione delle filariasi del cane in alcuni comuni dell'Emilia Romagna. *Studies on the diffusion of canine filariasis infestations in the Region of Emilia Romagna*. Atti IV Seminario: Filariosi, Milano, 7 — 8 dicembre 1988.

A survey on canine heartworm disease was carried out in two areas of Emilia — Romagna (Italy): in the province of Bologna (ematological prevalence of 41% among 891 dogs) and in the river Po Delta (autoptical prevalence of 64% among 109 dogs). The anamnestic information collected for each dog allowed the evaluation of important risk factors.

Poglayen G., Manfredi M.T., Capelli G., Altinier E., Boggio-Sola L., Maragno M.: Ricerche sulle parassitosi dell'apparato respiratorio di caprioli (*Capreolus capreolus*). *Lung parasitic fauna of the roe deer (Capreolus capreolus)*. *Parassitologia*, 30, 144, 1988.

A research on the lung parasitic fauna in 110 Roe deer (*Capreolus capreolus*) shot in an alpine area in the province of Vicenza (Italy) was performed. Eighty-eight lungs (80%) were found positive for lungworms; the identified parasites were *Dictyocaulus eckertyi* (30%) and *Capreocaulus capreoli* (57%). The 65% roe deers killed during the Spring presented also *Cephenemia stimulator*. *C. capreoli* was identified for the first time in Italy.

Poglayen G., Martini M., Guberti V., Battelli, G.: Indici di valutazione del test coprologico per alcune elmintiasi della volpe (*Vulpes vulpes*). *Performances of the coprological test for some helminthiasis of the red fox (Vulpes vulpes)*. *Parassitologia*, 30, 146, 1988.

Faecal samples and guts from 103 red foxes (*Vulpes vulpes*), shot in the province of Forlì (Italy), were examined for intestinal helminths. The discordance between the coprological results and those from necropsy gave a significant value ($P < 0.05$) only for tapeworms. Concordance was observed for *Toxocara canis*, *Trichuris vulpis*, and hookworms (*Uncinaria stenocephala*). Sensitivity values of the coprological test were: 0.915 for *T. canis*, 0.667 for *T. vulpis*, 0.867 for hookworms and 0.108 for tapeworms.

Poglayen G., Roda R., Ravaioli C., Leoni B., Guberti V.: Aggiornamenti sulla diffusione dei parassiti di *Vulpes vulpes* in provincia di Forlì. Implicazioni ecologiche e gestionali. *Updating on the spread of fox (Vulpes vulpes) parasites in the Forlì province. Ecological and management consequences*. *Ric. Biol. Selvaggina*, 14, 441, 1988.

In the period 1985 — 1987 a parasitological survey was carried out on 310 foxes (*Vulpes vulpes*) shot in the province of Forlì (Italy). None of the 202 animals examined only for trichinosis was found positive. The intestinal parasites identified in the other animals were: *Toxocara canis* (35%), *Ancylostoma caninum* (4%), *Uncinaria stenocephala* (31%), *Trichuris vulpis* (4%), *Dipylidium caninum* (1%), *Mesocestoides lineatus* (7%), *Taenia hy-*

datigena (4%), *Taenia pisiformis* (2%). Among the cestode found in 6 and 3 animals respectively, the authors identified only the genus *Taenia* and *Mesocostoides* since their preservation was not optimal. Moreover the necropsy results were compared with the coprological ones in order to assess their reliability. Finally these global results were compared with those of a previous survey in the same area.

Restani R., Fioravanti M.L., Gnes A.: Efficacia del Levomisolo nella terapia della parasitosi da *Anguillicola crassus* Kuwahara, Niimi e Itagaki, 1974, in *Anguilla anguilla* Linneo, 1758. *Therapeutic trials with levamisole against Anguillicola crassus Kuwahara, Niimi e Itagaki, 1974, in Anguilla anguilla Linneo, 1758.* IV Conf. Intern. Acquacoltura, 13-16 Ottobre, Verona 1988.

Therapeutic tests with levamisole against *Anguillicola crassus* in naturally parasitized eels (*Anguilla anguilla*) have been carried out. The levamisole has been dissolved in water at decreasing dosages from 15 mg/l to 2.5 mg/l for 6 and 12 hours. The results have shown that the levamisole devitalizes 100% of the anguillicola worms at dosages of 5 mg/l for 6 hours.

Restani R., Mattioli R., Tampieri M.P.: Dicroceliosi ovina: correlazione tra carica parassitaria epatica e numero di uova nelle feci. *Ovine dicrocoeliosis: relationship between the parasitic burden and the faecal egg count.* Atti dell'8° Congresso della Società Italiana di Patologia e Allevamento degli ovini e caprini (S.I.P.A.O.C.), Viterbo, Ottobre 1988, 349, 1988.

Livers and faecal specimens of 170 sheep have been parasitologically examined. The results pointed out a statistically significant correlation between parasitic burden and faecal eggs count.

Restani R., Tampieri M.P., Parolin M.: Diffusione delle rogne bovine in provincia di Treviso. *Survey on the occurrence of bovine mange in the Province of Treviso.* Obiettivi e Documenti Veterinari, 9, 53, 1988.

Anamnestic, clinical and parasitological surveys were carried out about the occurrence of bovine mange in 207 herds (10945 animals) in the Province of Treviso. The anamnestic and clinical data pointed out the problem in 52 (25,1%) herds. One hundred ninety six (1,8%) animals showed skin lesions like scab. The parasitological tests carried out on 151 animals showed mites of psoroptic mange almost only in fattening calves and chorioptic mange mites only in heifers or dairy cows.

Tampieri M.P., Mattioli R., Martini M.: Osservazioni sul rapporto fra vaccinazione anti-brucellare e presenza di elminti in agnelle. *Observations on connection between REV 1 vaccination and presence of gastro-intestinal parasites in ewes.* Parassitologia, 30 (suppl.1), 203, 1988.

A field REV 1 vaccination test was performed on 100 sarda and massese ewes, 4-5 month-old, divided in two groups: untreated animals and treated with tetramisole and niclosamide against gastro-intestinal parasites (taeniae and gastro-intestinal strongyles). Blood samples were collected 6 times after treatment and vaccination over a period of 150 days (days 0, 15, 30, 60, 100, 150). Treated ewes showed slightly but constantly higher

antibody titers against REV 1 at complement fixation test (CFT) as well as at slow agglutination test (SAT). Among the treated animals the number of seropositive ewes was higher than in the group of the untreated. At the 6th blood collection all the animals were found seronegative both at the CTF and at the SAT.

Tampieri M.P., Restani R., Cuzzato A.: Ricerche sulla cisticercosi dei conigli. *Research about rabbits' cysticercosis*. Parassitologia, 30 (suppl. 1), 205, 1988.

Cysticercus pisiformis was found in 17,85% of 56 domestic rabbit's breedings and in 8,99% of 1,457 examined rabbits (*Oryctolagus cuniculus*). In pups, experimentally infected with 15 cysticerci each, the prepatent period was 24 days. A total of 18 rabbits received (via stomach tube) 2,500 eggs of *Taenia pisiformis* each in 2 ml of saline. A mean of 171 (6,86%) cysticerci developed in the abdominal cavity of rabbits.

Trentini M., Marini M.: Osservazioni sui cromosomi di *Papilio hospiton* Gn. (Lepidoptera, Papilionidae). *Chromosomic observations on Papilio hospiton* Gn. (Lepidoptera, Papilionidae). Bollettino Società Entomologica Italiana, 120, 53, 1988.

The diploid chromosome complement of *Papilio hospiton* is $2n = 60$ in both males and females. The resemblance between *Papilio hospiton* and *Papilio machaon* is confirmed. The species of Papilionidae are characterized by a great stability of their chromosome numbers.

Turilli C., Marcolin G., Prosperi S.: Impiego e valutazione dell'ELISA nei confronti della fissazione del complemento nella diagnosi della listeriosi del bovino. *Evaluation of ELISA versus CF for the diagnosis of bovine listeriosis*. Clin. Vet., 111, 154, 1988.

The Authors have employed the ELISA test for the diagnosis of bovine listeriosis and they have compared it with the CF test. They have tested 946 animal sera, coming from random chosen breedings, from breedings characterized by abortion with unknown aetiology, and from beef cattle with encephalitis. The Authors have valued ELISA sensitivity and specificity in comparison with CF, and the results are respectively 90,62% and 97,51%. The ELISA test could therefore be used as a screening technique for the diagnosis of bovine listeriosis.

1989

Baldelli R., Morganti L., Cimmino C., Sebastiani P.: *Rickettsia conorii*: indagine sieroepidemiologica nel cane e nell'uomo in provincia di Bologna. *Rickettsia conorii infection: a seroepidemiological survey in dogs and humans in the province of Bologna*. Atti Soc. Ital. Sci. Vet., 43, 1105, 1989.

A serological survey for the presence of *Rickettsia conorii* antibodies was carried out on 804 canine sera and 149 human sera from 4 Municipalities in the province of Bologna. An indirect fluorescent antibodies test was performed with a commercially available antigen; the threshold titer was 40. One hundred and twenty one canine sera were positive (15%) with titers ranging from 40 to 640. Three human sera were positive (2%) with titer of 40.

Battelli G., Capelli G., Martini M., Poglayen G., Restani R., Roda R.: *Epidemiological analyses on animal parasitoses: recent activity of the I.M.I.P.P.V.* Parassitologia, 31, 197, 1989.

The paper presents a selected review of the epidemiological analyses performed in the years 1984-1988 in the Institute of Malattie Infettive, Profilassi e Polizia Veterinaria on animal parasitoses, with special reference to the evaluation of some risk factors of some bovine (fasciolosis, dicroceliosis, g.i. strongyloses), swine (g.i. strongyloses, ascariosis, whipworm infection), and canine (filariosis) helminthoses. The analyses on the accuracy of the coprological test for some parasites of the red fox (tapeworms, *Toxocara canis*, *Uncinaria stenocephala*, *Trichuris vulpis*) are also reported.

Battelli G.: Note sui danni socio-economici delle malattie degli animali da reddito. *On socio-economic impact of diseases of farm animals*. In: "Rapporti di Sanità pubblica veterinaria — Gestione di piani di intervento veterinario in caso di emergenze epidemiche". Ed. I.S.S./W.H.O./C.C., 41, 1989.

The social and economic consequences of diseases of farm animals and zoonoses are discussed, with special reference to direct and indirect costs and losses, and aim, difficulty and methods of their assessment. Epidemiological, zootechnical, economic and social data requested for the evaluation are pointed out.

Canestri Trotti G., Cappellaro H., Fioravanti M.L., Restani R.: Ricerche sui coccidi di *Anguilla anguilla* in soggetti di vallicoltura e di importazione in Italia settentrionale. *Researches on coccidia presence in Anguilla anguilla in Northern Italy*. Atti Soc. Ital. Sci. Vet., 43, 1407, 1989.

The coccidia seem to play the same role in fishes as in domesticated mammals and birds. Nevertheless they have not been intensively studied especially in Italy. The aim of this research was to investigate the presence of these parasites in *Anguilla anguilla*. Necropsy was performed on 284 fishes from 4 eel-farms. Coccidial infections were reported in all farms and in 99 out of the examined eels. *Eimeria variabilis* and *Epieimeria anguillae* respectively were found in 76 and 83 of the examined animals.

Cappellaro H., Fioravanti M.L., Paesanti F., Quaglio F.: *Infection by sporocysts and cercariae (Cercaria pectinata Huet, 1891) in the clam Tapes decussatus from the Northern Adriatic Sea*. Fourth International Conference of the European Association of Fish Pathology, 24-28 October, Santiago de Compostela, Spain, 1989.

A series of 983 specimens of *Tapes decussatus* was collected from two northern Adriatic localities (Chioggia and Pila) to investigate the origin of the mortality and losses in natural clam beds. Sporocysts and cercariae, identified as *Cercaria pectinata* Huet, 1891, were found in 215 (21.9%) of examined clams. The high frequency of *C. pectinata* infection in the clams, together with the high presence in the gonads, points out a relation between the presence of this parasite and life cycle of clams.

Corni M.G., Trentini M., Frogliani C.: *Karyological study on Nephrops norvegicus (L., 1758) (Astacidea, Nephropidae) in the central Adriatic Sea.* Nova Thalassia, 10, 127, 1989.

The chromosomes of *Nephrops norvegicus* collected in the central Adriatic Sea were studied. The diploid chromosome number ranges from 133 to 150, while the aploid chromosome number ranges from 74 to 79. The chromosome number variation in *Nephrops* and in Nephropidae is discussed.

Guberti V., Giovannini A., Battelli G.: *Host-parasite balance in the absence of human intervention: a study on wild goat on Montecristo Island, Italy.* 13th Conference of World Association for the Advancement of Veterinary Parasitology, Berlin (DDR) 7-13 August 1989. Abstract No. P2-18, Pag. 76.

During a two-year-period, 40 wild goats (*Capra aegagrus hircus*), shot on the Montecristo island, were employed to determine the g.i. nematodes. On the island no human management was carried out. Faecal samples were collected to assess the sensitivity (Se) of the coprological test (CT). Significant correlations ($P < 0.01$) were found between: a) e.p.g. and number of worms only for *Trichostrongylus axei*; b) parasitic burdens (p.b.) and age for the total number of nematodes, *Haemonchus contortus*, *Trichostrongylus colubriformis*, *Oesophagostomum venulosum*, *T. ovis* and *Ostertagia circumcincta*; c) p.b. and sex and p.b. and prevalence only for *H. contortus*. The Se of CT was 0.97 for Trichostrongylidae and 0.22 for *T. ovis*.

Marini M., Trentini M.: *Pachypasa otus (Drury): aspetti di oomorfologia e cariologia (Lepidoptera Lasiocampidae). Egg morphology and karyology of Pachypasa otus (Drury) (Lepidoptera Lasiocampidae).* Bollettino Società Entomologica Italiana, 120, 223, 1989.

The chorionic ultrastructure of the eggs of *Pachypasa otus* is described. The egg morphology presents no difference among examined populations (from Turkey, Greece and Southern Italy). The chromosome number ($n = 30$, $2n = 60$) of *Pachypasa otus* from Turkey is also reported.

Marini M., Trentini M.: *SEM morphological observations of Papilio hospiton Gn. 1839 and Papilio machaon L. 1758 eggs (Lepidoptera: Papilionidae).* Nota Lepidopterologica, 12, 175, 1989.

The chorionic morphology of the eggs of *Papilio hospiton* and *Papilio machaon* from Sardinia is described; the micropyle area morphology presents significant differences between the two species.

Morganti L., Tampieri M.P.: *Le zoonomici. Gli animali come fonte di contagio per l'uomo. Dermatophytophysis. Animals as source of infection to man.* Microbiologia Medica, 4(2), 82, 1989.

The importance of dermatomycoses in man caused by zoophilic dermatophytes in Italy is increasing. In urban areas the human dermatomycoses are prevalently caused by *Microsporum canis*. This fungus is present in apparently normal cats and dogs, but the cat seems more important as infection source. In the rural areas, *Trichophyton verrucosum* is present on calf-rearing farms and *T. mentagrophytes* on industrialized rabbit farms and also

on farms raising laboratory animals. We will discuss the different animal species as source of dermatomycoses.

Pampiglione S., Canestri Trotti G., Piro S., Maxia C.: Dirofilariasi palpebrale nell'uomo: un caso in Sardegna. *Human palpebral dirofilariasis: a case in Sardinia*. *Pathologica*, 81, 57, 1989.

One case of human palpebral dirofilariasis, in Sardinia, is described. The nematode, *Dirofilaria repens*, during its permanence in the host caused local signs of allergic type and migrated in the subcutaneous tissues from the left lower eyelid to the neck, the axillary region, the abdominal wall, reappearing in the right lower eyelid, from where it was removed.

Pampiglione S., Canestri Trotti G., Rivasi F.: *Enterobius gregorii* Hugot, 1983: sua presenza nell'uomo in Italia e nella repubblica Centro Africana. *Enterobius gregorii Hugot, 1983: its presence in man in Italy and in the Central African Republic*. *Pathologica*, 81, 421, 1989.

The presence of *E. gregorii*, a species recently identified by Hugot in France in man, is signaled by the Authors in Italy and in the Central African Republic. The diagnosis was based on the differential morphological characters reported by Hugot and Tourte-Schaefer in 1985.

Pizzino D., Negosanti M., Morganti L., Tampieri M.P.: *Survey on the etiology of human dermatomycoses in the Bologna Province*. I Congresso dell'Accademia Europea di Dermatologia e Venerologia, 25-28 Settembre 1989, Pag 243.

The importance of human dermatomycoses caused by zoophylic dermatophytes is increasing in Italy. We have done a survey on the epidemiological situation in the Province of Bologna. All the human cases of dermatomycoses observed at the Department of Dermatology of the University of Bologna were cultured to make an etiological diagnosis. We isolated: *Microsporum canis*, *Trichophyton mentagrophytes*, *T. rubrum* and *Epidermophyton floccosum*. *M. canis* was the predominant etiological agent in tinea corporis.

Poglayen G., Capelli G., Roda R., Credi G.: Endoparassitosi del cane: indagine a Bologna. *Canine endoparasitoses: a survey in Bologna (Italy)*. *Atti Soc. Ital. Sci. Vet.*, 43, 1455, 1989.

The results of a parasitological survey carried out from June 1988 to January 1989 on 105 dogs dead in the Municipal Kennel of Bologna was reported. In all the animals the autoptical and coprological examinations of the gastro-intestinal tract were performed. The kidneys and the urinary bladder were also examined for helminths. *Trichinella sp.* was searched in diaphragm samples by compressor slide techniques and, at the same time, by the digestion method. The parasites identified in 58 dogs (55%) were: *Trichuris vulpis* (23%), *Dipylidium caninum* (21%), *Toxocara canis* (18%), *Taenia pisiformis* (6%), *Uncinaria stenocephala* (2%), *Ancylostoma caninum* (1%), *Mesocestoides lineatus* (1%), *Iso-spora spp.* (18%). No parasites were found in other organs and muscles.

Poglayen G., Martini M., Danza Sproviero C., Agretti D.: Endoparassitosi bovine in Val d'Aveto (Genova). *A Survey on bovine endoparasitoses in Val d'Aveto, Genova, Italy.* Obiettivi e Documenti Veterinari, 10, 49, 1989.

A coprological survey was carried out on bovine endoparasitoses in Val d'Aveto (Genova, Italy). The 90% of the 135 involved herds was found positive for parasites. The parasites found in the 392 examined animals were: gastro-intestinal strongyles (67%), coccidia (20%), *Dicrocoelium dendriticum* (17%), *Fasciola hepatica* (9%) and *Paramphistomum sp.* (1%). Grazing practice is associated with higher prevalence rates. The data concerning only the autochthonous bovine breed Cabannina are reported. These reflect the parasitological situation of the entire cattle population.

Tampieri M.P., Morganti L., Pietrobelli M.: Mastiti da *Aspergillus* spp in ovini. *Aspergillus spp* as causal agent of ovine mastitis. Atti Soc. Ital. Sci. Vet., 43, 1091, 1989.

Four cases of ovine mastitis are described. *Aspergillus terreus* was isolated from milk and udder tissue of two sheep; *A.fumigatus* and *Candida guilliermondii* from other two respectively. Histopathologic examination of udder tissue confirmed the diagnosis in two cases. *A. terreus* was isolated also from the bedstead. Bacteriological examinations of milk and udder tissue were negative.

Tommasini S., Sabelli Scanabissi F. and Trentini M.: Scanning electron microscope study of eggshell development in *Triops cancriformis* (Bosc)(Crustacea, Notostraca). Vie Milieu, 39, 29, 1989.

The development of the eggshell of Notostracan *Triops cancriformis* is examined with the SEM. The eggshell is initially composed of one layer, then, this layer is delaminated into two and finally into three layers. The embryonic cuticle is recognized beneath the inner layer of the eggshell.

Trentini M., Canestri Trotti G.: Pseudo-parassitismo da astucci larvali di *Psyche* (*Fumea*) *crassiorella* Bruand (Insecta, Lepidoptera, Psychidae) sulla cute umana. *Pseudoparasitism by larval cases of Psyche* (*Fumea*) *crassiorella* Bruand (Insecta, Lepidoptera, Psychidae) fixed to the human skin. Biologia Oggi, 3, 25, 1989.

The occurrence is reported of two larval cases of *Psyche* (*Fumea*) *crassiorella* fixed to the skin of a woman in a hill locality in the territory of Bologna. These larval cases did not cause any trouble except for the slight distress due to the removal. This episode of pseudoparasitism associated with a moth is reported as our observations may suggest that similar events might be more frequent than expected.

Trentini M., Corni M.G., Froglija C.: The chromosomes of *Liocarcinus vernalis* (Risso, 1816) and *Liocarcinus depurator* (L., 1758)(Decapoda, Brachyura, Portunidae). Biol. Zentralbl., 108, 163, 1989.

Haploid and diploid chromosome numbers have been determined for *Liocarcinus vernalis* ($n = 27$, $2n = 54$) and *Liocarcinus depurator* ($n = 50$, $2n = 100$). In both species the chromosomes are mostly metacentric or submetacentric and there are no sex chromosomes. The taxonomic relation between the two species is discussed.

Vincenzi C., Bardazzi F., Costa A., Morganti L., Varotti C.: Micobatteriosi cutanea da *Mycobacterium marinum*. *Mycobacterium marinum: cutaneous mycobacteriosis*. Boll. Soc. Med. Chir. Moderna, 90, 181, 1989.

The Authors describe a case of cutaneous mycobacteriosis due to *Mycobacterium marinum* in a patient who looked after an aquarium of tropical fish. *M. marinum* was isolated both from tissue of the patient, following biopsy and from that of a diseased fish in the aquarium. The patient's lesions consisted of numerous red-purple nodular growths on his left arm; the fish, however, in addition to ulcerative cutaneous lesions, had granulomas in the internal organs. The Authors point out that better knowledge of the pathological manifestations that can be observed clinically in aquatic animals would help check the spread of this disease, which is not at all uncommon.

1990

Battelli G., Martani L., Poglayen G., Capelli G.: Prevalence changes of bovine fasciolosis in an endemic area of Northern Italy. Arch. Vet. Ital., 41, 229, 1990. 13th Conference of World Association for the Advancement of Veterinary Parasitology, Berlin (DDR) 7-13 august 1989. Abstract No. P2-8, Pag. 74.

To offer a better understanding of the diffusion of bovine fasciolosis in the province of Mantua (northern Italy), an area considered endemic for this disease, faecal examination of 566 animals (377 milk-cattle and 189 beef-cattle) from 84 farms was performed in 1988. 6% of animals (2.1% of milk cattle and 13.8% of beef-cattle) and 13% of farms resulted positive. With reference to the last prevalence data on the disease in the province (1975), fasciolosis seems to be decreasing, even if control programs were sporadically performed only on few farms. This reduction could be correlated to changes happened in the period 1975-1988 in the management and feeding.

Baldelli R., Martini M., Paulucci De Calboli L., Visani L.: Indagine preliminare nei confronti della febbre Q in allevamenti bovini dell'Emilia-Romagna. Preliminary survey on Q fever in cattle of Emilia-Romagna. Atti Soc. Ital. Sci. Vet., 44, 859, 1990.

Little is the information about Q fever infection in bovine in Italy. In order to assess the prevalence of this infection in Emilia-Romagna, a seroepidemiological survey was carried out in cattle from an Apenninic area. The complement fixation test was performed on 711 animals from 99 herds. The prevalence was of 1.3% with respect to the herds and of 4.4% with respect to the animals. The positive titers ranged from 8 to 256: the geometric mean was 22.30 and 1.14 for the positive animals and for the entire population respectively.

Battelli G., Gander M., Capelli G., Martini M.: Indagini sulla diffusione delle parassitosi dell'apparato digerente in bovini della Val Venosta. *Survey on the bovine parasitoses of the digestive apparatus in Val Venosta*. Arch. Vet. Ital., 41, 50, 1990.

The survey was carried out in an alpine area of Italy among 140 herds and 466 animals. By coprological test, nearly 93% of the herds and 76% of the animals resulted positive. The prevalences (%) in the animals were: 57 for g.i. strongyles, 33 for coccidia, 26 for *Dicrocoelium dendriticum*, 6 for cestoda, 3 for *Fasciola hepatica*, 2 for whipworms, and 0.4 for capillariae. These rates were analyzed even considering the different categories of the animals and of the herds. The status of the control practices and knowledge about the health and economic problems related to the parasitic diseases seems to be very inadequate in the investigated area.

Canestri Trotti G., Cappellaro H., Corradini L., Fioravanti M.L., Restani R.: Osservazioni parasitologiche in *Anguilla anguilla* in Italia. *Parasitological observations in Anguilla anguilla in Italy*. Atti Soc. Ital. Sci.Vet., 44, 1229, 1990.

1,587 wild and cultured eels (*Anguilla anguilla*) from different origins have been investigated for the presence of parasites. The following species were identified: *Dermocystidium anguillae*, *Tranosoma granulorum*, *Eimeria variabilis*, *Epieimeria anguillae*, *Ceratomyxa* sp., *Myxobolus* sp., *Myxidium giardi*, *Ichthyophthirius multifiliis*, *Trichodina anguilli*, *Pseudodactylogyrus anguillae*, *Deropristis inflata*, *Helicometra fasciata*, *Bothriocephalus claviceps*, *Proteocephalus macrocephalus*, *Anguillicola crassus*, *Contracaecum* type B, *Echinorhynchus clavula*, *Pomphorhynchus laevis*, *Ergasilus gibbus*.

Canestri Trotti G., Cappellaro H., Fioravanti M.L., Restani R.: Segnalazione di *Eimeria variabilis* e *Epieimeria anguillae* in anguille (*Anguilla anguilla*) di vallicoltura e di importazione in Italia settentrionale. *Occurrence of Eimeria variabilis and Epieimeria anguillae in eels (Anguilla anguilla) in brackish water or imported in Northern Italy*. Bollettino derella Società Italiana di Patologia Ittica, 3, 8, 1990.

The Authors report the occurrence of *Eimeria variabilis* and *Epieimeria anguillae* in eels (*Anguilla anguilla*) reared in Italian brackish waters or imported to Northern Italy. Necropsy was performed on 204 fishes from 4 eel farms. Coccidial infections were reported in all farms and in 99 out of the examined eels.

Canestri Trotti G., Fioravanti M.L., Cappellaro H., Corradini L.: Reperti elmintologici in cetacei spiaggiati in Adriatico. *Helmithological reports in cetaceans stranded in the Adriatic Sea*. Parassitologia, 32 (suppl.1), 44, 1990.

During the years 1985-89 the Authors had the opportunity to parasitologically examine 1 *Stenella coeruleoalba* and 5 *Tursiops truncatus* stranded along the northern Adriatic beaches. The parasites recovered were: *Haloecus delphini*, *H. lagenorhynchi* in *S. coeruleoalba* and *Anisakis* sp., *Braunina cordiformis*, *Diphyllobothrium* sp., *H. delphini*, *H. lagenorhynchi*, *Pholeter gastrophilus*, *Skrjabinalius guevarai*, *Stenurus ovatus*, *Synthesium tursionis* in *T. truncatus*.

Capelli G., Gadale O.I., Abduraham A.A., Poglayen G.: Elminti intestinali del gatto: prime segnalazioni nella Repubblica Democratica Somala. *Cat's intestinal helminths: first reports in the Somali Democratic Republic*. Parassitologia, 32, 46, 1990.

The Authors examined the digestive tract of 50 stray cats (*Felis catus*) captured and killed in Mogadiscio (Somali Democratic Republic). All the animals resulted positive for helminths: *Toxocara cati* (28%), *Ancylostoma braziliense* (78%), *A. tubaeforme* (2%), *Dipylidium caninum* (34%), *Diplopylidium noelleri* (4%), *Joyeuxiella pasqualei* (62%), *Taenia taeniaeformis* (4%), *Taenia sp.* (6%) and *Moniliformis sp.* (2%). None of these parasites was previously reported in somaliland cats. The potential zoonotic role of the involved helminths was also stressed.

Corni M.G., Trentini M.: *The chromosomes of Venerupis aurea and Ruditapes philippinarum of the Adriatic Sea (Bivalvia, Heterodonta, Veneridae)*. Jpn. J. Malacol., 49, 258, 1990.

The chromosomes of *Venerupis aurea* (Gmelin) and *Ruditapes philippinarum* (Adams & Reeve) were studied. In both species, collected in the Northern Adriatic Sea, chromosome numbers of 19 (n) and 38 (2n) were observed. The chromosome complement of *Venerupis aurea* consists of 19 pairs of metacentrics or submetacentrics. The relation between chromosome number and fundamental number of the Veneridae is discussed.

Frassetto A., Pizzino D., Tampieri M.P., D'Antuono A., Negosanti M.: Dermatofitozoonosi: studio comparato uomo-animale. *Dermatophytozoonosis: comparative study man-animal*. Atti 1° Congresso Nazionale Società Italiana di Micologia umana e animale (S.I.M.U.A.), Milano, 13 Settembre 1990, Pag. 204.

This study want to verify the real responsibility of animals in the trasmission of dermatophytes infections. In conclusion of the compared study man-animal, we can affirm that the role of animals in the determinism of mycoses is very important. Particularly we have to draw attention to the frequency of the asintomatic carrier condition in pets, which is the cause of dangerous and insidious infections.

Genchi C., Di Sacco B., Poglayen G., Gatti S., Pettoello-Mantovani M., Scaglia M.: Infezione umana da *Toxocara canis*: epidemiologia e fattori di rischio. *Human Toxocara canis infection: epidemiology and associated risk factors*. Parassitologia, 32, 121, 1990.

Sera from clinically healthy adults (2580) and adult patients (471) were tested to asses the main risk factors for *Toxocara canis* infection in humans in Italy. The patient group included 257 adult epileptics, 76 *Strongyloides stercoralis* - infected adult patients and 142 istituzionalized mentally retarded adult patients. The overall seroprevalence in the healthy population was 3.98%. No significant differences in seroprevalence were observed for sex, residence (urban or rural) or dog ownerships, while seroprevalence significantly incerases with age (18 to 51 years). Highest seroprevalence values were found in outdoor or soil - related workers and in patients with poor hygenic habits. These findings suggest that the prevalent source of human toxocariasis in Italy is environmental contamination by infectious eggs of the parasite.

Giannetto S., Niutta P., Fioravanti M.L., Canestri Trotti G.: *Anguillicola crassus* in *Anguilla anguilla* in Calabria e Sicilia. *Anguillicola crassus* in *Anguilla anguilla* in Calabria and Sicily. *Atti Soc. Ital. Sci. Vet.*, 44, 1225, 1990.

Anguillicola crassus (Nematoda, Dracunculoidea) is recognised and related histopathological features are described in the swim-bladder of eels (*Anguilla anguilla*) living in both eel-cultures and river waters of Catania, Catanzaro, Cosenza, Syracuse Italian cites. This parasite is localized inside the swim-bladder where it places an intense blood-sucking activity. *A. crassus*, is well-known and diffused in several European Countries, such as Belgium, Denmark, France, Germany, Great Britain, Holland and northern Italy.

Marchetti R., Guerzoni M.E., Sanguinetti V.: Previsione e controllo della crescita microbica nella conservazione di piatti pronti refrigerati. *Modeling of microbial growth on new refrigerated foods*. Supplemento alla Rivista di Merceologia, 29, 489, 1990.

In model systems simulating a meat salad the effect of simultaneous variation of the concentration of the ingredients (acetic acid, NaCl, potassium sorbate) was evaluated. The systems were incubated at temperatures ranging from 4 to 12.5°C. The concentration of the ingredients ranged according to an experimental factorial design. The microbial load of the samples, inoculated with a mixed population of yeast (*Saccaromyopsis fibuligera*) isolated from an industrial product of similar composition and a collection strain of *Lactobacillus plantarum*, were estimated over time along with pH variations in order to assess the combination of ingredients able to extend the microbiological shelflife of the products. On the basis of the best fit equations obtained shelflife isoresponse surfaces were drawn. Furthermore potential hygienic risks connected with this food typology were considered.

Morganti L., Sanguinetti V., Serratore P.: Igienicità dei compost da rifiuti solidi urbani, fanghi di risulta e stocchi. Aspetti microbiologici. *Microbiological aspects of compost containing solid urban waste and sewage sludge*. L'Igiene Moderna, 94, 33, 1990.

The Authors report the results of bacteriological exams (mesophylic count, total and fecal coliforms, enterococci, *Salmonella* spp.) on composts made of solid waste alone or of sewage sludge and vegetable waste. The mature compost had mesophylic counts, coliforms and enterococci counts higher than the compost at the end of the bioreactor. *Salmonella* spp was always absent.

Morganti L., Tampieri M.P., Galuppi R.: Igienicità dei compost da rifiuti solidi urbani, fanghi di risulta e stocchi. Aspetti micologici e parassitologici. *Mycological and parasitological aspects of solid urban waste and sewage sludge compost*. L'Igiene Moderna, 94, 180, 1990.

The Authors report the results of mycological and parasitological examen on compost made of solid waste, sewage sludge and vegetable waste in order to find pathogens. Only *Aspergillus fumigatus* was found.

Pampiglione S., Canestri Trotti G., Rivasi F.: Un nuovo caso di parassitosi epatica nel gatto in Italia da *Pseudamphistomum truncatum* (Trematoda: Ophisthorchidae). *A new case of hepatic parasitosis in the cat in Italy by Pseudamphistomum truncatum (Trematoda: Ophisthorchidae)*. *Parassitologia*, 32 (suppl. 1), 189, 1990.

The occurrence of *Pseudamphistomum truncatum*, parasite rarely signaled in Italy, is reported in a cat at Salò (Brescia). The study of the morphology of the genital apparatus seems to justify a different systematic position of the species.

Pampiglione S., Canestri Trotti G., Rivasi F.: L'aelurostrongilosi del gatto: due nuovi casi in Italia. *The Aelurostrongylosis of the cat: two new cases in Italy*. *Parassitologia*, 32 (suppl. 1), 191, 1990.

Two cases of Aelurostrongylosis in the cat are reported. A new morphological detail in the larvae of *Aelurostrongylus abstrusus* is described.

Pampiglione S., Canestri Trotti G., Rivasi F.: Segnalazione di *Enterobius gregorii*, Hugot, 1983, in Italia. *Report of Enterobius gregorii Hugot, 1983, in Italy*. *Parassitologia*, 32 (suppl. 1), 194, 1990.

The presence of *Enterobius gregorii*, a species recently identified by Hugot in France in man, is reported by the Authors in Italy. The diagnosis was based on the differential morphological characteristics reported by Hugot and Tourte-Schaefer in 1985.

Pampiglione S., Canestri Trotti G.: Dirofilariose humaine en Italie: observation de 23 cas. *Human dirofilariasis in Italy: observation of 23 cases*. VII Cong. intern. Parasitologie-Paris, 20-24 Août 1990, p. 896.

The Authors report 23 cases of human dirofilariasis caused by *Dirofilaria repens*. In their opinion, this parasitic infection is more frequent than it seems.

Pampiglione S., Manilla G., Canestri Trotti G.: Dirofilariasi umana in Italia: un nuovo caso palpebrale con guarigione spontanea in Abruzzo. *Human dirofilariasis in Italy: a new palpebral case with spontaneous recovery in Abruzzo*. *Parassitologia*, 32, 381, 1990.

One case of human palpebral dirofilariasis by *Dirofilaria repens* in Abruzzo is described. It is the first case reported in this region. The parasite was released following the energetic rubbing of the palpebral area, with the result in the spontaneous recovery of the patient.

Pampiglione S.: *Profile and education of personnel for health laboratories at the peripheral level in developing countries*. *Health Cooperation papers*, 10, 65, 1990.

The contribution of the author is an analysis of the possible solutions of many problems encountered during his experience pursued since 1980 in Guinea-Bissau with encoura-

ging results. He describes and debates the following topics: the role of the laboratory at the peripheral level, the selection and training of personnel, the function of personnel, the supervision and the review courses and the possibility of career advancement.

Piasentier E., Pietrobelli M., Tampieri M.P., Susmel P.: Influenza delle strongilosi gastro-intestinali degli ovini sull'ingestione e la digeribilità degli alimenti: osservazioni preliminari. *Influence of sheep's gastrointestinal nematodes on foods' ingestion and digestibility: preliminary remarks.* Atti del 9° Congresso Nazionale della Società Italiana di Patologia e Allevamento degli Ovini e dei Caprini (S.I.P.A.O.C.), 1.7, Grado 20-22 Giugno 1990.

From a group of 12 one-year-old wether bergamasca sheep, raised in a barn after weaning and naturally infested with gastrointestinal nematodes (*Haemonchus* sp. 68.1%; *Oesophagostomum* sp. 12.2%; *Ostertagia* sp. 3.7%; *Trichostrongylus* sp. 3.2%; *Oesophagostomum/Chabertia* sp. 3.2%, *Strongyloides* sp. 2.7%; *Nematodirus* sp. 0.5%), 4 animals were drenched with Thiabendazole (50 mg/kg LW). The remaining 8 animals were divided into 2 groups according to the average number of eggs per g of faeces (560 vs 3760). The apparent digestibility and voluntary intake of 2 diets composed of either fescue hay and concentrated (F:C 60:40 DM basis) or the fescue hay alone were measured in all 12 animals. DMD and OMD were not affected by the antiparasitic treatment, although it increased DM intake by 6g/kg LW^{0.75} for both diets. On the average, the drenched animals grew 75g/d more than those untreated. The concentration of faecal eggs showed no significant effects on any of the parameters measured.

Poglayen G., Capelli G., Bucci G.: Indagine sull'elmintofauna del capriolo (*Capreolus capreolus*) in provincia di Trento e Treviso. *Survey on the helminthic fauna of the roe deer (Capreolus capreolus) in the province of Trento and Treviso (Italy).* Parassitologia, 32, 208, 1990.

A survey was carried out on 71 roe deers (*Capreolus capreolus*) shot in the provinces of Trento and Treviso (Italy). 87% of animals was found parasited at the coprological test and 23 parasitic species (*Trichostrongylus longispicularis*, *Trichuris globulosa*, *T. skrjabini* first reported in Italy in the roe deer) were identified at the necropsy. The frequency distribution of the most represented parasitic species followed the negative binomial model, showing a well adapted host — parasite relationship. The presence of several parasitic species shared by both domestic and wild ruminants and the correlation between prevalences and morpho — biometrical data are discussed.

Poglayen G., Capelli G., D'Aloia A., Guberti V.: Analisi della distribuzione di frequenza di elminti gastro-intestinali nel daino (*Cervus dama*). *Frequency distribution analysis of gastro-intestinal helminths of the fallow deer (Cervus dama).* Parassitologia, 32, 210, 1990.

A survey on gastro-intestinal helminths was performed on 56 fallow deer (*Cervus dama*) shot in the S.Rossore preserve (province of Pisa, Italy). The following nematodes were identified: *Spiculopteria asymmetrica*, *Ostertagia drozdi*, *Skrjabinagia* sp., *Apteragia quadrispiculata*, *Trichostrongylus axei*, *T. longispicularis*, *Nematodirus roscidus*, *Cooperia pectinata*, *Capillaria* sp., *Oesophagostomum venulosum*, *Trichuris globulosa* and *Trichuris* sp. The

frequency distribution of six parasitic species followed the negative binomial pattern ($0.12 < K < 0.21$), showing a well adapted host — parasite relationship.

Poglayen G., Capelli G., Roda R., Fioravanti M.L., Michelini S., Prosperi S.: Pascolo e rischi sanitari per il bovino. *Grazing practice and bovine health risks. I. Survey on the parasites of the digestive apparatus.* Obiettivi e Documenti Veterinari, 11, 59, 1990.

A coprological survey was performed on 12 herds of grazing cattle in spring and autumn, 11 of which from the province of Bologna and one from the province of Macerata. Both samples showed high prevalence rates for coccidia, *Dicrocoelium dendriticum*, paramphistome flukes, gastro-intestinal strongyles. The autumnal rate was significantly higher for coccidia ($P < 0.05$) and for strongyles ($P < 0.01$) only in the herd from the province of Macerata. On the basis of our results, free range rearing of cattle can maintain a high degree of gastro-intestinal parasitism.

Poglayen G., Catani M., Battelli G.: *Eimeria* spp. of the roe deer (*Capreolus capreolus*) in an Apenninic area of Italy. *Acta Protozool.*, 29, 103, 1990.

Examination for coccidia of 133 roe deer (*Capreolus capreolus*) faecal samples from an Apenninic area in the Florence province revealed the following 4 species: *Eimeria capreoli* Galli Valerio, 1927 (in 14% of the specimens), *E. panda* Supperer and Kutzer, 1961 (26%), *E. ponderosa* Wetzel, 1942 (16%), *E. rotunda* Pellerdy, 1955 (1.5%). Morphological descriptions of these species are given. Sporulation of oocysts was obtained using an apparatus for continuous oxygenation studied by one of the Authors (P.G.). An experimental transmission of *E. panda* was performed to a male roe deer, and of *E. capreoli*, *E. ponderosa* and *E. rotunda* to a female roe deer.

Poglayen G., Giovannini A., Capelli G., Ravaioli C.: *Some epidemiological inferences on wild boar parasitism in Italy.* *Bulletin de la Société Française de Parasitologie*, 8, 820, 1990.

Metastrongyles were searched in 47, and gastro-intestinal parasites in 57 wild boars shot in Central Italy (Forlì province). Body weight, dressed weight, and total body length of shot boars were recorded. The parasite species found, their prevalence and mean intensity were: *Metastrongylus pudendotectus*, 51%, 15; *M. salmi*, 32%, 8.47; *M. confusus*, 40%, 5.63; *M. apri*, 15%, 1.57 (total metastrongyles, 60%, 62.57); *Globocephalus urosubulatus*, 87.72%, 27.80; *Physocephalus sexalatus*, 22.81%, 12.23; *Trichuris suis*, 15.59, 1.56; *Ascaris suum*, 1.75, 1. All the parasite frequency distribution did not significantly differ from the Negative Binomial (NB) model, whilst differed from the Poisson model except for *M. apri* and *T. suis*, probably due to low prevalence and mean intensity. *A. suum* distribution was not tested. The monoxenous parasites showed a NB distribution K parameter higher than diheteroxenous ones, evidence of a less clumped distribution in the absence of intermediate hosts. No statistically significant differences appeared for other parameters stressed.

Prosperi S., Baldelli R., Fioravanti M.L., Roda R., Galuppi R., Michelini S.: Pascolo e rischi sanitari per il bovino. Nota II-indagine sierologica per brucellosi, febbre Q, clami-

diosi e babesiosi. *Grazing practice and bovine health risks. II. serological survey on brucellosis, Q fever, chlamydiosis and babesiosis*. Obiettivi e Documenti Veterinari, 7-8, 59, 1990.

The Authors carried out a serological study for brucellosis, chlamydiosis, Q fever and babesiosis on 15 farms of grazing cattle; 14 of which in the province of Bologna and one in the province of Macerata. 327 cows were examined in spring at the time of entry into pasture, and 237 in autumn, at the time of re-entry. The results of the serological study were the following: 4 animals from 3 farms in autumn were positive for chlamydiosis; 4 animals from 2 farms for Q fever; 11 animals from 4 farms in spring and 19 from 9 farms in autumn for babesiosis. A statistical significance was demonstrated only for *Babesia bigemina* ($P = 0.031$), in the province of Bologna.

Prosperi S., Giovannini A., Battelli G., Martini M., Semproni G., Caporale V.P.: Relazioni tra fattori ambientali e sindromi respiratorie in vitelli durante lo svezzamento. *Relationships between respiratory diseases and behaviour factors in weaning calves*. Arch. Vet. Ital., 41, 34, 1990.

The Authors studied the relationships between respiratory diseases and some chemical and physical climatic variables during two weaning cycles (on 95 and 246 calves respectively) in a beef herd in the Po Valley (Italy). Multivariate (factor and discriminant analyses) and univariate (Pearson correlation coefficient) methods were used. The role of PI-3, IBR and BAV-3 viruses was investigated by analysis of the antibody patterns throughout the periods of observations. IBR virus in the first cycle (10 July-2 October) and all three viruses in the second cycle (8 October-2 January) seem to be responsible of the observed respiratory signs. The temperature in summer, the humidity in fall seem to be the most relevant risk factors for bovine respiratory diseases under the conditions of the present study.

Prosperi S., Giovannini A., Semproni G., Fiorentini G.: Relazioni tra fattori ambientali e sindromi respiratorie in bovini all'ingrasso. *Relationships between respiratory diseases and behaviour factors in beef calves*. Arch. Vet. Ital., 41, 153, 1990.

The Authors have carried out a survey on 114 beef calves on slatted-floor raised in Pianura Padana, during the period October to July. Through the use of multivariate statistical tests (factor and discriminant analyses) they have researched the relationships between respiratory diseases and chemical and physical microclimatic variables. Beside of this, they serologically tested the animals in the experiment for the viruses PI-3, IBR, and BAV-3 at the entry into the farm, during the respiratory disease, and at the end of the cycle, showing the roles played first by the virus BAV-3 and successively by IBR. They have ascertained that a determining role was played by strong changes of humidity and temperature, together with low levels of mean humidity.

Prosperi S., Giovannini A.: Emergenze sanitarie e servizi veterinari. *Epidemic emergency and the veterinary public health*. Sel. Vet., 31, 1009, 1990.

The Authors define a health emergency as an epidemic event with serious economic and health consequences. Successively, they analyse: the health emergency problem regarding

both exotic diseases and those present in Italy the necessary conditions for the action effectiveness, and the control strategies. They also take into account the public information and the information flows that have to be implemented in a health emergency situation.

Prosperi S., Giovannini A.: Fattori di insorgenza delle malattie infettive. *Determinants and the ecology of diseases*. Sel. Vet., 30, 567, 1990.

The Authors analyse the factors which condition the onset of infections, the frequency, the occurrence and the pattern of infectious diseases. First the characteristics of the parasite are studied: contagiousity, invasivity, virulence, pathogenicity; then those relative to the host: species, race, age, sex, general conditions, productive features. Particular emphasis is given to the environment, which is a factor of paramount importance on the case frequency, examining both biotic and abiotic factors and the ways in which these factors can determine the pattern of the infectious disease. Particular attention is also given to host-parasite environment interactions and modern methods of study of these interactions.

Trentini M., Canestri Trotti G.: Un caso di aracnidismo da *Chiracanthium punctorium* (Villers, 1789) (Aranea, Clubionidae). *A case of human arachnidism by Chiracanthium punctorium (Villers, 1789) (Aranea, Clubionidae)*. Biologia Oggi, 4, 55, 1990.

A case of human arachnidism by *Chiracanthium punctorium* was reported in Forlì. Besides acute persisting pain and local swelling, the bite caused slight temperature, nausea, numbness at the affected site and walking disturbances.

1991

Agnoletti F., Mutinelli F., Mazzolini E., Carlotto F., Cirelli L., Sanguinetti V.: Pleuropneumonia contagiosa bovina nel Triveneto. Approccio diagnostico. *Contagious bovine pleuropneumonia in Triveneto. A diagnostic approach*. Vet. Ital., 27, 19, 1991.

The Authors describe some aspects of the anatomopathologic changes observed in Contagious Bovine Pleuropneumonia (CBPP) outbreaks in Triveneto and underline the relevance of the coltural and immunohistochemical tests and of the indirect immunofluorescence test for the direct diagnosis of CBPP.

Andreucci A., Canestri Trotti G., Fioravanti M.L., Giani G., Restani R., Rizzoli M.: Osservazioni preliminari sulla presenza di metacercarie di *Clinostomum complanatum* (Trematoda: Digenea) in pesci catturati in corsi d'acqua della provincia di Bologna. *Preliminary observations of Clinostomum complanatum (Trematoda: Digenea) metacercariae in fishes from the Bologna province rivers*. Bollettino della Società Italiana di Patologia Ittica, 6, 37, 1991.

The Authors carried out a parasitological survey on 389 fishes of 11 different species from the Bologna province rivers. Metacercariae of *Clinostomum complanatum* were collected from 44 of the fishes examined.

Battelli G., Martini M.: Misure di frequenza degli eventi morbosi. *Measures of disease frequency*. Vet. Ital., 27, 35, 1991.

The measures of disease frequency are discussed, with reference to the following aspects and concepts: 1) population, population at risk, cases and time of the observations; 2) proportions, rates and ratios; 3) prevalence, incidence and their interrelationships; 4) sporadic, endemic and epidemic occurrence of diseases and infections; 5) mortality and case-fatality; 6) confidence limits of the estimated measures. Examples of calculation of point of prevalence, cumulative incidence and incidence rate are given.

Canestri Trotti G., Fioravanti M.L., Russel E.: Reperti ixodologici nel Friuli Venezia Giulia (1985-1989). *Ixodological reports in Friuli-Venezia Giulia (1985-1989)*. II Conv. Intern. "Malattie Infettive nell' Arco Alpino", 21-23 marzo, Siusi allo Sciliar (BZ), 1991.

The Authors carried out a research on ixodological fauna in the Friuli Venezia Giulia region during 1985-1989. 404 ticks mainly collected from dogs and cats were identified. In order of frequency were found: *Rhipicephalus sanguineus*, *Ixodes ricinus*, *I. hexagonus*, *R. turanicus* and *Ixodes* sp.

Dezfuli B.S., Fioravanti M.L., Rossi R.: *Helicometra fasciata* (Platyhelminthes: Digenea) parassita di *Anguilla anguilla* (L.): osservazioni istologiche sul tratto digerente dell'ospite. *Helicometra fasciata* (Platyhelminthes: Digenea) parasite of *Anguilla anguilla* (L.): *istological observations*. Bollettino della Società Italiana di Patologia Ittica, 5, 77, 1991.

Fourteen *Anguilla anguilla* specimens, out of 15 examined, were infected by *Helicometra fasciata* (Platyhelminthes: Digenea). The description of parasites with the results of the histopathological survey on the host digestive tract are here presented.

Giannetto S., Fioravanti M.L., Tumino G., Canestri Trotti G.: Aggiornamento sulla fauna ixodologica della Sicilia. *Revision on Ixodological fauna of Sicily. Note I*. Atti Soc. Ital. Sci. Vet., 45, 1425, 1991.

The Authors carried out a research on ixodological fauna in Sicily during the years 1986-90. 830 ticks were identified and in order of frequency were found: *Rhipicephalus sanguineus*, *R. bursa*, *Hyalomma marginatum*, *Hy. lusitanicum*, *Haemaphysalis punctata*, *Boophilus annulatus*, *Dermacentor marginatus*, *Hy. detritum*, *Ixodes ricinus*, *Hy. aegyptium*, *H. inermis*, *R. pusillus*. *H. inermis* and *Hy. aegyptium* were collected in Sicily for the first time.

Giovannini A., Proserpi S.: Epidemiologia e profilassi della rabbia silvestre in Italia. *Epidemiology and control of wild rabies in Italy*. Hystris, 3, 137, 1991.

The Authors analyse biological characteristics of the fox *Vulpes vulpes* with regard to the epidemiology of sylvatic rabies in Italy. Emphasis is put on the lack of deepen studies both on fox population densities, and on important behavioural habits. A retrospective analysis of wild rabies epidermics in Italy from 1977 to 1988 has shown: 1) the spread of

rabies by 20 to 80 km/year; 2) the existence of three/four year oscillations, clearly evident in single epidemics, but masked in the total number of cases in Italy; 3) the mosaic-like pattern of the final phase of the epidemic; 4) the extinction of outbreaks following the mosaic phase, in a few cases not correlated with human intervention. The Authors criticize the control measures enforced in Italy, on the bases of the inefficacy and inefficiency of the thinning out programme and, on the contrary, the efficiency of the oral vaccination of the fox population.

Guberti V., Poglayen G.: Zoonosi parassitarie: indagini in volpi (*Vulpes vulpes*) dell'Appennino settentrionale. *Parasitic zoonoses: survey in foxes (Vulpes vulpes) in the northern apennines*. Hystris, 3, 167, 1991.

A parasitological survey on 153 foxes was carried out in the northern Apennines, during the period 1984-1987. The following parasites were identified: *Toxocara canis* (46.4%), *Taenia sp.* (17%), *Uncinaria stenocephala* (11.8%), *Mesocostoides lineatus* (11.1%), *Ancylostoma caninum* (3.9%), *Taenia hydatigena* (3.3%), *Trichuris vulpis* (3.3%), *Dipylidium caninum* (2.6%), *Taenia crassiceps* (2%). All the foxes were negative for *Trichinella sp.* A statistical analysis was performed to evaluate differences in the parasitic fauna according to the sex and age classes of the hosts. The role that the fox could have as a reservoir of helminthic zoonoses is discussed. The results are compared with those of similar studies carried out in Italy.

Martini M., Poglayen G., Capelli G., Roda R.: *Diagnosis of canine filariosis: relative sensitivity and specificity of some hematological techniques*. Angew. Parasitol., 32, 133, 1991.

Blood samples from 329 dogs of an hyperendemic area in northern Italy were examined for filariosis. At the filter method (5 μ m), taken as reference test, 163 (49.5%) were positive: 160 for *Dirofilaria immitis*, 2 for *D. repens* and 1 for both. The direct smear test (DS), the modified Knott technique (KT) and a further modification of the Knott technique (MKT) were performed in order to assess their relative sensitivity (SE), specificity (SP), positive and negative predictive value (PPV and NPV). The relative SE values are of 88.3%, 91.0% and 91.8% for DS, KT and MKT, respectively. Only the DS relative SP value (99.3%) is less than 100%. Also the PPV and NPV are very high (all above 89%) as well as the values of the coefficient Kappa (all above 0.8), a measure of the concordance between the results of the FT and of the comparison tests.

Martini M., Poglayen G.: Etude sur la valeur de la coprologie chez les carnivores. *Accuracy of the coprological findings in carnivores*. Epidémiol. Santé anim. 18, 123, 1991.

The sensitivity (SE), the specificity (SP), the positive (PPV) and negative (NPV) predictive values of the coprological test, performed on 208 foxes, 105 dogs and 95 cats for tapeworms, ascarids, whipworms and hookworms were evaluated. The SP levels are always very high, whereas the SE shows rather low values, for tapeworms especially. PPV values lie between a minimum of 27% for whipworms in the fox and a maximum of 100% for tapeworms in all the three host species. The NPV lowest value is 50% for tapeworms in cat, the highest of 100% for hookworms in the dog. The parameters were also correlated with the prevalence, the mean intensity and the abundance of the parasitic infections in the hosts.

Mazzolini E., Nardelli S., Casati D., Turilli C., Scacchia M., Urbani G., Sanguinetti V., Agnoletti F., Friso S.: ELISA sandwich per la ricerca di anticorpi specifici per *Mycoplasma mycoides* subsp. *mycoides* nei sieri di bovino. Nota preliminare. *ELISA sandwich to detect specific antibodies to Mycoplasma mycoides subsp. mycoides in bovine sera. Preliminary note.* Vet. Ital., 2, 26, 1991.

An ELISA sandwich is described in which the bovine sera under test represented the coating phase of the reaction, whereas entire *M. mycoides* subsp. *mycoides* SC cells were used as antigen. Rabbit serum obtained from an antigen partially purified by density gradient was also employed. The OD values given by ELISA in 337 bovine sera coming from Contagious Bovine Pleuropneumonia-free herds showed a normal log distribution. 61 out of a total number of 128 Complement Fixation Test (CFT)-positive sera proved negative at ELISA; these sera were collected from herds where no Contagious Bovine Pleuropneumonia cases had been observed. Research is under way to assess whether the 61 sera should be considered as false CFT-positive samples.

Morganti L.: Ruolo del piccione nell'epidemiologia della Criptococcosi. *The pigeon role in the epidemiology of Cryptococcosis.* Abstract 2° Convegno internazionale "Malattie Infettive nell'arco alpino", 33, 1991.

The Author emphasizes the importance and the high prevalence (13%) of Cryptococcosis in AIDS affected patients. The birds' faeces and of pigeons in particular are a very important habitat for the growth and survival of *Cryptococcus neoformans* in the environment.

Ostanello F., Chiesa S., Govoni M., Prospero S.: Isolamento di Adenovirus da rene fetale ovino. *Isolation of Adenovirus from foetal lamb kidney.* Atti Soc. Ital. Sci. Vet., 55, 1105, 1991.

The Authors describe the isolation of a cytopathic virus referable to the Fam. Adenoviridae by secondary cultures from a foetal lamb kidney. This is the first isolation in Italy of an Adenovirus from sheep. Previously, in other Countries, isolation have been obtained from outbreaks of pneumoenteritis, but transplacentale transmissions have shown to be rare. The identification of the viral strain was based upon the type of nucleic acid, the sensitivity to ether, the type of cytopathic effect, electron microscope observations and seroneutralization test.

Pampiglione S., Candiani G., Del Maschio O., Pagan V.: Dirofilariasi polmonare nell'uomo: un terzo caso in Italia. *Human pulmonary dirofilariasis: thirth case in Italy.* Pathologica, 83, 21, 1991.

A new case of human pulmonary dirofilariasis is described. It occurred in a 66 years old man living near Venice. The pulmonary infarctual lesion caused few symptoms. The histological findings allowed the exact diagnosis, identifying the causal agent as *Dirofilaria* probably *repens*. The parasite was an immature male in advanced regressive conditions.

Pampiglione S., Canestri Trotti G., Rivasi F.: La Dirofilariose humaine en Italie. *Human Dirofilariasis in Italy*. Ann. Parasitol. Hum. Comp., 66, 195, 1991.

Since 1971, 30 cases of human dirofilariasis were observed out of 101 cases reported in Italy. The causative agent was identified in nearly all the cases as *Dirofilaria repens*, a parasite relatively common in the dog in Italy. 23 cases were localized in the subcutaneous tissue, 4 in the submucosa and 3 in the lungs. The Authors believe that human dirofilariasis is more frequent than reported by the scientific literature.

Pampiglione S., Canestri Trotti G.: Miasi umana naso-faringea con reperto di larve di *Oestrus ovis* L. di secondo stadio. *Human naso-pharyngeal myiasis by Oestrus ovis L. with the report of 2nd stage larvae*. Biologia Oggi, 6, 167, 1991.

A human case of naso-pharyngeal myiasis by *Oestrus ovis* L. (sheep nostril fly) is described, occurred in Rodi Garganico (Foggia) in July 1988. The patient, a 33 years old woman, was infected when sleeping, taking a rest by the edge of a swimming-pool in the afternoon. The parasite was in the 2nd larval stage, demonstrating the capacity of evolution of the larvae, in the unusual host that is man.

Pampiglione S., Fedeli F.: Dirofilariasi polmonare umana: aspetti parassitologici del secondo caso segnalato in Italia. *Human pulmonary dirofilariasis: parasitological aspects of the second case recorded in Italy*. Parassitologia, 33, 153, 1991.

The parasitological aspects of a case of human pulmonary dirofilariasis are described. This is the second case of the disease recorded in Italy. The nematode was rolled up inside a small pulmonary artery and was associated with a nodular infarctual lesion, discovered during an X-ray check as a "coin lesion". A pulmonary lobectomy was performed on the patient with a presumptive diagnosis of a malignant neoplastic nodule. The exact diagnosis was only made with the histological examination. In spite of the bad preservation of the nematode, it was possible to diagnose it as an immature female of *Dirofilaria* probably belonging to the species *repens*.

Pampiglione S., Garavelli P.L., Robutti F.: Dirofilariasi sottocutanea umana: un nuovo caso in provincia di Alessandria. *Human subcutaneous dirofilariasis: a new case in the Province of Alessandria*. G. Mal. Infet. Parassit., 43, 930, 1991.

A new case of human subcutaneous dirofilariasis has been reported in a 67-year-old woman from Valmadonna (Province of Alessandria). The parasite was located in the right arm and has provoked an abscessual nodular lesion. The causal agent was an immature female of *Dirofilaria repens*. This represents the 38th human case associated with that nematode to have occurred from the rice growing region of Piemonte/Lombardia in the last 50 years.

Pampiglione S., Mureto P., Del Fiasco S.: Dirofilariasi sottocutanea umana in Italia: primo caso nelle Marche. *Subcutaneous human dirofilariasis in Italy: first case in the Marche region*. Pathologica, 83, 17, 1991.

The first case of human subcutaneous dirofilariasis in the Marche region (Central Italy) is described. It was caused by *Dirofilaria repens* and localized in the abdominal wall of 23 years old university student from Pesaro. The presence of many histological sections of the nematode in strong regression, suggests that the death of the parasite occurred inside the nodule many months before the surgical intervention.

Pampiglione S., Rivasi F., Franco F.: Dirofilariasi sottocutanea umana: due nuovi casi nell'Italia del Nord. *Human subcutaneous dirofilariasis: two new cases in Northern Italy.* Parassitologia, 33, 147, 1991.

Two new cases of human subcutaneous dirofilariasis in Northern Italy are described. The first one occurred in a 56-year-old man living in Venezia Lido and was localized in the frontal region; the second one in a 52-year-old woman living in Modena and was localized in the sacrococcigeal region. Both lesions were associated with *Dirofilaria repens*.

Pampiglione S., Schiavon S., Candiani G., Fioravanti M.L.: Osservazioni cliniche e parassitologiche su di un caso di miasi foruncolosa disseminata da *Cordylobia rodhaini* nell'uomo in Etiopia. *Clinical and parasitological observations on a case of human furuncular myiasis by Cordylobia rodhaini in Ethiopia.* Parassitologia, 33, 159, 1991.

A severe case of myiasis is reported in an Italian technician working in a forest yard in Illubabor (Ethiopia). The patient returned to Italy with fever, malaise and scattered skin lesions: these were papulous at first, and later developed into foruncle-like, intensely burning boils which spread all over the body. From the lesions, 150 larvae were recovered and identified as *Cordylobia rodhaini* Geddoelst (Diptera: Calliphoridae), a myiasis agent adapted to various thinskin mammals in African forests, rarely observed in man.

Pampiglione S., Trentini M.: Dermatite eritemato-vescicolare da *Paederus sabaesus* Erichson 1840 (Coleoptera: Staphylinidae) in Repubblica di Guinea. *Erythematous-vesicular dermatitis caused by Paederus sabaesus Erichson 1840 (Coleoptera: Staphylinidae) in the Republic of Guinea.* Ann. Ital. Dermatol. Clin. Sper., 45, 15, 1991.

Epidemic cases of erythematous-vesicular dermatitis caused by *Paederus sabaesus* in Republic of Guinea are reported. The symptoms, the evolution of the lesions and their severity are described from a clinical point of view, as observed both in 65 spontaneously affected subjects and in 2 experimentally infected volunteers.

Pampiglione S., Vagliani G., Milani M.: Dirofilariasi umana in Italia: localizzazione insolita nel funicolo spermatico. *Human dirofilariasis in Italy: exceptional localization in the spermatic cord.* Prog. Med., 47, 97, 1991.

A case of human dirofilariasis associated with *Dirofilaria repens* localized in the spermatic cord is reported in a 57-year-old man from Mazara del Vallo (Trapani province-Sicily). Until now this represents the fifth recorded case from Sicily and the third from the same

locality. From the scientific literature regarding *D. repens*, this appears to be an exceptional location of the parasite.

Poglayen G., Ambrosi M., Capelli G., Piancastelli M.: Fauna elmintica gastro- intestinale del cinghiale (*Sus scrofa*): esperienze in Italia Centrale. *Gastro-intestinal helminthic fauna of the wild boar (Sus scrofa) in Central Italy*. Obiettivi e Documenti Veterinari, 12, 49, 1991.

A necroscopical survey was carried out on 106 digestive tracts of wild boar shoot in two areas in Central Italy (Emilia Romagna region, province of Forlì, Umbria region, province of Terni). The 93.4% were positive for helminths: 77.4% for *Globocephalus urosubulatus*, 39.4% for *Phisocephalus sexalatus*, 24.5 for *Oesophagostomum dentatum*, 20.8% for *Macracanthorhynchus hyrudinaceus*, 13.8 for *Ascarops (Arduenna) strongylina*, 9.4% for *Trichuris suis*, 3.8% for *Ascaris suum*, 0.9% for *Gongylonema pulcrum*, *Strongyloides ransomi*, *Dicrocoelium dendriticum*.

Poglayen G., Martini M., Battelli G., Ferioli S., Tamagna S., Catani M., Rizzi N.: Studio sull'emissione di uova di elminti in fattrici. *A study on egg output of helminths in mares*. Atti Soc. Ital. Sci. Vet., 45, 1333, 1991.

87 mares (5-23 years old) from 3 different stables were coprologically surveyed for a period of about 30 months. Data on main climatic variables were collected. Strongyles (*Cyatostominae*, *Strongylus vulgaris*, *Strongyloides westeri*, *Trichostrongylus axei*), tapeworms and *Parascaris equorum* were found. According to multiple linear regression analysis, the E.P.G. outputs of the strongyles seem to be influenced by the range of temperature, rainfall, pregnancy state and high temperature. Those of tapeworms by the stable of origin, rainfall and high temperature. Those of *P. equorum* by none of the considered variables.

Poglayen G.: Mammiferi selvatici: interpretazione delle informazioni parassitologiche in chiave gestionale. *The importance of the parasitological data in the wild mammals management*. Ric. Biol. Selvaggina, 19, 383, 1991.

The Author summarizes the results of the recent research performed on epidemiology of some wildlife parasitic diseases. Particular attention was given to the validity of coprological test in the red fox (*Vulpes vulpes*), to the helminth frequency distribution in the fallow deer (*Cervus dama*), in the roe deer (*Capreolus capreolus*) and in the wild boar (*Sus scrofa*), and to the domestic / silvatic relationship from a parasitological point of view. The importance of taking into account the parasitological aspects in the wildlife management programs was stressed.

Prosperi S., Ostanello F., Chiesa S., Morganti L.: Indagine sierologica nei confronti di Adenovirus-3 in ovini. *Sero-epidemiological survey on adenovirus-3 in sheep*. Acta Med. Vet., 37, 117, 1991.

Sera from 578 sheep were collected at slaughter and tested by micromethod SN in order

to search for antibodies against OAV-3. The sheep (lambs under six months and adults over 6 months) brought from North Italy and North Europe were tested. We found a very high serological prevalence (95.8). In particular, statistically significant higher positivities were found as follow: imported animals compared with homebred ones; farms with only sheep compared with those breeding also cattle, the animals tested in summer compared with those tested in spring and winter.

Prosperi S., Pini A.: Pleuropolmonite contagiosa del bovino. *Contagious Bovine Pleuropneumonia*. Veterinaria Italiana, Monografia N.13, pp.82, 1991.

The Authors have prepared a monography on Contagious Bovine Pleuropneumonia (CBPP). The publication includes the following specific papers: a review of CBPP, laboratory diagnostic techniques, diagnostic sampling, methods for epidemiological research, Italian regulations. A comprehensive literature is also provided.

Quaglio F., Fioravanti M.L., Restani R., Giorgetti G.: Sulla presenza di metacercarie del genere *Acanthostomum* in orate (*Sparus aurata* Linneo, 1758) di importazione. *Presence of Acanthostomum metacercariae in imported sea-breems (Sparus aurata Linneo, 1758)*. Bollettino della Società Italiana di Patologia Ittica, 5, 81, 1991.

On an intensive farm of sea-breems (*Sparus aurata*) and sea-basses (*Dicentrarchus labrax*) in Sardinia an heavy mortality took place on spring 1990 in a stock of imported sea-breems. Necroscopic, microscopic (fresh and after staining), histological, virological, bacteriological and parasitological examinations were carried out on 150 subjects. Parasitological examinations stressed the presence of very numerous larval stages of digenetic trematodes. The parasites were identified as belonging to the genus *Acanthostomum*.

Sanguinetti V., Bartolini L., Bignardi A., Rosmini R.: Dermatite nodosa del bovino: recenti osservazioni in Emilia-Romagna. *Skin lesions in cattle: recent observations in Emilia-Romagna*. Vet. Ital., 27, 31, 1991.

Attention is called to a bovine skin condition which passes often unnoticed both on the farm and at slaughter, and which may result in tuberculine-positive reactions. In such regions with low tuberculosis prevalence as Emilia-Romagna, out of a total sample of 15 tuberculine-reacting herds, 5 had animals with "skin lesions" and 1 was infected by *Mycobacterium avium*. Cultural and biological examinations of the exudate from the lesions were invariably negative.

Sanguinetti V., Galuppi R., Morganti L.: Segnalazione di un caso di pseudomicetoma da *Microsporium canis* in un gatto. *Report of a case of pseudomycetoma by Microsporium canis in a cat*. Atti I Convegno nazionale Associazione Italiana di Micopatologia, Roma, 24-25 Aprile 1991.

The clinical course of a case of pseudomycetoma in a cat has been followed for two years. From the lesion, which recurred after both drug therapy and surgery, an atypical

strain of *Microsporium canis* was recovered which was subjected to cultural and biochemical tests.

Sanguinetti V., Murari G., Rosmini R., Marcheselli M., Marocchio L.: Lesioni granulomatose da inoculazione di oli minerali in suini. *Granulomas associated with the inoculation of mineral oils in slaughtered pigs*. *Industrie Aliment.*, 30, 120, 1991.

From March to September 1988 about 1000 and 5100 parts of swine neck, for "coppa" production, have been inspected in a slaughterhouse and in a meat processing factory in the area of Modena. In the slaughterhouse about 13% mineral oil granulomas were observed and about 5% in the meat processing factory. Gram positive cocci and Enterobacteriaceae were isolated in 61 out 144 granulomas examined. Cultures for mycobacteria were negative. The importance of a more accurate "post mortem" inspection is stressed.

Sanguinetti V.: *Listeria monocytogenes* e alimenti di origine animale. *Listeria monocytogenes and foods of animal origin*. Atti II Convegno Internazionale Malattie Infettive dell'Arco Alpino, Siusi 21-23 Marzo 1991, 30-31.

A concise review is made of the most recent information on *Listeria monocytogenes* in foods of animal origin, such as its diffusion in the different foodstuffs of animal origin and its resistance to the various factors conditioning the microbial development. The need is also stressed to enforce the recommendations given in 1988 by the World Health Organization, and to educate consumers on how to preserve and handle foods correctly in order to minimise risks.

Trentini M., Marini M.: Prime osservazioni sulla variabilità cromosomica di *Cerura vinula* L. (Lepidoptera, Notodontidae). *Preliminary observations on chromosome variability of Cerura vinula L. (Lepidoptera, Notodontidae)* Atti del 16° Congresso Nazionale Italiano di Entomologia, 581, 1991.

The present paper describes the chromosome number in two Italian populations of *Cerura vinula*: the first, coming from Puglia, presents $2n = 46$ and $n = 23$, the second, coming from Marche, has $2n = 45$. These new data, compared with those available in literature, suggest that the populations of *Cerura vinula* of mainland Italy should be separated from those of Central Europe.

Zanoni R., Sanguinetti V., Paparella A., Ruocco G.: Indagine microbiologica sulla contaminazione superficiale delle carni bovine fresche. *Microbiological survey on the surface contamination of fresh beef*. *Industrie Aliment.*, 30, 459, 1991.

The surface contamination of fresh beef was monitored at the end of the slaughterline in three abattoirs in Emilia-Romagna. A total of 124 carcasses were examined at two defined sites using the excision technique. Despite some significant differences between the abattoirs, the results of this survey seem to indicate a satisfactory bacteriological quality at all the examined plants.

Andreani A., Rambaldi M., Locatelli A., Andreani F., Poglayen G., Degli Esposti M.: 3-(2-Thienylvinyl) indoles as potential specific inhibitors of the energy metabolism in helminthic parasites. *Eur. J. Med. Chem.*, 27, 729, 1992.

Seven indoles bearing a thienylvinyl group, present in the well-known anthelmintic drug pyrantel, were synthesized and tested as inhibitors of the mitochondrial energy metabolism in order to recognise selective compounds (active mitochondria of helminthic parasites but inactive on the mitochondria of birds and mammals). 1-Phenyl-2-chloro-3-(2-thienylvinyl)indole 14, showing this biochemical behaviour, was also tested on *Parascaris equorum* living worms, confirming its activity on the energy metabolism.

Baldelli R., Cimmino C., Pasquinelli M.: Dog-transmitted zoonoses: a serological survey in the province of Bologna. *Ann. Ist. Super. Sanità*, 28 (4), 493, 1992.

Eighty hundred and two sera of owned dogs from four towns north-west of Bologna were examined for the presence of antibodies against *Coxiella burnetii* and *Leishmania infantum*. At the same time, 149 sera of 69 dogs owners from the same area were tested for the presence of antibodies to Q fever, leishmaniosis, echinococcosis/hydatidosis and toxocarosis. Of the 802 dog sera, 7 (0.87%) were positive for Q fever. Of the 69 dog owners, 24 (35%) were positive for Q fever, 4 (6%) for echinococcosis/hydatidosis and 3 (4%) for toxocarosis. Some epidemiological evaluations are made on the possible role played by the dog in spreading the zoonoses considered, at least in the area examined.

Baldelli R., Di Francesco A.: Leishmaniosi in Italia: risultati di indagini sierologiche condotte su cani di diversa provenienza geografica. *Leishmaniosis in Italy: the results of a serological survey on dogs from different zones*. *Atti Soc. Ital. Sci. Vet.*, 46, 1395, 1992.

During 5 years, 793 dogs from different zones of Italy were tested for the presence of *Leishmania infantum* antibodies, using the immunofluorescence test. One hundred and thirty seven dogs (17.3%) were positive; 656 (82.7%) were negative. Serological controls were made on 11 positive animals, which had been treated, to assess changes in antibody titres. The results were evaluated according the anamnestic data, in order to contribute to the understanding of the epidemiological situation of leishmaniosis in Italy.

Baldelli R.: Uso del microscopio a fluorescenza nella diagnostica delle malattie infettive e parassitarie. *The fluorescence microscopy for the diagnosis of communicable diseases*. *Biologia Oggi*, 6 (3), 349, 1992.

The fluorescence microscopy, the immunofluorescent tests and the most important fluorescent antibody procedures are described. Some applications of fluorescent antibody techniques for the diagnosis and the control of communicable diseases of domestic animals are shown, with special regard for some important zoonoses.

Battelli G., Martini M.: Echinococcosis/hydatidosis: socio-economic consequences and economic analyses of control programmes. *Ann. Ist. Super. Sanità*, 28, 473, 1992.

A review is made of the socio-economic consequences of echinococcosis/hydatidosis and of the methods of economic analysis of control programmes. The main costs and benefits (both financial and social) which should be taken into consideration in evaluating health actions are also examined.

Battelli G., Scorziello M.: Collaborazione medico-veterinaria nel campo delle zoonosi. *Medical-veterinary collaboration in the field of zoonoses*. Ann. Ig., 4, 395, 1992.

Medical-veterinary collaboration is discussed, with special reference to zoonoses. After quoting some reasons, mainly of cultural nature, which presently hinder its implementation, the opportunities of such a collaboration in the following sectors are stressed, also with examples: research; information and surveillance; planning and management of control actions; health education and professional training. Particular emphasis is placed on the need to overcome the existing difficulties and to perfect the collaboration between physicians and veterinarians in order to improve the quality of health services and to promote the community's health with greater efficacy.

Battelli G.: Aspetti socio-economici delle malattie degli ovi-caprini. *Socio-economic aspects of sheep and goat diseases*. Atti del 10° Congresso della Società Italiana di Patologia e di Allevamento degli Ovini e dei Caprini. Pizzomunno (Vieste), 4-7 giugno 1992. Pag. 73.

The diseases of sheep and goats in Italy are discussed by the socio-economic point of view. Examples of evaluation of costs and losses from infectious and parasitic diseases and of benefits from health interventions are given. The data mainly concern gastro-intestinal parasitoses, echinococcosis/hydatidosis, brucellosis, mastitis, and clostridial infections.

Battelli G.: Nuove norme per la denuncia delle malattie infettive e diffusive umane. *New regulations for the notification of infectious and transmissible human diseases*. B.E.V., Regione Abruzzo, suppl. al n.2 di Vet. Ital., 1, ottobre-novembre 1992.

The new information system on infectious and transmissible human diseases in Italy (Departmental Order 15 December 1990) is discussed, with special reference to the zoonoses and features of the reports.

Boni P., Alborali G.L., Zanardi G., Cappellaro H., Fioravanti M.L.: Presenza e diffusione di *Lamproglena pulchella* (Nordmann, 1832) in ciprinidi dei principali laghi bresciani. *Presence of Lamproglena pulchella (Nordmann, 1832) in ciprinidae of Brescia province lakes*. Bollettino della Società Italiana di Patologia Ittica, 8, 27, 1992

During a parasitological survey carried out in the period December 1989-November 1991 in cyprinidae from the lakes of Garda, Iseo and Idro, was recovered a copepode identified, on morphometric basis, as *Lamproglena pulchella* (Normann, 1832). 587 copepodes on the gills of 103 fishes (408 examined) from the Garda lake were found. Just one *L. pulchella* was found in only one *Scardinius erythrophthalmus* from the Idro lake (4,333

fishes examined). All 414 cyprinides from the Iseo lake were negative. Previous records of *L. puchella* in Italy were in 1895 and 1898.

Canestri Trotti G., Fioravanti M.L., Ghittino C.: *Hysterothylacium* sp. (Nematoda: anisakidae) in cavità celomatica di sarago sparaglione (*Diplodus annulatus*). *Hysterothylacium* sp. (Nematoda: Anisakidae) in the coelomatic cavity of the white bream (*Diplodus annulatus*). *Parassitologia*, 34 (suppl.1), 211, 1992.

Adults of *Hysterothylacium* sp. (Nematoda, Anisakidae) were reported with a prevalence of 100% in the body cavity of *Diplodus annularis* from the Tyrrhenian Sea.

Canestri Trotti G., Fioravanti M.L., Pampiglione S.: Ricerche sul possibile ruolo degli anfibi come ospiti di protozoi del genere *Cryptosporidium*. *Researches on the amphibians as possible host of Cryptosporidium* sp. *Parassitologia*, 34 (suppl.1), 30, 1992.

Tadpoles of *Bufo bufo bufo* and adults of *B. bufo bufo* and *B. viridis* were examined for the presence of *Cryptosporidium* sp.. Oocysts were found in the experimentally infected adults of *B. bufo bufo* and *B. viridis*.

Canestri Trotti G., Fioravanti M.L., Pampiglione S., Virga A.: Segnalazione di *Heterophyes heterophyes* in un cane in Sicilia. *A report of Heterophyes heterophyes in a dog in Sicily*. *Atti Soc. Ital. Sci. Vet.*, 46, 1423, 1992

During a research on dog parasites in Sicily, the presence was found of many specimens of a digenean trematode in the intestine of a stray dog captured in the province of Trapani. The parasite was identified as *Heterophyes heterophyes*. On the basis of the relevant literature, this report would appear to be the first in Sicily and the second in Italy.

Canestri Trotti G., Fioravanti M.L., Restani R.: Ricerche sull'anguillicolosi condotte presso l'Istituto di Malattie Infettive, Profilassi e Polizia Veterinaria dell'Università di Bologna. *Researches on Anguillicolosis carried out in Italy by the team of Istituto di Malattie Infettive, Profilassi e Polizia Veterinaria dell' Università di Bologna*. *Parassitologia*, 34, 179, 1992.

The Authors report the results of investigations carried out on diagnosis, therapy, life cycle and effects of *Anguillicola crassus* on farmed eels.

Canestri Trotti G., Pampiglione S., Rivasi F., Virga A.: Infezioni da stadi larvali di *Mesocostoides* sp.: due nuovi casi, in cane e in *Rattus rattus* in Sicilia. *Infections by Mesocostoides sp. larvae: two new cases in dog and in Rattus rattus in Sicily*. *Parassitologia*, 34 (suppl. 1), 135, 1992.

Two new cases of peritoneal infections associated with tetrathyridia of *Mesocostoides* sp. in a stray dog and in *Rattus rattus*, both captured in Western Sicily, are reported.

Croppo G.P., Gomez Morales M.A., Pozio E., Virga A., Pampiglione S.: Primi risultati siero-epidemiologici sulla cisticercosi umana in Italia. *First sero-epidemiologic results on human cysticercosis in Italy*. *Parassitologia*, 34 (suppl. 1), 162, 1992.

The serodiagnosis of human cysticercosis revealed 9 cases out of 33 patients with suspected cysticercosis in Italy, in 1990-91. Eight positive patients did not visit foreign Countries, of these 3 were less than 10 years old, and 6 came from Apulia and Sicily regions (Southern Italy). These preliminary results point out the hypoendemicity of *Taenia solium* infection in Italy.

Dezfuli B.S., Fioravanti M.L., Onestini S., Rossi R.: *Deropristis inflata* (Platyhelminthes: Digenea) parasite of *Anguilla anguilla* (L.): morphology of the parasite and intestinal pathology of host. *Parassitologia*, 34 (suppl.1), 205, 1992.

The use of SEM permitted us to examine the superficial features of *Deropristis inflata* and its mode of attachment to the intestinal wall of *Anguilla anguilla*. Moreover, the results of the histopathological survey on the host alimentary canal are also reported here.

Fioravanti M.L., Restani R.: Osservazioni sullo sviluppo larvale di *Anguillicola crassus* (Nematoda: Anguillicolidae) in *Diacyclops bicuspidatus* (Copepoda, Cyclopidae). *Observations on the larval development of Anguillicola crassus* (Nematoda, Anguillicolidae) in *Diacyclops bicuspidatus* (Copepoda, Cyclopidae). *Bollettino della Società Italiana di Patologia Ittica*, 8, 34, 1992.

The larval development of *Anguillicola crassus* was experimentally studied in the copepod *Diacyclops bicuspidatus*, reared in laboratory from specimens selected on an eel farm infected by *A. crassus*. At 22-26 °C, when ingested by copepods, the 2nd stage larvae reach 3rd stage after 7-8 days (about 184 hours). Morphometric features of the observed developmental stages are also given.

Fioravanti M.L., Restani R.: Zoonosi parassitarie di origine ittica. *Parasitic zoonosis from fish*. *Bollettino della Società Italiana di Patologia Ittica*, 10, 8, 1992.

The Authors deal with some parasitic diseases that man may contract by eating fishes, with particular attention both to diphyllbothriasis and Anisakiasis. Other parasitic zoonoses having less epidemiological importance in Italy (heterophyiasis, opisthorchiasis, clinostomiasis) are considered. The importance of the parasitological inspection of the fishes in the prophylaxis of these parasitic diseases is pointed out.

Galuppi R., Morganti L., Tampieri M.P., Piccoli L.: Indagine sulla presnza di dermatofiti in gatti della città di Venezia. *Survey on dermatophytes in cats of Venice*. *Atti 1° Congresso Nazionale Federazione Italiana Micopatologia Umana ed Animale (F.I.M.U.A.)*, Firenze 26-28 novembre 1992, pag. 251.

A survey on prevalence of dermatophytes in domestic and stray cats of the city of Venice

was carried out. Two hundred thirty seven domestic cats and 97 stray cats were examined. Ninety cats (27%) were positive for dermatophytes: *M.canis* is mostly widespread (83.4%). Stray cats were mainly infected (43.8%) compared to domestic animals (15.7%), but showed lesions to a smaller extent (7.7% in opposition to 44.4%); 11.1% of owners of infected domestic cats was afflicted with dermatomycoses.

Giannetto S., Pampiglione S., Canestri Trotti G.: Su alcuni dettagli morfologici delle larve di II e III stadio di *Oestrus ovis*. *On some morphological details of second and third stage larvae of Oestrus ovis*. *Parassitologia*, 34 (suppl. 1), 207, 1992.

A new morphological detail of the second and third stage larvae of *Oestrus ovis* is described. It consists of paired groups of three small hairs on the ventral surface of each thoracic segments.

Guberti V., Poglajen G., Stancampiano L.: Analisi delle biocenosi parassitarie in due popolazioni di cinghiali. *Analysis of parasitic biocenoses in two wild boar populations*. *Parassitologia*, 34, 80, 1992.

While dominant parasites in two wild boar samples fit a negative binomial distribution, codominant and subordinate species fit a Poisson distribution. 95.19% of the cases fall into the correct group when a discriminant analysis is used. With the exception of *O.dentatum*, discriminant parasites are shared by the two sampled populations.

Marangon S., Martini M., Farina L., Cazzola L., Dalla Pozza G., Facchin E., Avanzini E., Vincenzi G., Cancellotti F. M.: Indagine epidemiologica sulla presenza della mixomatosi negli allevamenti cunicoli della provincia di Treviso. *An epidemiological survey on myxomatosis in rabbit farms of the Treviso Province (Veneto Region)*. *Arch. Vet. Ital.*, 43, 161, 1992.

In 1991 a census of rabbit farms with more than 5 mother-cages was carried out in the Treviso province. During the same year on the 381 identified rabbit farms, 20 outbreaks of myxomatosis were notified. Type of rabbit-house, management, hygienic and health status were correlated with the appearance of the disease. The type of rabbit-house and the size of the farm seem to be associated with the presence of the disease. On the basis of these results the epidemiology of the disease and the control methods are discussed.

Martini M., Battelli G.: L'epidemiologia nella veterinaria. *The role of epidemiology in the activity of veterinary services*. *Salute e Territorio* 14, 34, 1992.

The need of an epidemiological approach by the veterinary services is stressed, in the light of the recent changes in husbandry practices, in the inner and international trade of animals and products of animal origin and in their industrial processing, in the role of domestic, synanthropic, companion and wild animal populations, in the man-animal relationships, in the consumers expectations, in the health policies, in the veterinary sciences.

Martini M., Capelli G., Poglayen G., Bertotti F., Turilli C.: *Validity of some hematological and serological methods for the diagnosis of canine heartworm disease.* Proceedings of the VI European Multicollloquium of Parasitology, 92, 1992.

Examinations for *Dirofilaria immitis* were performed on 175 impounded dogs from an hyperendemic area of the Po Valley (Italy). Each blood sample was used with 5 hematological diagnostic methods (filtration, direct smear, modified Knott, clotted blood, capillary tube) and 3 commercial ELISA kits (PetChek, Diasystems Uni-tec). The results were compared with the true infection status obtained from *post mortem* examination. The prevalence of the infection by adult worms at necropsy was 63%. The sensitivity of the tests ranged from 60% (capillary tube) to 81% (Diasystems) and the specificity from 88% (filtration) to 98% (PetChek). The results of all the tests differed significantly ($P < 0.01$) from those obtained at necropsy. The sensitivity of the tests was also assessed with respect to the differing number of worms in the hosts. A positive correlation between the worm burden and the sensitivity was observed in all the tests. It is apparent that the ELISA methods were better able to detect cases with a low number of worms than the hematological tests.

Martini M., Poglayen G., Bonicelli F., Michelon D., Scozzoli M.: *Indagine sulle malattie parassitarie del bovino in Emilia Romagna nell'ambito dei Progetti Integrati Mediterranei. Survey on parasitic diseases of calves in Emilia Romagna (Italy) in the context of the Mediterranean Integrated Projects.* Vet. Ital., 28, 20, 1992.

The faeces of 209 cattle of the Romagnola breed from 40 herds of the Emilia Romagna Region were examined for parasites. The observed prevalences were of 22.0% for *F. hepatica*, of 20.1% for gastro-intestinal strongyles, of 7.2% for coccidia, of 4.8% for tapeworms, of 1.4% for *D. dendriticum*. The overall positivity for parasites was of 41.2%. The role in increasing the risk of infection of various factors was analyzed by means of multivariate logistic regression. The geographical location seemed to influence the prevalence of both fasciolosis and coccidiosis; treatments and pasture management appeared to be associated with gastro-intestinal strongylosis.

Martini M., Poglayen G., Minerva N., Zanangeli A.: *A study of factors influencing intestinal parasites in dogs.* Ann. Ist. Super. Sanità, 28, 477, 1992.

Coprological examinations were made on 686 owned dogs (23% of the total number of registered dogs) in 4 municipalities in a semiurban area of the province of Bologna. The findings were linked to information about the origin and the use of the animals, veterinary assistance, diet, cohabitation with other dogs and the presence of gastro-intestinal conditions. Prevalences were of 28.6% for whipworms, 7.1% for coccidia, 7.0% for ascarids, 3.6% for tapeworms, 2.8% for hookworms. The overall positivity for gastro-intestinal parasites was of 37.5%. Multiple linear regression analysis suggested that the presence of gastro-intestinal parasites was affected by the use of the animals, the veterinary assistance, the age, the anthelmintic treatments and the cohabitation with other dogs. In particular, ascarids appeared to be influenced by age and veterinary assistance; tapeworms by veterinary assistance, coccidia by cohabitation with other dogs, whipworms by age, function, treatments, veterinary assistance. None of the variables considered showed association with the presence of hookworms.

Meliota F., Prosperi S., Ostanello F., Callegari V.: *Efficacy of an inactivated gI deleted vaccine against Aujeszky's disease.* Proceeding of 12th Congress IPVS, 72, 1992.

An Aujeszky's disease gI-inactivated vaccine was tested in 18 pigs divided into three groups consisting of 6 animals receiving the vaccine under test (gI-AyV), 6 with a commercial vaccine (gI-Philaxia strain) and 6 as control. The efficacy was evaluated according to the following parameters: symptomatology, weight gain, reisolation of the challenge virus, serological response. The results were as follows: sharp reduction in duration and seriousness of clinical symptoms; reduction in quantity and duration of virus excretion; better weight gain. Accordingly, our gI-vaccine could be profitably used in programmes launched in Italy to control Aujeszky's disease.

Morganti L., Sanguinetti V., Ansuini A., Zavanella M., Perini S., Guadagnini P., Minelli F., Morelli R., Caprioli A.: *Caratterizzazione di ceppi di E.coli verotossina- produttori (VTEC) isolati da suini con diarrea e malattia degli edemi. Characterization of verotoxin-producing E.coli (VTEC) from pigs with diarrhea or edema disease.* Atti Soc. Ital. Sci. Vet., 46, 1119, 1992.

Two hundred and seventeen *E.coli* strains isolated from April 1991 to April 1992 from pigs with diarrhea or edema disease were examined. The 0149 serogroup represented 59.1% in suckling piglets diarrhea (A), 62.6% in weaned piglets diarrhea (B), 65.5% in weaned piglets hemorrhagic gastroenteritis (C). In edema disease (D) the 0139 serogroup was present in 58.7% of the cases. K88 was present in 72.7% of A cases, 78% of B, 80.3% of C. VT was present in 76.7% of D. The strain VT positive showed resistance to streptomycin, tetracycline and sulfonamides.

Morganti L., Tampieri M.P., Galuppi R., Menegali F.: *Morphological and biochemical variability of Microsporium canis strains.* Eur. J. Epidemiol., 8(3), 340, 1992.

Seventy-two strains of *Microsporium canis*, of different origins, were examined from a morphological point of view and tested in relation to their hydrolitic activity on tyrosine, xanthine, casein, gelatin, their ureasic activity and their capacity to assimilate different nitrogenous substances. The morphological aspects, that vary within the *M.canis* isolates, were constant in the strains isolated from rabbits. A strain with particular features was isolated many times from the dogs and cats coming from the same breeder. In one case of pseudomycetoma, different isolates suggested the co-existence in animals of two different strains, one present on fur, the other responsible for deep lesions.

Morganti L., Tampieri M.P., Galuppi R., El Attar A.A.: *Caratteristiche enzimatiche di dermatofiti zoofili isolati nelle regioni del Canale di Suez e di Sianai (Egitto). Enzymatic activity of zoophilic dermatophytes from men and animals in the Suez canal and Sianai district.* Atti del 1° Congresso Nazionale della Federazione Italiana Micopatologia Umana ed Animale (F.I.M.U.A.), Firenze, 26-28 Novembre 1992, pag. 252.

A study on some enzymatic activity of zoophilic dermatophytes, was carried out to emphasize pathogenicity factors. Seventy-six strains of *Microsporium canis*, 15 of *Trichophyton mentagrophytes* and 127 of *T.verrucosum*, coming from humans and animals of the Suez

canal and Sianai district, were tested in relation to their hydrolytic activity on casein and gelatin and to ureasic activity. Analysis of variance was employed to compare the data obtained.

Morganti L., Tampieri M.P., Galuppi R., El Attar A.A.: Crescita di *Microsporium canis* e *Trichophyton mentagrophytes* a diverse temperature. *Growth of M.canis and T.mentagrophytes at different temperatures*. Atti del 1° Congresso Nazionale della Federazione Italiana di Micopatologia Umana e Animale (F.I.M.U.A.), Firenze 26-28 Novembre 1992, pag. 254.

Strains of *M.canis* from humans and animals and of *T. mentagrophytes* from ovine, were cultivated on Sabouraud dextrose agar at 25°, 30°, 37° and 40°C. The rate of growth for each isolate at every degree of temperature was recorded daily measuring the diameter of colonies. For putting the effect of the temperature on the growth of colonies in touch with species and host characteristic, analysis of variance and of covariance were used. Rate of growth is greater at 30°C whether *M. canis* or *T. mentagrophytes* strains.

Morganti L., Tampieri M.P., Vecchi G., Galuppi R.: Indagine sulla presenza di miceti in cloache ed ingluvies di piccioni torraioli (*Columba livia*, Gmelin 1789) della provincia di Bologna. *Survey on fungi in cloaca and crops of rock-pigeons (Columba livia, Gmelin 1789) of Bologna province*. Atti del 1° Congresso Nazionale della Federazione Italiana di Micopatologia Umana e Animale (F.I.M.U.A.), Firenze, 26-28 Novembre 1992, pag. 263.

The rock pigeon is an important reservoir of potentially pathogenic fungi for human. *Cryptococcus neoformans*, in a particular manner, is often agent of disease in AIDS affecting patients. For this reason 172 cloaca and 144 crops of rock pigeons were cultured on Shields- Ajello medium and examined for mycetes. *Aspergillus* spp., *Penicillium* spp. and 51 yeasts were find. *C.neoformans* was isolated from 1 ingluvies alone.

Morganti L.: Le aspergillosi in patologia animale. *Animal Aspergillosis*. Atti del 1° Congresso Nazionale della Federazione Italiana di Micopatologia Umana e Animale (F.I.M.U.A.), Firenze, 26-28 Novembre 1992, pag. 32.

The Author describes the different pathologies due to *Aspergillus* spp. in various species of susceptible animals.

Pampiglione S., Fioravanti M.L., Rubbini R., Calderan M., Della Sala S., Marchese G.: Ricerca parassitologica in molluschi gasteropodi e bivalvi della laguna di Venezia. *Parasitological survey of gastropods and bivalves in the Venice lagoon*. Atti Soc. Ital. Sci. Vet., 46, 1429, 1992.

A survey was carried out on 10,948 gastropods and 1,069 bivalves with the purpose of ascertaining a possible parasitological role in the aetiology of cases of dermatitis observed in people collecting molluscs in the Venice lagoon. The investigations revealed the presence of larval stages of digenean trematodes in *Cerithium vulgatum* (4.97%), *Cyclope neritea* (1.25%), *Nassarius reticulatus* (0.12%), *Tapes decussatus* (6.25%), *T. philip-*

pinarum (5.76%), *T. aureus* (4.86%). Furcocercariae morphologically related to *Cercaria nassa* Martin, 1945 were found in 3 *N. reticulatus*. These furcocercariae may be the cause of human dermatitis.

Pampiglione S., Misciali C., Fanti P.A., Negosanti M.: *Larva currens* persistente da 31 anni guarita con ivermectina. Larva currens present for 31 years recovered by Ivermectin. *Parassitologia*, 34 (suppl. 1), 145, 1992.

An autoctonomous case of *Larva currens* present for 31 years in a 76-year-old man, associated with *Strongyloides stercoralis* larvae in the stool, was observed in the province of Bologna (Northern Italy). A light impairment of cell-mediated immunity was present. Ivermectin cured the syndrome.

Pampiglione S., Pampiglione E., Di Stefano M.A.: Iperinfezione da *Strongyloides stercoralis* associata a manifestazioni encefalitiche. *Iperinfection by Strongyloides stercoralis associated with encephalitic symptoms*. *Parassitologia*, 34 (suppl. 1), 129, 1992.

A case of encephalitis in a 34-year-old woman from the Ivory Coast, is reported. Being the patient in coma, a broncho-aspirate, done for suspicious pulmonary TB, revealed filariform larvae of *Strongyloides stercoralis*. Albendazole provoked a dramatic improvement.

Pampiglione S., Schiavon S., Fioravanti M.L.: Miasi disseminata da *Cordylobia rodhaini* nell'uomo in Etiopia. *Human myiasis by Cordylobia rodhaini in Ethiopia*. *Parassitologia*, 4 (suppl. 1), 131, 1992.

Furuncular myiasis by *Cordylobia rodhaini* in a 61-year-old Italian technician working in a forest region of Illubabor (Ethiopia) is reported.

Pampiglione S., Schiavon S., Fioravanti M.L.: *Extensive furuncular myiasis due to Cordylobia rodhaini larvae*. *Br. J. Derm.*, 126, 418, 1992.

The Authors report a case of a patient who presented in Italy an extensive furuncular myiasis due to *Cordylobia rodhaini* larvae acquired while working in Ethiopia.

Pampiglione S., Schmid C., Montaperto C.: *Dirofilariasi umana: ritrovamento di femmina gravida di Dirofilaria repens in nodulo sottocutaneo*. *Human dirofilariasis associated with Dirofilaria repens gravid female in a subcutaneous nodule*. *Pathologica*, 84, 77, 1992.

A case of human dirofilariasis occurred in a 53-year-old woman from Scafati (Salerno province). It was localized in the left submammary region. The patient was operated 16 years ago for a papillary carcinoma of the thyroid. For this reason a metastasis was clinically suspected. The histological examination revealed the presence of a granulomatous nodule formed around a *Dirofilaria repens* gravid female in the subcutaneous tissue. The presence of microfilariae in the uterus of the nematode would suggest that also a

mature male was present at the same time in the patient, although it was not possible to localise it. Haematic eosinophilia was observed.

Piasentier E., Pietrobelli M., Tampieri M.P., Galuppi R., Susmel P.: Digeribilità e incremento ponderale in agnelloni parassitati sperimentalmente con strongili gastro-intestinali. *Digestibility and grew faster in hoggets experimentally infested with gastrointestinal nematodes*. Atti del 10° Congresso Internazionale della Società Italiana di Patologia e Allevamento degli Ovini e dei Caprini (S.I.P.A.O.C.), 4-7 giugno 1992, pag. 89.

Eleven 10-month-old Bergamasca hoggets were divided into 3 groups: one control group of 4 worm-free sheep and two groups of animals orally infested with a single dose of 15000 (4 hogs) or 21000 (3 hogs) gastrointestinal nematodes larvae. After two months, 4 hogs, 2 per initial infested group, received anthelmintic (Thiabendazole, 50 mg/kg). They were maintained indoors in individual cages and offered a mixed diet of pelleted lucerne meal and straw (88/12 D.M.) at 98 g kg LW 0.75 level of intake. Feed digestibility was determined during 7 day periods during weeks 3 and 8 after infection and during week 4 after anthelmintic. Fecal egg counts and LW were also determined at intervals. In comparison with the controls (54%) the organic matter digestibility was lower at the larval stage than at the adult parasitic stage (-1.4 percentage points). The controls and the treated hogs grew faster than infested sheep, but the LWG differences did not reach $P=0.05$.

Piccoli L., Capelli G., Galuppi R.: Sorveglianza epidemiologica sugli animali sinantropici della città di Venezia. *Epidemiological surveillance on sinantropic animals in Venice*. Atti del 16° Convegno Nazionale "Epidemiologia ambientale", Venezia 1-3 aprile 1992, pag. 101.

In order to evaluate the sanitary and economic impact of the erratic animal populations in the area of the ULSS 16, 228 sera of cats and 257 sera of pigeons were examined for toxoplasmosis and chlamydiosis. Over 325 cats were examined for dermatomycosis and all the pigeons for salmonellosis. Eighty seven cats (38%) resulted positive for toxoplasmosis and 5 (2%) for chlamydiosis; the following dermatomycetes were isolated from 82 cats (25%): *Microsporium canis* (21%), *M.gypseum* (0.6%) and *Trichophyton terrestre* (4%). Ninety pigeons (35%) were positive for chlamydiosis and 26 (10%) for toxoplasmosis. *Salmonella typhimurium* was isolated from the intestine of 2 pigeons (0.8%).

Poglayen G.: Coccidiosi dei carnivori: algoritmo diagnostico. *Carnivores coccidiosis: diagnostic algorism*. Obiettivi e Documenti Veterinari, 13, 76, 1992.

The outbreak of canine parvovirus as the new aethiologic agent must focus the attention of the clinician on coccidiosis diagnosis. The Author proposes a simple algorism, based on morphobiometrical, epidemiological and clinical features for the approach to the cat and dog coccidiosis.

Prosperi S., Giovannini A., Ostanello F., Rossi T.: Evaluation of the size of stray dog population and of related problems in Emilia-Romagna. *Ann. Ist. Super. Sanità*, 28, 485, 1992.

An investigation was carried out on the diffusion of stray dog populations in Emilia-Romagna by submitting a questionnaire/interview. 30 gamekeeper officers and 21 public veterinarians of the Bologna and Forli provinces were interviewed. The data collected were compared with the official data of the Health Council of the Emilia-Romagna Region. Statistical analysis confirmed a correlation between number of biting dogs and inhabitants of the province; number of captured dogs and registered dogs; number of biting dogs and owned dogs, and the existence of factors favouring dog straying in mountain areas.

Prosperi S.: La peste bovina: pericolo per l'Europa? *Rinderpest, an emergency for Europe*. Summa, 6, 23, 1992.

The Author analyses the risk of introducing Rinderpest in Italy, following its apparition in Turkey and Georgia; he describes the epidemiological features in the Countries where Rinderpest is endemic, the main clinical signs, the post-mortem lesions, how to send the samples to the laboratory, the most valuable diagnostic techniques. At last, he records prophylactic measures to follow in order to avoid the introduction of the disease in Europe.

Rivasi F., Fabio A., Canestri Trotti G., Pampiglione S.: Ricerca di *Pneumocystis carinii* e *Cryptosporidium* sp. in lavaggi bronco-alveolari: considerazioni epidemiologiche e diagnostiche. *Search of Pneumocystis carinii and Cryptosporidium sp. in bronchoalveolar lavages: epidemiologic and diagnostic considerations*. Parassitologia, 34 (suppl. 1), 106, 1992.

The bronchoalveolar lavage (BAL) of 117 patients suffering from different lung pathologies were cytologically examined in order to verify whether *Pneumocystis carinii* and *Cryptosporidium* sp. are present both in immunosuppressed and immunocompetent subjects. Seven AIDS patients were positive for *P. carinii*, no patients were positive for *Cryptosporidium* sp.

Susmel P., Pietrobelli M., Tampieri M.P., Piasentier E.: Observations sur la distribution et sur les repercussions des parasitoses chez les ovins transhumants du nord-est de l'Italie. *Observations on the distribution and effect of gastro-intestinal nematodes in transhumant sheep of the north-east of Italy*. Agricoltura, 213, 1992.

The Friuli Venezia-Giulia region still has about ten transhumant flocks of Bergamasca, Biellese and Lamon sheep. An examination of 101 faeces samples taken from 2 flocks in May and June 1989 revealed a very high percentage (98%) of positives for gastro-intestinal nematodes. Taking into account the characteristics of transhumant systems, anthelmintic treatment, in spring and autumn, are considered the most effective method for parasite control. The intake and digestibility of two rations (hay:concentrate ratio either 60:40 or 100:0 on a DM basis) fed in two consecutive 5 week periods was measured in 8 naturally infected wethers (*Haemonchus* 68.1%, *Oesophagostomum* 12.2%, *Ostertagia* 3.7%, *Trichostrongylus* 3.2%, *Oesophagostomum/Chabertia* 3.2%, *Strongyloides* 2.7%, *Nematodirus* 0.5%) subdivided into 2 groups with an average of 560 and 3760 EPG respectively and in 4 wethers treated with 50 mg/kg LW thiabendazole. The digestibility coefficients for DM and OM were not significantly affected by the anthelmintic treatment or

the EPG load. However the treated animals ate more DM in both rations (+6 g/kg LW 0.75) and grew faster (+75 g/day).

Tampieri M.P., Morganti L., Galuppi R., Maiani A.: Indagini sulla presenza di dermatofiti in allevamenti cunicoli di diverse provincie italiane. *Survey on dermatophytes in rabbit farms to various italian districts.* Atti 1° Congresso Nazionale della Federazione Italiana di Micopatologia Umana e Animale (F.I.M.U.A.), Firenze 26-28 novembre 1992, pag. 259.

Three hundred twenty one rabbits of different age, from 35 farms positive for dermatophytes, were examined. *Trichophyton mentagrophytes* was isolated from 242 (75.4%) rabbits and *Microsporum canis* from 51 (15.9%). In the rabbits, the lesions appeared, on the average, at 28th and at 26th day of age whereas the clinical recovery occurred spontaneously at 58th and at 41st day of age for *T.mentagrophytes* and *M.canis* respectively.

Tampieri M.P., Pietrobelli M.: *Hirstionyssus* sp. in marmotte (*Marmota marmota* L.) in Italia. *Hirstionyssus* sp. in marmots (*Marmota marmota* L.) in Italy. *Parassitologia*, 34 (suppl. 1), 209, 1992.

Mites of genus *Hirstionyssus* (Gamasida) are described, for the first time in Italy, in *Marmota marmota*.

Trentini M., Corni M.G. and Froglija C.: *The chromosomes of Carcinus mediterraneus Czerniavsky, 1884, Liocarcinus maculatus (Risso, 1827) and Necora puber (L., 1767) (Decapoda, Brachyura, Portunidae).* *Zool. Anz.*, 228, 39, 1992.

The mitotic and meiotic chromosomes of three species of crabs belonging to the family Portunidae were investigated. *Carcinus mediterraneus* (Mediterranean shore crab) presents $2n = 88$ and $n = 44$, *Liocarcinus maculatus* $2n = 80$, $n = 40$ and *Necora puber* (velvet swimcrab) $n = 48$. The chromosome number variation in Portunidae is discussed.

Trentini M., Marini M., Pampiglione S.: La puntura di *Scleroderma domesticum* (Hymenoptera, Bethyilidae). *The sting of Scleroderma domesticum (Hymenoptera, Bethyilidae).* *Biologia Oggi*, 6, 415, 1992.

Some cases of the sting of a parasitoid wasp, *Scleroderma domesticum* (Insecta, Hymenoptera, Bethyilidae), were reported. Besides the acute pain, the bite caused small local erythematous papules or urticarioid patches associated with intense itch. It is possible that similar skin lesions whose aetiology is not clear, are caused by this insect, in the Emilia Romagna region.

Trentini M., Marini M.: *Biologia di Chiracanthium punctorium (Villiers, 1789) e sua importanza medica (Araneae Clubionidae).* *Biology of Chiracanthium punctorium (Villiers, 1789) with reference to its medical importance (Aranea Clubionidae).* *Boll. Soc. Ent. Ital.*, 123, 179, 1992.

Some morphological and biological observations on the spider *Chiracanthium punctorium* are reported. The medical importance of this species with its occurrence in Italy is discussed.

Zanni M.L., Capucci L., Fabbi M., Giovannini S., Lavazza A., Tagliabue S., Poglayen G., Roda R., Tasselli A.: Programma di monitoraggio sanitario nella lepre (*Lepus europaeus*) in provincia di Ravenna. *A program for controlling the health status of the brown hare (Lepus europaeus) in the Ravenna province.* Sel. Vet., 33, 1103, 1992.

Preliminary results of a survey on the health status of hares at importation in the Ravenna province led the Authors to arrange a program for controlling the sanitary conditions of the animals of this species. The incidence of epidemic and zoonotic diseases such as, respectively, European Brown Hare Syndrome (EBHS) and tularemia, leptospirosis, brucellosis, and Lyme borreliosis will be determined. Moreover the presence of heavy metal residual products in organs (liver and kidney) and muscles as well as of parasitic infection of the lungs and gut will be verified. The aims are principally addressed to protect both the health status of human people, as well as the welfare of the hares.

1993

Baldelli R., Borello B., Di Francesco A., Fioravanti M.L., Sanguinetti V.: Ehrlichiosi canina: segnalazione di un focolaio in Emilia-Romagna. *An outbreak of canine ehrlichiosis in Emilia-Romagna.* Prog. Vet., 48 (12), 397, 1993.

The Authors describe the first outbreak of canine ehrlichiosis in Emilia-Romagna, which occurred in a dog-pound in the summer of 1991. Out of 250 dogs, 51 showed clinical symptoms attributed to ehrlichiosis. The diagnosis was confirmed by microscopic examinations and serological tests.

Baldelli R., Calistri P., Cavone D., Di Francesco A., Musti M.: Indagine sieroepidemiologica in addetti alla zootecnia ed all'agro-industria in Puglia. *A seroepidemiological survey in farm workers in Apulia: first results.* Proceedings of the 3th Meeting of the Mediterranean Federation for Ruminants Health and Production. Teramo (Italy), October 22-23 1993, 8.1.

In the framework of the project for an "Information system for zoonoses surveillance in the Mediterranean area", a study is being carried out to evaluate the risk factors associated with zoonoses. The authors report the first results of a serological investigation for some zoonoses in farm workers.

Battelli G., Guberti V., Poglayen G., Martini M., Pastorelli G.: Strongili intestinali degli equini: fenologia dell'emissione di uova in fattrici di un allevamento della provincia di Bologna. *Equine intestinal strongyles: phenology of egg outputs in mares from a farm of the province of Bologna (Italy).* Arch. Vet. Ital., 44, 55, 1993.

Thirty-eight trotter mares from a stud of the province of Bologna were monthly surveyed

(June 1990-May 1991) by quali-quantitative coprological examination for g.i. strongyles. Twenty-three animals were treated with ivermectin at foaling. In the course of the study only larvae of intestinal strongyles (*Cyathostominae* and *Strongylus vulgaris*) were identified. The egg outputs (mean vectors falling in April and at the 7th month of pregnancy) seem to be influenced mainly by the individual variability, and poorly by the rainfall.

Bortolotti U., Poglayen G., Prosperi S.: Cane e sanità pubblica. *Dog and public health*. Officina Grafica S. Matteo. S.Matteo della Decima (BO), 1993.

The booklet collects the public health experience realized on a dog population living in a rural area near Bologna (Italy). Particular attention was given to the collaboration with the Veterinary Public Services of the area that allowed the carrying out of various scientific approaches (7 specific papers with several Authors). They range from the problems connected with stray dogs and dog bites, to specific pathological characteristics of the involved area (Filariasis, intestinal parasites) with a special attention toward the zoonotic aspects of canine illnesses (Q fever, dermatophytes, rickettsiosis, leishmaniosis, toxocarosis). For the same pathology it was also possible to examine a group of dog owners.

Canestri Trotti G., Fioravanti M.L., Restani R., Rizzoli M.: Tetracotilosi in cavedani (*Leuciscus cephalus L.*) in provincia di Bologna. *Tetracotylosis in chubs (Leuciscus cephalus L.) in the Province of Bologna*. Bollettino della Società Italiana di Patologia Ittica, 13, 34, 1993.

A survey of the parasitic diseases of fish carried out in the Bologna province revealed the chubs introduced onto a fish producing farm in the upper basin of the Reno river harboured *Tetracotyle* sp., metacercariae of Strigeidae trematodes. The larvae were seen in a conspicuous number (80 to 300) in the pericardia of all specimens examined. Since the chubs were presumed to come from the Garda lake, future studies disclosed that such metacercariae were present also in other individuals from the above locality which were ready for new immersion in public waters.

Canestri Trotti G., Fioravanti M.L., Restani R.: *Some notes on anguillicolosis in Italy*. International Workshop "Anguillicola and Anguillicolosis of Eels", 5-7 October, Ceske Budejovice, Repubblica Ceca. Abstract published on: *Folia Parasitologica*, 40 (4), 321, 1993.

During 1987-91 the Authors have carried out a research on *Anguillicola crassus* and particularly on: 1) the epidemiology of the parasites in eels (*Anguilla anguilla*) from several Italian regions and foreign countries; 2) the therapy, testing several drugs and demonstrating the efficacy of levamisole, in water, at the dosage of 5 mg/l for 6 hours; 3) the life cycle, carrying out experimental infection of *Diacyclops bicuspidatus* (Copepoda, Cyclopidae) with second stage larvae and then of glass-eels with infected copepods; and 4) the effects of *A. crassus* in farmed eels by statistical evaluation of some biometrical indexes.

Capelli G., Poglayen G., Sorgi C., De Guelmi A., Gatti F.: Indagine coprologica e dinamica larvale di strongili gastrointestinali in bovini all'alpeggio: risultati preliminari. *Copro-*

logical survey and larval dynamic of gastrointestinal strongyles in highland grazing cattle: preliminary results. Atti Soc. Ital. Buiatria, 25, 355, 1993.

The results of a prophylactic program of parasitic diseases (first part) in young highland grazing cattle in the province of Trento (Italy) are reported. Prevalence rate for parasites was 96%. Gastrointestinal L3 (*Ostertagia* and *Cooperia*) are able to survive in a cold and long winter until the next grazing season; the antielmintic treatment applied once a year seems to act more efficiently on the emission of parasite eggs and on the availability of L3 on pasture than on prevalence. It is suggested a more rational therapeutic approach and the practice of annual pasture-resting in order to reduce the risk factor "grazing" in these parasitoses.

Fioravanti M.L., Zamperetti S., Sigovini G., Restani R., Gavaudan S.: Indagine sulla presenza e diffusione di larve anisakidi in specie ittiche di provenienza nazionale ed estera commercializzate presso il mercato ittico di Venezia. *Presence and spread of anisakidae larvae in fish commercialized at the Venice market.* Atti Soc. Ital. Sci. Vet., (29-30 settembre/1-2 ottobre, Riccione-FO), 47, 1993 (in press).

Two thousand and 782 fishes, belonging to 29 species and coming from 16 Countries, were examined. Anisakidae larvae were observed in 935 (34.1%) fishes.

Governatori M., Bulgarini C., Rivasi F., Pampiglione S.: *A new portable aspirator for culicidae and other winged insects.* J. Am. Mosq. Control Assoc., 9, 460, 1993.

A new type of portable aspirator is described. The aspirator uses as a suction device a fan that normally cools computers, in conjunction with other structural elements especially designed to cope with the greater suction power available. The device proved to be efficient, strong, light, easy to use and silent.

Martini M., Cavanna L., Proserpi S., Battelli G.: Modello di raccolta dati per la sorveglianza sanitaria degli allevamenti. *Surveillance in cattle herds: a model of data collection.* Obiettivi e Documenti Veterinari, 14, 57, 1993.

Data on the hygienic, structural and managerial features from 63 bovine herds of a Sanitary District of the Emilia Romagna Region (Italy) are presented and analyzed. The use of a special form for the veterinary surveillance is discussed. Particular attention was paid to the analysis of the methodological approach applied. By multivariate statistical methods are selected the herd characteristics associated with the presence of mammary and respiratory pathology, which resulted the main health problems. Purchase of animals and herd size seem to be the major risk factors for mastitis and respiratory diseases, respectively.

Nobile L., Virga A., Cameli A., Fioravanti M.L.: Indagine sulla presenza di elminti intestinali in cani della Sicilia occidentale. *Survey on the presence of intestinal helminths in dogs from West Sicily.* Atti Soc. Ital. Sci. Vet., (29-30 settembre/1-2 ottobre, Riccione-FO), 47, 1993 (in press).

During 1991, in the municipal kennels of Trapani, Mazara del Vallo (TP) and Castelvetrano (TP), 106 dogs were examined to individuate the presence of intestinal helminthes; 95 dogs were parasitized and they showed: *Dipylidium sp.* (Dilepididae) (71.5%), *Taenia hydatigena* (Taeniidae) (10.5%), *Mesocestoides lineatus* (Mesocestoididae) (12.6%), *Toxocara canis* (Anisakidae) (10.5%), *Toxascaris leonina* (Ascaridae) (2.1%) and *Uncinaria stenocephala* (Ancylostomatidae) (13.6%).

Pampiglione S., Bettoli V., Cestari G., Staffa M., Fioravanti M.L.: Miasi da *Cordylobia anthropophaga*: 7 casi su turisti italiani di ritorno dal Senegal. *Myiasis due to Cordylobia anthropophaga: 7 cases in Italian tourists from Senegal.* Ann. Ital. Dermatol. Clin. Sper., 47, 195, 1993.

The clinical, parasitological and epidemiological features of 7 cases of furuncular myiasis due to *Cordylobia anthropophaga* are described. The cases were contracted in Senegal by Italian tourists and the symptoms appeared a few days after their return to Italy. All the collected and identified larvae were of the second stage.

Pampiglione S., Fruttaldo L., Canestri Trotti G.: Dirofilariosi umana: estrazione del nematode vivente da nodulo del labbro superiore. *Human dirofilariasis: extraction of the living nematode from a nodule in the upper lip.* Pathologica, 85, 515, 1993.

Calabar swellings appearing on the head during two months in a 53-year-old man, were followed by the formation of a nodule 2x1 cm wide, in the upper lip. A mobile filiform, 12 cm long, nematode was recovered from the nodule. It was diagnosed as *Dirofilaria repens*. The region where the case occurred, is to be considered as one of the most affected areas by this parasitic zoonosis in Europe.

Pampiglione S., Garavelli P.L., Raschio E.: Dirofilariosi umana: estrazione del nematode vivente ubicato sotto la congiuntiva bulbare. Revisione dei casi oculari italiani. *Human dirofilariasis: extraction of the living nematode from the bulbar conjunctiva. Review of the Italian ocular cases.* G. Mal. Infett. Parassit., 45, 293, 1993.

In a 54-year-old woman, Calabar swellings on the face were followed 2 months later by acute pain in the right eye associated with the presence of a living nematode localised under the bulbar conjunctiva. The parasite was an adult female of *Dirofilaria repens*. This is the 22nd case of similar localization in Italy. A brief review of the 21 foregoing cases is reported.

Pampiglione S., Misciali C., Fanti P.A., Passarini B., Negosanti M.: *Persistent Larva currens treated with Ivermectin.* Eur. J. Dermatol., 3, 457, 1993.

A case of *Larva currens* in a 76-year-old man from Bologna (Northern Italy) was associated with *Strongyloides stercoralis* larvae in the stool, eosinophilia and increased total IgE. The multitest showed an impairment of cell mediated immunity. The disease had been present for 31 years. An Ivermectin treatment cured the cutaneous manifestations in 48 hours.

Peracca L., Battelli G., Martini M., Poglayen G.: Rischi da esposizioni ambientali: il contributo dell'epidemiologia veterinaria. *Risks from environmental exposure: the role of the veterinary epidemiology*. *Epid. Prev.*, 18, 8, 1993.

The role of the veterinary epidemiology in contributing to the evaluation and surveillance of risks from environmental exposure is discussed. These risks, depending on man-animal-environment relationships, are divided into the following categories: 1) risks for the animal populations (pets, farm, sinantropic and silvatic animals), correlated to the techniques of animal production and environment of life; 2) risks for the human population, correlated to the professional activities, environment and rule of life, and contacts with animals and their products; 3) risks for the environment, mainly correlated to the animal wastes and zootecnical industries. The need of the epidemiological approach for the identification and control of these risks is stressed.

Poglayen G., Zamboni P., Caprioli M.: *Passalurus ambiguus* a intenzivni chov králiku. *Passalurus ambiguus and intensive rabbit breeding*. Seminar: Patologie Králika a technologie králičiho chovu. Porádany dne 3. prosince 1993 v Kasejovicích (CZ).

The importance of the rabbit pinworm was stressed; its prevalence in breeding units of the Emilia Romagna region (Italy) reaches the value of 47% and of 11% among rabbits. A comparative trial between treated animals (Pyrantel, 25 mg/kg b.w. every 15 days) and control ones revealed the real weight of the worm presence: > life weight, > daily weight gain, reduction of feed intake, better feed conversion and better quality of the carcass represent the performances of treated rabbits.

Prosperi S., Ostanello F.: Encefalomieliti equine da virus EEE, WEE e VEE. *Equine encephalomyelitis (EEE, WEE, VEE)*. *Summa*, 1, 31, 1993.

The Authors describe the epidemiological features, the clinical signs, the post-mortem lesions, the laboratory diagnosis, the international prophylactic measures of equine encephalomyelitis (EEE, WEE, VEE). They analyse the risk of introducing the infections in Italy and the methods of control measures against equine encephalomyelitis.

Quaglio F., Tulli F., Fioravanti M.L., Pietrobelli M., Pellizzato M., Lanari D., Restani R.: Presenza di anellidi policheti in cappasanta (*Pecten jacobaeus*) nel nord Adriatico. *Presence of polychaetic annelids in scallop (Pecten jacobaeus L.) in the Northern Adriatic sea*. *Bollettino della Società Italiana di Patologia Ittica*, 13, 23, 1993.

42 scallops (*Pecten jacobaeus*) of 60.5–67.7 mm shell height, were examined during a rearing trial in suspended culture in the Gulf of Trieste. Wide burroughs replated with muddy debris were observed on the inner surface of both valves. They were present in 90.5% of the scallops examined. Polychaetes (Anellida) were detected inside the burroughs. Among the causes of scallop mortality, the parasite lesions should be considered.

Tampieri M.P., Morganti L., Galuppi R.: Indagini sulla presenza di dermatomiceti in cani della provincia di Bologna. *Survey on the presence of dermatophytes in dogs of the Bologna province*. *Cane e sanità pubblica, Regione Emilia-Romagna*, 61, 1993.

In order to estimate the matter of the dog as asymptomatic carrier of dermatophytosis, a survey on 971 dogs without cutaneous lesions in rural areas of the Bologna province was carried out. 2.4% (23 dogs) was positive for dermatophytes and just 3 dogs (0.3%) were asymptomatic carriers of *Microsporum canis*.

Trentini M., Corni M.G. e Tinti F.: Alcune osservazioni cariologiche su due popolazioni di *Mytilus galloprovincialis* Lamark dell'alto Adriatico (Mollusca, Bivalvia). *Karyological observations on two populations of Mytilus galloprovincialis Lamark coming from the North Adriatic Sea* (Mollusca, Bivalvia). *Biologia Oggi*, 7, 147, 1993.

The study examines, with the air-drying method and Ag-staining technique, the chromosomes of two populations of the Mediterranean mussel, *Mytilus galloprovincialis* coming from the North Adriatic Sea: one cultivated near the Bellaria coast, another wild near the Cesenatico coast. The karyotypes ($2n = 28$) of these two populations show a similar pattern consisting of 6 metacentric pairs and 8 submetacentric or subtelocentric pairs. The results of this study, compared with those obtained from literature, do not support the existence of a chromosomal difference between *M. galloprovincialis* and *M. edulis*.

Trentini M., Marini M. e Falica M.: Ragni italiani di interesse medico: alcune osservazioni su *Latrodectus tredecimguttatus* e *Chiracanthium punctorium* (Arachnida, Aranaea). *Italian spiders of medical importance: some observations on Latrodectus tredecimguttatus and Chiracanthium punctorium* (Arachnida, Aranaea). *Biologia Oggi*, 7, 125, 1993.

This study examines the spiders of medical importance living in Italy, with special reference to the species *Latrodectus tredecimguttatus* and *Chiracanthium punctorium*. The geographic distribution of these two species, in relation also to their biological characteristics, is described.

Trentini M.: Ritrovamento di *Craspedacusta sowerbyi* (Coelenterata, Hydrozoa, Limnomedusae) nella vallata del fiume Foglia (provincia di Pesaro). *Discovery of Craspedacusta sowerbyi* (Coelenterata, Hydrozoa, Limnomedusae) in the valley of the Foglia river (province of Pesaro). *Quad. Studi Nat. Romagna*, 2, 51, 1993.

The Author reports the presence of the freshwater jellyfish, *Craspedacusta sowerbyi* Lankester 1880 (Coelenterata, Hydrozoa, Limnomedusae), in a small lake adjacent to the Foglia river near the Schieti village (province of Pesaro).

Virga A., Canestri Trotti G., Nobile L., Pampiglione S.: Ectoparassiti di roditori selvatici nella Sicilia occidentale. *Ectoparasites of wild rodents in Western Sicily*. *Atti Soc. Ital. Sci. Vet.*, 47, 1447, 1993.

In some municipalities of Western Sicily 100 wild rodents were examined for ectoparasites during 1991-92. We found *Polyplax spinulosa* in *Rattus rattus frugivorus*, *Apodemus sylvaticus* and *R. norvegicus*; *Leptopsylla segnis* in *R. rattus frugivorus* and *A. sylvaticus*; *Nosopsyllus fasciatus* in *R. rattus frugivorus*; *Laelaps achidninus* in *R. rattus frugivorus*, *R. norvegicus* and *A. sylvaticus*; *Ornithonissus bacoti* in *R. rattus frugivorus*.

Andreucci A., Canestri Trotti G., Fioravanti M.L., Giani G., Nobile L., Restani R., Rizzoli M.: Indagine sulla diffusione di *Clinostomum complanatum* (Trematoda: Digenea) nella ittiofauna della provincia di Bologna. *Survey on the spread of Clinostomum complanatum (Trematoda: Digenea) in the ichthiofauna of the Bologna province*. *Biologia Oggi*, 8, 27, 1994.

During 1990, fishermen of the Bologna province were alarmed by the very frequent capture of barbels and chubs harbouring metacercariae of *Clinostomum* sp. A parasitological survey showed the presence of metacercariae of *C. complanatum* in 21 out of 42 *Barbus barbus* (barbel), in 76 out of 349 *Leuciscus cephalus* (chub) and in 1 out of 1 *Chondrostoma toxostoma*. The parasite was absent in other 8 species of examined fishes. Adults of the same parasite were found in 4 out of 5 *Ardea cinerea* and 1 out of 1 *A. purpurea*.

Ansuini A., Morganti L., Sanguinetti V., Perini S., Fabbi M., Guadagnini P.F., Zavanella M., Minelli F., Morelli R., Caprioli A.: Caratterizzazione di ceppi di *Escherichia coli* isolati da suini con diarrea o malattia degli edemi in allevamenti della pianura padana. *Characterization of E. coli strains from pigs with diarrhea or edema disease in Italy*. *Sel. Vet.*, 35 (1), 1, 1994.

E. coli strains from 217 pigs with diarrhea or edema disease were characterized by serotyping and production of haemolysin (Hly), heat labile enterotoxin (LT), verocytotoxin (VT), cytotoxic necrotizing factor (CNF) and K88 adhesin. Strains were collected from April 1991 through April 1992 from 140 different herds in Northern Italy. Hly was produced by 90% of isolates. The commonest phenotype among isolates from pigs with either neonatal or post-weaning diarrhea was O149, Hly+, K88+, LT+. Seventy-seven per cent of *E. coli* strains from edema disease produced VT (VTEC) and most of them belonged to serogroups O139 and O141. The antimicrobial susceptibility of VT-producing strains was tested by the disc diffusion method. Most of them were resistant to sulphadiazine, tetracycline and streptomycin. This study indicates that a limited number of *E. coli* serogroups is responsible for most of the colibacillosis episodes in Italian herds. This finding could provide the basic knowledge to prepare effective vaccines against the different types of swine colibacillosis.

Baldelli R., Di Francesco A., Caria M., Lai M., Steri G.: Ehrlichiosi canina: segnalazione di alcuni casi in Sardegna. *Canine ehrlichiosis in Sardinia*. *Prog. Vet.*, 49 (18), 585, 1994.

The Authors report ehrlichiosis in five dogs in Sardinia. Clinical symptoms are described; the results of haematological and serological examinations and of tetracycline therapy are reported.

Baldelli R., Di Francesco A., Galuppi R., Leardini F., Piccari C., Stegagno G., Tagliavini M., Morganti L., Tampieri M.L.: Rapporto uomo-animale da compagnia: attività dei Servizi Veterinari in una USL della regione Emilia-Romagna. *Man/pet relations: the activities of the Veterinary Service in a Local Health Unit of Emilia-Romagna*. *Prog. Vet.*, 49 (7), 220, 1994.

In the framework of the problems associated with animals in urban areas, a study to determine the presence of mainly zoonotic infections was carried out on dogs and cats. Owned dogs, owned and stray cats were tested for the presence of intestinal parasites and dermatophytes. The dog sera were also examined for the presence of antibodies against *Rickettsia conorii* and *Leishmania infantum*. The results showed a low prevalence of intestinal parasites and confirmed both the diffusion of *Microsporium canis* among cat populations and the high prevalence of *R. conorii* antibodies in dogs. One dog resulted positive for leishmania antibodies. It was emphasized that continuous surveillance for leishmaniosis must be carried out.

Battelli G., Guberti V., Martini M.: *Trichinellosis control in Italy: considerations on sampling in imported horses and their meat.* In: Campbell W.C., Pozio E., Bruschi F. (Eds.): *Trichinellosis. Proceedings of the Eighth International Conference on Trichinellosis, Orvieto 7-10 September 1993.* Istituto Superiore di Sanità Press, Rome 1994, pag. 593.

The criteria on which the trichinellosis control of slaughter horses and their meats, imported from eastern Europe, is based in Italy, is analyzed and discussed. The control is based on microscopic examination of samples from 20% of horses or meat pieces forming each stock at destination. This sampling intensity does not take into account the number of units of the stocks, the expected level of infection, and the desired confidence limit. On the basis of official data and relevant literature, the highest prevalence in imported horses may be hypothesized to be 0.1%. Even if this clearly excessive prevalence is considered real, the present sampling intensity has to be considered unreliable. Therefore, according to the epidemiological situation and horse import and consumption, it seems advisable that controls either should involve all the units of any origin or should not be carried out.

Battelli G., Martini M., Guberti V.: *Surveys of parasitic diseases: some considerations on sampling.* *Parassitologia*, 36 (Suppl. 1), 14, 1994.

Health surveys usually involve counting members of a group of units and measuring their characteristics such as disease prevalence. These surveys can be conducted properly only when parameters and data required to determine sample sizes are known. The main are: 1) the aim and type of survey and sampling; 2) the expected disease prevalence and the size of the population investigated; 3) the desired confidence level and absolute precision; 4) the accuracy of diagnostic tests. Some considerations are made on the above points. The importance of the use of appropriate sampling methodology in parasitic diseases survey and surveillance programmes is stressed.

Canestri Trotti G., Fioravanti M.L., Patarnello P.P., Restani R.: *Capsule branchiali da trematodi Didymozoidae in cernie (*Epinephelus guaza*) (Perciformes: Serranidae) dell'Adriatico meridionale. Branchial capsules by trematodes Didymozoidae in groupers (*Epinephelus guaza*) from the South Adriatic sea.* *Parassitologia*, 36 (suppl. 1), 26. 1994.

Forty *Epinephelus guaza* and 35 *E. alexandrinus* fishes during 1993 along the Adriatic coast from Otranto to S. Maria di Leuca (Apulia) were examined for gill parasites. Thirtyfive out of 40 *E. guaza* proved positive for parasitic capsules (1/5 for fish) while all

the subjects of *E. alexandrinus* were negative. The characteristics of the parasites allow us to attribute them to the family Didymozoidae; they are partially referable to the genera *Gonapodasmius* Ishii, 1935 and *Indoglomeritrema* Madhavi & Hanumantha, 1983.

Canestri Trotti G., Giannetto S., Pampiglione S.: *Scanning electron microscopy of Pseudamphistomum truncatum (Trematoda, Opisthorchidae)*. *Parassitologia*, 36 (suppl. 1), 28, 1994.

The morphology of *Pseudamphistomum truncatum*, a cat parasite rarely found in Italy, was studied by SEM and described.

Eleni C., Borello B., Fioravanti M.L., Pampiglione S.: *Hepatozoon canis* in un focolaio di ehrlichiosi canina in provincia di Bologna. *Hepatozoon canis in an outbreak of canine ehrlichiosis in the province of Bologna (Italy)*. *Summa*, 11 (6), 57, 1994.

The occasionally report of *Hepatozoon canis* (Apicomplexa, Haemogregarinidae) is noticed in the tissues of 4 autopsied dogs coming from the kennel of Imola (Bologna) and showing clinical signs of ehrlichiosis. The anatomo-histopathological findings were to be related to ehrlichiosis, also because of the low pathogenicity referred to *H. canis*.

Fioravanti M.L., Canestri Trotti G., Giannetto S., Restani R.: *Gill and skin infection by Sphaerospora sp. in Carassius auratus: light and scanning electron microscopy of the spore*. *Parassitologia*, 36 (suppl. 1), 58, 1994.

A case of gill and skin infection caused by *Sphaerospora* sp. is reported for the first time in the goldfish (*Carassius auratus*) from Italy. Histological examination of the skin showed the presence of the sphaerospores in the epidermis with extended atrophic areas. Some sphaerospores showing the same morphology were also observed in the liver and kidneys.

Galuppi R., Cappellaro H., Fioravanti M.L., Tampieri M.P.: *Ittiofonosi in trote iridee (Oncorhynchus mykiss) d'allevamento: osservazioni sull'agente eziologico nell'ospite e in vitro. Ichthyophonosis in farm rainbow trouts (O. mykiss): study on the ethiological agent in the host and in vitro*. *Parassitologia*, 36 (suppl. 1), 63, 1994.

Thirty 13.5-21.5 cm rainbow trouts from a farm in Central Italy, showing exophthalmus, erosive lesions in the skin, swollen kidney and small whitish granules in the internal organs, were examined. Many cysts (average diameter: 129.6 μ m; SD= 39.4) referred to *Ichthyophonus hoferi* (Plehn & Muslow, 1911) were microscopically observed. The resting spores were cultured either in liquid and solid media; the germinated spores showed short branched hyphae with bulbous tips or "daughter" spores. The isolation and growth of *I. hoferi* in vitro are reported for the first time in Italy.

Galuppi R., Morganti L., Tampieri M.P., Zanoni R.: *Caratteristiche differenziali di due ceppi di Microsporium canis isolati in un gatto da pelo e derma. Differential features of two*

strains of *M.canis* from hair and derma of one cat. Abstract 2° Congresso Nazionale della Federazione Italiana di Micopatologia Umana e Animale (F.I.M.U.A.), Torino 10-12 Novembre 1994.

Two strains of *M.canis* were isolated from a short haired cat with pseudomycetoma. These two strains and two strains of *M.canis* from a cat and a dog with typical ringworm, were morphologically examined and tested for hydrolytic activity on tyrosine, casein, elastin and urea, to rate of growth at different temperature and to mating-type. The strain isolated from pseudomycetoma exhibits peculiar characteristics.

Galuppi R.: Tecniche diagnostiche nelle malattie micotiche. *Laboratory methods in mycotic diseases*. Bollettino della Società Italiana di Patologia Ittica, 14, 17, 1994.

The main laboratory methods for the diagnosis of mycotic diseases are reported. Direct microscopical examination, isolation and identification of fungal coltures are explained. At last a short description of some methods for the isolation of fungi responsible for saprolegniosis, branchiomycosis and ichthyophonosis is given.

Giannetto S., Pampiglione S.: Scanning electron microscopical differentiation of dog microfilariae. *Parassitologia*, 36(suppl.1), 72, 1994.

The zoonotic relevance of some species of *Dirofilaria* is increasingly recognized. We therefore studied the commonest dog microfilariae in our Country: *Dirofilaria immitis*, *D. repens* and *Dipetalonema reconditum*. On the basis of our observations, it can be concluded that SEM is a suitable tool for discriminating the 3 species, even from simple observations of the cuticle and the cephalic end. This research could be an useful alternative in providing sure identification criteria compared to other difficult methods.

Martini M., Baldelli R., Paulucci de Calboli L.: An epidemiological Study on *Q* fever in the Emilia Romagna Region, Italy. *Zbl. Bakt.*, 280, 416, 1994.

A serological survey was carried out in cattle from an Apenninic area of the Emilia Romagna Region (Italy) in order to assess the prevalence and to analyze the epidemiology of *Coxiella burnetii* infection. The complement fixation test was performed on 711 animals from 99 herds. The prevalence of the infection was of 13.1% with respect to the herds and of 4.4% with respect to the animals. The positive titres ranged from 1:8 to 1:256. Significant differences in positivity were found between animals of different age and breed and between animals from herds of different types of production and management. The infection seems to be associated with infertility and influenced by replacement from the outside.

Morganti L., Tampieri M.P., Galuppi R., El Attar A.A., Monaldi L.: Comportamento sessuale di *Microsporium canis* (= *Arthroderma otae*). *Sexual behaviour of Microsporium canis* (= *Arthroderma otae*). *Micologia Dermatologica*, 8 (1), 3, 1994.

Microsporium canis, the main agent of dermatophylic infection in dogs and cats, causes a

broad range of clinical forms in the host animal, including the asymptomatic varieties most frequent in cats, the typical ring-shaped lesions, marked and sometimes total alopecia, and even pseudomycetoma-like deep lesions. In this study we tested 282 strains of *M. canis* isolated in different hosts (dogs, cats, humans, etc.) from various parts of Italy and Egypt (Suez Canal and Sianai regions) to determine mating types. Whenever possible we tried to correlate the different pathogenicity of strains with the mating type (+o-) or according to reaction capacity to the mating type tests.

Nobile L., Fioravanti M.L., Virga A., Canestri Trotti G.: Aggiornamento alla fauna ixodologica della Sicilia. Nota II. *Revision of ixodological fauna in Sicily. Note II.* Atti Soc. Ital. Sci. Vet., (28 settembre-1 ottobre, Giardini Naxos-Me), 48, 1994 (in press).

During a research on ixodological fauna in Sicily, the Authors identified 2312 ticks found in Palermo, Agrigento and Trapani provinces during the years 1988-1992. In order of frequency were found: *Rhipicephalus sanguineus* (1251), *R. bursa* (663), *Hyalomma marginatum* (374), *Dermacentor marginatus* (13), *R. turanicus* (6), *Boophilus annulatus* (5). *R. turanicus* was collected in the Agrigento province for the first time, as well as *B. annulatus* in the Trapani province. *R. turanicus* in the horse is reported for the first time in Italy.

Nobile L., Giannetto S., Trentini M., Canestri Trotti G., Restani R.: Indagine sulla diffusione di *Branchiobdella* spp. (Annelida, Branchiobdellidae) in gamberi d'acqua dolce (*Austropotamobius pallipes italicus*) dell'appennino toscano-emiliano. *Survey of the diffusion of Branchiobdella spp. (Annelida, Branchiobdellidae) in freshwater crayfishes (Austropotamobius pallipes italicus) from rivers of Toscana and Emilia-Romagna.* Bollettino della Società Italiana di Patologia Ittica, 16, 26, 1994.

During 1992-1994 a survey was undertaken of the diffusion of *Branchiobdella* spp. (Annelida, Branchiobdellidae) in the freshwater crayfish (*Austropotamobius pallipes italicus*) from 6 rivers (Bidente, Rio Meraviglia, Rovigo, Santerno, Venola and Zena) of Toscana and Emilia-Romagna. Sixty-three (87.5%) out of 72 freshwater crayfishes examined were parasitized, in order of frequency, by: *B. pentodonta italica* (283 specimens), *B. parasita* (32 specimens) e *B. hexodontia* (19 specimens).

Pampiglione S., Arlotta M.R., Carlà T.G., D'Ambrosio E., Filotico R., Primiceri O., Ve-trugno M.: La dirofilariosi umana nel sud d'Italia. I: Regione Puglia. *The human dirofilariosis in Southern Italy. I: Apulia Region.* Pathologica, 86, 528, 1994.

Nine new cases of human dirofilariosis by *Dirofilaria repens* in subjects living in Apulia, aged 30 to 60 years, are reported. Six were subcutaneous and 3 subconjunctival.

Pampiglione S., Bosi F., Maconi A.G., Meriggi F., Remotti F., Scaglia M.: *Pulmonary Dirofilariosis: clinical and parasitological findings of a new human case.* G. Ital. Mal. Torace, 48, 1, 1994.

We describe a fourth Italian case of human pulmonary dirofilariosis in a 61-year-old woman. The parasite was an immature *Dirofilaria* sp., located inside and occluding the

lumen of a pulmonary arteriole. The symptoms consisted in non-productive cough, intermittent pain and itching localized electively to the back.

Pampiglione S., Brolo A., Giurissa A., Canestri Trotti G.: *Zoonotic filaria of possible american origin in Italy.* *Parassitologia*, 36, 533, 1994.

From a 31-year-old man, resident in Monfalcone (Venezia Giulia) a nodule in the right temporal region was surgically removed, in January 1992 a filiform living nematode. On the basis of the morphological characters, the nematode proved to be *Dirofilaria* sp subgenus *Nochtiella*, but the exact species was not possible to define. The medical history indicated that the patient had spent the last summer in Florida.

Pampiglione S., Canestri Trotti G., De Santolo G.P., Fabbri F., Garavelli P.L., Mastinu A., Rivasi F., Schmid C.: *Dirofilariasi sottocutanea umana: 8 nuovi casi in Italia settentrionale.* *Human subcutaneous dirofilariasis: 8 new cases in northern Italy.* *Pathologica*, 86, 396, 1994.

Eight new cases of human *Dirofilariasis* in people living in northern Italy were recorded. All the patients were adult, 42 to 66 years old, 4 men and 4 women. The localization of the nematode in all cases was subcutaneous.

Pampiglione S., Canestri Trotti G., Rivasi F.: *Dirofilaria repens nell'uomo in Italia.* *Dirofilaria repens in man in Italy.* *Biologia Oggi*, 8, 69, 1994.

Human filariasis generally relate to exotic pathology, but one of them is zoonotic and autochthonous in Italy. It is caused by *Dirofilaria repens*, filaria specific for dog, which is endemic in many regions in Italy and transmitted by mosquitoes living in temperate zones. Our scientific team has studied 40 cases from a total of 118 cases described in Italy. Further important information about this zoonosis, almost unknown amongst most physicians and biologists, can be obtained from a detailed analysis of the cases we have studied as well as the other Italian cases.

Pampiglione S., Del Maschio O., Pagan V., Rivasi F.: *Pulmonary Dirofilariasis in man: a new case. Review of the european literature.* *Parasite*, 1, 379, 1994.

In June 1991 a 62-year-old retired man was suddenly affected by dyspnoea. X ray and CT control detected a coin lesion in the lung. The lesion was surgically removed. Histological examination revealed the presence of a nematode inside an arteriole which had provoked a small infarct in the pulmonary tissue. The parasite presented marked regressive phenomena that made an accurate morphological analysis impossible. However, in the light of certain details of the cuticle, and by analogy with four similar cases occurring in northern Italy, the aetiologic agent was thought to be *Dirofilaria (N.) repens*. Over all 10 cases of human pulmonary dirofilariasis were reported in Europe: five in Italy, two in Germany, two in Spain and one in U.S.A. in a man who previously visited Italy.

Pampiglione S., Gallippi G., Giannotta G., Iuele R.: La dirofilariosi umana nel sud d'Italia. II: Regione Calabria. *The human dirofilariasis in Southern Italy. II: Calabria Region.* Pathologica, 86, 533, 1994.

A new case of subcutaneous human dirofilariasis, in a 42-year-old woman from the province of Cosenza, is described. In a collateral research on dogs in different areas of the same province, microfilariae of *Dirofilaria repens* in two out of 134 individuals were detected.

Pampiglione S., Giannetto S.: Evidence of alae in *Aelurostrongylus abstrusus* larvae examined by scanning electron microscope (SEM). Parasite, 1, 177, 1994.

Aelurostrongylus abstrusus larvae lateral alae, previously noticed in cat lung sections, are described by SEM in larvae found in the faeces of an infected cat.

Poglayen G., Roda R., Zanni M.L., Amendola B., Pepa M.: Parassiti dell'apparato digerente della lepre (*Lepus europaeus*) nelle province di Bologna e Bolzano. *Brown hare (Lepus europaeus) gastro-intestinal parasites in the provinces of Bologna and Bolzano (Italy).* Sel. Vet., 35, 19, 1994.

The gastro-intestinal parasitic fauna was compared between two groups of brown hares shot in the provinces of Bologna (n = 39) and Bolzano (n = 17) in northern Italy. Four species of helminths were found in Bolzano (*Trichostrongylus retortaeformis*, with a prevalence value of 85%, *Trichuris leporis* 6%, *Passalurus ambiguus* and *Andrya cuniculi*, 1%) and three in Bologna (*T. retortaeformis*, 92%, *P. ambiguus* and *A. cuniculi*, 10.5%). Moreover the coprological test gave us information on coccidia prevalence (53% in Bolzano and 92% in Bologna), and thus evaluating the coprological tool in terms of Se (91%) and Sp (60%) for *T. retortaeformis*. For each species were calculated the epidemiological parameters, according to Margolis et al. (1982) and the frequency distribution. The composition of biocenosis and the single species weight were also investigated.

Prosperi S., Martinello F.: Anemia infettiva degli equini. *Equine Infectious Anaemia.* Ippologia, 5, 77, 1994.

A concise review has been made of Equine Infectious Anaemia in the light of the most recent knowledge, with special reference to aetiological, epidemiological, clinical, diagnostic and preventive aspects. The Italian situation is also discussed with regard to this disease for which it would be desirable to bring up to date the current health regulations.

Prosperi S., Meliota F.; Ostanello F., Callegari V.: Valutazione sperimentale di vaccini inattivati contro la malattia di Aujeszky nel suino. *Experimental trials of inactivated vaccines for Aujeszky's disease in swine.* Vet. Ital., 30, 18, 1994.

Three Aujeszky's disease inactivated gI-vaccines (glycoprotein-deleted) were clinically tested in 34 pigs. A monovalent vaccine (gI-AyV strain, aluminium hydroxide adjuvant) was compared with another vaccine sharing similar characteristics but containing also

subtypes H1N1 and H3N2 of swine influenza virus, and a monovalent gI-AyV strain vaccine in oil emulsion was compared with a commercial gI-Philaxia strain vaccine. The efficacy was evaluated according to the following parameters: symptomatology, weight gain, reisolation of the challenge virus, serological response. The three vaccines tested proved efficient in reducing the losses associated with the disease and may be a profitable help in Aujeszky's disease eradication campaigns in that they allow infected animals to be distinguished from vaccinated ones.

Prosperi S., Ostanello F., Baldelli R., Falcone A.: Ruolo del cane nell'epidemiologia della brucellosi ovi-caprina. *The role of the dog in the epidemiology of ovine brucellosis.* Vet. Ital., 30, 2, 1994.

In order to assess the role of the dog in the epidemiology of sheep and goat brucellosis, a serological investigation was performed in shepherd dogs belonging to both infected and non-infected flocks. 131 sera were tested from dogs attending 43 flocks in the provinces of Bologna, Chieti, Campobasso. Slow agglutination (SAT) and complement fixation tests (CFT) were used to detect *Brucella abortus* antibodies, and fast agglutination test (FAT) was used for *B.canis*. 90 dogs proved positive to SAT, 15 to CFT, and only 4 were CFT-positive (*B.canis*). A statistically significant correlation was observed among dogs' age, their belonging to infected flocks and SAT positivity. The difference between SAT antibody titres and belonging to flocks with differing health status was also significant. According to these results, the Authors believe that the dog may become infected only occasionally with *B.abortus* and *B.melitensis*, thus representing only an epiphenomenon in the epidemiology of sheep and goat infection.

Rivasi F., Biglieri E., Canestri Trotti G., Pampiglione S.: A survey of *Enterobius sp.* from the Modena province. *Parassitologia*, 36 (suppl. 1), 124, 1994.

A Scotch tape-test survey of *Enterobius sp.* in children 3 to 5 years old from kinder-gardens of towns in the Modena province during the years 1988/1993 gave as a result a prevalence of 9.2%. Both *Enterobius vermicularis* and *E. gregorii* adults were observed in faeces from positive children treated with an anthelmintic.

Ruggeri L., Fanti P., Pampiglione S.: Lotta integrata per il controllo muscidico in zootecnia. *Integrated pest management in livestock production.* *Parassitologia*, 36 (suppl. 1), 129, 1994.

The widespread use of pesticide for the control of *Musca domestica* and other synantropic flies in livestock and poultry production systems involves many undesirable side effects. Moreover, the greater awareness of ecology and environment in relation to agricultural production has stimulated the development of Integrated Pest Management (IPM) programs for muscoid flies control. The purpose of this communication is to provide a first link between parasitologists and entomologists interested in the veterinary and medical topics related to *M. domestica*.

Sanguinetti V., Galuppi R., Capitani O., Pigato M., Tampieri M.P.: Isolamento di *Trichosporon beigeli* dalle cavità nasali di due cani. *Isolation of T. beigeli from nasal cavity.*

two dogs. Abstract 2° Congresso Nazionale della Federazione Italiana di Micopatologia Umana e Animale (F.I.M.U.A.), Torino, 10-12 novembre 1994.

The Authors describe the isolation of *T. beigeli* from the nasal cavities of two dogs. In one case the treatment with itraconazole was efficient.

Tampieri M.P., Morganti L., Martini M., Galuppi R.: Dermatofitosi: tre anni di attività del laboratorio di micologia. *Dermatophytosis: three years of work in the Mycological Laboratory*. Micologia Dermatologica, 8 (1), 15, 1994, 1° Congresso Nazionale della Federazione Italiana di Micopatologia Umana e Animale (F.I.M.U.A.), Firenze 26- 28 novembre, 1992, pag. 258.

The results of epidemiological analysis of data obtained from diagnostic activity of the Veterinary Mycological Laboratory in the triennium 1989-1991 are given. In this period, 1839 cats and 800 dogs were examined; *Microsporum canis* was found respectively from 612 cats and 106 dogs. The recovery of *M.canis* was analysed with respect to race, sex, age of the hosts, the season, the antimycotic therapy and to the presence of lesions in animals and/or their owners.

Tampieri M.P., Pietrobelli M., Galuppi R., Rumiz G., Vasumi G.: Setariosi bovina: osservazioni preliminari in un allevamento del Friuli Venezia Giulia. *Bovine setariosis: preliminary surveys in a farm of the Friuli Venezia Giulia region*. Parassitologia, 36 (suppl. 1), 143, 1994.

Blood samples from 407 bovines were examined for microfilariae, 143 (35.1%) were positive. The prevalence was significantly correlated with the age of animals. In cows it was lower (23.9%) than in young animals (46.1%). Blood microfilariae (N 210) and adult parasites (6 females) were identified as *Setaria labiatopapillosa*. This is the first report of Setariosis in cattle from Friuli Venezia Giulia.

Tampieri M.P.: Conoscenze attuali sulla micopatologia ittica. *Present knowledge in fishing mycopathology*. Bollettino della Società Italiana di Patologia Ittica, 14, 2, 1994.

Mycotic diseases had always aroused a little interest in fishing pathology, but in many works remarkable productive damage has been described in all stages of fish biological cycle: eggs hatchlings, fry, fingerlings and adults. In this work the main causes of mycology delay, compared to parasitology and bacteriology, are explained. After fungi classification and description of diseases (dermatomycoses, vascular mycoses or branchiomycoses, deep mycoses), a review of the present knowledge on principal mycoses (saprolegniosis, branchiomycosis and ichtyophonusis) is made. Etiology, epidemiology and pathology are discussed for each disease. At last the still inadequate knowledge on a few distinctive of these diseases is pointed out. A reference laboratory for fishing mycology is proposed for Italy.

Trentini M., Canestri Trotti G.: Lesioni pruriginose nell'uomo associate a *Limothrips cerealium* (Insecta, Thysanoptera). *Human skin irritations caused from Limothrips cerealium* (Insecta, Thysanoptera). Biologia Oggi, 8, 137, 1994.

Some cases of skin irritation, caused from *Limothrips cerealium* (Insecta, Thysanoptera, Thripidae), were reported. The presence of thrips and their ability to slip into the clothes caused widespread itch, especially on the abdomen; sometimes small red lesions and ocular irritations appear. The symptoms can persist some days.

Trentini M., Marini M.: Distribuzione in Italia di *Latrodectus tredecimguttatus* Rossi 1790 (Araneae, Theridiidae). *Distribution of Latrodectus tredecimguttatus Rossi 1790 (Araneae, Theridiidae) in Italy*. *Parassitologia* 36 (Suppl. 1), 145, 1994.

The geographic distribution in Italy of *Latrodectus tredecimguttatus* Rossi 1790 (Araneae, Theridiidae) is described, in relation also to its biological characteristics. *Latrodectus tredecimguttatus* is the most dangerous spider species to humans in South Europe. The map shows the presence of *L. tredecimguttatus* in Italy on the ground of: 1) the black widow findings and the human bites reported by the literature, 2) some unpublished data obtained from the study of arachnological collections. Our observations indicate that *L. tredecimguttatus* prefers to live in uncultivated lands and pastures of regions with a warm temperate climate. The species is very localized. Where it is present it can be common. The Italian black widow is a non aggressive spider and only bites if provoked or squeezed.

Trentini M., Marini M.: *First case of sting to the man from a parasitoid wasp, Allepyris microneurus* Kieff. 1906 (Hymenoptera, Bethyridae) in Northern Italy. *Parassitologia* 36 (Suppl. 1), 146, 1994.

The Bethyridae are ant-like insect that usually paralyze the larvae of Coleoptera with their sting and lay the egg on the outside of the host. They can sometimes inflict to the man a painful bite, that causes a small local erythematous papule associated with intense itch. The species of greater medical interest are *Scleroderma domesticum*, *S. abdominalis* and *Cephalonomia benoiti*. We report the first case of sting to the man from *Allepyris microneurus*. A 14-year old student, living in Ozzano Emilia (Bologna), was painfully stung from a small and quick insect on the right arm beneath his shirt, while sitting on his bed. Besides the acute pain, the bite caused a slightly raised red spot associated with intense itch, similar to the bite of a mosquito. The minute wasp was identified as *Allepyris microneurus* Kieff. 1906 (Hymenoptera, Bethyridae), species not yet reported as stinging man. At last it is possible that some similar skin lesions whose aetiology is not clear, are caused by this insect.

Trentini M., Pampiglione S., Marini M. e Fioravanti M.L.: Alcune osservazioni istologiche ed al microscopio elettronico a scansione sulle larve di *Dermatobia hominis* Linneus jun., 1781 (Diptera, Cuterebridae). *Histological and scanning electron microscope observations on larval instars of Dermatobia hominis Linneus jun., 1781 (Diptera, Cuterebridae)*. *Boll. Ist. Entomol. Univ. Studi Bologna "G. Grandi"*, 48, 219, 1994.

Morphological features of second and third larval stages of *Dermatobia hominis* are given. Mouth parts, cephalo-pharyngeal skeleton, digestive system, anterior closed and posterior open spiracles were described by light and scanning electron microscopy.

Virga A., Canestri Trotti G., Nobile L., Pampiglione S.: Elminti intestinali di roditori selvatici nella Sicilia occidentale. *Intestinal helminths of wild rodents in Western Sicily*. *Parassitologia*, 36 (suppl. 1), 148, 1994.

Wild rodents from some municipality of Western Sicily were examined during 1991-92 for intestinal helminths. We found *Nippostrongylus brasiliensis* in 2 *Apodemus sylvaticus*; *Syphacia muris* in 1 *Mus musculus*; *Brachylaema recurva* in 15 *Rattus rattus frugivorus*; *Hymenolepis diminuta* in 2 *R. rattus frugivorus*; *H. nana* in 2 *R. rattus frugivorus*; *Mesocostoides* sp. (larvae) in 2 *R. rattus frugivorus*; *Aspicularis tetraptera* in 3 *R. rattus frugivorus*; *S. muris* in 38 *R. rattus frugivorus*; *Trichuris* sp. in 1 *R. rattus frugivorus*.

1995

Baldelli R., Battelli G., Calistri P., Musti M.: *Seroepidemiological study of echinococcosis/hydatidosis in farm workers in the Apulia Region, Italy*. Proceedings of XVII International Congress of Hydatidology, Limassol (Cyprus), 6-10 November 1995, abstract n° A4.

Within the project for an "Information system for zoonoses surveillance in the Mediterranean area", a serological investigation on echinococcosis/hydatidosis (e/h) was carried out, by IHA test, in humans at a Local Health Unit of the Apulia Region (Italy). The study was made during the period March 1992-May 1993 in 218 workers involved in farming and allied activities (FW) and in 188 workers belonging to other occupational categories (OW). Out of 406 persons examined, 34 (8.4%) proved positive. No statistically significant differences ($P > 0.05$) in prevalences and titres were found between FW (9.6%; geometric mean of positive titres=1:265) and OW (6.9%; 1:196). However, the workers having habitual contacts with dogs ($n=112$) showed a prevalence (16.1%) higher than that (5.4%) of those having no such contacts ($n=294$). The observed prevalences, although not referring to clinical cases, are clearly higher than those of official data or their evaluations. Further research is recommended, especially incident studies, in order to better evaluate risk factors associated with e/h and other zoonoses in this area.

Baldelli R., Calistri P., Battelli G., Cavone D., Di Francesco A., Musti M.: Indagine sieroepidemiologica su alcune zoonosi in addetti alla zootecnia in Puglia. *Seroepidemiological study of some zoonoses in farm workers in Apulia*. *Annali di Igiene e Medicina Preventiva*, 7 (6), 1995.

In the framework of the project of an "Information system for zoonoses surveillance in the Mediterranean area", a serological investigation was carried out at a Local Health Unit of the Apulia Region (Italy) in workers involved in farming and farming related activities (AZC) and in workers belonging to other occupational categories (AAA). The zoonoses under study were brucellosis (BR), Q fever (QF), listeriosis (LI) and echinococcosis/hydatidosis (E/H). No positivities were found for LI. Higher seroprevalences ($P < 0.01$) were observed in AZC compared with AAA for BR (38.5% and 13.8%) and QF (11.9% and 0.5%). With regard to E/H, for which no differences in positivity were recorded between AZC and AAA, those having habitual contacts with dogs gave a prevalence (16.1%) higher ($P < 0.01$) than that of those having no such contacts (5.4%). The prevalence rates observed, although not referring to clinical cases, are clearly higher than those of official data or their evaluations. Further research is recommended, especially

incidence studies, in order to better evaluate risk factors (occupational or otherwise) associated with the above zoonoses.

Baldelli R., Di Francesco A., Fioravanti M.L., Borello B.: Ehrlichiosi canina: indagine sieroepidemiologica in un canile dell'Emilia-Romagna. *Seroepidemiological study in a dog-pound in the Emilia-Romagna Region*. *Obiettivi e Documenti Veterinari*, 16 (3), 61, 1995.

A serological survey was carried out in a dog-pound in the Emilia-Romagna Region (Italy), in which previously there had been an outbreak of ehrlichiosis. Out of 154 dogs examined by IFA test, 111 (72%) resulted positive at different titers. It is to be discussed if the antibody titers persisted from the previous outbreak or if there has been a new infection. It was confirmed that the environment (the dog-pound) favours the vectors and an endemic situation.

Battelli G.: Note sulla sorveglianza epidemiologica e sui sistemi informativi veterinari. *On the epidemiological surveillance and veterinary information systems*. Atti del Corso di Formazione per Medici Veterinari dipendenti delle UU.SS.LL. della Regione Molise. Arti Grafiche La Regione, Ripalimosanti (CB), 1995, pag. 83.

The epidemiological surveillance and the veterinary information are discussed, pointing out the principal aim and methods of the surveillance, the type of the data to be collected, and the negative aspects of the veterinary information system in Italy. The need of improving the efficacy and the efficiency of this system seems to be advisable.

Battelli G., Galuppi R., Pietrobelli M., Tampieri M.P.: *Eimeria leuckarti* (Flesh, 1883) (Reichenow, 1940) from *Equus caballus* in Italy. *Parassitologia*, 37, 1995.

Fecal examinations of horses (*Equus caballus*) from studs in the province of Udine (Friuli Venezia Giulia region, NE Italy), carried out during two periods of the year 1993, revealed coccidian oocysts in six foals, two stallions and one mare. The species was identified as *Eimeria leuckarti*. This species was reported once in Italy, more than 20 years ago (1972). For this reason, the prevalence of the parasite and the description of immature and sporulated oocysts are given.

Borghesan F., Grandi M., Fioravanti M.L., Restani R.: Osservazioni sulla diffusione di trematodi monogenei in specie ittiche curialine allevate nell'Italia Nord-Orientale. *Observations on the spread of monogenean trematodes in euryhaline fish from farms in North-East Italy*. *Bollettino della Società Italiana di Patologia Ittica*, 17, 25, 1995.

During 1992-94 a parasitological research on gills of 70 sea-basses (*Dicentrarchus labrax*), 34 sea-breams (*Sparus aurata*) and 6 mugilids (5 *Liza aurata* and 1 *L. ramada*), periodically drawn from several fish-farmings in northern Italy, was carried out. The presence of monogeneans was observed in 68 (61.8%) out of 110 fishes. Some epidemiological and pathogenetic consideration will be given.

Cancrini G., Pietrobelli M., Frangipane di Regalbono A., Tampieri M.P., della Torre A.: *Development of Dirofilaria and Setaria nematodes in Aedes albopictus*. *Parassitologia*, 37, 1995.

The development of *Dirofilaria repens*, *D. immitis* and *Setaria labiatopapillosa* up to L3 stage was documented in a laboratory colony of *Aedes albopictus* originating from specimens collected in Civitavecchia (Central Italy). The susceptibility of *Ae. albopictus* and its plastic trophic habits, strongly suggest that this mosquito may contribute to the spreading of these nematodes in the country. It is particularly emphasized the danger for human health of an increased probability of transmission of *Dirofilaria* in urban areas.

Canestri-Trotti G., Fioravanti M.L., Restani R.: Argomenti di patologia parassitaria degli animali acquatici. *News on parasitic pathology of aquatic animals*. In: "Argomenti di Idrobiologia e Acquacoltura", Ed. CLUEB, Bologna, p. 203, 1995.

Very little post graduate education is available to technicians wishing to work in aquaculture. This article is a trial to summarize our knowledge on parasitic pathology of aquatic animals in Italy. The major part of these notes are based on personal experiences of the Authors and are mainly devoted to the recently reported diseases in Italian aquatic animals as, for example, anguillicolosis, ichthyophthiriosis, pseudodactylogyrosis, anisakidosis, clinostomosis, etc....

Cattoli G., Zanoni R., Benazzi C., Della Salda L., Serraino A., Sanguinetti V.: *Isolation of Helicobacter felis from dogs in Italy*. 8th International Workshop on Campylobacters, Helicobacters and Related Organisms, Winchester, U.K. July 10-13th 1995.

To evaluate the prevalence of *Helicobacter felis* infection in a dog population, we examined the stomach of 15 dogs dead for various causes in a dog pound. All the stomachs were gram stained and observed microscopically. Histological and electron microscopical examinations were performed on 3 cases; 15 gastric mucus samples were cultured. Gram negative tightly coiled bacteria were seen in different numbers associated with abundant polymicrobial flora in each sample. EM showed a bacterium with spiral morphology, polar tufts of flagella and single or paired periplasmic fibrils. Two isolates were identified as *H.felis* but differences with published data were observed.

Dalla Pozza M., Marangon S., Ferrè N., Martini M., Muraro A., Vio P.: Tubercolosi bovina, brucellosi bovina e ovi-caprina. Andamento dei piani di profilassi ed eradicazione nella Regione Veneto. *The national campaigns of eradication of bovine tuberculosis and brucellosis and of ovi-caprine brucellosis in the Veneto Region (Italy) in the period 1987 — 1994*. *Prog. Vet.*, 50, 605, 1995.

The trend of the national campaigns of eradication of bovine tuberculosis and brucellosis and of ovi-caprine brucellosis in the Veneto Region in the period 1987 — 1994 is analyzed in terms of prevalences, incidence rates, number and percentage of herds and heads under control and officially free. In all the three cases the eradication seems to be within reach. Given such an epidemiological situation and given the EC and national rules, it is stressed the need of a strict surveillance, based mainly on an extension of the control activity to all the breeding herds and on the identification and control of the risk factors.

Dezfuli B.S., Fioravanti M.L.: *Morphological study of Digenean Trematodes, parasite of Anguilla anguilla from the northern Adriatic Sea.* 7th Intern. Helminthological Symposium, September 19-22, Kosice, Slovak Republic, 1995.

Different species of digenean trematodes parasitized the digestive tract of fishes. The occurrence of three species of digeneans, namely *Deropristis inflata* (Fam. Acanthocolpidae), *Helicometra fasciata* (Fam. Allocreadidae) and *Bucephalus polymorphus* (Fam. Bucephalidae) was recorded within the alimentary tract of the european eel (*Anguilla anguilla*), from Comacchio lagoons (Northern Adriatic Sea). The use of SEM allowed us to examine the surface features of trematodes and detect their peculiarities.

Fioravanti M.L., Virga A., Acciarri S., Cameli A.M.: Indagine sui parassiti intestinali dei gatti randagi nella Sicilia occidentale. *Researches on intestinal parasites of stray cats in West Sicily.* Atti Soc. Ital. Sci. Vet., 49, 1995 (in press).

The faeces of 110 stray cats from some municipalities of western Sicily (Calatafimi, Cammarata, Castellana Sicula, Castelvetro, Corleone, Monreale, Piana degli Albanesi, Piana di Vicari, San Giovanni Gemini) were parasitologically examined during 1991-92. Sixtyfive (59.1%) subjects were parasitized: *Toxocara cati* was observed in 27 cats, *Joyeuxiella* sp. in 1 Ancylostomatidae in 16, *Capillaria* sp. in 3, *Dipylidium* sp. in 1, *Dicrocoelium dendriticum* in 1, *Isospora felis* in 7, *Eimeria cati* in 1 and *Aelurostrongylus abstrusus* in 9.

Gemmel M.A., Battelli G., Martini M.: *Echinococcosis/hydatidosis: socio-economic consequences and economic analyses of control programmes.* In: Ghirotti M., Scorziello M. (Eds.)-Planning echinococcosis/hydatidosis control: a methodological approach. Veterinary Public Health Reports, WHO/FAO Collaborating Centre for Research and Training in Veterinary Public Health, Rome 1995. ISS/WHO/FAO-CC/IZSTe/95.24, Annex 5, pag. 60.

The socio-economic consequences of echinococcosis/hydatidosis and the costs and benefits of the control programmes are listed and discussed. The following items are taken into account: 1) socio-economic impact of the disease in man and in farm animals; 2) economic analyses of control programmes (cost-effectiveness and cost-benefit analyses); 3) programme costs, benefits (financial and otherwise), and facilities; 4) formulating cost-effective control strategies. Examples of production losses in sheep and economic analysis of a control programme, with regard to the Mediterranean area, are given. The equation for evaluating the response of an applied control activity and some indicators of economic performance are pointed out.

Martinello F., Ostanello F., Della Salda L., Prosperi S.: Comparazione di prove diagnostiche nella diagnosi eziologica di parvovirus del cane. *Comparison of diagnostic trials for the detection of canine parvovirus in dogs.* Atti Soc. Ital. Sci. Vet., 49, 1995.

Virological investigation for canine parvovirus (CPV) was performed on faecal samples from dogs exhibiting symptoms of viral gastroenteritis, using hemagglutination test with porcine RBC, ELISA-sandwich (commercial kit) and virus isolation on cell cultures (FEA). Relative sensitivity and specificity of these assays were evaluated in order to identify the most suitable technique to detect the infected animals.

Pampiglione S., Azzaro S., Bongiorno A., Fioravanti M.L., Garavelli P.L., La Valle S.: La dirofilariosi oculare umana in Italia: descrizione di 6 nuovi casi. Revisione della casistica italiana. *Human ocular dirofilariosis in Italy: description of 6 new cases. Revision of the Italian literature.* Ann. Oftalmol. Clin. Ocul., 121, 257, 1995.

Six new cases of human ocular dirofilariosis are described: 3 subconjunctival and 3 palpebral. From the review of the Italian literature, this zoonosis, present in dogs in all the national territory, is reported in man in 35 cases for the only ocular and periocular localizations. When the parasite was not seen under the conjunctiva a wrong diagnosis was the rule. Prognosis was benign provided the nematode was readily extracted. Treatment was always surgical.

Pampiglione S., Villani M., Fioravanti M.L., Rivasi F.: La dirofilariosi umana nel sud d'Italia: Regione Molise. *Human dirofilariosis in Southern Italy: Molise Region.* Pathologica, 87, 139, 1995.

A case of subcutaneous human dirofilariosis associated with *Dirofilaria repens* in the arm of a 9-year-old child resident in Campobasso is described. Blood samples taken from dogs in the same region, confirmed the presence of *D. repens* microfilariae in the natural reservoir, few km from the clinical case.

Pampiglione S.: Dirofilariosi umana sottocongiuntivale: su di un probabile caso osservato in Francia da Amatus Lusitano nel XVI secolo. *Human subconjunctival dirofilariosis: on a probable case observed in France by Amatus Lusitanus in XVI the century.* Parassitologia, 37, 75, 1995.

In the book *Curatium medicinalium Centuria septima* (1566) of the Portuguese physician Amatus Lusitanus, a curious clinical case is reported concerning a 3-year-old girl affected by ocular filariasis with the worm spontaneously emerging from the eye. The nematode might be *Dirofilaria repens*. If this identification is correct, the zoonosis may have existed in Southern France and Italy for 400 years and the report by Lusitanus may represent the first human case of dirofilariosis published in the world.

Pampiglione S.: Un cas probable de dirofilariose humaine sous-conjonctivale observé par Amatus Lusitanus dans le midi de la France au XVI siècle. *A probable case of human subconjunctival dirofilariosis observed in France by Amatus Lusitanus in XVI century.* Parasite, 2, 92, 1995.

In the book *Curatium medicinalium Centuria septima* (1566) of the Portuguese physician Amatus Lusitanus, a curious clinical case is reported concerning a 3-year-old girl affected by ocular filariasis with the worm spontaneously emerging from the eye. The nematode might be *Dirofilaria repens*. If this identification is correct, the zoonosis may have existed in Southern France and Italy for 400 years and the report by Lusitanus may represent the first human case of dirofilariosis published in the world.

Patarnello P.P., Fioravanti M.L., Caggiano M., Restani R.: Infestazione da Gnathiidae (Crustacea: Isopoda) in *Pagrus major*. *Infection by Gnathiidae (Crustacea: Isopoda) in Pagrus maior*. Bollettino della Società Italiana di Patologia Ittica, 17, 32, 1995.

A case of infection by Gnathiidae (Crustacea: Isopoda) in *Pagrus major* reared for reproduction in the intensive marine farming Ittica Ugento S.p.a. (Lecce) is reported. The group of 21 subjects, weighing 450-1100 g, was reduced by three cases of mortality occurred from March to July 1994. The bacteriological examination, carried out on 30% of the subjects, had always negative results. The parasitological examination showed the presence of larval stages (pranizae) of isopods Gnathiidae on the gills, in the mouth and in the cutaneous fold under the dorsal fin.

Pietrobelli M., Frangipane di Regalbono A., Segato L., Tampieri M.P.: Indagine sulla setariosi bovina in Friuli Venezia Giulia. *Survey on bovine setariosis in Friuli Venezia Giulia, Italy*. Parassitologia, 37, 69, 1995.

Blood samples from 407 bovines of "Azienda Marianis", a farm in Friuli Venezia Giulia, Italy, were examined for microfilariae; 143 (35,1%) were positive. A survey in other 23 farms of dairy cattle from 6 communes of the province of Udine revealed a prevalence of 11.28%. The prevalence was significantly correlated with the age of animals; in cows it was lower than in young animals. Blood microfilariae (210) and adult females (15) were identified as *Setaria labiatopapillosa*.

Pietrobelli M., Frangipane di Regalbono A., Cancrini G., Tampieri M.P.: Setariosi bovina (nota I): progettazione, realizzazione ed efficienza di una trappola per la cattura dei possibili ospiti intermedi di *Setaria labiatopapillosa*. *Bovine setariosis (note I): planning, execution and efficiency of a trap utilized to catch possible intermediate hosts of S. labiatopapillosa*. Parassitologia, 37, 1995.

The Authors describe a trap utilized in the field to catch possible intermediate hosts of *Setaria labiatopapillosa* attracted by naturally infected bovine. The trap was bulky and stable but also decomposable and removable. It was tested in an area of Friuli Venezia Giulia (Udine province NE Italy) during 21 nights in the summer 1994 (29/6-29/9) and allowed to catch 16159 mosquitoes and 218 other Diptera, showing a very good efficiency.

Pietrobelli M., Schiff D., Battelli G., Giordani A.: Indagine sulle parassitosi intestinali degli equini in provincia di Udine. *A survey of equine intestinal parasites in the province of Udine*. Arch. Vet. Ital., 46, 136, 1995.

Faecal examination (by the McMaster technique and flotation) of horses in the province of Udine were carried out twice in the year 1993. In the period 1 (June to July) 158 out of 335 animals from 16 studs were examined. Eighty-nine horses among those examined in period 1 from 13 studs were checked again in period 2 (November to December). High prevalences (76 and 78% in period 1 and 2, respectively) for intestinal strongyles and for ascarids (22 and 24%) were found. Oocysts of *Eimeria leuckarti* were identified in 6 young animals and in 3 adults. No significant differences ($P > 0.05$) in prevalences were

observed either in equine categories or periods. Larval identification of strongyles revealed only the presence of Cyatostominae.

Poglayen G., Battelli G.: Sanità animale e socio-economia: considerazioni concettuali, metodologiche ed etiche. *Animal health and socio-economic aspects: conceptual methodological and ethical reflections*. Atti del Corso di Formazione ed Aggiornamento professionale per Medici Veterinari dipendenti delle UU.SS.LL. della Regione Molise. Arti Grafiche La Regione, Ripalimosani (CB), 1995, 24 maggio, pag. 73.

The socio-economic aspects of animal diseases (especially infectious and parasitic diseases) are discussed with special reference to the production losses, the zoonotic aspects, the cost of prophylactic programs and the relative benefits. The lack of standardization of methods for economic evaluation of the disease-associated losses and of the control plans is pointed out. The Authors conclude that greater attention by the public veterinarians on the socio-economic aspects of animal health should be advisable.

Poglayen G., Capelli G., Martini M., Zampiccoli R.: Epidemiologia delle parassitosi dell'apparato digerente del bovino nella Provincia Autonoma di Trento. *An epidemiological survey on cattle parasitic diseases of the Trento Province (Italy)*. Atti Soc. Ital. Buiatria, 27, 483, 1995.

A survey was carried out on 839 cattle of 105 herds in three different areas of Trentino. The results of the coprological examinations were linked with data about the animals and the herds. 90% of the herds and 56% of the animals resulted positive for parasites. In particular 36% of the animals were found positive for gastro-intestinal strongyles, 24% for coccidia, 13% for *Nematodirus*, 5% for *Fasciola hepatica*, 3% for both *Dicrocoelium dendriticum* and tapeworms, 1% for whipworms. The main factors influencing these values are the age of the host, the herd location and the application of the unifeed technique.

Zamperetti S., Fioravanti M.L., Restani R., Sigovini G.: Reperti parassitari in *Xiphias gladius* d'importazione. *Parasitological reports in imported Xiphias gladius* Bollettino della Società Italiana di Patologia Ittica, 17, 46, 1995.

Slices from 37 swordfishes (*Xiphias gladius*) were examined for parasites in the fish-market of Venice. The swordfishes, weighing 9-91 kg, were imported from Spain and Portugal. In 19 (51.4%) fishes were observed parasites. In particular muscular lesions caused by crustaceans copepods Pennelliformes were found in 11 (29.7%) subjects, larvae of cestods (Trypanorhyncha) in 10 (27%) subjects and digeneans (Didymozoida) in 2 (5.4%) subjects.

Zanni M.L., Poglayen G., Marzadori F., Benassi M.C., Capucci L., Carpenè E., Fabbi M., Magnino S., Tagliabue S., Roda R., Tasselli A., Serra R., Venturi L., Bartolucci M., Galuppi R., Lavazza A.: Monitoraggio sanitario nella lepre (*Lepus europaeus* Pallas) in Provincia di Ravenna. *Control of the health status of the brown hare (Lepus europaeus Pallas) in the Ravenna province, northern Italy*. Sel. Vet., 36, 1, 1995.

A survey has been conducted with the aim to assess the health status of the hares ($n = 459$) living in the province of Ravenna including both wild and captive reared animals as well as those imported from abroad for restocking. 93% of the samples tested positive for anti-EBHSV antibodies, 6.8% for anti-*Leptospira spp.*, 0.35% for anti — *Brucella spp.* and 3.5 for anti *Borrelia burgdorferi* whilst all the sera resulted negative for *Francisella tularensis*. Virological examinations for EBHSV resulted positive in 6 animals. Necropsy and bacteriological investigations revealed an important role of *Yersinia pseudotuberculosis* (23%); *Escherichia coli*, *Pasteurella spp.*, *Streptococcus spp.* were also identified in a lower number of cases. Coccidia prevalence was 33%, 100% and 52% for respectively captive, imported and wild hares. *Trichuris leporis* were detected mainly among imported animals as well as strongyles. *Trichophyton mentagrophytes* was the only zoophylic fungus isolated.

DIPARTIMENTO DI SANITÀ PUBBLICA VETERINARIA
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1988

Catelli E., Tonelli A.: Rassegna delle forme patologiche riscontrate nel pavone (*Pavo cristatus*) presso l'Istituto di Patologia Aviare di Bologna dal 1965 al 1987. *Review of the diseases of the the peacock (Pavo cristatus) diagnosed at the Laboratory of Avian Pathology, University of Bologna, from 1965 to 1987.* Atti Soc. Ital. Sci. Vet. (Mantova 29 settembre/1 ottobre 1988), 42, 849, 1988.

The Authors report the diseases of the peacock (*Pavo cristatus*) diagnosed at the Laboratory of Avian Pathology, University of Bologna, from 1965 to 1987. The incidence of the diseases diagnosed by post mortem, histopathological and bacteriological examinations is evaluated. The Authors conclude that the most prominent diseases of the peacock constantly observed during the considered period are histomoniasis, tuberculosis and helminthiasis.

Govoni S., Maestrini N., Catelli E.: Prove di efficacia dell'Enrofloxacin nel controllo di infezioni batteriche e da micoplasmi in alcune specie avicole domestiche e selvatiche. *Results of clinical studies with Enrofloxacin in the control of bacterial and mycoplasmal infections of some domestic and game birds.* 27° Convegno della Società Italiana di Patologia Aviare (S.I.P.A.), Forlì 15/16 Settembre 1988.

The Authors reported on the therapeutic and protective efficacy of Enrofloxacin — a chemotherapeutic agent with bactericidal and mycoplasmicidal activity, from a group of new quinolone carboxylic acid derivatives — studied on some domestic and game birds, principally affected by respiratory diseases. The trials were carried out in laboratory on affected birds taken from outbreaks under field conditions. The birds were divided into two groups: one treated by water medication and the other one untreated. The demonstration of efficacy of the substance was obtained by clinical and anatomo-pathological observations.

Maestrini N., Govoni S., Milani A.: Possibilità di impiego dell'Enrofloxacin (Baytril®) in alcune specie avicole domestiche e selvatiche. *Possible use of Enrofloxacin (Baytril®) in some domestic and game birds.* Prax. Vet., 9 (4), 11, 1988.

Enrofloxacin, a new chemotherapeutic agent from a group of quinolone carboxylic acid derivatives, was tested at different dosages in order to determine the tolerability in some domestic and game birds. For each species the trials were repeated twice and compared to untreated controls. The data related to feed and water intake were statistically analysed. The enrofloxacin resulted well tolerated in all species of birds used in the trials and without side effects.

Benassi M.C., Catelli E.: Episodi di botulismo in un allevamento di fagiani dell'Emilia Romagna: rilievi epidemiologici e interventi profilattici. *Botulism outbreaks in a pheasant farm in Emilia Romagna: epidemiology and prophylaxis*. Atti XI Convegno "Allevamenti di Selvaggina", Bastia Umbra 9/10 giugno 1989. Ed. Grafiche Diemme, Bastia Umbra (PG), 239, 1990.

The Authors describe botulism outbreaks occurred in a pheasant farm at Pineta di Classe (Ravenna). Botulism outbreaks are discussed and mortality (%), occurred from 1985 to 1988 is reported (1985: 34,44%, 1986: 10,92%, 1987: 9,70%, 1988: 5,38%). The disease conditioning factors are considered and the prophylactic measures listed. Although management procedures have decreased the disease incidence, the authors look forward to further researches in the field of vaccine prophylaxis.

Piazza V., Govoni S.: Il certificato di origine e sanità che scorta il pollame al macello. *The origin and health certificate which accompanies the poultry to the processing plant*. Rivista di Avicoltura, 59 (7/8), 29, 1990.

The origin and health certificate which accompanies the poultry to the processing plant is a determining factor of better quality either under prescribing rules or practical applied aspects. The Authors, after an accurate analysis of the genesis and evolution of the prescribing rule concerning inspection of poultry productions, take into account the technical-judicial aspects that clear up the rules in the trade of food supplies which is of extreme interest..

Piazza V., Govoni S.: La vigilanza veterinaria sulla selvaggina importata. *The veterinary control of the imported game*. Rivista di Avicoltura, 59 (12), 25, 1990.

The trade of the meat of the reared game and that shot in its wild environment appears increasing today. The proposal of regulation (EEC) of October 30, 1989 concerning the rabbit and game meats, gives a high value to the practice of the control on the game. The Authors take into account the prominent aspects of the legislative measures.

Piazza V.: I contenitori per il trasporto delle carni fresche di volatili, di conigli allevati e di selvaggina: considerazioni sul decreto del 2 ottobre 1989, n. 450. *The containers for the carriage of fresh meats of poultry, reared rabbits and game: considerations about the D.M. 2-10-1989, No. 450*. Prog. Vet., 45, 785, 1990.

The Author analyses the D.M. 2-10-1989, No. 450, of the Health Ministry that provides the characteristics of containers used for the carriage of fresh meats of poultry, reared rabbits and game. The Author underlines the importance of such measures for the protection of the hygienic quality of meats also in the distribution phase. Therefore, the D.M. guarantees the consumers against the risk of meats unfit for human food.

1991

Benassi M.C., Catelli E., Maestrini N.: Profilassi della malattia di Newcastle nella Starna (*Perdix Perdix*) e nella Pernice rossa (*Alectoris Rufa*): prove di efficacia di un piano vaccinale. *Prophylaxis of Newcastle disease in the Gray partridge (Perdix perdix) and in the Red-legged partridge (Alectoris rufa): efficacy investigations of a vaccination programme.* Atti I Convegno Europeo "Allevamenti di Selvaggina", Grado 10/12 ottobre 1991. Ed. Delta Grafica, Città di Castello, 383.

The Authors refer the results of an investigation about the efficacy of a vaccination programme against Newcastle disease used in one intensive rearing unit of gray and red-legged partridges. Birds were twice water vaccinated, first by B1 and then by LaSota live strains at 10 and 18 days. Trials, consisting in evaluating immunity by serological tests (Hemoagglutination inhibition — HI) and challenges, showed that this programme was ineffective to protect birds at their releasing in the environment.

Catelli E., Benassi M.C., Govoni S.: Patologia perinatale e neonatale del Fagiano (*Phasianus colchicus*) in allevamento intensivo. *Diseases of new-born pheasants (Phasianus colchicus) reared in intensive units.* Atti I Convegno Europeo "Allevamenti di Selvaggina", Grado 10/12 Ottobre 1991. Ed. Delta Grafica, Città di Castello, 391.

The Authors report on diseases found in new-born pheasants reared in intensive units in the first fourteen hatches of the reproduction cycle. Mortality was estimated for each hatch, relatively to the first three weeks of life. Diseases were diagnosed using necropsy of all dead and rejected subjects, and serological, bacteriological and histopathological examinations. Total mortality was 5.77% — 4.99% was in the first week. Most of the losses were attributed to "Splay legs" (1.43% of day-old chicks). Results of survey did not show specific diseases causing prominent losses.

Catelli E., Benassi M.C., Maestrini N.: Evoluzione della Patologia in alcune specie di galliformi selvatici allevati intensivamente nell'ultimo decennio. *Evolution of the diseases of some intensively reared gamebirds (Galliformes) in the last ten years.* Atti del 12° Convegno Nazionale "Allevamenti di Selvaggina", Cagliari 5/6 ottobre 1990. Ed. Grafiche Diemme, Bastia Umbra (PG), 97, 1991.

The incidence of the most important diseases found in pheasant (*Phasianus colchicus*), grey partridge (*Perdix perdix*) and red-legged partridge (*Alectoris rufa*), at the Laboratory of Avian Pathology, University of Bologna, from 1980 to 1989, is reported. The evolution of the prominent pathological conditions and the factors that are thought responsible for the changes occurred in the incidence of the various diseases are considered. The authors emphasize the decrease in traditional diseases, as nematode infections and nutritional deficiencies, and the increase in syndromes depending on different factors such as environment and management.

Guberti V., Govoni S., De Marco M.A.: Elminti del tratto digerente di Folaghe (*Fulica atra*) e Moriglioni (*Aythya ferina*) abbattuti nell'Italia nord-orientale. *Parasitological survey of Coot (fulica atra) and Pochard (Aythya ferina) in Northern Italy.* Ric. Biol. Selvaggina, 88, 1-48, 1991.

During the hunting season 1986/87, the digestive tracts of 85 coots (*Fulica atra*) and 58 pochards (*Aythya ferina*) were examined to evaluate the parasitic burden. Prevalence and mean intensity of the parasite species isolated were calculated. Significant differences were recorded for presence and number of parasite species in relation to the host sex, age class and place of capture. A synthetic review of the parasites reported in the coot and pochard according to the recent literature is given, with a brief description of the species identified in the present study.

Maestrini N., Veggetti A.: La veterinaria italiana dalla fondazione delle scuole allo stato unitario. Da pratica empirica a scienza basilare per il progresso dell'economia e la salvaguardia della salute pubblica. *Italian Veterinary Medicine from the foundation of the schools until unification. From empirical practice to basic science for economic progress and safeguarding of public health.* Atti del Convegno sulla storia della Medicina Veterinaria, Reggio Emilia, 18/19 ottobre 1990. Ed. Bertani & C., Cavriago (RE), 29, 1991.

The Authors begin by examining the socio-economic conditions that led, in the second half of the Eighteenth century, to the foundation of the first Schools of Veterinary Medicine in many European countries. Then they go on to examine the varied Italian scenario before Unification, when too many charlatans usurped the right to practise medicine on dumb animals. Such trial and error practises greatly slowed down the process of establishment, even in social terms, of the new medical class of veterinary surgeons within the academic framework.

Piazza V., Govoni S.: Trasporto, macellazione e qualità igienica del pollame. *Transportation, slaughtering and hygiene quality of poultry.* Rivista di Avicoltura, 60 (5), 15, 1991.

The Authors pinpoint a series of factors that may adversely affect the hygiene characteristics of poultry meat for consumption. Transportation and slaughtering represent the major risks: during these operations problems connected with the animals' welfare and with the various so-called polluting phases encountered during slaughtering. They conclude by advocating a rational use of refrigeration, which has a real bacteriostatic effect, especially if combined with dehumidification of the carcasses, eliminating conditions where micro-organisms can develop.

Piazza V., Maestrini N.: Ispezione e patologia del pollame al macello. *Inspection and pathology of poultry at the slaughterhouse.* Rivista di Avicoltura, 60 (11), 13, 1991.

After evaluating the frequency of pathological cases found in slaughterhouse chickens, the Authors conclude that inspection of poultry must be substantially reorganized in the near future. Modifications must take account of the new community policies, based on control effectiveness and the cost-benefit ratio of controls.

Piazza V., Scalisi E.: Fatta chiarezza sul pollo "tradizionale". *Clarity on "Traditional" poultry.* Rivista di Avicoltura, 60 (4), 33, 1991.

The Authors make a few observations on D.P.R. 193/88 — completing D.P.R. 503/82 —

which governs the partial evisceration of poultry. First of all it must be observed that this regulation cancels all previous laws on the matter, thus ending an absolutely unclear and, in some cases, even discriminatory situation: the more recent avicultural companies were not allowed to waive regulations on evisceration introduced before D.P.R. 193/88. The Authors consider on the succession of legislative acts that end up to this D.P.R. as well as all provisions and limitations contained in it.

Scalisi E.: Domanda redibitoria ed estimatoria nel commercio del bestiame. *Redhibitory and evaluation demand in livestock trade*. Obiettivi e Documenti Veterinari 12 (7/8), 33, 1991.

The Author provides a historical analysis of the redhibitory and evaluation demand in livestock trading, clearly tracing the regulations introduced in the course of time and how these have contributed to the formation of contracts and settlements of disputes.

Scalisi E.: Vendita degli animali. Le norme sono inadeguate. *Animal trading. Inadequate regulations*. Inform. Zootec., 38 (13), 23, 1991.

The Author examines the current regulations controlling animal trade. The well-known inadequacy of these regulations now requires legislative actions to introduce a law and clarify the whole field once and for all, doing away with local interpretations.

1992

Guberti V., De Marco M.A., Amicarella M.: Principali patologie e anestesia della Lontra (*Lutra lutra*). *A review of the most important diseases and anaesthetic techniques in the Otter (Lutra lutra)*. In: Prigioni C., Fumagalli R., Barrasso P., Ottino P., Guberti V., De Marco M.A., Amicarella M. (Eds.): La Lontra: specie minacciata in Italia. Collana Verde — Ministero dell'Agricoltura e delle Foreste — Corpo Forestale dello Stato, 89, 49, 1992.

The Authors reviewed the most important diseases and anaesthetic techniques reported in free-living and captive otters. The effect due to the presence of organochlorine, polychlorinated biphenyl, heavy metal, mineral oil and radio-active residues on the population dynamic of the species is discussed; the most important infectious diseases (distemper, parvoviral infection, rabies, Aujeszky's disease, Aleutian disease, tuberculosis, leptospirosis) and diseases more strictly related to an improper management practice (botulism, pasteurellosis, salmonellosis, nutritional diseases) are described. A synthetic review of parasites reported on the otter is given.

Guberti V., De Marco M.A., Govoni S., Maestrini N.: *Eutrophic water-bodies and parasitic biocenoses in Coots (Fulica atra)*. Proceedings of the 9th International Symposium on Waterfowl, Pisa, September 16-18, 1992. Ed. Novastampa, Parma, 188, 1992.

Intestinal parasites of 75 coots (*Fulica atra*), collected from 5 brackish-water wet-biotopes subject to varying degrees of eutrophication in Northern Italy, were isolated and

identified. The parasitic biocenoses found in the coot-sample relative to the most eutrophicated site is set well apart from the remaining, less eutrophicated biotopes. Most of the parasites species which significantly typify the two situations show evidence for an indirect biological cycle. Because trophic resources increase with eutrophication, it is also possible the latter increases chances for parasites to cycle completely and thus parasitize a larger number of final hosts.

Maestrini N., Pascucci S., Govoni S., Catelli E., Viarani C.: Epatopatia del pollo da carne come reperto ispettivo al macello. *Liver abnormality in broiler chickens at processing*. Atti del 30° Convegno della Società Italiana di Patologia Aviaria (S.I.P.A.), Forlì 11-12 settembre, 1991 in *Zootecnica International*, 3(2) Supplemento, 84, 1992.

The Authors describe a condition in regularly slaughtered broilers in Romagna during the last two years. The incidence of this condition is very low (1/10,000). The liver is enlarged, firm, pale and mottled with irregular surface. Histologically massive bile duct and fibrous tissue proliferation, replacing the most part of the normal liver parenchyma, are observed. Great and widespread infiltration of heterophils and mononuclear cells is also prominent. Gross and histological changes resemble those reported in Great Britain (1983) and Canada (1987). In order to investigate the unknown aetiology of this condition the Authors have made histological, bacteriological and virological examinations. No bacterial isolation have been obtained; virological examinations were positive and revealed adenovirus in 75% of all samples. High adenovirus isolation percentage is not conclusive in order to establish their aetiological role, as frequently they are isolated from healthy chickens.

Maestrini N.: Giulio Sandri e il suo fortunato "Manuale di Veterinaria". *Giulio Sandri and his much acclaimed "Manual of Veterinary Medicine"*. Obiettivi e Documenti Veterinari 13 (11), 64, 1992.

The Author looks back on the most important moments of the life of the eminent scholar, Sandri. Sandri's numerous works were an excellent means for spreading veterinary science. His "Manual of Veterinary Medicine", in nine editions (from 1824 to 1873) and made up of three parts — devoted to livestock owners, veterinary doctors and blacksmiths — is considered to be an outstanding scientific and, at the same time, popular work. Its style — a dialogue — is in the veterinary tradition of the time. The Author quotes other works by Sandri of even greater importance from a strictly scientific point of view: among them his "Guide to the study of contagion and other similar specific diseases", which was, however, less successful than the manual.

Piazza V., Maestrini N.: I problemi igienico-sanitari delle ovine di gallina. *Hygiene and health problems in spent hen yolks follicles*. Rivista di Avicoltura, 61(12), 57, 1992.

The Authors provide information on the so-called ova. This uncertain and imprecise term indicates yolk follicles taken from spent laying and breeding hens. These follicles represent a particular and ill-defined product in legislative terms. It may thus raise a problem during official checks by the Veterinary Service. The Authors provide a precise

description of the hygiene and prevention measures needed in trading the product, hoping that these guidelines will become norms of behaviour.

Piazza V., Di Pietra A.M., Govoni S., Cavrini V., Maestrini N.: Ricerca di residui di cloramfenicolo nelle carni di alcune specie di volatili selvatici. *Research of chloramphenicol residues in gamebirds meat of different species*. Atti del 30° Convegno della Società Italiana di Patologia Aviaria (S.I.P.A.), Forlì 11/12 settembre 1991 in *Zootecnica Internazionale*, 3(2) Supplemento, 53, 1992.

In the last years the importation of gamebirds meat in our country has turned prominent, consequently to an increased demand. Considering the animals type traded — they are often gamebirds shot in game reserves but almost always obtained by intensive breeding — and their provenance from countries in which the drug use is regulated by less rigid or different laws in comparison with the Italian ones, the Authors have carried out a first research about a possible chloramphenicol residues presence in the pheasant and mallard meat. The research also regulated the Japanese quail, a gamebird which is intensively reared in large quantity in our country. The analysis of chloramphenicol residues was performed by high-performance liquid chromatography (HPLC), under isocratic conditions, with diode array-UV detection. Chloramphenicol residues were not present in the samples of the three species (detection limit of the method: 7 µg/kg).

Piazza V., Scalisi E., Govoni S.: La vigilanza sanitaria sul pollame da macello vista nella successione cronologica della normativa. *The chronological evolution of regulations in the control of poultry at slaughterhouse*. CLUEB, Bologna, 1992.

The Authors have collected national and European regulations from 1972 to 1992 dealing with poultry control. They focus on all measures providing a substantial change and becoming part of the actual structure of the current regulatory system (D.P.R. 967/72, D.P.R. 503/82, D.P.R. 193/88). There has been a noteworthy shift from a supervisory system to a more incisive and effective system of inspection, in compliance with precise community regulations. In order to understand the legislators' viewpoint, the conceptual and chronological evolution of the regulatory system is analyzed, at the same time verifying the primary concern of safeguarding public health.

Piazza V.: Carni fresche di pollame: norme CEE per gli scambi. *Fresh poultry meat: EC regulations on trading*. Rivista di Avicoltura, 61(3), 19, 1992.

The Author describes EC regulation 91/494 of June 26, 1991 dealing with veterinary norms governing intracommunity trade and importation of fresh poultry meat from non-member Countries. This EC approach highlights the need for changes in our Country not only to the veterinary regulations on meat but also to the related question of public health. The problems of safeguarding health need to be tracked with all due rigour and attention to detail.

Catelli E., Nonis S., Pinter F., Govoni S.: Epitelioma spinocellulare cutaneo (carcinoma squamoso) in polli da carne. *Dermal squamous cell carcinoma in broiler chickens*. Atti del 31° Convegno della Società Italiana di Patologia Aviaria (S.I.P.A.), Forlì 7/8 ottobre 1992 in *Zootecnica International*, 4(2) Supplemento, 67, 1993.

Dermal squamous cell carcinoma is reported in slaughtered chickens in Northern Italy. The tumor appeared as a crater-like ulcer with raised edges. The size of each ulcer varied from 3 to 15 mm in diameter. Microscopically the ulcerative areas contained nests and cords of tumor cells which had penetrated deep into the dermis with epithelial pearl formations. Metastasis to visceral organs were not observed. About 2,200,000 broiler chickens have been controlled and the frequency of this condition averages 1 per 14,000 birds slaughtered. Number and locations of lesions are determined and some correlations of the condition to age, sex and commercial strain of the animals are also investigated.

De Marco M.A., Delogu M.: Specie selvatiche di elevato valore biologico: aspetti eziopatogenetici e terapeutici del "bumblefoot" nei rapaci in cattività. *Endangered wild animals: aetiology, pathogenesis and therapy of "bumblefoot" in captive raptors*. In: Greppi G.F. e Ciceri A. (Eds.) Atti del 28° Simposio Internazionale di Zootecnia, Milano, 14 maggio 1993, 255, 1993.

Rehabilitation or captive breeding programs are thought to realize reintroduction projects and thus conserving small populations close to the extinction. Improper management of captive raptors is a crucial factor in the most common diseases of these birds, like "bumblefoot" (*pododermatitis*). The Authors examine predisposing factors, aetiology, pathogenesis, medical and surgical treatments of this clinical condition.

Delogu M., De Marco M.A., Maestrini N., Govoni S.: Vasectomia nel piccione: tecnica chirurgica e potenzialità applicative nel controllo numerico della popolazione sinantropica di *Columba livia* forma domestica. *Pigeon vasectomy: surgical technique and potential applications in birth control of the sinanthropic population of *Columba livia* domestic form*. Atti del 31° Convegno della Società Italiana di Patologia Aviaria (S.I.P.A.), Forlì 7/8 ottobre 1992 in *Zootecnica International*, 4(2) Supplemento, 87, 1993.

The constant increase of the urban pigeon populations has originated both social and health problems; sometimes a decrease in the number of this birds is needed. A surgical technique, providing vasectomy in an adequate number of pigeons, is described and discussed in this study. The Authors examine the social, biological, ethological and economical aspects of this intervention.

Formenti M., Tonelli A., Festi G., Raether W.: Valutazione della farmacosenibilità di due ceppi di *Eimeria* (*E. acervulina* ed *E. tenella*) isolati in campo in Italia, con prove di laboratorio eseguite in batteria. *Evaluation of drug sensitivity of two *Eimeria* (*E. acervulina* and *E. tenella*) strains isolated in Italy in battery experiments*. *Rivista di Avicoltura*, 62(7/8), 47, 1993.

The *Eimeria* isolate, including *E. acervulina* and *E. tenella*, was collected from 30 day-old broilers under intensive farming conditions. In order to test the effectiveness of several coccidiostats, 3 day-old chicks were infected and the following parameters were evaluated: fecal scores, coccidiosis-related morbidity weight gain, lesion scores and oocyst count. Considering all the parameters, salinomycin sodium, methylchlorpindol/methylbenzoquate and nicarbazin obtained the best results.

Maestrini N., Piazza V.: La visita *ante mortem* negli allevamenti avicoli. *Ante mortem visits to poultry farms*. Rivista di Avicoltura, 62(9), 33, 1993.

The Authors focus on a series of regulatory procedures that have given rise to a radical change in the evolution of inspection in the avicultural field. From the control system introduced by Regulation no. 3298 of December 20, 1928 they passed to the inspection system in compliance with D.P.R. 967/72 and subsequently completed by D.P.R. 503/82. The importance of a continually up-dated knowledge of avian pathology is obvious, both from a clinical-infectious and from a pathological-inspection point of view. Such knowledge should filter through to the breeding and slaughterhouse trades.

Piazza V., Catelli E.: Norme sanitarie per l'importazione dello struzzo. *Sanitary regulations concerning ostrich importation*. Rivista di Avicoltura, 62(1), 27, 1993.

The Authors describe the growing interest in this new avicultural line and the need to control importation in order to avoid the spreading of diseases. The Ministerial Decree (D.M.) dated June 6 1992 stipulates a series of measures such as the Health Ministry authorization for importation and the health and origin certificate. These are satisfactory means to ensure a reasonable control and the necessary prevention if correctly complied with. The Authors discuss the D.M. analysing its effectiveness comparatively against the more rigid and restrictive community legislation.

Piazza V., Zanoni R., Sanguinetti V., Maestrini N.: Ricerca di Salmonelle in follicoli ovarici prelevati da galline macellate a fine carriera e commercializzati in Italia. *Research of Salmonella in spent hens yolks follicles commercialized in Italy*. Atti del 31° Convegno della Società Italiana di Patologia Aviaria (S.I.P.A.), Forlì 7/8 ottobre 1992 in *Zootecnica International*, 4(2) Supplemento, 71, 1993.

The spent hens yolks follicles are commercialized in some areas of Italy by different denomination: "ova", "yolks" or without any denomination. This peculiar food is not defined by law and it may thus raise difficulties for the veterinary vigilance. The Authors have carried out a research about a salmonella possible presence in this food because there is only one microbiological research in literature and the salmonella problem is always present. They have been analysed yolks follicles collected from 26 spent hens flocks slaughtered in 6 processed-plants of Emilia Romagna from April to July 1992. Sixteen flocks of the twenty six examined resulted positive for *Salmonella* spp.

Tonelli A.: *Megabacteriosis in exhibition budgerigars*. Vet. Rec., 132, 492, 1993.

Megabacteriosis was diagnosed in numerous cases in many species such as canaries and

other fringillidae, Zebra finch (*Poephila castanotis*), budgerigars, *Noephema* species, *Platycercus* species, *Agapornis* species and *Forpus cyanopigi*us, both as clinically inapparent infections and as highly pathological conditions. These cases were successfully treated with amphotericin B in drinking water. Only twice megabacteria were found to be resistant to amphotericin B and then ketoconazole was tried which worked adequately.

1994

Catelli E., Maestrini N., Fenicia L., Ferrini A.M., Piazza V., Nicoli P.A.: Botulismo nella coturnice orientale (*Alectoris chukar*) in allevamento intensivo. *Botulism in intensively farmed chukar partridges* (*Alectoris chukar*). Atti del 32° Convegno della Società Italiana di Patologia Aviaria (S.I.P.A.), Forlì 7/8 Ottobre 1993. *Zootecnica International*, 5(6) Supplemento, 39, 1994.

It is reported an outbreak of botulism occurred in chukar partridges in a farm located in the north of Italy in which game birds are raised commercially for release. Clinical signs were legs and wings paralysis. Affected birds might recover if placed in cages. On 5000 birds total mortality was 39%. Gross pathological findings were visceral congestion and mild catarrhal enteritis; in some animals cecal coccidiosis with whitish cecal cores was present. No microscopical changes were present, except those caused by coccidiosis. Mouse bioassay and bacteriological examination have been attempted on samples of serum, liver and gut. Botulinal toxin and spores of *Clostridium botulinum* type C have been found in gut samples. Other cases of botulism are not reported in the chukar partridge.

De Marco M.A., Govoni S., Guberti V., Maestrini N.: Anticorpi nei confronti del virus EDS'76 in anatidi e rallidi selvatici. *Antibodies to EDS'76 virus in wild waterfowl in Italy*. Atti del 32° Convegno della Società Italiana di Patologia Aviaria (S.I.P.A.), Forlì 7/8 Ottobre 1993 in *Zootecnica International*, 5(6) Supplemento, 87, 1994.

170 waterfowl serum samples were examined, using the hemagglutination-inhibition (HI) test, to detect antibodies against EDS'76 virus. The serum samples were obtained from 88 wild ducks (*Anas platyrhynchos* no. 72, *Anas penelope* no. 10, *Anas crecca* no. 3, *Anas acuta* no. 2, *Tadorna tadorna* no. 1) and 82 coots (*Fulica atra*) which were trapped for ringing purposes in wetlands of central Italy in November 1992. 45.4% of the ducks were positive in the HI test with titres ranging from 1:8 to 1:256. 7.3% of the coots were positive with titres ranging from 1:8 to 1:32.

De Marco M.A., Guberti V., Raffini E., Delogu M., Govoni S.: Virus influenzali aviari e virus della malattia di Newcastle: indagine sierologica in uccelli acquatici svernanti in Toscana. *Influenza type A and Newcastle disease viruses: seroprevalences in waterfowl wintering in Tuscany (Italy)*. Convegno Nazionale: Ecopatologia della Fauna Selvatica, Bologna, 15/17 dicembre 1994 (in press).

In November 1992, November and December 1993 and January 1994 a total of 372 serum samples were collected from wild waterfowl (205 ducks and 167 coots) which were trapped for ringing purposes in Tuscany. A double antibody sandwich blocking ELISA was

developed to detect antibodies against Influenza A nucleoprotein; the haemagglutination inhibition test was carried out to detect antibodies against the Newcastle disease virus. 65% of the ducks and 11.4% of the coots were positive for antibodies to influenza viruses. 19.1% of the ducks and 4% of the coots were positive for antibodies to the Newcastle disease virus. Within the examined species those which had been translocated (by reintroduction programs or hunting activities) showed a significant higher prevalence of antibodies. Thus captivity seems to be an important risk factor in maintaining and spreading the two infections.

Delogu M., Catelli E., De Marco M.A., Guberti V., Lavazza A., Govoni S.: Malattia a corpi inclusi dei falchi (IBDF) in un ibrido di Falco pellegrino (*Falco peregrinus*) X Falco della prateria (*Falco mexicanus*): segnalazione di un caso in Italia. *Inclusion body disease of falcons (IBDF) in a hybrid of Peregrine falcon (Falco peregrinus) X Prairie falcon (Falco mexicanus): a case report in Italy*: Convegno Nazionale: Ecopatologia della Fauna Selvatica, Bologna 15/17 dicembre 1994 (in press).

Inclusion body disease of falcons has been reported sporadically in European countries such as the United Kingdom and Spain. The disease is reported for the first time in Italy in a male hybrid of Peregrine falcon (*Falco peregrinus*) X Prairie falcon (*Falco mexicanus*) imported from The United States of America. The diagnosis is based on clinical, anatomical-histopathological and ultrastructural findings. Some pathogenetic and epidemiological aspects of this condition are discussed, and health risks for sensitive wild populations is underlined, especially in relation to falcon importation from countries where the disease is present.

Delogu M., Catelli E., Sanguinetti V., De Marco M.A., Guberti V., Govoni S.: Sindrome ischemica del gheppio (*Falco tinnunculus*): descrizione ed ipotesi eziopatogenetica. *Ischemic Syndrome of the Kestrel (Falco tinnunculus): description and etiopathogenetic hypothesis*. Convegno Nazionale: Ecopatologia della Fauna Selvatica, Bologna 15/17 dicembre 1994 (in press).

A new syndrome characterized by ischemic necrosis of the limbs is reported in 18 young free-living kestrels (*Falco tinnunculus*) found in several Italian regions from 1990 to 1994. The kestrels showed dry gangrene in the proximal third of *carpometacarpus* and/or *tibio-tarsus*. The Authors made a careful study on the etiopathogenesis of this syndrome by bacteriological, haemoparasitological and histological examinations. Plasmodium spp. is thought to be the most likely cause of the ischemic lesions.

Mora P., Piazza V.: Selvaggina cacciata, cosa prevede la CEE. *Shooted-game, EC regulations*. Obiettivi e Documenti Veterinari, 15(3), 33, 1994.

The Authors review community regulations dealing with game trading. They show the scope and limits of EC Dir. 92/45. A principle has gradually gained ground, by which there should be no difference in hygiene, health and victualling quality checks between game for consumption in the Country it was hunted in and game for consumption abroad.

Piazza V., Catelli E.: Vigilanza ed ispezione. *Control and inspection*. Rivista di Avicoltura, 63(12), 29, 1994.

The Authors examine EC regulation 116/92 dealing with sanitary problems in the fresh poultry meat trade. The importance of EC regulation 71/118 is stressed; it has proved to be a milestone in the poultry sector. Italian legislators have complied with it by bringing in first D.P.R. 967/72 and then D.P.R. 503/82. Thanks to these laws an ante and post mortem inspection procedure has been created, guaranteeing a satisfactory sanitary inspection of poultry. The Authors focus on the innovatory measures of the more recent law 116/92, highlighting the importance and responsibility of the veterinary officer.

1995

Catelli E., Piazza V.: Forme morbose dello struzzo. *Diseases and pathological conditions of ostrich*. Rivista di Avicoltura, 64(9), 17, 1995.

The Authors consider the literature about diseases and pathological conditions of ostriches. Infectious and parasitic diseases are reviewed. Besides these health problems, conditions related to breeding and incubation, nutritional disorders, some poisons and toxins, conditions of uncertain or various aetiology (including gastric stasis, frequently observed in reared ostriches) are considered.

De Marco M.A., Delogu M., Raffini E., Guberti V., Piazza V.: Prevalenze sierologiche nei confronti del virus della malattia di Newcastle e di virus influenzali aviari in rapaci notturni. *Newcastle disease and influenza type A viruses: seroprevalences in owls in Italy*. Atti del 33° Convegno della Società Italiana di Patologia Aviaria (S.I.P.A.), Forlì, 6/7 Ottobre 1994 in *Zootecnica International*, 6(2) Supplemento, 88, 1995.

During the period July 1993/July 1994, 112 sera were collected from owls treated in two rehabilitation centers in Italy. The haemagglutination inhibition test (HI) was performed in order to detect antibodies against Newcastle disease virus, whereas an ELISA test was developed to detect antibodies against the influenza viruses type A. 11.6% (13/112) of the examined sera were positive for Newcastle disease (titres ranging from 1:16 to 1:256). None of the sera were positive for antibodies to influenza viruses. The role of rehabilitation centers in maintaining and spreading infections is discussed.

De Marco M.A., Delogu M., Raffini E., Guberti V., Marzadori F., Govoni S.: Monitoraggio sierologico nei confronti della malattia di Newcastle e dell'influenza aviaria in *Strigiformes*, *Falconiformes* e *Accipitriformes* ospitati presso due centri di recupero dell'Emilia-Romagna. *Newcastle disease and avian influenza: seroprevalences in birds of prey in two rehabilitation centers in Emilia-Romagna (Italy)*. Atti del 2° Seminario Nazionale dei Centri di Recupero Animali Selvatici, Vanzago 17-18 giugno 1995 (in press).

During the period July 1993/September 1994, 149 sera were collected from 116 nocturnal and 33 diurnal raptors treated in two rehabilitation centers in Emilia-Romagna (Italy). The serum samples were examined to detect antibodies against Newcastle disease and influenza viruses. 12 nocturnal raptors were positive for antibodies to the Newcastle

disease virus; none of the sera collected from owls were positive for antibodies to influenza viruses. Two of the sera collected from diurnal raptors were positive for influenza, none of them were positive for Newcastle disease. Serological surveys are an effective method to study the presence and diffusion of these infections in wild populations. The same approach reveals its weakness when applied in controlling epidemics in the rehabilitation centers; indeed, until now, preventive actions are the most effective control measures.

De Marco M.A., Guberti V., Lavazza A., Delogu M., Catelli E., Capua I., Govoni S.: Segnalazione di tre casi di vaiolo nel gufo comune (*Asio otus*). *Avian pox in three long-eared owls (Asio otus) in Italy*. Atti del 34° Convegno della Società Italiana di Patologia Aviaria (S.I.P.A.), Forlì 12/13 Ottobre 1995 (in press).

During June and July 1995, large, pox-like lesions of the feet were observed in three long-eared owls sheltered in a rehabilitation facility in Emilia-Romagna, Northern Italy. Two individuals, hatched to the same wild brood in 1995, developed the lesions while in captivity, and died after 36 and 39 days. The disease was clinically manifest in the third owl upon its retrieval from the wild following a shock trauma that caused its death. Histopathological exams, electron microscopy and virus isolation, diagnosed the pox-virus infection. Avian pox in nocturnal raptors is rarely reported in literature. As for today, three cases including the present one, are known in Italy.

Delogu M., Sanguinetti V., De Marco M.A., Govoni S., Guberti V.: La tubercolosi aviaria nei rapaci diurni: descrizione di alcuni casi di patologia spontanea in soggetti rinvenuti in natura. *Avian tuberculosis: description of six cases in free-living raptors*. Atti del 2° Seminario Nazionale dei Centri di Recupero Animali Selvatici, Vanzago 17-18 giugno 1995 (in press).

6 cases of avian tuberculosis were described in 4 different species of diurnal raptors: two kestrels (*Falco tinnunculus*), two honey buzzard (*Pernis apivorus*), one buzzard (*Buteo buteo*) and one sparrowhawk (*Accipiter nisus*). When retrieved from the wild all the animals showed starvation, three of them dyspnea and one inability in using a wing. Autopsy findings and cultural exams revealed *Mycobacterium avium* as causative organism. Due to aspecific symptoms, clinical diagnosis in still alive birds results extremely difficult: thus the implementation of preventive measures is a very important rule when new subjects are hospitalized in rehabilitation centers.

Delogu M., Sanguinetti V., De Marco M.A., Guberti V., Govoni S.: Infezione da *Aeromonas hydrophila* in uno sparviere rinvenuto in natura. *Aeromonas hydrophila infection in a free-living sparrowhawk*. Atti del 2° Seminario Nazionale dei Centri di Recupero Animali Selvatici, Vanzago 17-18 giugno 1995 (in press).

When retrieved from the wild a subadult female of sparrowhawk showed starvation and then died after few hours. Pathological exams revealed epatitis with numerous small foci of necrosis. *Aeromonas hydrophila* was isolated from the liver and the spleen. This is the first report of a fatal case due to *A. hydrophila* in raptors.

Maestrini N., Scalisi E.: La garanzia nei contratti di compravendita del bestiame in Italia. Indagine storico-giuridica su norme, documenti dottrinali e atti congressuali. *Contracts of sale of livestock in Italy: an account of warranty & redhibitory defects, and the development of legislation and relevant documentation.* II Convegno sulla storia della Medicina Veterinaria, Reggio Emilia 25/26 marzo 1995 (in press).

In this study the Authors analyse, in a historical context, the development of legislation controlling the sale of livestock, and related documentation and publications. A comparison of regulations from different regions or states (pre- Unification) in force at different times emphasises their diversity and evolution. The need for such legislation became evident during the Roman period: the *Aedilium Curulium Edictum* established rules and "actions" in the trade of slaves and animals which protected the buyer against serious latent defects in the item sold, defects for which the vendor was considered fully responsible. In modern law, which retains some features of the previous legislation, this principle has been reversed to the extent that the vendor is protected and the buyer assumes the responsibilities. Thus there is now a form of synallagmatic contract between vendor and purchaser.

DIPARTIMENTO DI SANITÀ PUBBLICA VETERINARIA
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1988

Abdijabar Hassan D., Borrow H.A., Osman Mohamed A., Testi F.: Papillomatosi del *Bos indicus*. Studio preliminare. *Papillomatosis in the Bos indicus*. 7° Bollettino Scientifico della Facoltà di Zootecnia e Veterinaria dell'Università Nazionale Somala, Anno 1987-88, pag. 17.

The Authors carried out a preliminary survey on cutaneous nodular lesions in the zebu in Somalia. The disease was diagnosed on clinical observations and histopathology. On the basis of histopathological findings, it was confirmed as multiple papilloma.

Benazzi C.: Enteriti croniche ipertrofiche nel cane. *Chronic hyperthrophic enteritis in the dog*. Bollettino dell'Associazione Italiana Veterinari Piccoli Animali (AIVPA), 27, 361, 1988.

Four dogs of different age, breed and origin, with a common history of prolonged diarrhea, grossly showed thickening of the mucosa of the small bowel with variable narrowing of its lumen. Histologically all cases presented proliferation of the crypts of the intestinal mucosa, with numerous mitoses in the epithelial cells, and moderate to severe infiltration of lymphocytes and plasma cells. Bacteriological investigations evidenced only bacteria normally forming the intestinal mucosa. No *Campylobacter* sp. was present. Viral investigations demonstrated *Parvovirus* in one case. The lesions observed are similar to those typical of lymphocytic-plasmacytic enteritis and immunoproliferative enteropathy of Basenjis, both considered to be due to a defective immune mechanism.

Biavati S., Gelli M.C.: *Extracellular matrix proteins (type IV collagen and laminin) cross react and bind the cell walls of pathogenic fungi*. Proceedings of International Congress of Histochemistry and Cytochemistry, 8, 865, 1988.

In the macroscopic evaluation of tissue specimens, mycotic infections are frequently mistaken for neoplasm or other diseases, and mycoses often may not even be considered until the histopathologic examination is completed. In most cases of deep mycotic infections in man and animals, a diagnosis can be made from tissue sections on the basis of the type of reactions and morphologic findings of the organisms involved. At present three special fungus stains are the ones we most commonly use in the histological study of mycotic diseases: Gomori-Grocott, PAS and Gridley. In a recent study on the structure and pathology of the basal lamina in deep mycoses (lung, spleen and kidney) in man and animals, in formalin-fixed and paraplast-embedded tissue sections, we have seen that type IV collagen and laminin cross react and bind the glycoprotein in fungal cell walls. The attachment of fungi to basal lamina and subsequent proteolysis of the matrix will clearly disrupt tissue integrity and promote infectivity.

Biavati S., Gelli M.C.: *Animal models of human disease: Caroli's disease in a calf.* Proceeding of European Teratology Society Conference, 16, 13, 1988.

Recently we have observed a 10-day-old calf with renal and hepatic cystic disease similar to congenital hepatic fibrosis of man. At necropsy the liver was enlarged, the gall bladder and the extrahepatic bile ducts were in the normal side. The cut surface of the liver presented some cysts, containing a yellow green watery fluid, surrounded by varying amounts of immature and fibrous connective tissue. Both kidneys were moderately enlarged with an irregular surface. In the cut surface the cortex and medulla were easily recognizable and the pelvis was normal. The histogenesis of the liver and kidney cysts was studied by immunohistochemical means, using lectins and antibodies anti-BM components laminin and type IV collagen. Histologically the renal cysts were spherical and scattered throughout the parenchyma. In the cystic liver the portal spaces were enlarged and contained numerous proliferating bile ductules. The kidney embryologically arises from mesoderm only and the mesenchyma is the only tissue present both in kidney and liver, therefore an altered mesenchyma might induce an anomalous stimulus to the proliferating epithelial cells.

Biavati S., Gelli M.C.: *Laminin, type IV collagen and lectins in the study of the embryopathogenesis of genetic and congenital cystic kidney.* Proceeding of European Teratology Society Conference, 16, 14, 1988.

Polycystic kidney disease includes various conditions in which one or more visible cystic cavities are observed in the renal parenchyma. Cysts arise during organogenesis and may be associated with renal dysplasia. Cysts can develop in any part of the nephron, including the glomerular space, or in the collecting system. We have examined 10 polycystic kidneys, surgically removed in 5 children, and obtained at autopsy in 3 calves, 1 horse and 1 cat. The heritable human cystic kidney has been shown to be due to a defective gene on chromosome 16. In one of our human cases we have noted, using antibodies anti-BM components, that the basement membrane was thicker than in the other kidney considered. In 9 human and animal apparently nonhereditary cystic kidneys the cysts formation was only limited to a portion of the parenchyma. In the kidney of one child and one calf we have observed some yeast-like cells with PAS, Gomori-Grocott and lectins WGA and ConA. On account of these observations an inflammatory-transformative hypothesis is suggested.

Biavati S.: Il Museo Ercolani dell'Istituto di Patologia generale e Anatomia patologica veterinaria. I Laboratori storici e i Musei dell'Università di Bologna. *The Ercolani Museum of the Institute of Veterinary General pathology and Pathological anatomy. The historical laboratories of the Bologna University.* Amilcare Pizzi Editore, Milano, 1988.

Biavati S.: I Materiali del Museo dell' Istituto di Patologia generale e Anatomia patologica Veterinaria dell'Università di Bologna. *The materials of the Museum of Veterinary pathology and Pathological Anatomy of the Bologna University.* Atti Associazione Nazionale Musei Scientifici, Orti Botanici, Giardini Zoologici, Acquari (A.N.M.S.), 6, 55, 1988.

In the Bologna University the Veterinary Pathology and Teratology Museum was founded by Giovanni Battista Ercolani in 1863 when the Comparative anatomy laboratory was dismembered. In 1863 the Comparative anatomy laboratory had a collection of 6636

samples of anatomical, pathological and teratological specimens. Most of the collection remained in the Comparative anatomy Museum. A second share of preparations was given to Cesare Taruffi, first professor of morbid anatomy and new director of the Taruffi Museum in the Bologna University, and a third share 1704 samples of veterinary pathology and teratology is now preserved in Ercolani Museum. At present in the Ercolani Museum there are 5350 dry preserved and alcohol preserved samples and 320 wax and plaster models exactly reproducing the original specimens of animal pathology and teratology even in their dimension.

Biavati S.: Il rene cistico congenito nei vitelli (Embriopatogenesi). *Congenital cystic kidney in calves (Embryopathogenesis)*. Atti Soc. Ital. Sci. Vet., 42, 861, 1988.

After recalling the kidney embryogenesis in mammals the Author studies the histological patterns of the congenital cystic kidney in five calves using lectins and anti-BM. As for the pathogenesis, it is still uncertain, and there are several theories that can be listed as follows: retention theories, tumor theories, transformative theories and the heritable theory recently shown to be due to a defective gene in man and dog. The Author asserts that congenital cystic kidneys are the results of an anomalous growth in a mesenchyma seldom influenced by environmental factors such as fungi. From the gravid uterus, through the chorionallantoic membrane or coelomatic cavity the fungi can penetrate the embryo which lacks immune responsiveness.

Biavati S.: *Where art imitates animal pathology and teratology. Ercolani Museum*. Proceedings of the European Association of Museums of History of Medical Sciences (E.A.M.H.M.S.), 4, 261, 1988.

In our Museum there are alcohol-preserved preparations, dried tissues, surgical and necroscopical collections and teratological skeletons. There are also colour drawings and 320 wax and plaster casts exactly reproducing the original specimens even in their dimension, performed by Cesare Bettini, wax modeller of the anatomical laboratories of the Bologna University. The wax moulding tradition for instructional purposes in Bologna began with Ercole Lelli, anatomist and sculptor, and continued with Anna Morandi, Giuseppe Astorri and Cesare Bettini. At the beginning of the 20th century the fixative formalin substituted the wax model giving the preserved tissues a grey insignificant colour, while the photographic slides removed a dimension from the object.

Della Salda L.: Il mastocitoma nel cane e nel gatto. *Canine and feline mast cell tumor*. Bollettino dell'Associazione Italiana Veterinari Piccoli Animali (A.I.V.P.A.), 27(4), 427, 1988.

Mastocytoma is a common mesenchymal tumor characterized by benign-to-malignant proliferation of mast cells. Mast cell tumors may occur in almost all domestic animals and in particular in dogs and cats. In dogs they represent 50 per cent of mesenchymal tumors and 20 per cent of skin tumors. The cause is unknown. Mast cell tumors are graded histologically as anaplastic, intermediate or mature in relation to cellular differentiation.

Della Salda L: Neoplasie linfoidi e mieloidi dell'equino. *Equine lymphoid and myeloid neoplasms*. Obiettivi e Documenti Veterinari, 1(10), 19, 1988.

Equine hemopoietic neoplasms are quite rare or exceptional; lymphosarcoma represents almost the totality of these, while myeloid forms are definitely scarcely represented. The aetiology of lymphosarcoma is still unknown. The most important hematological findings are represented by anaemia, lymphocytosis, which is sometimes relevant, and granulocytopenia. Lymphosarcoma shows different symptomatology depending on the affected organs, though spleno and lymphadenomegaly are always present. With regard to the main localization of the lesion we distinguish multicentric, alimentary, thymic and cutaneous forms of lymphosarcoma. Multicentric and alimentary forms are the most frequently observed and lymph nodes, spleen and liver are the most often affected organs. The neoplastic cells, which spread through the tissue either fully infiltrate them or they form sarcomatous firm masses, and are able to change from infiltrate cells (lymphoblast) to more or less mature cells (prolymphocytes or lymphocytes). The commonest lymphosarcoma is the lymphoblastic one.

Galeotti M., Marcato P.S: Il fenomeno di Splendore-Hoepli. Studio immunistoichimico. *Splendore-Hoepli phenomenon. An immunohistochemical study*. Atti Soc. Ital. Sci. Vet., 42, 857, 1988.

Several Authors believe that Splendore-Hoepli phenomenon (SHp) is the product of an Ag-Ab reaction with deposition of immune complexes or immunoglobulins around pathogens. By means of immunohistochemical techniques (P.A.P.) applied to lesions in cattle including SHp and caused by *Actinobacillus lignieresii* (8 cases), *Staphylococcus aureus* (8 cases) and *Aspergillus fumigatus* (5 cases), we could not demonstrate IgG, IgM and IgA in the club-like material of SHp. However, immunoglobulins were present only close to the causal microorganisms.

Marcato P.S., Benazzi C., Della Salda L., Galeotti M., Marocchio L., Mutinelli F., Simoni P., Sanguinetti V., Vecchi G.: *Researches on acute (atypical) interstitial pneumonia of calves*. 15° Congreso Mundial de Buiatria, Palma de Mallorca (Espana) 11-14 ottobre 1988, pg. 603-608.

32 cases of acute, atypical, interstitial pneumonia were diagnosed in fattening calves, housed indoors, 16 of which dead, and 16 slaughtered. The lesions were in caudal lobes and very similar to those found in human adult respiratory distress syndrome (ARDS) with diffuse alveolar damage (DAD), edema, hyaline membranes, and early septal fibrotic changes. Immunolabelling and electron microscopy demonstrated an acute pneumocyte damage and gap formation in epithelial basement membranes. Deposition of type IV collagen, laminin, fibronectin, and cross-striated collagen fibrils in septal interstitium followed. Viral antigens (IBR, BVD, PI-3, BRSV) were not found in the lesions, except in 1 case (IBVR positive). *Mycoplasma bovis* was isolated in cultures from 6/11 diseased lungs, but the lesions were neither coincident with those described in *M. bovis* experimental pneumonia of calves, nor with those of anaphylaxis and endotoxemia. The most striking affinity of our pathological findings was with fog fever of grazing adult cattle.

Marcato P.S.: Patologia respiratoria animale. *Pathology of the respiratory system of animals. A color atlas.* Edagricole, Bologna, 1988.

The relevant incidence of respiratory diseases in animals makes it necessary to acquire a specialistic competence in veterinary pneumology. This in respect to the respiratory pathology of both intensively reared animals — influenced by rearing technologies — and domestic carnivores — more similar to human respiratory pathology because of their longer life-span. For these reasons the Author has attempted to prepare a text-atlas especially useful to students and veterinary practitioners who are willing to extend their knowledge in basic clinic and pathological diagnostics of respiratory diseases, and in general to all those interested in comparative pneumology. In the field of comparative pneumology the present volume contributes to fill a gap: in fact, this is the first text-atlas pertaining to the vital field of respiratory pathology of animals. The atlas provides illustrative materials of almost all the pathological entities described in the text. The purpose of this book is to facilitate interpretation of the respiratory lesions that are most significant in order to arrive at a precise diagnosis.

Rosmini R., Marocchio L., Morganti L., Corradini L., Bassi S.: *Adiaspiromycosis in an adult male wild rabbit.* Riv. Coniglicolt., 26 (8), 51, 1989 e Atti Soc. Ital. Sci. Vet., 42, 727, 1988.

The Authors describe a case of spontaneous adiaspiromycosis of an adult male wild rabbit which was captured in the Comacchio valley. The lesions were limited to the lungs. Numerous nodules 1-2 mm in diameter, grey in color and well-defined were found in the lung lobes. The single spherules were present in the nodules which histologically became visible in the bronchiolar lumina. When stained by H.-E., two zones were visible in the thick wall. Usually the centre of the fungal spores was empty. The walls of the adiaspores were also stained purple with PAS, black with Grocott's methenamine silver and blue with Giemsa. Each adiaspore was surrounded by foreign body granulomas containing variable numbers of lymphocytes, alveolar macrophages, plasma cells and fibroblasts. Occasionally polymorphonuclear leucocytes, epithelioid and giant cells were observed. Necrosis and calcification were not present, but rarely around the fragmented spore wall there were focal eosinophilic aggregates probably similar to the Splendore-Hoeppli material. The sizes of the spherules, more than 250 microns in diameter with a cell wall about 50 microns thick which intensely stained by PAS and Grocott's method, and the absence of endospores suggest that the aetiological agent was probably *Emmonsia crescens*.

Rosmini R., Marocchio L., Morselli A.: Urolithiasis und Nephrocalcinose beim Jungbullen. *Urolithiasis and nephrocalcinosis in normally slaughtered steers.* Prakt. Tier., 7, 14, 1988.

An incidence of 11.10% of urolithiasis was found at the inspection of 1018 regularly slaughtered steers. The lesions observed in the urinary bladders and kidneys are characterized by haemorrhagic inflammation of urinary bladder and atrophy of the renal parenchyma. In the kidney a chronic interstitial inflammation is present as the consequence of mechanical lesions of the pelvis caused by calculi. Sometimes ectasia of the calyces and pelvis due to calculi may produce hydronephrosis. The calculi have been stained in the renal parenchyma by PAS, Alizarin Red S and von Kossa and Pizzolato's methods. The chemical composition of the calculi present in 15 subjects was identified. Histochemically

these bodies gave a reaction for glycoproteins and calcium carbonate and phosphate or ammonium magnesium phosphate. The Authors point out the importance of the bladder inspection at slaughtering.

Rosmini R.: *Present situation, future developments and problems of meat inspection. Wholesomeness and quality of meat.* Atti Conferenza Internazionale Sanità e Produzione Bovina nell'Area del Mediterraneo, Bologna, 3-5 maggio 1988. Editografica Rastignano, Bologna, 143, 1988.

The present situation of meat inspection at slaughterhouses is well-defined. Particularly, modern technology of mass slaughtering and the situation of private and public slaughterhouses in connection with the numbers of responsible veterinarians are considered. A future objective concerning bovine slaughter should be to issue a health-certificate for slaughter animals which presents the results of the tests for infectious agents and residues, and which must be considered for meat inspection and evaluation. The value and limits of *ante mortem* and *post mortem* health inspection are presented. There is no doubt that the *ante mortem* and *post mortem* examination of the slaughter animals is only of limited value without the health-certificate. The veterinary inspector should also refuse to accept a time-period for the inspection prescribed for purely economic reasons where slaughtering is performed on a production-line. The future developments of meat inspection are with respect to the quality of meat. The following tests have been taken into consideration for their possible use in slaughterhouses: measurements of activity water and pH of muscle and *rigor mortis*. The role of meat inspection in the year 2001 will be the evaluation and assessment of the quality of meat in addition to existing hygienic aspects.

Testi F., Di Guardo G.: Studio casistico dei tumori della base del cuore (chemodectomi) nel bovino. *Case contribution to the study of heart-base tumours (chemodectomas) in cattle.* Obiettivi e Documenti Veterinari, 9(12), 45, 1988.

The Authors describe the macro-microscopic features of a nodular mass observed at the heart base of a regularly slaughtered cow. The spontaneous neoplasm, on the basis either of its localisation, or of its cytohistochemical characteristics (PAS and CHROMO-NEGATIVITY) and benign behaviour, was interpreted as a chemodectoma (glomus tumour) originating from one of the chemoreceptors sited in the adventitial tissue of the pulmonary artery.

1989

Benazzi C., Marcato P.S., Piacini A.: Lesioni associate alle neoplasie della mammella del cane e del gatto. *Cancer-associated lesions in the mammary gland of dogs and cats.* Bollettino dell'Associazione Italiana Veterinari Piccoli Animali (AIVPA), 28, 245, 1989.

Human pathologists showed that a high proportion of cancerous breasts also have various benign conditions. Most Authors consider hyperplastic epithelial lesions as potentially precancerous. The same significance has been attributed to cancer-associated epithelial proliferations with grade III and IV of atypia. Our studies are based on the histologi-

cal examination of biopsies from mammary neoplasms and surrounding tissues of 91 dogs and 16 cats. Lobular and ductal hyperplastic lesions, both typical and atypical, were present in 73.63% of the dogs and 56.25% of the cats at the periphery of neoplastic nodules. The evaluation of our data indicates that also in the considered species these alterations may be precancerous. The presence of benign precancerous lesions at the periphery of tumours, besides indicating a multicentric histogenesis, might suggest that the development of neoplasias could recognize successive stages and that a continuity of the cancerous stimulus could exist.

Benazzi C.: Le neoplasie del torace nel gatto. *Neoplasms of the thorax in the cat*. Bollettino dell'Associazione Italiana Veterinari Piccoli Animali (AIVPA), 28, 55, 1989.

The thoracic neoplasms comprise a number of different forms, primary and secondary, the former rare in the cat, where the *intra vitam* diagnosis is difficult. Four groups are considered: 1-tumours of the trachea; 2-primary tumours of the lungs; 3-intrathoracic non respiratory tumours; and 4-tumours of the thoracic wall.

Biavati S., Gelli M.C.: *Mucorales interference with extracellular matrices antigens in congenital cystic kidney*. Bas. Appl. Histochem., 23, 17, 1989.

In congenital cystic kidneys the cells lining the cysts may acquire some degree of proliferative capacity in response to certain yet undefined stimuli that reflect a metabolic change of various components of the extracellular matrices. In this study we used formalin-fixed cystic kidneys obtained from 4 patients and 3 cats soon after birth for delineation of the changes in extracellular matrices. We studied paraffin-embedded tissue sections employing antibodies directed against various antigenic components of basement membranes (BMs): type IV collagen, laminin, fibronectin and six lectins: PNA, ConA, WGA, DBA, RCA, LTA. In one human and in two cat kidneys, antibodies anti-BMs components and lectin ConA and WGA bind the walls of PAS+ runner-like hyphae which produce an imbalance in various antigenic components of the extracellular matrices and may have a fundamental role in the pathogenesis of this cystic alteration.

Biavati S.: Il Museo Ercolani. *The Ercolani Museum*. Obiettivi Documenti Veterinari, 1, 42, 1989.

In the Ercolani Museum there is a historical and educational collection where art imitates perfectly animal morbid anatomy and teratology. Some wax and plaster casts exactly reproducing the original specimens even in their dimension, performed by Cesare Bettini concerning veterinary morbid anatomy and teratology, are showed and described.

Biavati S.: Le componenti intrinseche ed estrinseche della membrana basale (MB) nel rene cistico del gatto. *The basal membrane (BM) components in the cystic kidney of the cat*. Atti Soc. Ital. Sci. Vet., 43, 853, 1989.

Normal and cystic kidney tissue of five cats was analysed with respect to the distribution of BM. Type IV collagen, laminin and fibronectin were studied on the basis of polyclonal

antibodies in paraffin embedded tissue sections. The structure of the BM was well preserved in the normal kidney tissue of one normal cat and in the cystic kidney of two cats. The cystic kidney tissue of other two cats exhibited essentially similar results. The reactivity toward anti-type IV collagen and laminin was focally increased. The reactivity toward fibronectin, normally absent, increased in the peritubular regions and interstitium. It may be that fungi and runner-like hyphae observed in the last two cat kidneys interfere with extrinsic BM components determining a dramatical thickening of the pericystic BM.

Della Salda L., Preda P.: Diagnosi della epatite necrotica infettiva del coniglio mediante immunoelectronmicroscopia su fase solida (S.P.I.E.M.) con proteina A. *Solid phase immune electron microscopy (SPIEM) by use of protein A for the diagnosis of necrotic infectious hepatitis of the rabbit.* Atti Soc. Ital. Sci. Vet., 43, 947, 1989.

In order to detect the viral agent responsible for necrotic infectious hepatitis of the rabbit (s.c. haemorrhagic viral disease) from liver homogenates, the Authors have employed SPIEM (solid phase immuno electron microscopy) by use of protein A, a method not yet utilized on organ homogenates in veterinary medicine. Virus particles of 30-35 nm have been detected (picornavirus like); they are very similar to those observed by other Authors with different methods. SPIEM was compared with the standard negative stain for E.M. and another IEM method (direct IEM) and appeared to be the most efficient and specific technique, permitting a more rapid detection of the virus particles.

Ferrari P., Venturi L., Rosmini R.: *Main anatomo-pathological lesions in rabbit inspection.* Riv. Coniglicolt., 26 (4), 37, 1989.

The Authors report anatomo-pathological data gained from meat inspection of 253,611 rabbits. The main lesions are described from the anatomo-pathological point of view and statistically analysed. The lesions are most frequent in the respiratory system and subcutaneous tissue, respectively 22.6% e 22.2% of condemned rabbits. Urinary and genital system, above all adult rabbits, are also affected. The predominant lesions are interstitial nephritis and purulent metritis. On the contrary the lesions in the digestive system as catarrhal chronic enteritis, hepatic necrosis, fibrino-purulent peritonitis, hepatic coccidiosis and cysticercosis are infrequent.

Galeotti M., Marcato P.S., Sarli G.: Immunohistologia del fenomeno di Splendore-Hoeppli nelle actinogranulomatosi e aspergilloso bovine. *Immunohistology of Splendore-Hoeppli phenomenon in bovine actinogranulomas and aspergillosis.* Atti Soc. Ital. Buiatria, 21, 581, 1989.

In some chronic inflammations the lesions show histologically the s.c. Splendore-Hoeppli phenomenon (SHp) which consists of club-like projections of an acidophilic amorphous material around bacteria, fungi or parasites. Many Authors believe it is an antigen-antibody reaction with deposition of immunoglobulins or immunocomplexes, but so far an immunohistochemical demonstration is still lacking. Cases of bovine actinomycosis (1), actinobacillosis (8), chronic staphylococcosis of the mammary gland (8) and respiratory granulomatous aspergillosis (5), showing typical SHp, were studied by means of PAP technique in order to identify IgG, IgM, IgA and C3. The club-shaped material of SHp

did not show any positivity for the above mentioned Ig and C3 in the examined cases. We suppose, though, that an interaction exists between Ig-C3 (present on microorganisms) and leucocytes, with precipitation of incapsulating amorphous substances, as an expression of the host resistance to infection. We can exclude, on immunohistochemical basis (PAP), that immunoglobulins and complement have a part in the composition of the material which precipitates in Splendore-Hoeppli phenomenon.

Gelli M.C., Biavati S.: *Congenital cystic kidney in man and calf. Embryopathogenetic study.* International seminar on cystic renal disease. Wictig Ed. Milano, 91-93, 1989.

In our study a precise correlation of the origin of the cysts on the basis of lectin binding is impossible. Probably, the lectin affinity can be highly influenced by tubular distension and by functional patterns of the cell coat lining the tubules surrounded by an altered mesenchyma. Embryologically only an alteration of an undifferentiated mesenchymal area could justify a cystic kidney in association with a dysplastic kidney or a cystic liver in the same body. The detection of mycotic material in two dysplastic cystic kidneys of two newborn children and in the kidney of one calf with intrahepatic congenital cystic liver suggests that a pathologic event occurs in early pregnancy before the growth of a nephrogenic center between the post cardinal vein and coelom. The fungal invasion can produce an alteration in biochemical compounds of mesenchyma and BM components, and it might induce an anomalous stimulus to the proliferating epithelial cells and explain the dysplastic congenital cystic kidney.

Marcato P.S., Benazzi C., Vecchi G., Della Salda L., Simoni P., Aiello P., Tumino G.: L'epatite necrotica infettiva del coniglio. Profilo patogenetico di una nuova malattia emorragica. *Infectious necrotic hepatitis of rabbits. Pathogenesis of a new hemorrhagic disease.* Riv. Coniglicolt., 25(9), 59, 1988. Cunicultura, 14(77), 6, 1989.

The Authors illustrate the macro- and microscopical features and pathogenesis of the acute disease of rabbits recently spread throughout the Country. On the basis of morphological studies on natural and experimental cases, this disease is referred to as infectious necrotic hepatitis of rabbits. Particular ultrastructural alterations of hepatocytes support the hypothesis of a viral etiology. The severe hepatic damage is accompanied by microangiopathy (disseminated intravascular coagulation) and multiple hemorrhagic foci in various organs, necrosis of the lymphoid tissue, regressive changes of the nervous system, nephrosis, anemia and leucocytosis. A primitive or secondary defect of coagulation factors and endothelial lesions are possible causes of the hemorrhagic syndrome. The Authors obtained the transmission of the disease to healthy rabbits inoculated with suspensions of liver and lung from a diseased subject. Infectious necrotic hepatitis of rabbits shows a number of similarities with the s.c. hemorrhagic disease recently described in China.

Marcato P.S., Di Guardo G., D'Onofrio G., Mutinelli F., Marocchio L., Della Salda L.: Le gastropatie nei suini. I. Indagini su 3.057 suini macellati. *Gastric pathology of swine. I. Survey on 3,057 slaughtered pigs.* Sel. Vet., 30, 167, 1989.

A survey concerning swine gastric lesions was carried out in the stomach of 3,057 regular-

ly slaughtered pigs. Erosions and ulcers were commonly observed (437 cases), mainly as single lesions (265 cases), less frequently in association with other gastric alteration (172 cases): hyperemia (33 cases), catarrhal gastritis (54 cases), hyperplastic follicular gastritis (85 cases). The erosions of the esophageal region were the most common among the erosive and ulcerative lesions. 377 cases of hyperplastic follicular gastritis and 230 cases of catarrhal gastritis not associated with erosions and/or ulcers were also detected. Moreover, 39 stomachs showed single para-cardial nodules of various size (0.8-2 cm Ø), originating from hyperplasia of collagen fibers and myocytes. Such nodules were considered as submucosal reactive processes to erosive and/or ulcerative alterations.

Marcato P.S., Sidoli L., Barbieri G.: Encefalomiocardite (EMC) da cardiovirus in suini della Valle Padana: osservazioni preliminari. II. Lesioni anatomoistopatologiche spontanee e sperimentali. *Encephalomyocarditis (EMC) caused by cardiovirus in swine of the Val Padana. Preliminary observations. Note II. Spontaneous and experimental lesions.* Sel. Vet., 30, 261, 1989.

The Authors examine the lesions found in 6 swine which died of encephalomyocarditis and those experimentally induced in a piglet and in mice inoculated with material from the spontaneous cases.

Marcato P.S., Benazzi C., Galeotti M., Della Salda L.: L'epatite necrotica infettiva dei leporidi. Nuove ricerche sulla patogenesi della malattia emorragica del coniglio e della lepre. *Infectious necrotic hepatitis of leporids. Further investigations on the pathogenesis of viral hemorrhagic disease of the rabbit and hare.* Riv. Coniglicolt., 26(8), 41, 1989.

The Authors present the conclusive result of their investigations in this second paper, which follows a previous report appeared on a 1988 issue of the same Journal. Fifty-three rabbits and 17 hares were studied by means of anatomohistopathological, ultrastructural and immunohistochemical techniques. The findings lead to the following conclusions: 1) the s.c. hemorrhagic disease of the rabbit and a condition exactly alike EBHS (European Brown Hare Syndrome) present very similar pathogenetical characteristics and share a common viral origin, as demonstrated by immunohistology and/or immunoelectron microscopy; 2) both diseases may be indicated with the denomination infectious necrotic hepatitis of Leporids, because of the importance and severity of the hepatic parenchymal damage; 3) the hepatic damage is due to direct (cytolytic) and indirect (microthrombotic) action of the causal agent; 4) the histological and ultrastructural lesions in the liver are similar to those found in viral acute hepatitis in man and particularly to those seen in non A/non B hepatitis; 5) infectious necrotic hepatitis of Leporids shares with non A/non B hepatitis also the difficulties in the identification and isolation of the causal agent; 6) the extrahepatic lesions consist in necrosis of lymphoid tissue, microvascular alterations, DIC (disseminated intravascular coagulation) and hemorrhages, all leading to a fatal shock; 7) in some cases the hepatic lesions can undergo chronic evolution, especially in hares.

Mengoli A., Rosmini R.: Etichettatura delle carni fresche (refrigerate e congelate) bovine, bufaline, ovine, suine ed equine. *The labelling of fresh and frozen meat in bovine, buffalo, sheep, swine and horse.* Eurocarni, 4 (12), 65, 1989.

The Authors review the EEC laws, concerning the labelling of the meat and meat products, and the marketing ways of the fresh and frozen meat. Particularly they explain the D.P.R. 18-5-1982, no. 322 concerning the labelling of the fresh and frozen meats. The Authors also describe the indications and the directions of the labels on the packed fresh meats, on the prepacked chilled meats and on the non-prepacked meats. Finally the labelling of frozen or in paper wrapped meats is reported.

Preda P., Della Salda L.: Importanza della immunoelectronmicroscopia su fase solida (S.P.I.E.M.) con proteina A nella ricerca di particelle virali in omogenati di tessuto. *Solid phase immune electron microscopy (SPIEM) with protein A for detection of viruses on tissue homogenates*. Atti Congresso della Società Italiana di Microscopia Elettronica, 42, 35, 1989.

Solid phase immune electron microscopy (SPIEM) with protein A is an immunologic method in which nickel grids are precoated with protein A of *Staphylococcus aureus* before coating with specific antiserum and it is commonly used for detecting plants viruses and virus particles from stool specimens. With this technique applied on liver homogenates of rabbit affected by necrotic infectious hepatitis, we managed to detect more virus particles than with other immuno electron microscopy methods. SPIEM with protein A appears as a highly specific and sensitive method, useful for rapid detection of viruses in liver homogenates.

Rosmini R., Lollini L.: *Animal growth promoters and public health*. Prog. Vet., 45 (3), 97, 1990 e Atti del Convegno Problematiche inerenti all'uso di sostanze ad azione anabolizzante nell'allevamento dei bovini e risultati di una ricerca sperimentale, Mantova, 9-12-1989. Tecnograf Reggio Emilia, 1989.

The use of growth promoters in animals is discussed in relation to the consumer safety. The effects of residues of hormonal anabolic agents in carcasses are considered. The potential carcinogen effects of sex steroids as oestradiol, testosterone, methyltestosterone, 17-beta-19 nortestosterone, and progesterone are summarized. Effects of three synthetic hormones, zeranol, trenbolone and megestrol acetate are also analysed. Since the mode of action of anabolic steroids is not fully understood and they have high hormonal activity and are associated with cancer, it is important that they present no risk to the meat consumer. Finally the Authors remember the use of beta-adrenergic agonists, clenbuterol and cimaterol, and growth hormone such as anabolic agents. The mode of action of beta-agonists is poorly understood and there are no experiments in which beta-agonists and growth hormone have been considered from the point of view of human safety.

Rosmini R.: Sostanze ad azione anabolizzante negli alimenti di origine animale: validità, limiti e potenzialità dell'esame istologico. *Hormonal anabolic agents in meat: validity, limits and power of histological examination*. Atti corso di aggiornamento obbligatorio per i veterinari UU.SS.LL. della provincia di Bologna: I residui negli alimenti di origine animale. Sfera software, 1989.

The Author presents the histological method of analysis for anabolic agents in meat. The biological and chemical methods of diagnosis for hormones used as anabolic agents in

slaughtered calves, maximum six months old, are compared with the histological exams of prostates and Bartholin's glands. The validity and the limits of histological examination in animals chemically treated with diethylstilboestrol (DES) and other anabolic agents, such as, for instance, testosterone, estradiol 17- beta, progesterone, zeranol and trenbolone acetate, are analysed. The Author demonstrates that the finding of squamous metaplasia of the prostate gland has lost most of its value as an exclusive screening parameter. More attention should be paid to glandular hypersecretion alone or associated with slight metaplasia of the epithelium. However, it is difficult to identify treated animals by the help of the histological exam. The Author describes also the anabolic agent effects on the thymus gland. More attention should be paid to thymic involution, in slaughtered calves, characterized by reduction of the cortex with lymphocyte depletion and fatty tissue infiltration. Glycocorticoids, oestrogens and androgens are supposed to play the leading role in the early thymic involution.

Sidoli L., Barigazzi G., Foni E., Marcato P.S., Barbieri G.: Encefalomiocardite (EMC) da cardiovirus in suini della Valle Padana: osservazioni preliminari. I. Aspetti clinici, isolamento, caratterizzazione del virus, trasmissione sperimentale. *Encephalomyocarditis (EMC) due to cardiovirus in Po Valley swines. Preliminary observations. Note 1: clinical aspects, virus isolation and characterization, experimental transmission of disease.* Sel. Vet., 30, 249, 1989.

Encephalomyocarditis virus was isolated from the myocardium of pigs dying during two outbreaks of acutely fatal disease occurring on a fattening unit (4.5% mortality) and on weaned piglets (8% mortality). The outstanding lesions were severe myocarditis in 100 Kg pigs, and hydropericardium, hydrotorax, pulmonary edema, ascites, myocarditis and subendocardic hemorrhages in piglets. Isolation, characterization and identification of the isolates are described. One of the six-week-old piglets inoculated with the viral isolate developed a systemic infection, died and encephalomyocarditis virus was reisolated.

1990

Benazzi C., Marcato P.S., Galeotti M.: Immunolabeling of basement membrane components in adenocarcinomas of the mammary gland of the dog and cat. *Schweiz. Arch. Tierheilk.*, 132, 414, 1990.

Laminin and type IV collagen are intrinsic components of basement membrane (BM) in normal mammary tissue and may be considered the main markers of this structure. Changes occur in their distribution and quantity in the transition from normal tissue to carcinoma. Immunohistochemistry has proven to be a reliable method of detecting BM, so we decided to use it to investigate the patterns of BM deposition in mammary tubular adenocarcinomas of the dog and cat.

Bettini G., Marcato P.S.: Ricerche sulla mielosclerosi nel cane e nel gatto. *Research on myelosclerosis in the dog and cat.* Berl. Münch. Tierärztl. Wschr., 105, 32, 1992. Proceedings of 40th Meeting of the European Society of Veterinary Pathology. Friedrichshafen (D), 20-21.5.1991, pag. 63. Atti Soc. Ital. Sci. Vet., 44, 783, 1990.

Myelosclerosis and myelofibrosis are histologic terms denoting an increase of reticulin network in the bone marrow, leading to progressive substitution of hematopoietic tissue. Bone marrow samples from 45 dogs and 22 cats were histologically examined for the detection of myelosclerotic lesions in 41 cases of neoplastic diseases of the hematopoietic and lymphoid tissues and in 26 cases of other various diseases, including 12 infectious viral non-neoplastic diseases. Sections stained by Gomori's silver impregnation were graded for reticulin content. Furthermore, in sections stained with HE, Masson's trichrome, toluidine blue and Perls' method, the association of myelofibrosis with possible pathogenetic factors, including cellular density, megakaryocyte and mast cell number, intramedullary lymphoid infiltrates and hemosiderin content, was evaluated. In some cases megakaryocytes were also identified and counted by the immunohistological demonstration of factor VIII-related antigen using a rabbit polyclonal antiserum (Anti F-VIII, Dakopatts). 75.6% of hematopoietic and lymphoid neoplasms were accompanied by slight to marked reticulin fibrosis. Lymphoma was the condition with the highest prevalence of myelofibrosis (83%). No relation was found, in any group of cases, with megakaryocyte and mast cell count and hemosiderin content. In hematopoietic neoplasms the presence of lymphoid infiltrates and the high cellular density were associated with myelofibrosis in 81.6% of cases. We suggest that in these cases myelofibrosis might be due to unidentified factors released from neoplastic cells that stimulate fibroblast proliferation and secretion of collagen, or might be reactive, linked to hypoxia consequent to hypercellularity.

Bettini G., Mutinelli F.: Ipotesi e ricerche sulla teleangiectasia maculosa del fegato nei bovini. *Hypotheses and research on bovine hepatic telangiectasis*. Atti Soc. Ital. Buiatria, 22, 603, 1990.

The Authors present a review of etiopathogenetic hypotheses concerning bovine hepatic telangiectasis (HT). Furthermore they show the results of histologic studies performed on 45 cases of HT that exclude the occurrence of aspects like those described by Jensen et al. (1982) which allowed these Authors to formulate their most recent hypothesis. This hypothesis is based on the finding of intrahepatic thrombotic venopathies that were not found in the serial histologic sections examined in the present work. On the basis of the finding of similarities with *peliosis hepatis* of man, the Authors propose a further hypothesis on the etiopathogenesis of bovine HT: there may be a relationship between the development of HT and lesions to the sinusoidal endothelium induced by hormone administration or stress.

Biavati S., Manera M.: Dermatopatologia nei teleostei. Dermatite cronica in *Mugil Cephalus*. (Nota 1). *Skin pathology in teleosts. Chronic dermatitis in Mugil cephalus (Note 1)*. Atti Soc. Ital. Sci. Vet., 4, 893, 1990.

After recalling briefly the pathogenesis of chronic tegumentitis in teleosts the Authors study the histochemical and histopathologic patterns of an abdominal chronic dermatitis in a *Mugil cephalus*. Histologically in the dermal layer of the abdomen some Nocardial mycetomas are mainly seen with Gomori-Grocott and MacCallum-Goodpasture stains. The actinomycotic grains are formed by opportunists that complicate traumatic or infective injuries.

Biavati S., Manera M.: Studio istochimico ed istopatologico di lesioni dermiche croniche nei teleostei. *Histochemical and histopathological study of chronic dermic lesions in teleosts*. Bollettino della Società Italiana di Patologia Ittica, 5, 109, 1990.

The Authors briefly describe the pathogenesis of chronic dermic lesions in teleosts then they report a case of a chronic dermatitis in *Mugil cephalus*. Histochemical and immunohistochemical methods were performed on normal and pathological skin of *Anguilla anguilla*. Immunohistochemistry carried out with policlonal antibodies reveals that xenoma possesses a basement membrane composed only of the endogen component laminin. Moreover the cross-reaction between the antibody anti-laminin and anti-fibronectin and the wall of sporozoans was observed.

Biavati S.: *Lectin histochemistry of fungi in formalin-fixed paraffin-embedded tissue sections*. Arch. Pathol. Lab. Med., 114, 351, 1990.

Regarding the article by Karayannopoulou and colleagues in the July 1988 issue of the Archives and the letter to the editor by Senba in the Archives in April 1989, the following may be of interest. In unstained paraffin-embedded tissue sections of deep mycoses in man and mammals we have not seen autofluorescence of fungi. On the contrary, in paraffin-embedded tissue sections, the biotin lectins (1:10 dilution) WGA and ConA react consistently and provide the most selective staining for fungi in human and animal tissues, as recently proved by TEM. We are pleased that Karayannopoulou et al. confirmed independently our findings that lectins can be used for histochemical detection of fungi and spores in paraffin-embedded tissue sections.

Bollini D., Bettini G., Pallotti C., Pettazoni P., Salsi U., Simoni P.: Trattamento statistico di immagini digitalizzate in microscopia ottica. *Statistical elaboration of digital images in light microscopy*. AIIM'90. Atti del Congresso dell'Associazione Italiana Informatica Medica. Franco Angeli Libri, Milano, 1990, p. 271.

The functional status of cells in pathologic conditions can be assessed by the evaluation of some physical and geometric parameters. Several valuable information can be obtained from nuclei by measuring parameters as the nuclear area and the pattern of chromatin distribution. To obtain such information in a statistically profitable form, a method has been developed working on commonly used personal computers, if supplied with a digitizer card. The software comprises as well a subroutine performing a flat field correction while computing the nuclear area.

Marcato P.S., Della Salda L.: Linfosarcoma equino. Descrizione di 17 casi. *Lymphosarcoma in horses. Description of 17 cases*. Atti Soc. Ital. Sci. Vet., 42, 827, 1988.

Della Salda L., Marcato P.S.: 17 Casi di linfoma equino classificati secondo la National Cancer Institute Working Formulation. *17 cases of equine lymphomas classified according to the National Cancer Institute Working Formulation*. Arch. Vet. Ital., 41, 93, 1990.

A survey of equine necropsies revealed 17 cases (1.44%) of equine malignant lymphoma (L), which have been studied from an anatomohistopathological and ultrastructural (1 case) point of view. On the basis of the prevalent location of the lesions, the cases have

been classified into three forms: intestinal (8/17), multicentric (5/17) and splenic (4/17). According to the N.C.I.W.F. (National Cancer Institute Working Formulation) they have been classified into the following types: small lymphocytic (6 cases), follicular small cleaved cell (1 case), follicular mixed (1 case), diffuse small cleaved cell (1 case), diffuse mixed (2 cases), diffuse large cell (2 cases), large cell immunoblastic (1 case), lymphoblastic (1 case), small non cleaved cell (2 cases). Most cases of lymphoma exhibited a non follicular, diffuse proliferative pattern, with non cleaved nuclei. N.C.I.W.F. results useful to classify equine lymphomas. The ultrastructural study of one case showed the presence of nuclear pockets and nuclear bodies similar to those found in viral lymphomas affecting different animal species.

Della Salda L.: Su alcuni tumori dell'orbita e degli annessi oculari del cane. *Some orbital and lid tumors of the dog.* Atti Soc. Ital. Sci. Vet., 44, 787, 1990.

The cases presented include orbital and lid tumors of the dog rarely classified from an histological viewpoint: a pleomorphic adenocarcinoma of the lacrimal gland, an adenocarcinoma of the gland of the third eyelid, an osteochondrosarcoma arising from the periorbital tissues and a malignant melanoma originating from the upper eyelid margin.

Della Salda L.: Il sarcoide equino. *Equine sarcoid.* Ippologia, 1(4), 57, 1990.

Equine sarcoid is the commonest neoplasm in horses, and it also affects mules and donkeys. Equine sarcoid, first described by Jackson in 1936, shows well determinate histopathological features that distinguish it from other cutaneous spindle cell tumors. The aetiopathogenesis of this specific skin tumor still remains an enigma, although many aspects might indicate a viral cause. In spite of the various methods of treatment applied, none of them seems to be effective, and sarcoid continues to recur after surgical excision. Therefore, after 50 years, sarcoid still remains mysterious and continues to be one of the most prominent interests for veterinary pathologists and clinicians.

Marcato P.S., Benazzi C., Della Salda L., Simoni P.: I tumori primitivi del polmone nel cane. Indagini istologiche e ultrastrutturali. *Primary lung tumors in the dog. Histological and ultrastructural researches.* Arch. Vet. Ital., 41, 177, 1990.

Primary lung tumors are considered from a diagnostic-statistic point of view, on the basis of the findings collected during the post mortem examinations of 5,084 dogs performed from June 1961 to June 1988. 540 (10.53%) cases of tumor were found, 149 (27.60%) of which involving the lungs, 23 (15.44%) primarily and 126 (84.57%) secondarily. The reported data also indicate that primary lung neoplasms affect 0.45% (23/5,084) of the necropsied dogs and account for 4.26% (23/540) of the tumors. The 23 primary neoplasms were: 1 squamous cell carcinoma; 3 anaplastic cell carcinoma (2 of the small cell type and 1 of the large cell type); 17 adenocarcinoma (12 of the capillary type and 5 of the bronchiolo-alveolar type); 1 malignant histiocytosis; 1 lymphomatoid granulomatosis. Three rare cases (lymphomatoid granulomatosis, malignant histiocytosis and giant anaplastic carcinoma) were studied in detail also by means of transmission electron microscopy.

Marcato P.S., Bettini G., Della Salda L., Galeotti M.: *Pretelangiectasis of the bovine liver and capillarisation of sinusoids. Immunolabeling and electron microscopy.* Schweiz. Arch. Tierheilk., 132, 409, 1990.

The pathogenesis of telangiectasis (TA), the most common liver lesion in the bovine, remains a matter of debate since the various hypotheses are not confirmed. Results indicate that pretelangiectasis shows constant and prominent changes, i.e. the formation of an abnormal basement membrane (capillarisation of sinusoids) and perisinusoidal fibrosis. None of the previously emphasized alterations in pretelangiectasis are evident, i.e. necrosis, hepatitis, thromboembolism or accumulation in the Disse's space of glycogen extruded from hepatocytes. In contrast to the findings of Dimitrovic et al., we find an early thickening of the reticulin framework. The observations suggest close microscopic similarities between bovine liver TA and human peliosis hepatis. The Authors do not hypothesize on the primary cause of TA, but their research reinforces the concept of direct injury to the sinusoidal barrier. The consequent circumscribed capillarisation of sinusoids may be the trigger which initiates the vicious circle of alterations leading to TA.

Marcato P.S., Bettini G.: *La nefropatologia bovina all'ispezione sanitaria post-mortem. Incidenza e lesioni anatomopatologiche nelle vacche. Bovine renal pathology at post-mortem inspection. A survey of the prevalence and type of renal lesions in cows.* Atti Soc. Ital. Buiatria, 22, 105, 1990. Prax. Vet., 11(3), 26, 1990.

The Authors carried out an abattoir survey of bovine kidney disease. Of 1500 cows surveyed, 120 (8%) had kidneys rejected for gross abnormalities. The histological investigations evidenced lesions classified as follows: interstitial nephritis, amyloidosis, nephrocalcinosis and nephrolithiasis, pale kidneys (anaemia), embolic nephritis, pyelonephritis, pigment nephrosis, glomerulonephritis, cysts, tuberculosis, hydronephrosis, steatosis, infarcts, nephroangiosclerosis and lymphoma. The most frequent lesions, single or associated, were: interstitial nephritis (93/120 = 77.5%); 93/1500 = 6.2%), amyloidosis (43/120 = 35.8%; 43/1500 = 2.8%). The most frequent associations were: interstitial nephritis + amyloidosis (19/120 = 15.8%) and interstitial nephritis + nephrocalcinosis-nephrolithiasis (19/120 = 15.8%). All the lesions of the renal calix and pelvis (nephrolithiasis and suppurative pyelitis) were always accompanied by chronic interstitial nephritis. Renal amyloidosis was often associated with amyloidosis of the adrenal glands (81.8%).

Mengoli A., Rosmini R.: *L'etichettatura dei prodotti ittici surgelati. The labelling of deep-frozen sea products.* Il Pesce, 1, 80, 1990.

The Authors review the different deep-frozen sea products and the distinctive feature of the packings. The laws of the deep-frozen products, particularly the D.M. 3-11-1982 concerning the labelling, are analysed. The Authors also describe the EAN code (European article numbering) and the instruction for the preservation of products after the bargain and discuss the problem regarding the affixing of the price to the labelled products.

Nonis S., Rosmini R., Lollini L.: *Qualitative and quantitative histological methods in the sanitary control of minced meat.* Industrie Aliment., 31, 1028, 1992 e Atti Soc. Ital. Sci. Vet., 44, 625, 1990.

The Authors present qualitative and quantitative histological methods that could be associated with bacteriological exams for a judgment on the quality of minced meat in accordance with 88/657/EEC Directive and D. P. R. 1.3.1992, no. 227. The histological methods are based on histochemical stainings such as P.A.S. by Bauer and Calleja, Van Gieson stain and Trichrome stain by Pfeiffer, Wellhäuser and Gehra; as for the histometric evaluation of the minced meat components a model is used based on a binomial distribution.

Parenti E., Rosmini R., Dalvit P., Nonis S., Mari L., Giuriolo P.: *Clinical and anatomico-histopathological findings in cases of atrophic hepatic cirrhosis in feedlot calves.* Atti Soc. Ital. Buiatria, 22, 307, 1990.

The clinical case histories and anatomico-histopathological findings in two outbreaks of atrophic hepatic cirrhosis in feedlot calves are described below. In the first herd, with 30 animals, 5 subjects died in a 20 day-period, at the age of five months; 5 more calves died during the following 3 months, reaching an age of 6-8 months. In the second herd, with 6 heifers, only one died. The remaining subjects were necessarily slaughtered because, like the animals of the first herd, they did not grow sufficiently. The last animal, slaughtered at twelve months of age, weighed only 280 Kg. With small variations the clinical history was similar in all cases. Early clinical signs were inappetence and weight loss followed by the rapid development of haemorrhagic diarrhoea or tenesmus with eversion of the rectum in many cases. All the animals were hypothermic with locomotor disorders. The animals usually died after the onset of severe symptoms. Hepatic trouble was suspected by serological abnormalities that included increase in direct and indirect bilirubin, AST, GGT, LDH and ALT. At the necropsy of eight animals (five from the first herd and three from the second) the most important anatomico-histopathological findings were atrophic hepatic cirrhosis characterized by diffuse fibrosis which disrupted the lobular structure, proliferation of hepatic cells, blood vessels and bile ducts and veno-occlusive lesions. The Authors suppose that the hepatic lesions have been produced by aflatoxins.

Polidoro A., Rosmini R.: *Razionalizzazione dei punti di macellazione in Italia. Readjustment of slaughter-houses to EEC legislation.* Prog. Vet., 45(17), 595, 1990.

The Authors describe the slaughter-houses situation in Italy and in European countries considering the next rationalization of slaughter-houses and meat processing factories. The functions of the private and public slaughter-houses are emphasized. The requirements of the meat dissection factories and cold stores licensed by EEC laws in Italy and in European countries are also reported. The Authors come to the conclusion that the preservation of a double slaughter system is essential as a consequence of social and economic reasons.

Rosmini R., Lollini R., Diquattro G., Canestri Trotti G.: *Swine cysticercosis due to Taenia hydatigena: meat inspection considerations.* Industrie Aliment., 30 (290), 279, 1991 e Atti Soc. Ital. Sci. Vet., 44, 623, 1990.

At *post mortem* inspection of 643 regularly slaughtered swine from a single farm, 491 (76.3%) subjects were found infected with visceral cysticercosis. Parasitological exams

based on number and dimensions of the hooks identified the cysticerci as larvae of *Taenia hydatigena*. Examinations of the feces from two dogs present on the farm were negative after anthelmintic administration. The Authors give evidence to the diagnostic difficulties and inspective judgment.

1991

Benazzi C., Della Salda L., Marcato P.S.: Peliosi epatica in tre gatti e due cani. *Peliosis in three cats and two dogs*. Bollettino dell'Associazione Italiana Veterinari Piccoli Animali (AIVPA), 30, 55, 1991.

Peliosis hepatitis is a disease of the liver characterized by the formation of blood-filled cysts in the hepatic parenchyma. The condition, which is well known in human pathology but has rarely been reported in dogs and exceptionally in cats, shows a lot of similarities with teleangiectasis of the bovine liver. The Authors describe three cases of peliosis hepatitis in cats and two in dogs, and compare their observations with those reported in veterinary and human literature, with special regard to the possible causes and the pathogenesis of this condition.

Bettini G., Marcato P.S.: I tumori epatici primitivi nel bovino. Classificazione di 66 casi. *Primary hepatic tumours in cattle. A classification of 66 cases*. J. Comp. Path., 107, 19, 1992. Atti Soc. Ital. Buiatria, 23, 367, 1991.

A study of 66 primary hepatic tumours was carried out on cattle. These consisted almost entirely of adult females. 50 hepatocellular tumours (10 adenomas and 40 carcinomas), 10 cholangiocellular tumours (three adenomas and seven carcinomas), two cavernous haemangiomas, two haemangioendothelial sarcomas, one fibroma and one Schwannoma were diagnosed. The 50 hepatocellular tumours were classified into adenomas (20 per cent) and carcinoma (80 per cent), both prevalent in the solitary macronodular form. The hepatocellular carcinomas were divided into six groups based on their distinctive histological arrangement and the morphology of the neoplastic cells: trabecular (55 per cent), pseudoglandular (10 per cent), solid (12 per cent), scirrhus (12 per cent), pleomorphic (7 per cent) and fibrolamellar (2 per cent). Twenty-seven out of 50 hepatocellular tumours (54 per cent) were associated with features of blood-filled lakes resembling telangiectasis within the neoplastic tissue. Metastasis was uncommon (10 per cent of hepatocellular carcinomas) and grading according to Edmondson's system (1958) showed a low level of anaplasia in most carcinomas (55 per cent). An association with cirrhosis was never found.

Bettini G.: La mielofibrosi. *Myelofibrosis*. Bollettino dell'Associazione Italiana Veterinari Piccoli Animali (AIVPA), 30(3), 47, 1991.

Fibroblast proliferation and collagen deposition in the bone marrow cavity (myelofibrosis) may accompany many disorders, both neoplastic and non-neoplastic. When excessive it impedes haemopoiesis and results in severe non-regenerative anemia. Definitive diagnosis requires core biopsy examination, because the marrow aspirate is ineffective. The main pathogenetic hypotheses are reviewed.

Bettini G.: La patologia dell'apparato urinario nel cavallo. *Pathology of the equine urinary system*. Ippologia, 2, 65, 1991.

The principal diseases of the equine urinary system are reviewed. Besides the uncommon congenital (cystic kidney), parasitic (*Klossiella equi* and *Micronema deletrix*) and neoplastic forms, the most important pathologies are represented by circulatory (acute renal ischemia with cortical necrosis), iatrogenic (toxicosis by aminoglycosides, phenylbutazone, organic mercurial compounds, etc.) and inflammatory (glomerulonephritis, purulent nephritis, cystitis) diseases. Glomerulonephritis, in the past a rare occurrence, is now considered an emerging disease due to its increased incidence. Urolithiasis was, and continues to be, infrequent, even though a high content of calcium carbonate is excreted with the urine. The diagnostic and prognostic importance of renal biopsy is emphasized.

Biavati S., Manera M.: Biotinylated lectins as desmosomes markers in bovine normal and pathologic tongue. *Bas. Appl. Histochem.*, 24, 19, 1991.

Biotinylated lectins were used to investigate the expression of glycoconjugates on stratified squamous epithelium in the tongues of three calves with lingual granulomas and two control calves. Paraffin embedded tissue sections of all calf tongues were studied by routine histologic methods and the following lectins: ConA, WGA, RCAI^o, PNA, UEAI^o, DBA, SBA and SJA. The results show that the lectins WGA and SBA bind the intercellular bridges in all calf tongues. Sialidase digestion reveals diminished binding sites for WGA. Lectin PNA shows strong positivity of the intercellular spaces in the lower strata of the spinous layer. The tongue of pathologic calves show changes in the desmosomal glycoprotein compounds. The PNA lectin may be a useful marker to differentiate between basal cell carcinoma and squamous cell carcinoma in the skin.

Biavati S., Manera M.: Contributo alla conoscenza delle dermatiti granulomatose nei teleostei. *Contribution to the knowledge of granulomatous dermatitis in teleosts*. Bollettino della Società Italiana di Patologia Ittica, 6, 13, 1991.

In a preliminary communication the Authors characterised the histopathological and histochemical patterns in tissue sections in order to differentiate the chronic dermatitis in teleosts. This could help to distinguish between nocardiosis and tuberculosis (I.B.A.R. Ghittino 1985). Three types of granulomas are present in the nocardial induced tissue reaction.

Biavati S., Manera M.: Marine animals teratology in monitoring of environmental risks. *Proceedings of European Teratology Society*, 19, 33, 1991.

The Authors describe two abnormal marine benthic organisms caught in the same fishing area of the Adriatic sea: a malformed sole (*Solea vulgaris*) and a badly conformed bivalve. The fish shows an evident abnormal mass upon the head possessing a skeletal base radiologically demonstrated. The bivalve shows an evident, probably teratological, relative disproportion between the foot and the shell but the Authors can neither specify the nature nor the origin of this alteration. Probably there is a relation between these

two dismorphoses under the influence of ignote alteration-inductor- factors present in the fishing area were the two animals live.

Biavati S., Manera M.: Peritonite da batteri acido resistenti in tonno (*Thunnus thynnus*). *Acid-fast bacteria granulomatous peritonitis in a tuna fish (Thunnus thynnus)*. Bollettino della Società Italiana di Patologia Ittica, 7, 7, 1991.

The Authors briefly recall the problematic of the histopathological differentiation between tuberculosis and nocardiosis then they report the case of a tuna fish (*Thunnus thynnus*) affected by granulomatous peritonitis. The morphology, the stains (Gram +, G.M.S. +, acid-fast ++, alcohol- acid-fast +) and the histopathological pattern with fibroblastic-epithelioid granulomatosis (soft and hard tubercles) lead the Authors to a diagnosis of tuberculosis. The Authors underline the diagnostic doubt, related to the zoonosical danger of this pathology.

Biavati S.: Dalla teratologia manifesta alla criptoteratologia. *From monstruosity to cryptoteratology*. Proceedings of the First International Symposium Environment and human reproduction, 1, 99, 1991.

The risks inducing monstruosity have become during the last decade some of the possible deleterious effects of the introduction of an increasing number of exobiotic substances into the environment. The toxicologic properties of most of these compounds as well as many natural substances are only now beginning to be evaluated. The alteration produced, called cell DNA damage, can lead to two deleterious consequences. First the damage can grossly interfere with the essential functioning of DNA and cause cell death. Second, in some instances the damage is an intermediate in the production of mutation. This is an immediate concern, because mutations have been implicated in the pathogenesis of many inherited and somatic human disease states. Now it is time to evaluate also the chemical compounds in animal products reserved to human food. The last may be an underhand environmental risk for human malformations.

Borrow H.A., Della Salda L., Testi F., Cianti L.: Dermatite nodosa (skin lesions) del bovino. *Skin lesions in a cow*. Obiettivi e Documenti Veterinari, 12(11), 35, 1991.

The Authors describe a naturally occurring case of bovine skin lesions. Ziehl-Neelsen bacterial stain revealed acid-fast microorganisms in the cytoplasm of some macrophages. It was also performed differential diagnosis in order to exclude bovine farcy (nocardiosis). The affected cow reacted positively to tubercolin test.

Borrow H.A., Testi F.: Dermatite nodulare del bovino Lumpy Skin Disease. *Lumpy skin disease in cattle*. Obiettivi e Documenti Veterinari, 12(7/8), 61, 1991.

The Authors describe briefly the etiological, epidemiological and pathological aspects of the Lumpy Skin Disease in Somalia. The disease was diagnosed on clinical observations, histopathology and electron microscopy. The zoo-economical and sanitary impacts of the disease in Somalia are also discussed.

Borrow H.A., Testi F.: Papillomatosi del *Bos indicus*. *Papillomatosis in Bos indicus (Zebu)*. *Obiettivi e Documenti Veterinari*, 12(10), 57, 1991.

The Authors describe a particular and rare case of cutaneous exanthema in one zebu (*Bos indicus*) in Somalia. Clinical features and histopathological observations of the disease suggest a multiple papilloma. The ultrastructural study failed to reveal the occurrence of the viral particles in the cells.

Lollini L., Nonis S., Rosmini R.: *Results of a research on the distributive efficiency indicators of retail meat*. *Industrie Aliment.*, 30, 825, 1991.

This work provides the results of a research on the distributive efficiency indicators of retail meat. The Authors present checklists similar to HACCP method; histological and bacteriological exams were performed on manufactured meat products for a judgment on the quality. Here we report data relative to 35 butcher's shops in the Bologna and Verona districts. We have considered the hygienic-sanitary conditions of the premises, equipment, personnel and products. Altogether the result was good.

Marcato P.S., Benazzi C., Vecchi G., Galeotti M., Della Salda L., Sarli G., Lucidi P.: *Clinical and pathological features of viral haemorrhagic disease of rabbits and the European brown hare syndrome*. *Rev. Sci. Tech. Off. Int. Epizoot.*, 10, 371, 1991.

The Authors review the clinical, macro- and microscopical features, and pathogenesis of viral haemorrhagic disease (VHD) of rabbits and the European brown hare syndrome (EBHS). The two diseases share similar clinical and pathological manifestations involving an acute syndrome, sometimes accompanied by nervous and respiratory symptoms and epistaxis, and in all cases by severe hepatic damage and multifocal haemorrhages leading to fatal shock. The hepatic lesions (necrosis and inflammation) result from direct cytotoxic and indirect microthrombotic effect of the causal agent. Endothelial lesions and a primary or secondary defect of coagulation factors are possible causes of the haemorrhagic syndrome. Typical lesions consist of necrotic hepatitis and congestion, haemorrhaging and oedema of the lungs and trachea. The histological and ultrastructural alterations of the liver are similar to those found in certain cases of acute fatal hepatitis in man. The high correlation between histologically typical hepatic findings and immunohistochemistry and immunoelectron microscopy is of diagnostic value. Both microscopic lesions and pathogenesis favour the unifying definition of infectious necrotic hepatitis of Leporids for the two disease entities.

Marcato P.S., Della Salda L., Lollini L., Zaghini L.: *Pancreatite acuta sierosa (edema pancreatico o pancreatite edematosa) in suini macellati. Acute serous pancreatitis (edematous pancreatitis) in slaughtered pigs*. *Schweiz. Arch. Tierheilk.*, 132, 441, 1990. *Sel. Vet.*, 32, 335, 1991.

A form of acute serous pancreatitis (edematous pancreatitis, edema of the pancreas) was found in slaughtered pigs of different places of origin. The incidence was 0.8% (125/15,939), reaching a maximum of 32.3%. Furthermore, the average incidence varied in relation with the time of fasting before slaughter: in pigs fasted for more than 40 h. it was

2.8% (101/3,547), in those fasted for less than 40 h. it was 0.08% (9/11,377). In groups of pigs of the same place of origin slaughtered at different intervals, the incidence of the lesions was quite different: it was 3.1% (4/127) as for the pigs fasted for 50 h. and reached 322.3% (44/136) as for the pigs fasted for 73 h. Pancreatitis was constantly accompanied by very frequent autophagic lesions of the rough endoplasmic reticulum of acinar cells (s.c. intracisternal sequestration) in the form of large vacuoles containing cellular material and organelles undergoing disintegration. Inside the dilatations of the rough endoplasmic reticulum there were sometimes fibrils which showed the same characteristics of amyloid. In the two cases examined by TEM no ultrastructural lesions were observed in acinar cells that could be due to ischemic, toxic or infectious damage (absence of mitochondrial and nuclear lesions). The Authors hypothesize that the time of fasting before slaughter together with eventual stressors might produce, in susceptible animals, the activation or liberation of pancreatic enzymes with consequent autophagia of acinar cells, and extrusion of autophagic vacuoles into the interstitium with liberation of enzymes which stimulate an inflammatory reaction.

Mengoli A., Rosmini R.: L'irradiazione delle derrate alimentari e norme Codex per una corretta applicazione. *The ionizing radiation of foodstuff according to the rules of Codex alimentarius*. Eurocarni, 4, 73, 1991.

The Authors present the electromagnetic radiation that is known to inhibit the growth of bacteria and other micro-organisms. It is possible, in the future, to use it for the sterilization and preservation of food. The use of ionizing radiation for the conservation of meat or other animal food is at present prohibited in the EEC. The Authors analyse, in this work, the possible irradiation of foodstuff according to the rule of Codex alimentarius and synthetically review the law concerning the use of ionizing radiation for preservation of food in the world. The validity and the limits of ionizing radiation in the field of food preservation are presented. Electromagnetic radiation of short wavelength and high energy in the form of X-rays and gamma rays are considered. High frequency radiation has not been proposed because of the difficulty in controlling the heat produced, but this method may be of value in defrosting frozen foods. In the correct application of ionizing radiation the amount of energy that is released in irradiated foods is very small and the temperature rise negligible. Chemical changes, however, may occur in meat including changes in taste and odour. Finally the labelling of irradiated foods, according to the rules of Codex alimentarius, is proposed.

Rosmini R., Lollini L.: *First studies on haemorrhages of lymph nodes in slaughtered pigs*. Industrie Aliment., 30, 838, 1991.

This work provides for giving information on haemorrhages of lymph nodes in slaughtered pigs that result healthy at post mortem inspection. Anatomico-histopathological features suggest that these lesions should be due to the slaughter procedure. Haemorrhages, which are of various severity in size, are usually localized in the gastric, medial iliac, lumbar-aortic and renal lymph nodes. Histochemically in the haemorrhages, located under the capsule but also in the perifollicular areas of lymph nodes, are present numerous red blood corpuscles but not pigments such as haemosiderin or liposiderin. We have also discussed about the problem of the differential diagnosis.

1992

Benazzi C., Sarli G., Galeotti M., Marcato P.S.: *Laminin, type IV collagen and type VII collagen in mammary tumors of the dog and cat. Diagnostic significance.* *Medicina Veterinaria*, 9(9 suppl.), 80, 1992.

Basement membrane modifications appear to be particularly evident in poorly differentiated tumours. Monoclonal antibody LH7.2, against type VII collagen, has revealed to be especially useful for the study of tumors in which abundant newly formed blood vessels could mask small alterations of epithelial basement membranes. This type of collagen is present in basement membranes surrounding epithelia, but not in that underlying blood vessels.

Bettini G., Martini G., Venturi A.: *Leucosi sporadica (forma multicentrica) in vitelli gemelli. Sporadic leukosis (multicentric type) in twin calves.* *Obiettivi e Documenti Veterinari*, 14(4), 61, 1993. *Atti Soc. Ital. Buiatria*, 24, 377, 1992.

Multicentric lymphoma occurred at 5 and 7 months in twin calves. The dam was a normal multiparous Frisian cow from an officially EBL-free herd. Gel immunodiffusion tests for the detection of BLV antibodies gave negative results both in the dam and in the second twin (the test was not performed in the first one). According to these facts the case was diagnosed as Sporadic Bovine Leukosis (SBL) — calf multicentric type. Histopathology showed evidence of a diffuse neoplastic proliferation of intermediate-size lymphoid cells (lymphoblastic lymphoma). The main etiopathogenetic hypotheses for SBL are reviewed, but each one still needs to be confirmed.

Bettini G.: *La patologia epatica del gatto. Hepatic pathology of the cat.* *Obiettivi e Documenti Veterinari*, 13(4), 13, 1992.

Some anatomical and biochemical peculiarities that predispose cats to liver diseases are revised. Etiopathogenesis, clinical, laboratory, and anatomohistopathological findings are reviewed for the main feline hepatic disorders: lipidosis, cholangiohepatitis — biliary cirrhosis complex, toxic hepatopathies, primary and metastatic neoplasms, portosystemic shunts, viral and parasitic hepatites. Among the above listed disorders, lipidosis and chronic cholangiohepatitis are frequent and, when diffuse, can result in hepatic encephalopathy. Liver biopsy techniques are considered, and are prompted as a valuable diagnostic tool.

Biavati S., Manera M.: *Istopatologia ed istochimica in un caso di cercariosi in *Mytilus galloprovincialis* (Lamarck, 1819). Histopathological and histochemical patterns in a case of cercariosis in *Mytilus galloprovincialis* (Lamarck, 1819).* *Bollettino della Società Italiana di Patologia Ittica*, 9, 1, 1992.

The Authors study the mantle of *Mytilus galloprovincialis* histopatologically and histochemically in a case of cercariosis (orange sickness). They describe two different types of reaction: the first one is not apparent with the routinary histological methods, it lines the vital trematode digenium (sporocysts and cercariae), and resembles the fibroblastic en-

capsulation (Cheng et al., 1970). The second one is very evident and leucocytic and it lines the degenerated parasites. Lectin histochemistry has led the Authors to evidence some reactive particulars and some anatomical particulars of the parasites.

Biavati S., Manera M.: La diagnosi morfologica, istochimica e immunoistochimica delle micosi negli animali. *Morphological, histochemical and immunohistochemical diagnosis of mycotic diseases in animals*. Atti Federazione Italiana di Micologia Umana e Animale (F.I.M.U.A.), 1, 220, 1992.

The accuracy of a histopathologic diagnosis of a mycotic or actinomycotic disease depends upon a number of factors such as the agent involved, the adequacy of staining method procedures, the use of proper stains and the expertise of the microscopist. Today some mycoses are caused by any one of a number of fungi belonging to various genera and these fungi are similar in appearance in tissues. The lectins seldom contribute to eвидentiate the walls of hyphae and sporae in tissue sections.

Biavati S.: Museo di Anatomia patologica veterinaria. Ercolani. *Veterinary morbid pathology Museum. Ercolani*. Scienza spazio aperto. Settimana della cultura scientifica e tecnologica 4-10 maggio 1992.

The Ercolani Museum is also a teaching room because the collection has not become obsolete and presents some plaster and wax models concerning veterinary pathology and teratology. Every week the models are employed for instructional purposes to the students of Veterinary medicine. A plaster model of anencephalia in a calf is documented.

Borrow H.A., Testi F.: Dermopatie in zebù e dromedari. *Dermatopathology in zebu and dromedary*. Obiettivi e Documenti Veterinari, 13(5), 37, 1992.

The Authors describe several types of cutaneous lesions in zebu and dromedary caused by physical and chemical noxae. Physiopathological and zoeconomical aspects are also discussed.

Della Salda L., Sarli G., Benazzi C., Marcato P.S.: Anaplastic mammary carcinoma with giant cells in carnivora. *Immunohistochemical and ultrastructural analysis of three cases*. Medicina Veterinaria, 9(9 suppl.) 78, 1992.

Two cases of anaplastic mammary carcinoma with giant cells in the dog, one of which had in addition some giant cells with osteoclastic appearance, were investigated in order to characterize the multinucleated giant cells origin by the electron microscopy and histochemical and immunohistochemical stains.

Eleni C., Sarli G., Terzi L., Galeotti M., Marcato P.S.: Comparative aspects of cellular reaction of haemolymph nodes, lymph nodes and spleen in bovine disease. 41 Jahrestagung der Europäische Gesellschaft für Veterinärpathologie, Graz (Österreich), 8-9 Juni 1992, pg. 65.

Haemolymph nodes, lymph nodes and spleens from 100 slaughtered young cattle affected with bronchopneumonia or purulent hepatitis were studied by means of histological and immunohistochemical methods. The main aspects of cellular reaction in these immunohaemopoietic organs were compared with regard to lymphoid tissue (B cells and T cell subpopulations) and to numbers of plasma cells, neutrophils and eosinophils. Whereas lymphoid cellular reactions showed similar aspects in all the above mentioned organs, differences were noted in plasmacytic and granulocytic responses. In particular the eosinophil response was more intense in haemolymph nodes.

Galeotti M., Sarli G., Eleni C., Marcato P.S.: *Bovine mediastinic hemolymph nodes. II. Immunological competence investigated by means of monoclonal antibodies (MoAb).* Berl. Münch. Tierärztl. Wschr., 105, 29, 1992.

Mediastinic hemolymph nodes (HN) and lymph nodes (LN) of 15 healthy calves and 10 healthy steers and 27 steers with respiratory diseases (pneumonias) have been studied by means of monoclonal antibodies specific to bovine B and T lymphocytes. BAQ155A (B), CH128A (BoT2), CACT138A (BoT4), CACT80 (boT8), BAQ4A (Null Cells), TH14B (MCH II) (VMRD Inc. Pullman WA). Only for the 15 healthy calves and 10 healthy steers the HN have been studied by means of polyclonal antibodies specific to bovine immunoglobulin classes: IgG1, IgG2, IgA and IgM. Topographical distribution of the HNN populations and subpopulations T and B appears to be similar to LN: in the secondary follicle, the germinal centers contained B, BoT2 and BoT4 positive cells, whereas no staining of lymphocytes could be seen in the mantle zone. Lymphocytes stained with anti- BoT2, BoT4 and partially with anti-BoT8 antibodies were located in the parafollicular lymphatic tissue, whereas using anti- B and anti-Null Cells antibodies the positive lymphocytes were scattered. This is also true for the reaction of the HN (hyperplastic hemolymphadenitis) of steers with respiratory diseases

Lollini L., Rosmini R., Mengoli A.: *Nutritional labelling of foodstuffs of animal origin.* Industrie Aliment., 31, 865, 1992.

The Authors introduce the D. Lgs. 27-01-1992, no. 109, which changes the D. P. R. 322/82, with regard to the labelling, presentation, advertisement of foodstuff. The 90/496/EEC Directive concerning the nutritional labelling is illustrated and models of animal foodstuffs labelling are proposed. Particularly are presented nutritional labelling of tuna in oil, Parmesan cheese, calf liver, beef muscle only, horse meat, pork muscle only, rabbit meat, cow milk, butter from cream and sour cream, sausage mortadella, turkey leg, chicken for roasting, cod (*Gadus morhua*), sole (*Solea vulgaris*), mackerel (*Scomber scombrus*), eel (*Anguilla anguilla*), trout (*Salmo gairdneri*), mussel (*Mytilus edulis*), oyster (*Ostrea edulis*), spiny lobster (*Palinurus vulgaris*), edible snail (*Helix pomatia*), turtle (*Chelonia mydas*).

Lollini L., Rosmini R., Sanguinetti V.: *Bovine skin lesions and meat inspection judgement according to 91/497/EEC.* Atti Soc. Ital. Sci. Vet., 46, 667, 1992.

The Authors describe bovine skin lesions in animals which result positive or dubious at the tuberculin test. Diagnosis has been made possible with the aid of histological and

microbiological methods performed on samples collected on the farm and at the slaughterhouse. The 91/497/EEC Directive is discussed as for the difficulties to formulate a final judgement concerning the carcasses of bovine, without tuberculous lesions, which result positive or dubious at the tuberculin test. Suggestions are advanced to modify the above mentioned Directive as for the inspective judgement regarding these carcasses.

Marcato P.S., Benazzi C., Bettini G., Masi M., Della Salda L., Vecchi G., Poli A.: *Blood and serous cyst in the atrioventricular (AV) valves of the bovine heart.* 11th Autumn Meeting ESVP, Zaragoza, 23-26 settembre 1992. *Medicina Veterinaria*, 9(9 suppl.), 126, 1992.

Cysts of the AV valves are considered common congenital lesions in animals (3) and man (7) that regress with age. We have studied their morphology in the hearts of 5,984 calves, 15,937 steers and 8,986 cows. Cysts were classified as for their content (blood/serous fluid), anatomical site (mitral/tricuspid) and size. Our data indicate that, contrary to most previous reports, valvular cysts are frequently detectable not only in newborn calves, but also in adult cattle and that their size tends to increase with the advancing age.

Marcato P.S., Di Emidio B., Benazzi C., Della Salda L., Galeotti M., Capucci L., Spinaci M., Lucidi P., Poemi M.G.: *Necrotic hepatitis experimentally induced in the rabbit by 3 strains of viral haemorrhagic disease (VHD) calicivirus. I. Hepatic and extrahepatic histopathology. II. Immunohistochemistry and electron microscopy.* *Riv. Coniglicolt.* 29(4), 29, 1992. *Medicina Veterinaria*, 9 (9 suppl.), 69, 1992.

The pathogenesis of infectious necrotic hepatitis (viral hepatitis) of the rabbit was studied by experimental infections of 50 rabbits using three strains of VHD (Viral haemorrhagic disease) calicivirus of which one (TE 5/88) with high virulence, the remaining two with reduced virulence. Histological investigations were carried out to study the morphogenesis of the organ lesions in the 50 subjects, deceased or divided into groups suppressed at 24-30 hrs, 48 hrs, 72-96 hrs and 9 days post infection (PI). The main lesion is granulocytic (heterophilic) acute hepatitis, with massive periportal and midlobular necrosis of the hepatocytes in the animals deceased from 24 to 30 hrs PI, and submassive confluent periportal necrosis (bands of necrosis between adjacent portal tracts) in the animals suppressed during the agonistic phase from 24 to 30 hrs PI. Lymphocytic inflammation becomes relevant at 48 hrs PI in the portal tracts, where proliferation of bile ductules and fibrosis also start. In the subjects suppressed at 72-96 hrs PI, periportal hepatitis appears subacute. In the subjects suppressed at 9 days PI (4/5 infected with reduced virulence strains), the necrosis is absent and the porto-periportal and porto-portal fibrosis prevails (chronic active hepatitis).

Marcato P.S., Eleni C., Sarli G., Galeotti M., Terzi L.: *Bovine mediastinic hemolymph nodes. I. Anatomohistopathology relating to thoracic diseases.* *Berl. Münch. Tierärztl. Wschr.*, 105, 29, 1992.

The pathology of mediastinic hemolymph nodes (HN) was studied in young slaughtered cattle affected by intrathoracic diseases: catarrhal pneumonia, fibrinous pneumonia, tuberculosis, echinococcosis, interstitial emphysema, pleuritis and pericarditis. 715 HN

from 212 diseased animals and 21 HN from 10 healthy animals were collected, fixed, measured (min. 1x1 mm, max. 20x20 mm) and studied by means of histological and histochemical techniques. A grading (0-4) of histopathological findings was performed. As regular feature HN contained lymph vessels besides blood sinuses and showed myelopoietic besides lymphocytopoietic activities. Three forms of high grade (3) reactivity (hemolymphadenitis) were found: hyperplastic or simple, observed mainly in lung echinococcosis (18%) and tuberculosis (8%); eosinophilic, observed mainly in echinococcosis (21%) and lung interstitial emphysema (22%); granulomatous, rarely associated with lung tuberculosis (8%).

Marcato P.S., Sarli G., Della Salda L., Barigazzi G., Foni E., Sidoli L., Spinaci M.: *Ultrastructural study of experimental myocarditis induced by cardiovirus (EMCV.M) in swine.* J. Submicrosc. Cytol. Pathol., 24, 371, 1992. Sel Vet., 33, 789, 1992.

Eight 6-week-old piglets were inoculated with a strain of encephalomyocarditis virus (EMCV) isolated from an outbreak which occurred naturally in the Po Valley in 1988. Two non-identified animals, kept in the same cage, were used as controls. Out of the eight inoculated piglets, two died and two were suppressed on the 2nd post infection day (PID), the four remaining were killed at the end of the experiment. The pathogenesis of myocarditis has been studied using routine methods (Alcian-PAS, Masson's trichrome, Gomori's for reticulin and Mallory's stain), histochemical techniques (ATPase and NADH-TR reactions) and ultrastructural observations (TEM). All the inoculated piglets showed macro and/or microscopic lesions of lymphocytic myocarditis, only in one case associated with fibrinous exudation. One control piglet also showed myocarditic lesions, probably due to a contact infection. An early myocardial fibrosis was already present on the 5th PID. Ultrastructurally the cardiac muscle cells showed severe myofibrillar losses and other regressive alterations. Only on the 15th PID did we observe calcification of the degenerating myocytes, while ultrastructurally we detected needle-like calcium deposits in the mitochondria from the 5th PID. From the 5th PID in the areas of myocarditis the myocytes showed a reduction and/or absence of ATPase and NADH-TR reactions. On TEM one or more aggregates of viral particles in crystalline array were detected in the cytoplasm of many endothelial cells.

Marcato P.S.: *Patologia mammaria animale. Pathology of mammary glands.* Edagricole, Bologna, 1992.

The major pathologic issues are those of inflammatory and neoplastic diseases. Bovine mastitis and mammary dysplasia and neoplasia of the dog and cat are treated in detail and illustrated with 197 full colour photographs. The purpose of this atlas is to facilitate interpretation of the mammary lesions in order to arrive at a precise diagnosis.

Preziosi R., Sarli G., Benazzi C., Marcato P.S.: *Detection of proliferating cell nuclear antigen (PCNA) in canine and feline mammary tumours.* J. Comp. Path. 113, 301, 1995, Atti dell'11 Meeting autunnale E.S.V.P. (European Society of Veterinary Pathology); Medicina Veterinaria 9(9 suppl.), 82, 1992.

Quantitation of immunohistochemical staining of the proliferating cell nuclear antigen

(PCNA, clone PC10) by image analysis was performed on benign and malignant mammary tumours of dogs and cats. Scoring of the slides was carried out using image analysis to assess the percentage of labelled nuclei (expressed as a ratio of areas). Either the strongly labelled nuclei (SP-PCNA index), or all of the stained nuclei (TP-PCNA index) were counted as positive to determine the growth fraction and its correlation with the histopathological classification and nuclear grade. A significant difference in the values of PCNA indices was seen between benign and malignant growths ($P < 0.0001$ dog; $P < 0.05$ cat). Both PCNA indices showed no correlation with nuclear grade in dogs ($P = 0.14$ for SP-PCNA index and $P = 0.31$ for TP-PCNA index) or cats ($P = 0.09$ for SP-PCNA index and $P = 0.07$ for TP-PCNA index). A significant difference in the number of mitoses, expressed as mitotic index, was seen between benign and malignant growths in the dog ($P < 0.01$) but not in the cat ($P = 0.078$). A good correlation of mitotic index between nuclear grade was revealed in canine malignant growths ($P < 0.05$), while in feline malignant tumours, mitotic index showed a good correlation with nuclear grade ($P < 0.05$) only when the values of intermediate plus typical forms were compared with the data referred to atypical forms. It is concluded that quantitation of PCNA-positive nuclear area by image analysis provides an objective method for discriminating proliferative activity of benign and malignant mammary tumours of dogs and cats.

Sarli G.: Encefalomiocardite virale suina. *Porcine encefalomyocarditis virus*. Riv. Suincolt., 33(4), 93, 1992.

The Author presents a review of swine viral encephalomyocarditis. He points particularly to etiopathogenesis, anatomohistopathological and electronmicroscopic features and diagnostic methods of the disease.

Sarli G.: Patologia dell'infezione sperimentale da virus dell'encefalomiocardite nel topo. *Pathology of the experimental infection by encephalomyocarditis virus in the mouse*. Obiettivi e Documenti Veterinari, 13(7/8), 45, 1992.

The Author, reviewing the literature on experimental EMCV infection in the mouse, presents the cardiac and pancreatic lesions of mice inoculated with a strain of EMCV. The latter was isolated from a naturally occurred outbreak in Italy and has shown to resemble the myocardiotropic variant of EMC virus (EMCV-M) reported in the literature.

Sbizzera F., Nonis S., Sanguinetti V., Zanoni R., Lollini L., Sarli G., Rosmini R.: *The new meat purification process on cattle at the slaughterhouse: anatomo-histopathologic and bacteriological examinations*. Industrie Aliment., 34, 1298, 1995 e in Atti Soc. Ital. Buiatria, 24, 333, 1992.

The Authors analyse the meat purification process in the bovine. This process involves a cardiovascular infusion into the animal at the moment the animal is bled. The isotonic infusion solution removes virtually all the remaining blood, induces tenderness and maximizes juiciness. The Authors investigate 12 slaughtered Polish cattle from 460 to 595 Kg live weight. Bacteriological examinations are carried out, before and after the process of cardiovascular infusion, on the solution in the container used to infuse the cardiovascu-

lar system of the animals. The bleeding, pH, temperature values and water holding capacity are pointed out on the carcasses. Histopathological examinations are made on the main organs and apparatus. Weight losses of boiled or grilled meat are determined and the tenderness with juiciness are evaluated. Meat inspection considerations are pointed out on the meat purification process that did not achieve the purpose proposed in this work.

1993

Barbani R., Giglioli L., Rosmini R., Sanguinetti V.: *Bovine bone tuberculosis*. Atti Soc. Ital. Buiatria, 25, 291, 1993.

The Authors describe bone tuberculosis in a 7-year-old half-breed cow and in its 1-year-old calf. The animals came from a breeding farm free from tuberculosis during 1990-91. From the calf bone lesions *M. bovis* has been detected by culture. The tuberculous lesions are localized in one cervical vertebra of the calf and in one thoracic vertebra of the cow. The caseous material is prevalent in the calf lesions. Nodular tuberculous lesions are also present in the lung and liver of both cow and calf, but minute yellow-grey tubercles are observed only in the pleura and peritoneum of the cow.

Benazzi C., Sarli G., Galeotti M., Marcato P.S.: *Basement membrane components in mammary tumours of the dog and cat*. J. Comp. Path., 109, 241, 1993.

The distribution of the basement membrane (BM) components, laminin, type IV collagen and type VII collagen were studied immunohistochemically in benign and malignant growths of the mammary epithelium of the dog and cat. Intact BMs were found in benign growths, but in well-differentiated malignant tumours they were generally discontinuous, and missing in poorly differentiated carcinomas. An increase in the histological grade of atypia was accompanied by a more marked disruption or fading of BM.

Benazzi C.: *La patologia dismetabolica del suino. Rapporto con l'ulcera gastrica*. *Gastric ulcer in swine*. Sel. Vet., 34, 293, 1993.

Ulceration of the pars oesophagea in swine is often a finding at the slaughterhouse. The occurrence of ulcers is worldwide and their frequency varies within geographic areas, still remaining quite high. A review of the most recent literature is carried out concerning this condition.

Benazzi C.: *Malattie dismetaboliche del suino*. *Metabolic diseases of swine*. Atti del 19° Meeting annuale della Società Italiana di Patologia e Allevamento dei Suini (S.I.P.A.S.) e Convegno su: *Malattie dismetaboliche del suino*. Fondazione Iniziative Zooprofilattiche e Zootecniche, 34, 345, 1993.

An important chapter in swine pathology is that concerning metabolic disturbances. The best known conditions in this group are porcine distress syndrome, gastric ulcer, mulberry heart disease and hepatosis dietetica. The present paper presents an updated review.

Bertuzzi S., Urrai G., Manfreda G., Rosmini R.: *The use of vitamin E in preparing inactivated oil adjuvant vaccine, made with Aujeszky's disease virus.* Atti Soc. Ital. Sci. Vet., 47, 1189, 1993.

The Authors studied the possibility of preparing inactivated and emulsified vaccines with Aujeszky's disease virus, by partly or totally replacing the mineral oil with D, L alfa-tocopheryl acetate. 120 piglets, males and females, 12 weeks old, divided in 6 groups, have been used. In the animals, at 21, 47, 74 and 141 days post vaccination, the checking of the antibody level has been made using enzyme linked immunosorbent assay (ELISA). Animal samples of subcutaneous tissue have been collected to verify abnormal inflammatory reactions in the area of vaccination. Results show a similar antibody production in the animals of experimental groups and a decrease in inflammatory reactions when vitamin E increases in the emulsion.

Bettini G., Bracciale F., Monteduro M.: *Megaidronefrosi unilaterale cronica in un vitello. Unilateral chronic megahydronephrosis in a calf.* Obiettivi e Documenti Veterinari, 15(4), 55, 1994. Atti Soc. Ital. Buiatria, 25, 387, 1993.

A case of unilateral chronic hydronephrosis in a one-year calf is described, in which the right kidney enlargement (73 cm in diameter) produced clinical evidence. Furthermore a review of the main causes of hydronephrosis in the bovine species and of the pathogenetic mechanisms leading to renal pelvis cystic dilation and renal tissue atrophy is presented.

Biavati S.: *Gli animali dei parchi come sentinelle biologiche. Wild animals in national parks as biological monitors.* Atti Fe. Me. S. P. Rum., 3, 8, 1993.

The diseases in free-living wild animals of the national parks cannot be separated from the consideration of their effect in man and/or domesticated stock and nowadays it is widely accepted that the problem must be looked at as a whole and not merely from one particular angle. For this reason, because of the interaction of diseases between free-living wild animals, domestic animals, environment and man, it is in our interest to find out as much as we can about diseases in nature. For this purpose I hope to use the live and necropsied wild animals as environmental monitors in our national parks.

Biavati S., Manera M.: *Anguillicolosi in anguille (Anguilla anguilla L.) europee di allevamento. Prime osservazioni istopatologiche ed istochimiche. Anguillicolosis in two farmed european eels (Anguilla anguilla L.). A preliminary histopathological and histochemical study.* Bollettino della Società Italiana di Patologia Ittica, 11, 53, 1993.

The Authors study histopathologically and histochemically (lectins) the tissue of two eels during anguillicolosis. The localisation of larvae (probably referring to *Anguillicola* spp.) in good vascularised tissues and in blood vessels leads the Authors to suppose a specific haematogenous spread or a specific tropism of the larvae in good vascularised tissues other than gasbladder.

Biavati S., Pozzuoli S.: Il rene policistico ereditario da autosoma recessivo nel cane da pastore tedesco e nell'uomo. (Studio anatomo isto-patologico comparativo). *Autosomal recessive polycystic kidney disease (ARPKD) in german shepherd dogs and in infant male. (Anatomo histo- pathological comparative study)*. Atti Soc. Ital. Sci. Vet., 43, 1043, 1993.

Two one-week-old related German shepherd male puppies with abdominal distension caused by nephromegaly were examined. The kidneys were enlarged and reniform and the capsules were not grossly distorted. On the cut surface fusiform cysts of various size, containing a clear watery fluid radiated through the renal parenchyma from the cortex to the medulla. Two related female puppies of the same litter were normal. The described ARPKD observed in the two male puppies are spongy kidneys similar to the polycystic kidney disease observed in a two-day-old necropsied male infant. Although the mode of inheritance of the disorder in the dog is unknown observations suggest a recessive mode of inheritance like in man. In the dog the trait is apparently sex linked, since the only two males in the litter were involved.

Biavati S.: Il Museo Ercolani dell'Istituto di Patologia generale e Anatomia patologica Veterinaria di Bologna. Il patrimonio storico scientifico italiano: una realtà straordinaria. *The Ercolani Museum of General Pathology and Veterinary Pathological Anatomy*. Proceedings of International Scientific Instrument Symposium, 11, 99, 1991.

Biavati S.: Università degli studi di Bologna. Museo di Anatomia-patologica veterinaria. Ercolani. Introduzione storica alla collezione dei preparati in cera. *The Ercolani Museum. The wax models history*. Scienza spazio aperto. Settimana della cultura scientifica, 19-24 aprile 1993.

The wax moulding tradition for instructional purposes in Bologna began with Ercole Lelli, anatomist and sculptor, and continued with Anna Morandi, Giuseppe Astorri and Cesare Bettini. A wax model reproducing variola in a sheep performed by Cesare Bettini is documented.

Borghetti P., De Angelis E., Della Salda L., Conti V., Maltarello M.C.: Indagini istochimiche ed immunoistochimiche sui glicosaminoglicani di matrice in cartilagini normali e patologiche di suino. *Histochemical and immunocytochemical techniques to study the glycosaminoglycans on normal and pathologic pig cartilage*. Atti Soc. Ital. Sci. Vet., 47, 933, 1993

Histochemical techniques for GAGs and monoclonal antibodies anti-chondroitin-4-and-6-sulfate and anti-keratansulfate were used to study normal and osteochondrotic pig articular cartilage. The quantity and localization of GAGs changes either throughout the normal cartilage layer or because of the severity of lesions. The immunocytochemistry showed a different behaviour between C-4-S and C-6-S in the osteochondrotic pathology: the C-4-S more detectable in early lesions, decreased more drastically than C-6-S with the increasing of severity of lesions.

Borghetti P., Della Salda L., Maltarello M.C., De Angelis E., Conti V.: Discondroplasia (Osteocondrosi) e processi degenerativi articolari nel suino pesante: aspetti morfologici e patogenetici differenziali. *Discondroplasia (osteochondrosis) and degenerative joint di-*

sease in heavy pigs: morphologic and pathogenetic differential features. Atti della Società Italiana di Patologia e Allevamento dei Suini (S.I.P.A.S.), 20, 147, 1993.

The study of articular epiphyseal cartilage complex in some joints (shoulder, elbow, hip, and stifle) showed types of lesion with different pathogenetic development. Progressive reduction, erosion and failure of cartilage were expression of a continuous compressive mechanical load. The exacerbation of osteochondrotic lesions and the degenerative process in all cartilage layers could also indicate the action of shearing forces because of an articular instability. The results stressed the different pathological effect of mechanical load on cartilages with morphologic and structural differences.

Borrow H.A., Testi F.: Dermatite necrotica contagiosa del cammello (*Camelus dromedarius*). *Contagious skin necrosis of camels* (*Camelus dromedarius*). Obiettivi e Documenti Veterinari, 14(1), 41, 1993.

The Authors investigated the occurrence of contagious skin necrosis of camels in Somalia. Affected camels were seen in all areas of the southern regions. Salt deficiency and skin damage associated with rainy weather, biting flies, ticks, animal pecker birds (*Buphagus africanus*) and thorny bushes seem to increase the susceptibility. The most consistent gross lesions noted were isolated areas of scabby alopecia, crusting, necrosis and ulceration. Histopathology showed Gram, Giemsa, Grocott and Toluidine blue positive cocci in clusters and in long chains that tinctorially and morphologically resembled *Dermatophilus congolensis*. The electron microscopy revealed coccoid cells bounded with partially degenerated thick walls. The potential impact of the disease in camels is discussed.

Borrow H.A., Testi F.: Esantema vaioloso dello zebù (*Bos indicus*). *Cutaneous exanthema associated with poxvirus infection in two zebu bulls*. Obiettivi e Documenti Veterinari, 14(2), 27, 1993.

The clinical, gross and histopathological findings from two cases of zebu poxvirus infection in Somalia are described and epidemiological observation discussed. In one of the described cases the skin lesions were severe and diffuse, while the other one had localized lesions on the medial thighs and on the scrotum. Diagnosis was confirmed by the demonstration of eosinophilic intracytoplasmic type A inclusions in the skin specimens using H&E and special stains (Feulgen, Montroni, Page green). Histopathology revealed ballooning and reticular degenerations, acantholysis and microvesicles. Dermal lesions include haemorrhages, vasculitis and thrombosis. The possibility of a wild mammal reservoir of infection is discussed.

Della Salda L., Sarli G., Benazzi C., Marcato P.S.: *Giant cells in anaplastic mammary carcinoma of the dog and cat.* J. Comp. Path., 109, 345, 1993.

Four uncommon anaplastic mammary carcinomas containing numerous giant cells are described in three dogs and one cat. The giant cells of all cases were studied by means of monoclonal and polyclonal antibodies to detect epithelial (carcinoembryonic antigen and

keratin) and mesenchymal (vimentin, lysozyme and S-100 protein) differentiation. Most of them proved to have an epithelial immunophenotype. Ultrastructurally, scattered bundles of tonofilaments but no lysosome-like bodies could be detected. One tumor had an additional, different type of giant cell, which had a benign multinucleated osteoclast-like appearance, gave positive staining for acid phosphatase, had a histiocytic-stromal immunohistochemical pattern, and was, ultrastructurally, multinucleate with irregular folds and no evidence of tonofilaments. In one case some giant cells had an epithelial immunophenotype and others a stromal immunophenotype, even though their histological and ultrastructural features were the same. In the least histologically differentiated tumor the giant cells presented a coexpression of intermediate filaments. This supported the theory that there might be a stem cell origin for most canine mammary tumours.

Foni E., Barigazzi G., Sidoli L., Marcato P.S., Sarli G., Della Salda L., Spinaci M.: *Experimental encephalomyocarditis virus infection in pigs.* J. Vet. Med. Ser. B, 40, 347, 1993.

A field isolate of Encephalomyocarditis (EMC) virus was inoculated intravenously into 8 pigs. Four animals died at post inoculation day (PID) 2, the remaining being sacrificed at PID 5, 7, 11 and 15. Two control, in-contact pigs were sacrificed at PID 19. Virus was isolated from leucocytes and nasal swabs until PID 4, from rectal swabs until PID 2 and, in the pigs found dead at PID 2, from several organs. EMC virus was further isolated from brain and spleen of the pig sacrificed at PID 7. One of the 2 control pigs became infected: virus was isolated from nasal swabs at days 6 and 7 and from leucocytes at day 4 of the experiment. Serum-neutralizing (SN) antibody was detected in the injected pigs starting from PID 4; two days later, it was also revealed in the infected, in-contact control. To our knowledge, this is the first report of an experimental transmission of EMC virus infection in pigs by contact exposure.

Galeotti M., Sarli G., Eleni C., Marcato P.S.: *Identification of cell types present in bovine haemolymph nodes and lymph nodes by immunostaining.* Vet. Immunol. Immunopathol., 36, 319, 1993.

Mediastinal haemolymph nodes (HN) and lymph nodes (LN) of 15 healthy calves and ten healthy steers and 53 steers with respiratory diseases (pneumonias) were studied using monoclonal antibodies (Mabs) specific to bovine B and T lymphocytes: BAQ155A (B), CH128A (BoCD2), CACT138A (BoCD4), CACT80 (BoCD8), BAQ4A (Null cells). Topographical distribution of the HN T and B cell subset appears similar to the distribution in the LN. The germinal centres contained B+, BoCD2+ and BoC4+ cells, whereas no staining of lymphocytes could be seen in the mantle zone. BoCD2+, BoC4+ and BoC8+ lymphocytes were located in the parafollicular lymphatic tissue, whereas B and Null lymphocytes were scattered. The same pattern was observed in the hyperplastic haemolymphadenitis of steers with respiratory diseases with an increased positive staining for BoCD4 and BoCD8. A similar pattern was observed for HN and LN Immunoglobulin Containing Cells (ICC). Furthermore, in the calf HN, IgM positive ICC were the most frequent class (44% in HN vs. 33% in LN). It is likely that they could contribute to produce a particularly efficient primary immune response. This is the first study of the distribution of different lymphocyte phenotypes in mammalian haemolymph nodes.

Marcato P.S., Eleni C., Zaghini L.: Linfomi tipo Burkitt nei suini. *Burkitt type lymphoma in swine*. Obiettivi e Documenti Veterinari, 14(9), 53, 1993.

A retrospective histologic study was made of 33 cases of swine lymphoma using the National Cancer Institute Working Formulation (NCIWF) for human non-Hodgkin's lymphomas. This classification scheme was found to be readily applicable to swine lymphomas. Eighty-five percent (28/33) of swine lymphomas were high-grade malignant neoplasms, the others were intermediate-grade neoplasms. The high-grade lymphomas were diffuse small non-cleaved cell type and comprised Burkitt type and non-Burkitt lymphoma. The others were diffuse small cleaved cell type (2 cases) and diffuse large non cleaved cell type (3 cases) lymphomas. The high incidence (11/33 = 33%) of Burkitt type lymphoma was in marked contrast to cattle where this variant of lymphoma is rare (0.7-1.6%). An abattoir survey was also performed during one year (1991) and 8 cases of lymphoma out of 275,628 slaughtered pigs (29/million) were found.

Marcato P.S., Eleni C.: La leucosi suina. *Swine leukosis*. Summa, 10(5), 25, 1993.

Leukosis in swine is almost exclusively lymphoid and lymphoma is a more appropriate name. It is the more commonly encountered neoplastic disease of the species (23-41%) in post mortem meat inspection. Lymphoma affects mainly animals under six months, and clinical signs of appetite disorders, lymphadenomegaly and lymphocytosis are rarely reported. Multicentric, alimentary, thymic and exceptionally cutaneous forms are pathologically described. In the Author's experience the multicentric form prevails (81%). Sporadic findings of retrovirus-like particles in lymphoma tissues were not followed by virological demonstration of their etiological significance. Histocytological classification according to classic schemes (N.C.I.W.F., Kiel) is not available, however most swine lymphomas are immunophenotypically diagnosed as B cell lymphomas of centrofollicular origin.

Nonis S., Rosmini R., Lollini L.: *Histological methods in sanitary control of hamburgers in accordance with D. P. R. 1st march 1992, n. 227*. Industrie Aliment., 32, 741, 1993.

Qualitative and quantitative histological researches on 32 frozen hamburgers produced by 4 alimentary industries, and 35 fresh ones produced locally have been carried out. Qualitative evaluation was based on histochemical staining such as Hematoxylin and eosin, Van Gieson stain, Azan stain by Kotter, Trichrome stain by Pfeiffer, Wellhäuser and Gehra and Periodic Acid Schiff by Bauer and Calleja. For the quantitative evaluation of collagen a histometric test was used. Pieces of bone were found in 26 hamburger samples. D. P. R. 1st march 1992, no. 227 does not authorize the presence of bone tissue in hamburgers. The collagen amount was acceptable, however this exceeded sometimes the limit of 15%. The bread-crumbs were found only in regularly labelled frozen hamburgers.

Rosmini R., Lollini L.: Il controllo dell'uso di sostanze anabolizzanti nell'allevamento bovino. *The veterinary inspection on anabolic agents used in cattle breeding*. In Servizi veterinari e di igiene pubblica nel contesto delle derrate alimentari di origine animale, Ed. Azzali, Parma, 1993.

The Authors present the human safety problems connected with the use of growth promoters in animals and review the law concerning the use of hormonal anabolic agents. The carcinogen effects, such as the hepatic tumours by anabolic steroids in body builders and the hyperplasia and prolapse of hepatocytes into hepatic veins during long term methyltestosterone treatment, are reported and correlated with peliosis hepatis and liver tumours. The veterinary inspection for prevention the risks to the meat consumer is specified. The Authors remember the diagnostic methods to identify the animals treated chemically with diethylstilboestrol (DES), oestradiol, testosterone, methyltestosterone, 17-beta-19 nortestosterone, progesterone, beta-adrenergic agonists such as clenbuterol and cimaterol, thyrostatics such as thiouracil compounds, and growth hormone. The biological test, histological exams on the thymus, adrenal glands, prostate and Bartholin's glands and chemical methods such as TLC, HPLC, HPTLC, GC-MS and RIA are compared.

Sarli G., Benazzi C., Preziosi R., Marcato P.S.: Stima dell'attività mitotica nei tumori mammari del cane e del gatto: standardizzazione del parametro. *Evaluation of the mitotic activity in canine and feline mammary gland tumors: standardization of the parameter.* Argomenti di Patologia Veterinaria, Ed. Fondazione Iniziative Zooprofilattiche e Zootecniche, Brescia, 427, 1994; Atti del 1° Congresso Nazionale della Società Italiana di Citologia, 189, 1993.

In 59 canine and 33 feline mammary gland tumors and in 5 cases of normal mammary tissue of the dog and 3 of the cat, mitotic activity has been evaluated according to several methods available in literature: mitotic count (number of mitoses counted in several fields), mitoses/ μ^2 (number of mitoses corrected for total nuclear area), mitotic index (number of mitoses corrected for cellularity and expressed for 10,000 cells). The results have been correlated with another marker of proliferation: PCNA index. All the parameters concerning mitoses revealed similar ability to discriminate kinetic activity of the samples grouped for histotypes or as benign and malignant growths ($P < 0.01$). In the cat, that showed an higher variability of cellularity with respect to the dog (mean \pm standard deviation; cat: 526 ± 229 ; dog: 602 ± 153 ; $P < 0.01$), mitotic index was revealed as the only mitotic parameter significantly correlated to PCNA index ($P < 0.01$). On the contrary in the dog all the parameters expressing mitotic activity showed similar degree of association with PCNA index ($P < 0.01$). It is suggested that mitotic index should be used as an expression of the mitotic activity, because of its objectivity of evaluation with respect to the two other parameters, and because it simplifies the comparison of data between different laboratories.

Sarli G., Marcato P.S., Poemi M.G., Di Emidio B.: L'attività rigenerativa nell'epatite sperimentale del coniglio da MEV. *Regenerative activity in rabbit VHD experimental hepatitis.* Pathologica, 86, 403, 1994; Atti Soc. Ital. Sci. Vet., 47, 1199, 1993.

Liver regeneration has been studied in necrotic hepatitis of 21 rabbits infected with the haemorrhagic disease virus (VHD). Formalin fixed and paraffin embedded liver sections have been immunostained for the proliferation associated antigen PCNA (Proliferating Cell Nuclear Antigen — clone PC10) and counterstained with toluidine blue that enhances histologic recognition of mitoses. Hepatocytes and bile ducts proliferative activity has been quantified, by means of image analysis, both as PCNA reactivity and mitotic

activity. The results, compared with a semiquantitative estimation of liver necrosis, showed a positive correlation between hepatocytes proliferative activity and liver necrosis, both in acute and subacute hepatitis. In the chronic phase a residual proliferative activity appeared in bile duct cells.

Spinaci M., Marcato P.S.: Pancreatiti e altre patologie del pancreas esocrino nel gatto. *Pancreatitis and other pancreatic diseases in cats*. Obiettivi e Documenti Veterinari, 14(1), 35, 1993.

A retrospective study on 1069 feline necropsies, performed over a period of 15 years, was made to evaluate the main exocrine pancreatic diseases and their frequency. Pathological changes were recorded in 31 cases (2.9%). The Authors have classified them using morphologic criteria as follows: pancreatic accessory spleens (1), pancreatic atrophy (1), pancreatitis (6 acute interstitial and FIP-associated, 2 acute necrotizing, 1 of them caused by toxoplasma, 2 sialodochitis-associated, 3 chronic), nodular hyperplasia (12 cases, 11 of them associated with mild and focal pancreatitis) and neoplasms (2 adenocarcinomas, 1 lymphoma and 1 metastatic haemangiosarcoma).

1994

Bettini G., Marcato P.S.: L'innovazione dei rilevamenti patologici nei macelli. I. Preselezione degli animali e semplificazione delle procedure. *New procedures and technologies in meat inspection. Part I. Preselection of the slaughter animals and alternative procedures*. Obiettivi e Documenti Veterinari, 15(11), 27, 1994.

The current EC meat inspection procedures are today regarded as only partially adequate in protecting public health. The traditional inspection system removes from the slaughterchain only the grossly detectable abnormalities, which in developed countries are mostly caused by non zoonotic agents, and is actually ineffective against chemical and microbiological hazards. Moreover, the traditional meat inspection procedures are accused to facilitate cross-contamination of carcasses and to reduce the linespeed. In a more efficient system animals should be preselected, e.g. with an accurate ante mortem inspection at the farm, into a group with visible abnormalities and another with no abnormalities. Animals from the former group should receive a detailed inspection, while animals from the latter group could be less actively inspected. Alternative inspection procedures (e.g. only visual inspection, without palpation and incision) are widely proposed, and the article 17 of the Directive 91/497/EEC gives the opportunity for a reappraisal of the present mandatory inspection system if the new methods will ensure a level of health equivalent to that guaranteed by the current methods. The results of the Danish and Dutch comparative studies are presented and discussed.

Bettini G., Marcato P.S.: L'innovazione dei rilevamenti patologici nei macelli. II. Registrazione continua delle lesioni e determinazioni strumentali on line. *New procedures and technologies in meat inspection. Part II. Registration of post mortem abnormalities and on line quality determinations*. Obiettivi e Documenti Veterinari, 15(12), 28, 1994.

Recent technological improvements in informatics make it possible to permanent monitor

lesions and other meat quality parameters at the slaughterhouse. Systems for the registration of post mortem abnormalities on the slaughterline and future possibilities for improvements are reviewed, and the factual benefits of this practice to the farmers, health service and researchers are listed. When implementing a lesion recording system on the slaughterline, other relevant quality parameters could be automatically registered, regarding the carcass quality, the meat quality and the hygienic quality. Current technologies provide the possibility to follow meat products throughout all the phases of their production, and to link quality and hygienic information in a network from the farm to the consumer, being the slaughter the more important, but not the exclusive, part of the meat chain. In an Integrated Quality System meat inspection and quality findings are constantly feeded back to the farmer, and more information on live animals is given to meat inspectors. In such an integrated control strategy, applied to each step of animal and meat production under HACCP schemes, meat inspection procedures could be more flexible and adapt and change under circumstances upon a quantitative assessment of risks, being the post mortem examination only one of the many control points, and assure the safety and quality of meat in different regions without the necessity of identical meat inspection procedures being followed.

Bettini G., Martelli A., Vannuccini M., Masi M., Marcato P.S.: *The effects of the transport stress on bovine bone marrow histology in normally slaughtered steers.* Proceedings of the 18th World Buiatric Congress, Bologna, 1994, 519. Proceedings of the 12th Autumn Meeting of the European Society of Veterinary Pathology, Mondovì, 18-22/9/1994.

In order to value if the duration of transport to which cattle are subjected before slaughter produces significant changes in the bone marrow histology, trephine samples were taken from the first sternebra of 118 normally slaughtered and healthy steers of various breeds (Frisian, Charolais, Limousine, crossbreed), road transported from the farm to the abattoir for a distance ranging from 20 to 450 kilometers. Samples were B5-fixed, EDTA-decalcified and paraffin-embedded. In HE-stained sections cellular density (BMC) and megakaryocyte (MGK) number were measured by video analysis, and the results correlated with the breed and the travelled distance. The mean marrow cellularity was 0.35 (standard deviation 0.11, range 0.15-0.60), with a symmetric normal distribution. The mean value for MGK density was 17.08 (standard deviation 7.48, range 3.21-42.13). Grouping the data according to the breed showed no significant differences among the groups. Plot scattering between the travelled distances and the analysed bone marrow parameters did not show any dependence relationship, neither in the pooled samples, nor within breeds. A positive correlation was found between BMC and MGK density ($r = 0.572$, $p < 0.01$). These results indicate that in randomized samples of normally slaughtered steers the stress of a 20-450 Km transport has no significant influence on BMC and MGK number, suggesting that the mechanisms of hematopoietic adaptation to stress resulting in marrow hyperplasia probably takes more than 24 hours.

Biavati S., Della Salda L., Manera M.: Il tegumento di *Anguilla anguilla* (Linneo, 1758) in condizioni normali e patologiche. Contributo sperimentale. *Anguilla anguilla* (Linneo, 1758). *Normal and pathological integument. Experimental contribute.* Argomenti di Patologia veterinaria. Fondazione iniziative zooprofilattiche e zootecniche. Brescia, 36, 359, 1994.

The Authors study the *Anguilla anguilla* normal and pathological integument with special regard to the most superficial layer: the epidermis mucosa. Histochemical, immunohistochemical, ultrastructural, immunocytochemical methods are performed to evaluate the plasticity of the epidermal mucosa and its reaction to various stimuli. The obtained data lead the Authors to propose an interesting structural hypothesis of the epidermal mucosa. It seems to be structured like a dynamic reticulate form by the malpighian cells. Inside this reticulate the other cell types are kept: club cells and mucous cells. The reticulate modules dynamically its cell population in response to the different noxae.

Biavati S., Manera M.: *An immuno-histochemical technique used to demonstrate the transition form of a squamous cell carcinoma in a mirror carp, (Cyprinus carpio L.).* J. Fish Dis., 17, 93, 1994.

Immunohistochemistry was carried out on a squamous cell carcinoma in a mirror carp using a polyclonal antibody against cytokeratines (Dako) and PCNA-PC 10 clone. The Authors used the Protein A-gold technique (Protein A from Sigma) and a silver enhancer kit (Sigma) in formalin-fixed, paraffin-embedded tissue sections. No difference was seen between the cytokeratine expression of normal and neoplastic cells, although there was an interesting difference between the PCNA expression by normal and neoplastic epidermis. In the neoplastic area, the PCNA expression was most abundant in the outermost layer. The latter is thus the most mitotically active layer. This tendency to expand towards the outer layer of the epidermis suggests a transition state from a precancerous, papillomatous stage to a true, invasive, squamous cell carcinoma in situ the heaviest PCNA expression in nuclei of the upper epidermal layer. The Authors considered that it might explain the low invasivity of squamous cell carcinoma in situ.

Biavati S.: *Ercolani's Museum in Bologna. Historia medicinae veterinariae.* International Symposium on the History of Veterinary Medicine, 27, 86, 1994.

Biavati S.: *Le plastiche in gesso del Museo Ercolani. The plaster models in the Ercolani Museum.* Scienza Spazio aperto. Settimana della cultura scientifica, 18-24 aprile 1994.

In the Museum we have preparations preserved in alcohol, as well as dried surgical and necropsy preparations and teratological skeletons collected between 1807 and 1835. From the period 1835 to 1890 we have a number of coloured drawings and 320 wax and plaster models — made by the wax modeller Cesare Bettini in the anatomical laboratories of the Bologna university — which reproduce the original tissues exactly in the original size. Extremely interesting are the plaster models of Ercolani Museum. In the world museums the plaster models are damaged and destroyed. A plaster model, corresponding to the original, of a bovine tuberculosis pneumonia is reported.

Borghetti P., Martelli P., Corradi A., Cantoni A.M., Della Salda L.: Contributo allo studio della patogenesi della sindrome Humpy-backed (cifosi lombare) del suino. Rilievi clinici ed anatomopatologici. *Clinical and anatomopathological features in Humpy-backed syndrome of the pig.* Atti della Società Italiana di Patologia e Allevamento dei Suini (S.I.P.A.S.), 21, 159, 1994.

The Authors clinically examined four 15-week-old piglets with and without signs of Hum-

py-backed syndrome. Blood exams were carried out on animals along with radiological and anatomopathological studies on the spine and vertebrae from kyphotic and lordotic regions. Blood exams did not show any mineral imbalances. Radiographic and anatomopathologic findings demonstrated an acquired hemivertebra (wedge-shape) condition of the last thoracic and first lumbar vertebra only in pigs older than 12 weeks of age. This lesion showed histopathological features of altered osteocartilaginous development which could be attributed to a local mechanical overloading. This led to consider that the anatomical lesion could have taken place when an abnormal functional position of the column appeared in an early phase of the vertebra osteocartilaginous development, which was maintained in strength and specially in duration.

Eleni C., Marcato P.S., Terzi L.: La patologia degli emolinfonodi nel bovino: III. Ricerche istologiche comparative su emolinfonodi, milza e linfonodi di animali sani e affetti da pneumopatie ed epatopatie. *Pathology of bovine hemal nodes. III. Comparative histology of hemal nodes, spleen and lymph nodes of normal and diseased animals.* Atti Soc. Ital. Buiaatria, 24, 589, 1992.

Eleni C., Marcato P.S., Terzi L.: Patologia degli emolinfonodi bovini. Nota III. Ricerche comparative su emolinfonodi, milza e linfonodi nelle pneumopatie e nelle epatopatie. *Pathology of bovine haemolymph nodes. III. Comparative studies on haemolymph nodes, spleen and lymph nodes in cattle affected by bronchopneumonia or hepatitis.* Obiettivi e Documenti Veterinari, 15(10), 59, 1994.

The histopathology of 480 portal haemolymph nodes (HN) was studied in 60 slaughtered young cattle affected by purulent hepatitis or catarrhal bronchopneumonia. A comparison was also made with the histological findings from portal lymph nodes and spleen of the same animals. The HN response was more similar to that of the spleen as far as the lymphoplasmacytic reaction is concerned. Differences were noted in erythrophagocytosis and in myelopoiesis. The former was much lower in the HN. Myelopoietic activities were high both under normal and pathologic conditions especially in the spleen. However, only HN showed significant increases in eosinophils content under certain pathologic conditions.

Galeotti M., Eleni C., Volpatti D., Marcato P.S.: Le unità della corticale profonda (UCP) dei linfonodi di bovino. *Deep cortex units in bovine lymph nodes.* Atti Soc. Ital. Sci. Vet., 47, 1201, 1993. Argomenti di Patologia Veterinaria, Fondazione Iniziative Zooprofilattiche, Brescia, pg. 401, 1994.

The relationship between the structure of the paracortex or deep cortex and the lymphatic tissue reactive state was studied in 61 bovine lymph nodes (6 Lymphonodi renalis, 14 L. lumbales aortici, 13 L. mediastinales, 6 L. hepatici portales, 10 L. mandibulares, 5 L. cervicales profundi, 2 L. cervicales superficiales, 3 L. subiliaci, 2 L. poplitei). The distribution of reticular fibres (silver impregnated with a variant of the Gomori technique), high endothelial venules, interdigitating reticulum cells (S100) and lymphocyte subsets (BoCD4, BoCD8, Null cells, B cells) was evaluated. The deep cortex appear to be subdivided into round or oval shaped units, which comprise most of the T lymphocyte subsets in the lymph node. Units were often in contact with follicles and constitute a functional lymph node compartment with a portion of subcapsular sinus and adjacent medullary cords. Sometimes the units, and consequently the compartments, are fused

into complexes. In 79 of the studied lymph nodes (48/61) structural arrangements in the deep cortex were observed: 32/48 (67%) were constituted of simple units and 16/48 (33%) by complexes. The smaller lymph nodes (< 1 cm) tended to be composed of simple units (70%), whereas the larger lymph nodes were formed of simple units (40%) and complexes (35%). Relating to lymph node anatomical site, hepatici portales, cervicales profundi and lumbales aortici lymph nodes, showed the most evident structuration of the deep cortex in units, normal or fused into complexes. The units were constantly present in the different kinds of hyperplasia especially in the follicular and paracortical type. In non-reactive lymph nodes and those with acute lymphadenitis, small units were frequently observed (62% of cases); these units were probably quiescent pending antigenic stimulation.

Manera M., Biavati S.: Mostruosità in *Solea solea*. (Fowler, 1936). *Monstruosity in Solea solea*. (Fowler, 1936). Bollettino della Società Italiana di Patologia Ittica, 14, 34, 1994.

The malformation of a sole captured alive is described. It presents functional somatic inversion, ambicolouration, absence of right eye migration — normally it is the left one that migrates. The right eye is covered by normal pigmented skin instead of cornea. The Authors could not establish the relationship between the unequivocal developmental failures described. In fact there could be either a diagnostic or a causal relationship between them.

Marcato P.S., Benazzi C., Bettini G., Masi M., Della Salda L., Vecchi G., Poli A.: Cisti ematiche e sierose delle valvole atrio-ventricolari nel cuore bovino. *Blood and serous cysts in the atrioventricular valves of the bovine heart*. Atti Soc. Ital. Sci. Vet., 45, 829, 1991. Argomenti di Patologia Veterinaria, Fondazione Iniziative Zooprofilattiche, Brescia, pg. 437, 1994.

The incidence of valvular cysts was studied in the hearts of 5,984 calves, 15,937 steers and 8,896 cows. Cysts were classified on the basis of their content as blood and serous cysts. In the heart of 79 calves, 140 steers and 193 cows the cysts were measured and classified as for their location on atrioventricular valves. Cyst samples were processed for histology and transmission electron microscopy. The content of some cysts was studied by means of microbiology, biochemistry and electrophoresis. Valvular cysts were found in 11.5% of calves, 7.7% of steers and 16.2% of cows. Blood cysts were mainly on both atrioventricular valves; serous cysts, usually larger, prevailed on the left. As for dimensions, they increase with animal aging. The cysts were sessile and protruding above the atrial surface of the valves. Histologically the cysts wall was composed of irregular stratification of elastic and collagenous fibres, thinner in the serous cysts, and internally lined by endothelium. The fluid of the serous cysts was sterile and biochemically and electrophoretically similar to lymph. The hypothesis is discussed that the cysts may derive from ectasia of blood and lymph vessels.

Marcato P.S., Eleni C., Sarli G., Galeotti M., Terzi L.: Patologia degli emolinfonodi bovini. Nota II. Gli emolinfonodi mediastinici nelle malattie intratoraciche. *Pathology of bovine haemolymph nodes. II. Researches in animal affected by intrathoracic diseases*. Obiettivi e Documenti Veterinari, 15(9), 59, 1994.

The pathology of mediastinic haemolymph nodes (HN) was studied in young slaughtered cattle affected by intrathoracic diseases. 715 HN from 212 diseased animals and 21 HN from 10 healthy animals were measured and studied by means of histological and histochemical techniques. Three forms of high grade (>3) reactivity (haemolymphadenitis) were found: hyperplastic or simple, eosinophilic and granulomatous (tbc). Another prominent alteration was follicular amyloidosis. The main form of morphological reaction of HN to various thoracic diseases resulted mostly an aspecific one, i.e. hyperplasia of immunohaemopoietic lymphoid tissue (hyperplastic haemolymphadenitis).

Marcato P.S.: Aspetti morfologici, patogenetici e comparativi dell'epatite necrotica infettiva dei leporidi (complesso VHD-EBHS). una rassegna. *Morphologic, pathogenetic and comparative aspects of the infectious necrotic hepatitis of leporidae (VHD-EBHS complex). A review.* Argomenti di Patologia Veterinaria, Fondazione Iniziative Zooprofilattiche, Brescia, pg. 111, 1994.

The Author reviews anatomo-histopathological, electronmicroscopical and immunohistochemical aspects of rabbit viral haemorrhagic disease (VHD) and European brown hare syndrome (EBHS). Pathogenetic mechanisms and comparative features are outlined together with differential diagnostic elements. The two diseases (VHD-EBHS complex, infectious necrotic hepatitis of Leporidae) have similar pathological lesions and in Europe virologists have identified the causal agents as caliciviruses. Histopathologic and ultrastructural morphology of the liver alterations have led the Author and his collaborators to define these diseases as true viral hepatitis since 1988. In fact the VHD-EBHS complex has been recognised as a viral infection that produces primarily necrosis and inflammation of the liver and secondarily bleeding and disseminated intravascular coagulation. With regard to clinical symptoms, pathological lesions and mode of transmission (foecal-oral route), the two disease entities share remarkable resemblance to the fulminating form of human viral non-A non-B hepatitis, and in particular to hyperacute hepatitis (hepatitis E) caused by a calicivirus. No report about the zoonotic potential of calicivirus hepatitis of Leporidae have been published up to now. However the potential role of animals in spreading the caliciviruses of human hepatitis E has recently been demonstrated. This raises the importance of further comparative researches.

Marcato P.S.: Patologia diagnostica della sindrome della lepre bruna europea (SLBE, EHBS). *Diagnostic pathology of the european brown hare syndrome (EHBS).* Atti del 13° Convegno Nazionale Patologia della Selvaggina, Volterra 17-19 marzo 1994, pg. 35. Riv. Coniglicolt., 31(9), 37, 1994.

The EHBS is a viral disease causing severe acute, subacute or chronic hepatitis in *Lepus europaeus* and in *L. timidus*. The EBHS virus belongs with the calicivirus, and it is morphologically similar and appears to be immunologically related to the virus of RVHD (Rabbit viral haemorrhagic disease). However the virus from diseased hares failed to produce disease in the rabbit and did not effectively protect against subsequent challenge with the rabbit calicivirus. The acute pathologic changes occurring in hares with EBHS and in rabbits with VHD are quite similar (s.c. VHD-EHBS complex) and histological liver changes can be used to diagnose them both. This statement was recently confirmed by experimental reproduction of EBHS. Acute granulocytic hepatitis with periportal or panlobular hepatocellular necrosis are the liver lesions most characteristic of EHBS.

These lesions have not been reported in other known disease conditions in hares, and particularly in cases of acute bacterial, protozoan or toxic hepatitis or hepatosis. Calcification of necrotic hepatocytes, beginning as mitochondrial calcium deposition, is also a prominent feature of acute spontaneous EHBS hepatitis. Virus particles are very difficult to find by electron microscopic examination of ultrathin sections. Although techniques of immune electron microscopy are needed to identify the virus particles and their location in the cells, the immunohistochemical method provides a sensitive and more simple technique for identifying the viral antigen and confirming the histological diagnosis of EHBS. With regard to pathological lesions and mode of transmission, acute EHBS and VHD are very similar to the fulminating form of human viral non-A non-B hepatitis, and especially to the hyperacute human hepatitis caused by a calicivirus (hepatitis E).

Preziosi R., Benazzi C., Sarli G., Marcato P.S.: *Cytological characterization of canine testicular tumours: correlation with histological classification, cell proliferation and invasiveness.* Proceedings of the 12th Meeting ESVP (European Society of Veterinary Pathology), 117, 1994.

Canine testicular tumours are usually classified according to histological criteria considering morphological patterns such as intratubular or diffuse growth of the neoplastic cells. The need for cytological standards characterizing these types of tumours is scarcely felt in literature, probably due to the low tendency of these neoplasms to metastasize. In the present investigation 65 testicular neoplasms of the dog have been characterized from a cytological point of view. The tumours have been grouped into differentiated, intermediate and undifferentiated forms according to the resemblance with the cells of the normal testis and the degree of pleomorphism. The results have been compared 1) with those obtained from the histological classification of the same tumors; 2) with the proliferative grade assessed by mitotic index, Ki67 index and PCNA index (available for 33 cases out of 65) and 3) cell invasiveness as expressed by basement membrane alterations (available for 40 cases out of 65). The cytological characterization resulted independent of the histological classification, not correlated with the proliferative activity and poorly correlated with basement membrane alterations. The results obtained suggest that the cytological characterization could be used together with the histological classification as an additional prognostic element to discriminate between tumours of the same histological type.

Rosmini R.: Modificazioni tissutali dei principali organi degli animali da macello conseguenti ad inquinamento chimico. *Anatomo-histopathological lesions in main organs of the animal at the slaughterhouse caused by chemical pollution.* In Problemi igienico-sanitari delle derrate alimentari di origine animale. Ed. Azzali, Parma, 1994.

The Author describes the main anatomo-histopathological lesions caused by chemical pollution in food animals. Particular attention is paid to the anatomo-histopathological features of the musculoskeletal system caused by *Cassia occidentalis*, *Karwinskia humboldtiana*, monensin, cobalt, cadmium, zinc, copper, mercury, thallium, iron, fluorine and selenium. Synthetically are reported the lesions caused by iodine, bromine, thallium, arsenic and thiouracil compounds in the skin and subcutaneous tissue and the changes caused by mycotoxins, herbicides such as paraquat, rodenticides such as warfarin, lead and arsenicals in the liver and digestive system. At last the alterations caused by antibio-

tics, mycotoxins, hormones, chlorinated organic and thiouracil compounds in the heart and thyroid gland and in the respiratory, urinary and nervous system are synthesized.

Sarli G., Della Salda L., Marcato P.S.: *Dystrophy-like myopathy in a foal.* Vet. Rec., 135(7), 156, 1994.

Two muscle biopsies (gluteus medius and semitendinosus) of a six-month-old male Standardbred trotter, with clinical signs of hypertrophy, hypertonicity and an electromyogram showing myotonic discharges in glutei, semitendinosus and semimembranosus muscles, were examined by histological, histochemical and ultrastructural methods. Histologically the main findings were represented by variation in fibre size and shape, vacuolization, hyalinization and splittings of fibres, increase of internally positioned nuclei, connective tissue and fat infiltration, hypertrophy and predominance of type I fibres as well as type grouping. Histological results resembled those in human muscular dystrophy. The Authors discuss the similarities between the dystrophy-like myopathy present in this foal and human or animal muscular dystrophy.

Sarli G.: Epatite cronica attiva nel cane. *Chronic active hepatitis in the dog.* Veterinaria, 6(1), 63, 1992; European Journal of Companion Animal Practice, 4(1), 61, 1994.

The Author presents a review of the recent literature on chronic active hepatitis of the dog and he points out comparative aspects with the same hepatopathy in man. Histological findings and pathogenesis of chronic active hepatitis in the Bedlington Terrier and Dobermann Pinscher, which are related to copper overloading, are also described. The aim of the paper is to analyse and explain the histopathological findings so that liver biopsy might become more useful in diagnosis and prognosis of canine chronic active hepatitis. The conclusion points to the strong histological and aetiopathogenetic similarities of chronic active hepatitis in man and dog. In terms of aetiology, infectious diseases (leptospirosis and adenovirus) and hereditary metabolic-toxic causes (copper metabolism disorders) are important, but sometimes primary autoimmunitary involvement is suspected (e.g. idiopathic chronic active hepatitis). Liver biopsy should be the benchmark for canine chronic active hepatitis, prognosis and therapeutic planning.

Spinnato M. C., Rosmini R.: *Aleutian disease eradication programme: relationship between the anatomo-histopathological research and the counter current immunoelectrophoresis (CCIE).* In: Argomenti di Patologia Veterinaria Ed. Fondazione Iniziative Zooprofilattiche e Zootecniche, Brescia, 1994.

Fifty-one female minks, two years old, Standard race and with some reproduction problems, have been subjected to the anatomo-histopathological examination. These animals belong to a closed cycle breeding farm where the Aleutian Disease (AD) is endemic. In 1988 this breeding farm started a prophylaxis programme based on the elimination of the animals positive to immunoelectrosmoporesis (IEOP), a serological test similar to counter current immunoelectrophoresis (CCIE) or counter immunoelectrophoresis (CIEP). Twenty minks out of the 51 examined were negative to IEOP, while 31 were positive. We tried to point out the relationship between the serological positiveness and the anatomo-histopathological lesions observed. All this in order to find out whether

the AD course on the breeding farm is inapparent or, on the contrary, it is responsible for lesions in animals. For each animal we have subjected to the anatomo-histopathological examination specimens of lung, heart, spleen, liver, bladder, uterus, salpinx, kidney, brain, cerebellum, stomach, intestine and mesenteric lymph nodes. The anatomo-histopathological examination we carried out revealed, both in positive and negative to IEOP animals, absence of macroscopic lesions caused by AD and presence of histological lesions due to it in 8 out of the positive subjects, corresponding to 25.8%. These results show that AD on the considered breeding farm is not an inapparent infection in all the animals.

Valentini S., Della Salda L.: Analisi comparata tra reperti ecografici ed istopatologici relativi ad un seminoma in un cavallo. *Equine seminoma. Comparative analysis between echographic and histopathological studies.* Ippologia, 5, 83, 1994.

A seminoma of an eutopic testicle of a stallion is described. The Authors explain the methodology adopted to make a diagnosis, with particular reference to the comparison between echographic and histopathologic images. They emphasize the utility of ultrasonographic examination as a collateral technique to evaluate changes objectively and to allow the best therapeutic approach.

1995

Benazzi C., Preziosi R., Sarli G., Marcato P.S.: *Considerations on histological grading of canine and feline mammary tumours and survival.* Proceedings of the 13th European Congress on Veterinary Pathology. Edinburgh, Scotland, 27th-30th Sept. 1995.

The employment in veterinary medicine of the histological grading as a prognostic tool in mammary cancer has usually concerned the dog. In this study a series of canine and feline mammary neoplasms were graded according to two different methods and the results evaluated on the basis of the data referred to a two-year period following surgical excision of the neoplasms.

Benazzi C., Sarli G., Preziosi R., Marcato P.S.: *Laminin expression in testicular tumours of the dog.* J. Comp. Path., 112, 141, 1995.

The expression of laminin was studied to determine the distribution pattern of basement membranes (BMs) in normal testes and in a series of 40 canine testicular tumours (seminomas, Leydig and Sertoli cell tumours). BM was present around seminiferous tubules and blood vessels in normal testes and in seminomas and Sertoli cell tumours of the intratubular type without invasion. BM changes (fragmentation or loss, or both) were usually found in invasive neoplasms which retained their tubular structure; disruption or absence was observed in tumours with a diffuse pattern. The BM was never expressed in Leydig cell tumours, except around vessels, irrespective of their histological growth pattern (cystic-vascular, pseudoadenomatous, diffuse). An attempt was made to relate the degree of BM modification to proliferative activity as assessed by PCNA (proliferating cell nuclear antigen) and Ki67 monoclonal antibodies and mitotic index. In parallel with a progressive loss of BM an increase in proliferative activity occurred,

indicating that BM changes are additional useful prognostic indicators in testicular tumours of the dog.

Benazzi C.: *Sindrome da stress nel maiale. Porcine stress syndrome.* Riv. Suincolt., 36(5), 13, 1995.

Swine are sensitive to stress stimuli. The conditions which derive are the porcine stress syndrome with the PSE (pale, soft, exudative) and DFD (dark, firm, dry) muscles and the necrosis of dorsal muscles, which can lead to the so called banana disease.

Bettini G., Bovenga F., Marcato P.S.: *La patologia neoplastica negli equini. Rassegna bibliografica e contributo casistico. Neoplastic pathology in horses. A literature review and case contribution.* Atti del 14° Convegno Nazionale dell'Associazione Italiana dei Patologi Veterinari (APIV), 16-18/3/1995, Saturnia (GR), 163, 1995.

Although neoplasms are generally regarded uncommon in horses, the critical revision of the published literature on equine tumours gives figures indicating an incidence ranging from 0.1% to 18% according to the source of data and type of population. A retrospective study was carried out on 1,590 cases recorded in the registration files of the Institute of Veterinary Pathology at the Bologna University. In 270 cases the written report fitted in with a neoplasm, and in 168 (10.57%) the macroscopic diagnosis was histologically confirmed. Tumours were benign in 38% of cases and malignant in 62%. Incidence was higher among surgically removed samples (54/182: 29.67%) and organs from abattoirs (80/436: 18.35%), lower among necropsies (34/972: 3.5%). The most commonly occurring neoplasms were sarcoid (17%), lymphoma (16%) and melanoma (10%). Histogenetically, tumours of mesodermal origin were the most frequent (35%) due to sarcoid and other fibroconnective neoplasms, while epithelial tumours accounted for 27%, and the commonest were adenoma or carcinoma of the kidney (7%), liver (6%), thyroid (3%), adrenal cortex (2%) and the squamous cell carcinoma (4%). The more frequently involved systems were the cutaneous (38%), hemopoietic (19%), alimentary (13%) and genital (12%). Figures from this study are similar to those of previous surveys from other Countries, except for the high proportion of lymphoma. Nevertheless, the Authors underline that only qualified epidemiological studies can provide reliable information and suggest the creation of a tumour registry for oncologic monitoring in horses.

Biavati S.: *Il museo Ercolani: archivio storico indicante la nascita della patologia veterinaria a Bologna. The Ercolani Museum: a historical archiv that attests: in Italy veterinary pathology was born in Bologna.* Scienza spazio aperto. Settimana della cultura scientifica, 3-8, aprile 1995.

Ercolani medical doctor and comparative pathologist described also morphologically and histopathologically hermaphroditism in the eel and placental pathology in mammals. He took advantage of the availability of fish as simplified models for his studies in comparative pathology. Ercolani can be considered the progenitor of the disciple Sebastiano Rivolta and of the disciple Gianpietro Piana. Piana, veterinary pathologist from Bologna, went to Parma and later to Milan. Piana is now considered the father of the modern veterinary pathology in Italy.

Biavati S., Della Salda L., Manera M.: *Histochemistry and ultrastructure of the macrophage aggregates (MAs) of Sparus aurata L. Preliminary results.* Proceedings of European Congress on Veterinary Pathology. 13, 51, 1995.

The histochemical and ultrastructural patterns of the macrophage aggregates (MAs) in *Sparus aurata* are reported. 40 spleens, kidneys and livers were processed for light microscopy in order to evaluate the nature of the macrophage pigments. The macrophages seemed to be rich in pigments optically resembling melanin, but the histochemical techniques failed to detect them undoubtedly melanin. Ultrastructurally melanosomes, small amounts of granules resembling hemosiderin and of lipofuscine and ceroid were recognised in macrophages. No MAs were detected in the liver probably in relation to the age of the young fishes. Melanin seems to be the most abundant pigment in MAs of the young fishes used in the research but it displays different histochemical features compared to mammalian melanin.

Biavati S., Manera M.: *Le neoplasie nei teleostei. Teleosts neoplasms.* Atti del Convegno Nazionale dell'Associazione Patologi Italiani Veterinari (A.P.I.V.), 14, 77, 1995.

Neoplasms in teleosts were described since the end of the nineteenth century but only recently they were rationally, systematically, and experimentally studied. The multi-steps neoplastic progression mode is demonstrated in some fish, in any case fishes neoplasms display other features that prevent the simple extension of mammalian neoplasms data in teleosts. Only the morphological mammalian neoplasm classification can be used to classify teleosts neoplasm. Fishes neoplasms could be used as biomarkers or as experimental models.

Biavati S.: *Modificazioni postmortalì dei teleostei. Postmortal changes in teleosts.* Atti del Convegno Nazionale dell'Associazione Patologi Italiani Veterinari (A.P.I.V.), 14, 127, 1995.

Chapter concerning teleosts thanatology.

Borghetti P., Della Salda L., De Angelis E., Maltarello M.C., Petronini P.G., Cabassi E., Marcato P.S., Maraldi N.M., Borghetti A.F.: *Adaptive cellular response to osmotic stress in pig articular chondrocytes.* Tissue and Cell., 27, 173, 1995.

The Authors studied the effects of a wide range of medium osmolarities (from 0.28 osM (physiological osmolarity of plasma and synovial fluid) to 0.58 osM) by altering Na⁺ concentration in high density cultures of pig articular chondrocytes in order to analyze the behaviour of some functional and structural parameters during cell adaptation to these imposed changes in the ionic environment. They showed a similar biochemical and morphological behaviour when cultured at 0.28 osM and 0.38 osM but they were able, with regard to protein synthesis, aminoacid transport and proliferation rates, to respond quickly and to adapt to 0.48 osM medium as well. On the contrary, the treatment at the highest osmolarity (0.58 osM) early altered these biochemical parameters and was detrimental or even gave rise to lethal damage during long-term treatment. Furthermore, while chondrocytes cultured in 0.28-0.38 osM medium maintained phenotypic characteris-

tic in culture, the highest osmolarities (0.48-0.58 osM) caused morphological changes in cell populations resulting in loss of phenotypic cell stability as demonstrated by their taking on a fibroblast-like shape as well as a lack of ability to assemble matrix proteoglycans.

Della Salda L., Cattoli G., Zanoni R., Sanguinetti V., Serraino A., Benazzi C.: *Isolation of Helicobacter felis from naturally dead kennel dogs in Italy.* Proceedings of 13th European Congress on Veterinary Pathology, P4, 1995.

Fifteen dogs from the same kennel, found dead with no signs other than considerable weight loss, were submitted to necropsy over a one-year period. Common features to all dogs were severe haemorrhage and ulcerations in the gastric mucosa. Samples were taken from the antral and pyloric mucosa from all the stomachs, and Gram stained. Cultural exams were performed on 5% sheep blood agar and Skirrow's agar for 7 days at 37°C in microaerophilic atmosphere. Histological exams were performed on 7 of the subjects and 3 were also observed by TEM and SEM. Gram negative tightly coiled bacteria were seen associated with abundant polymicrobial flora. Histologically, spiral organisms were detectable in the mucus on the surface of the mucosa and in the cryptae. The inflammatory reaction was evident in a single case and consisted of lymphocytes and plasma cells infiltrating mainly the pyloric mucosa. Electron microscopy evidenced spiral bacteria with trilaminar wall, bipolar tufts of flagella and periplasmic fibrils (single or paired) on the mucosal surface and within the parietal cells. In one case extracellular coiled bacteria were detected, with multiple unipolar flagella and no axial filaments (Gastrospirillum-like organisms). The bacteria with periplasmic fibrils could be cultured in two cases, and the isolates, on electron microscopy observation, had the same morphology as those seen in the samples of gastric mucosa. On the basis of their biochemical and morphological characteristics, they were identified as *Helicobacter felis*. To the best of our knowledge this is the first report of *H. felis* isolation from spontaneously infected dogs in Italy.

Manera M., Biavati S.: Argomenti di patologia dei teleostei — In: Argomenti di idrobiologia e acquacoltura — *Teleosts pathology.* In: Proceedings of hydrobiology and aquaculture. Carpenè E., Isani G., Serra R., Ed. CLUEB, Bologna, 1995.

A chapter concerning the special organs pathology in teleosts.

Manera M., Biavati S.: Dermatopatologia comparata dei teleostei. *Teleosts comparative dermatopathology.* Atti del Convegno Nazionale dell'Associazione Patologi Italiani Veterinari (A.P.I.V.), 14, 119, 1995.

The teleosts integument is structured like that of other vertebrates but presents some anatomic and functional features, mainly in its upper stratum, the epidermis which is mucogenic. Likewise the defensive and reactive integument patterns display particular aspects. So a table was drawn in order to compare the histologic integument lesions of teleosts with those of mammalian.

Marcato P.S., Ingrà L., Zaghini L., Sarli G.: Patologia comparata delle linfadenopatie suine. *Comparative pathology of pig lymph nodes*. Atti della Società Italiana di Patologia ed Allevamento Suini, (SIPAS), 23, 139, Reggio Emilia, 23-24 marzo 1995.

Marcato P.S., Ingrà L., Zaghini L., Della Salda L., Sarli G.: *Reaction pattern of aspecific reactive lymphadenopathies in pigs*. Proceedings of 13th European Congress on Veterinary Pathology, Edinburgh, 27th-30th september 1995.

Pathological and normal submaxillary lymph nodes from 4,466 slaughtered pigs were subjected to histological, immunohistological (S-100, alpha-1-antitrypsin, lysozyme, vimentin, Factor VIII, desmin, GFAP, Pan-keratin CD2, CD4 CD8), enzyme histochemical (NASD) and electron microscopical investigations. 34 out of 265 pathological nodes showed nodular lesions: 7/31 necrotic, 6/31 suppurative, 1/31 mycotic and 10/31 tuberculous. 175 out of 265 pathological nodes showed reactive lymphoid hyperplasia (reactive lymphadenopathy) in which expressions commonly found in other domestic mammals were lacking (sinus histiocytosis, sinus catarrh, medullary plasmacytosis) or rare (starry sky pattern of lymphoid hyperplasia). In high grade lymphoid hyperplasia obliteration or disappearance of s.c. diffuse tissue (medulla-like) was found.

Marcato P.S., Sarli G., Preziosi R., Benazzi C.: *The importance of kinetic parameters in the prognostic of canine and feline mammary tumours*. First World Conference on Spontaneous Animal Tumors, Congress Center Fiera Internazionale Genoa, Italy, Final Programme Abstract Book, 10 Invited Lectures, 28-30 aprile 1995.

In the present study kinetic parameters were estimated in a group of mammary tumours of the dog and cat as follows: 1. mitotic index: number of mitosis per 1,000 cells, assessed by image analysis on toluidine blue-stained sections; 2. Ki67 index: percentage of nuclear area immunohistochemically positive for the monoclonal antibody M1B1 (Immunotech, Int., Marseille, France); 3. AgNOR quantification: area (expressed in square micrometers) occupied by the nucleolar organizer regions-linked-argyrophilic proteins (Ag-NOR proteins), visualized by silver stain and assessed by image analysis; 4. DNA index: assessed by cytophotometric analysis on cell smears stained with a quantitative Feulgen stain. The results obtained are presented with respect to a follow-up period of two years as both bivariate and multivariate analysis.

Marcato P.S., Zaghini L., Sanguinetti V., Ingrà L., Bettini G.: Valutazioni istopatologiche e batteriologiche dell'ispezione dei linfonodi sottomascellari nei suini macellati. *Histopathological and bacteriological evaluation of the mandibular lymph node inspection in slaughter pigs*. Atti della Società Italiana di Patologia ed Allevamento dei Suini (SIPAS), 22, 117, Reggio Emilia, 23-24 marzo 1995.

In the article 17 of the current Fresh Meat Directive 91/497/EEC is stated that proposal for alternative inspection methods will be considered by the European Council if they ensure a level of consumer health equivalent to that accomplished by the traditional post mortem inspection (TPMI). The objective of the present anatomoistopathological and bacteriological research was an approach to the evaluation of a simplified, visual post-mortem inspection (VPMI) method, as proposed by Danish reports for slaughter pigs. A comparative study of VPMI and TPMI of submaxillary (Lnn. mandibulares) lymph nodes was carried out on 4,466 heavy slaughter pigs. The approximate difference in non-detec-

tion rates (ADNDR) per 1,000 carcasses between VPMI and TPVI resulted 6.9 (31/4466) for lesions of nodular or caseous lymphadenitis. The additional risk (AR) per 1,000 carcasses of VPVI for undetected tuberculous lymphadenitis was subsequently estimated at 2.23 (histologically confirmed). *Yersinia enterocolitica* was isolated from normal submaxillary lymph nodes of 5/200 slaughter pigs of the same lot (AR of cross contamination per 1,000 carcasses = 25). The results from the present investigation provide an early quantitative risk assessment approach to the efficiency of the current TPVI versus the proposed, alternative VPVI methods.

Marcato P.S.: Les affections de l'appareil urinaire chez le lapin. *Infections of the urinary apparatus in rabbits*. Rec. Méd. Vét., 166, 105, 1990. In: Pathologie du lapin et des rongeurs domestiques, J. Brugere- Picoux, Ecole Nationale Veterinaire d'Alfort, Maisons Alfort, pg. 157, 1995.

Lesions of the urinary apparatus in rabbits can be due to a congenital malformation, a vascular disturbance, nephrosis, (glomerulonephrosis, tubulo-nephrosis) or nephritis, (glomerulo-nephritis, nephritis) or a problem in the urinary tract (lithiasis, ectasia, cystoplegia) or rarely a tumoral lesion.

Marcato P.S.: Les affections nerveuses chez le lapin. *Nervous conditions in rabbits*. Rec. Méd. Vét., 166 95, 1990. In: Pathologie du lapin et des rongeurs domestiques, J. Brugere-Picoux, Ecole Nationale Veterinaire d'Alfort, Maisons Alfort, pg. 145, 1995.

Nervous conditions in rabbits can be related to an anomaly in the embryonic development of hereditary origin (hydrocephalus, syringomyelia, spina bifida) or may be caused by lack of vitamin A. Paresis and paralysis can have many different causes: traumatism, encephalitozoonosis, toxoplasmosis, listeriosis, pasteurellosis. The problems can also have a vascular cause (hyperhemia, cerebral ischemia, cerebral oedema, haemorrhages) or can be inflammatory (bacteria, virus, parasites). The differential diagnosis between toxoplasmosis and encephalitozoonosis is underlined.

Marcato P.S.: Patologia animale e ispezione sanitaria delle carni fresche. *Food animal pathology and meat hygiene. A colour atlas of meat inspection pathology*. Edagricole, Bologna, 1995.

This atlas is intended to contribute to the meat inspector's diagnostic accuracy by providing him with a readily available visual reference to the lesions he is most likely to encounter in meat-producing animals at the time of slaughter. The judgements referred to in the captions, although based on EC meat inspection legislation, should be regarded as general guidelines for meat inspector's decisions. The atlas will be of help not only to veterinary food hygienists and veterinarians engaged in food animal practice, but also to veterinary students in pathology and others who are concerned with animal and food science and technology.

Mollica D., Rosmini R.: Problemi interpretativi concernenti i principali quadri anatomo-patologici ricordati nel D. Lgs. 286/1994. *The questions concerning the main anatomo-pat-*

hological lesions reported in D. Lgs. 286/94. In Organizzazione della visita ispettiva nel nuovo contesto europeo. V° Convegno Nazionale Associazione Italiana Veterinari Igienisti (A.I.V.I.), Veronafiere. Ed. ETS, Pisa, 1995.

The Authors examine minutely the questions concerning the main anatomico-pathological lesions reported in D. Lgs. 286/94, at the articles 9 and 10. In this work the veterinary judgement is described with regard to generalized actinobacillosis and actinomycosis, anthrax and clostridial disease, generalized tuberculosis and lymphadenitis, glanders, rabies, tetanus, acute salmonellosis and brucellosis, swine erysipelas and botulism. The Authors consider also the veterinary judgement as to septicaemia, pyaemia, bacterial and viral toxins, acute inflammations and parasitic diseases such as generalized sarcosporidiosis, cysticercosis and trichinellosis. The judgement with regard to still-born or dead animals is presented as well as that concerning meat of abnormal color, odour and taste, such as icterus and sexual odour, or meat of animals with haemorrhages, purulent or suppurative inflammations, pseudotuberculosis, neoplasms, traumatic lesions, pyrexia or fever.

Sarli G., Benazzi C., Preziosi R., Marcato P.S.: *Proliferative activity assessed by anti-PCNA and Ki67 Mabs in canine testicular tumours.* J. Comp. Path., 110, 357, 1994; Atti del 42° Meeting primaverile E.S.V.P. (European Society of Veterinary Pathology), Berl. Münch. Tierärztl. Wschr. 106(11), 390, 1993; Atti del 2° Congresso Nazionale della Società Italiana di Citologia, 107, 1995.

In the present study the proliferative activity of testicular tumours of the dog (seminomas, Sertoli and Leydig cell tumours) was investigated with two monoclonal antibodies to Proliferating Cell Nuclear Antigen (PCNA), clone PC10, and Ki67 clone MIB1. The former recognizes a formalin-resistant epitope of PCNA and MIB1 the same antigen as Ki67 in formalin-fixed, paraffin wax-embedded sections following incubation in a microwave oven. Three parameters of proliferative activity were considered: PCNA and Ki67 indices (percentage of nuclear area positive to PCNA and Ki67 respectively) and mitotic index (number of mitoses per 1,000 cells). PCNA index and Ki67 index revealed a good correlation in linear regression analysis ($P < 0.001$) as did the mitotic index ($P < 0.01$). None of the parameters considered revealed a significant difference in proliferative activity of the three types of tumours ($P > 0.05$ — Spearman test), but in both seminomas and Sertoli cell tumours the progression from tubular to diffuse pattern paralleled an increase in growth fraction. It is interesting to point out that some seminomas of the diffuse type, often considered, histologically, to be the most malignant, showed the highest values of the above mentioned parameters.

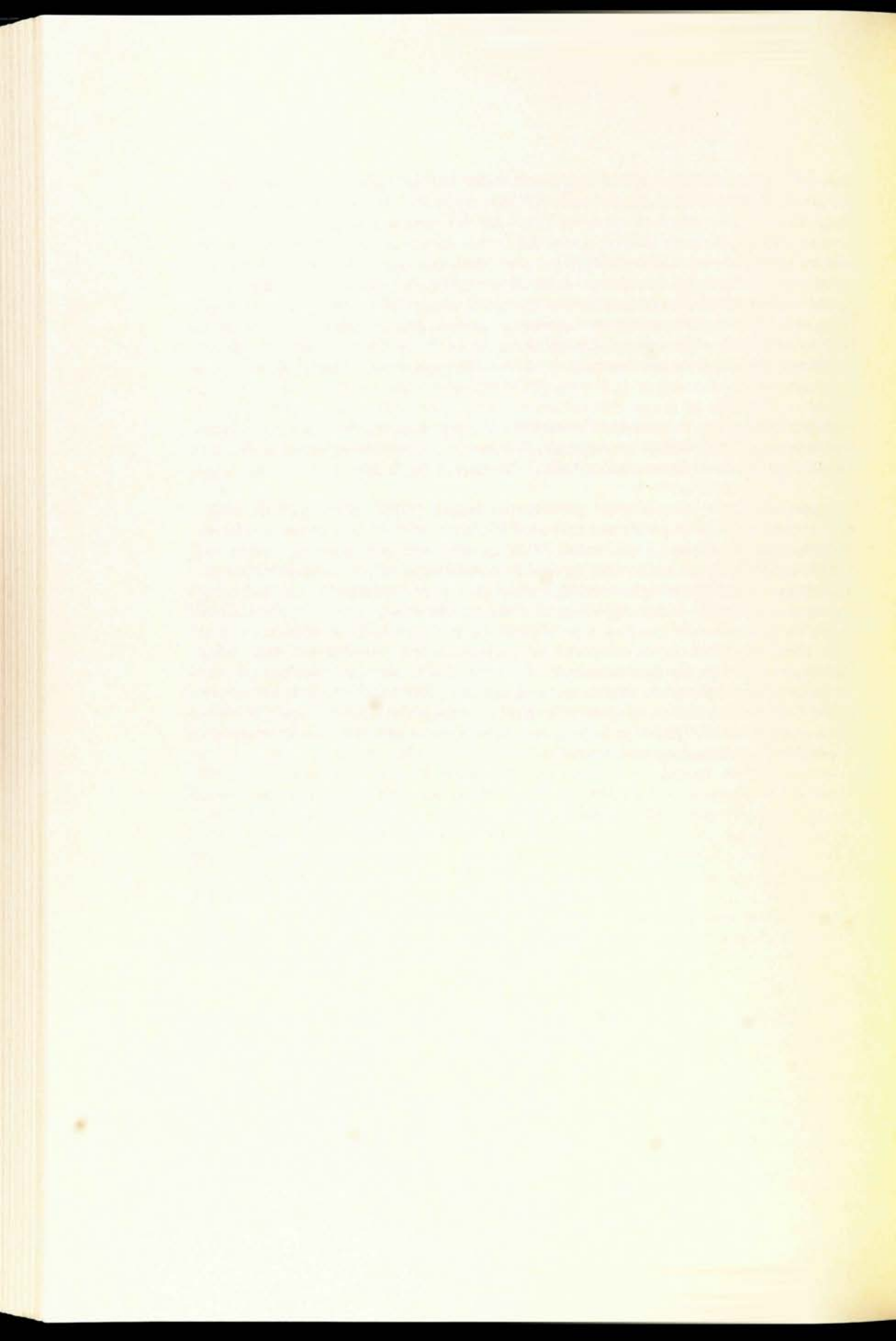
Sarli G., Benazzi C., Preziosi R., Marcato P.S.: *Assessment of proliferative activity by anti-PCNA MAb in formalin-fixed paraffin-embedded samples and correlation with mitotic index.* Vet. Pathol., 32, 93, 1995.

The proliferating cell nuclear antigen (PCNA) is a 36kD nonhistone nuclear protein that functions as a cofactor for DNA-polymerase delta. Among the available monoclonal antibodies to PCNA, clone PC10 recognizes a formalin-fixed and paraffin-embedded resistant epitope of the protein. In the present study the employment of clone PC10 in veterinary oncology has been investigated, with regard to immunoreactivity in dogs and

cats and reproducibility of the method on samples with known and unknown time of fixation. The percentage of labeled nuclei (PCNA index) was evaluated by computerized image analysis. Two different values of PCNA index were considered: one counting as positive only the strongly labeled nuclei (SP-PCNA index) and the other counting as positive all the labeled nuclei (TP-PCNA index). Both values of PCNA index were compared with mitotic index (number of mitoses per 1,000 cells). Both PCNA indexes revealed a good correlation with mitotic index and this revealed PCNA index as a good parameter to assess the proliferative activity of tumors. PCNA index can be assessed both as a measure of the strongly labeled nuclei or of all the positive nuclei; this latter parameter appears to be the better to determine the measure with more objectivity.

Sarli G., Preziosi R., Benazzi C., Capitani O., Marcato P.S.: *The importance of kinetic parameters and DNA ploidy in the prognosis of canine and feline mammary tumours.* Atti 1st World Conference on Spontaneous Animal Tumours, 1995 (in press).

The prognostic relevance of some proliferation indices (MIB1 index, AgNOR index, mitotic index) and DNA ploidy was evaluated in a series of thirty-one canine and feline malignant mammary tumours, of which follow up data were available over a two-year-period. As follow up parameters the survival time and the cancer-free interval were used. Two groups of tumours with low and high proliferative activity were characterized using the median for MIB1 index, AgNOR index and mitotic index, while for modal DNA ploidy the tumours were grouped in peridiploid and peritetraploid+aneuploid. The Kaplan-Meier estimated curves, compared using a log-rank test, revealed that MIB1 index and modal DNA ploidy (respectively $P < 0.01$ and < 0.05) are significantly predictive variables for the cancer-free interval in the dog, and AgNOR and mitotic indices (both $P < 0.05$) of the same follow up interval in the cat. At the multiparametric analysis MIB1 index and modal DNA ploidy in the dog and AgNOR index and mitotic index in the cat resulted independent prognostic variables.



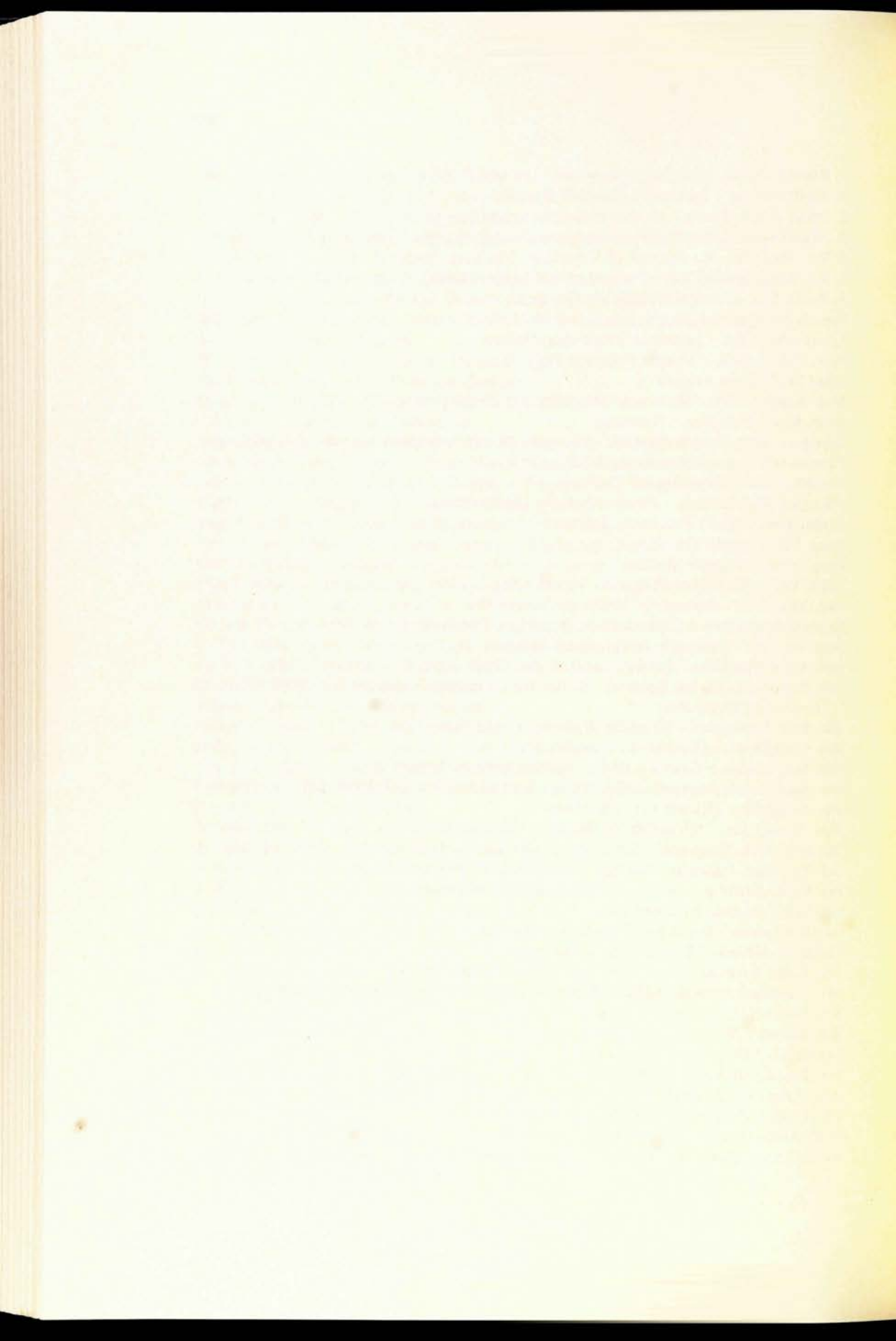
ELENCO DELLE ABBREVIAZIONI UTILIZZATE

(secondo il: Periodical Title Abbreviations, 9° Ed., L.G. Alkire, Jr.,
Gale Research Inc., Detroit, 1994).

- Acta Endocrinol.** - Acta Endocrinologica
Acta Med. Romana - Acta Medica Romana
Acta Med. Vet. - Acta Medica Veterinaria
Acta Protozool. - Acta Protozoologica
Acta Toxicol. Ther. - Acta Toxicologica et Therapeutica
Am. J. Anat. - American Journal of Anatomy
Am. J. Physiol. - American Journal of Physiology
Anat. Anz. - Anatomischer Anzeiger
Anat. Embryol. - Anatomy and Embryology
Anat. Rec. - Anatomical Record
Angew. Parasitol. - Angewandte Parasitologie
Anim. Feed Sci. Technol. - Animal Feed Science and Technology
Ann. Ig. - Annali d'Igiene
Ann. Ist. Super. Sanità - Annali dell'Istituto Superiore di Sanità
Ann. Ital. Dermatol. Clin. Sper. - Annali Italiani di Dermatologia e Clinica Sperimentale
Ann. NY Acad. Sci. - Annals. New York Academy of Sciences
Ann. Oftalmol. Clin. Ocul. - Annali di Oftalmologia e Clinica Oculistica
Ann. Parasitol. Hum. Comp. - Annales de Parasitologie Humaine et Comparee
Ann. Zootech. - Annales de Zootechnie
Arch. Chir. Torac. Cardiovasc. - Archivio di Chirurgia Toracica e Cardiovascolare
Arch. Environ. Contam. Toxicol. - Archives of Environmental Contamination and Toxicology
Arch. Gerontol. Geriatr. - Archives of Gerontology and Geriatrics
Arch. Ital. Anat. Embriol. - Archivio Italiano di Anatomia e di Embriologia
Arch. Ital. Biol. - Archives Italiennes de Biologie
Arch. Neurol. - Archives of Neurology
Arch. Pathol. Lab. Med. - Archives of Pathology and Laboratory Medicine
Arch. Vet. Ital. - Archivio Veterinario Italiano
Archs. Int. Pharmacodyn. Ther. - Archives Internationales de Pharmacodynamie et Therapie
Arzneim. Forsch. Drug Res. - Arzneimittel-Forschung/Drug Research
Atti Accad. Sci. Ist. Bologna - Atti Accademia delle Scienze. Istituto di Bologna
Atti Congr. Naz. Assoc. Sci. Prod. Anim. - Atti del Congresso Nazionale dell'Associazione Scientifica di Produzione Animale (ASPA)
Atti Fe. Me. S. P. Rum. - Atti della Federazione Mediterranea Sanità e Produzione Ruminanti
Atti Soc. Ital. Anat. - Atti della Società Italiana di Anatomia
Atti Soc. Ital. Buiatria - Atti della Società Italiana di Buiatria
Atti Soc. Ital. Sci. Vet. - Atti della Società Italiana delle Scienze Veterinarie
Bas. Appl. Histochem. - Basic and Applied Histochemistry
Berl Münch. Tierärztl. Wschr. - Berliner und Münchener Tierärztliche Wochenschrift
Biochem. Biophys. Res. Commun. - Biochemical and Biophysical Research Communications
Biochem. Pharmacol. - Biochemical Pharmacology

- Biol. Reprod.** - Biology of Reproduction
Biol. Zentralbl. - Biologisches Zentralblatt
Biotechnol. Tech. - Biotechnology Techniques
Boll. Ist. Entomol. Univ. Studi Bologna - Bollettino dell'Istituto di Entomologia «G. Grandi»
Boll. Oceanol. Teor. ed Appl. - Bollettino di Oceanologia Teorica ed Applicata
Boll. Soc. Ent. Ital. - Bollettino. Società Entomologica Italiana
Boll. Soc. Ital. Biol. Sper. - Bollettino della Società Italiana di Biologia Sperimentale
Brain Res. - Brain Research
Br. J. Derm. - British Journal of Dermatology
Cardiovasc. Surg. - Cardiovascular Surgery
Chem. Phys. Lipids - Chemistry and Physics of Lipids
Clin. Vet. - (La) Clinica Veterinaria
Comp. Biochem Physiol. - Comparative Biochemistry and Physiology
Drug Metab. Drug Interact. - Drug Metabolism and Drug Interactions
Dtsch. Tierärztl. Wochenschr. - Deutsche Tierärztliche Wochenschrift
Equine Vet. J. - Equine Veterinary Journal
Eur. J. Epidemiol. - European Journal of Epidemiology
Eur. J. Med. Chem. - European Journal of Medicinal Chemistry
Eur. J. Neurosci. - European Journal of Neuroscience
Exper. Neurol. - Experimental Neurology
Gamete Res. - Gamete Research
G. Ital. Dermatol. Venereol. - Giornale Italiano di Dermatologia e Venereologia
G. Ital. Mal. Torace - Giornale Italiano delle Malattie del Torace
G. Mal. Infett. Parassit. - Giornale Italiano di Malattie Infettive e Parassitarie
Industrie Aliment. - Industrie Alimentari
Inform. Agr. - (L')Informatore Agrario
Inform. Zootec. - (L')Informatore Zootecnico
Ital. J. Anat. Embryol. - Italian Journal of Anatomy and Embriology
Ital. J. Biochem. - Italian Journal of Biochemistry
J. Am. Mosq. Control Assoc. - Journal. American Mosquito Control Association
J. Anat. - Journal of Anatomy
J. Anim. Sci. - Journal of Animal Science
J. Appl. Bacteriol. - Journal of Applied Bacteriology
J. Assoc. Off. Anal. Chem. - Journal. Association of Official Analytical Chemists
J. Biol. Res. - Journal of Biological Research
J. Biomed. Mat. Res. - Journal of Biomedical Materials Research
J. Cardiovasc. Surg. - Journal of Cardiovascular Surgery
J. Chem. Tech. Biotechnol. - Journal of Chemical Technology and Biotechnology
J. Chromatog. - Journal of Chromatography
J. Chromatog. B - Journal of Chromatography Biomedical Applications
J. Comp. Path. - Journal of Comparative Pathology
J. Comp. Physiol. B - Journal of Comparative Physiology B
J. Endocrinol. - Journal of Endocrinology
J. Fish. Biol. - Journal of Fish Biology
J. Fish Dis. - Journal of Fish Diseases
J. Ind. Microbiol. - Journal of Industrial Microbiology
J. Membr. Biol. - Journal of Membrane Biology
J. Muscle Res. Cell Motil. - Journal of Muscle Research and Cell Motility
J. Plankton Res. - Journal of Plankton Research

- J. Reprod. Fertil.** - Journal of Reproduction and Fertility
J. Shellfish Res. - Journal of Shellfish Research
J. Small Anim. Pract. - Journal of Small Animal Practice
J. Submicrosc. Cytol. Pathol. - Journal of Submicroscopic Cytology and Pathology
J. Vet. Med. Ser. B - Journal of Veterinary Medicine. Series B
J. Vet. Pharmacol. Ther. - Journal of Veterinary Pharmacology and Therapeutics
J. Wildl. Dis. - Journal of Wildlife Diseases
Jpn. J. Malacol. - Japanese Journal of Malacology
Livest. Prod. Sci. - Livestock Production Science
Mar. Pollut. Bull. - Marine Pollution Bulletin
Meat Sci. - Meat Science
Mol. Reprod. Dev. - Molecular Reproduction Development
Nutr. Res. - Nutrition - Research
Pfluegers Arch. Eur. J. Physiol. - Pfluegers Archiv. European Journal of Physiology
Pharmacol. Res. - Pharmacological Research
Physiol. Zool. - Physiological Zoology
Phytopathol. Mediterr. - Phytopathologia Mediterranea
Prakt. Tier. - (Der) Praktische Tierarzt
Prax. Vet. - Praxis Veterinaria
Prog. Med. - Progres Medical
Prog. Vet. - (Il Nuovo) Progresso Veterinario
Rec. Méd. Vét. - Recueil de Médecine Vétérinaire
Reprod. Nutr. Dev. - Reproduction, Nutrition, Developpement
Res. Vet. Sci. - Research in Veterinary Science
Rev. Fr. Corps Gras - Revue Francaise des Corps Gras
Rev. Sci. Tech. Off. Int. Epizoot. - Revue Scientifique et Technique OIE (Office International des Epizooties)
Ric. Biol. Selvaggina - Ricerche di Biologia della Selvaggina
Riv. Coniglicolt. - (Rivista di) Coniglicoltura
Riv. Ital. Sostanze Grasse - Rivista Italiana delle Sostanze Grasse
Riv. Soc. It. Sci. Aliment. - Rivista della Società Italiana di Scienze dell'Alimentazione
Riv. Suinicolt. - (Rivista di) Suinicoltura
Riv. Zootec. Vet. - Rivista di Zootecnia e Veterinaria
Schweiz. Arch. Tierheilk. - Schweizer Archiv für Tierheilkunde
Sci. Tec. Latt.-Casearia - Scienza e Tecnica Lattiero-Casearia
Sci. Total. Environ. - Science of the Total Environment
Sel. Vet. - Selezione Veterinaria
Small Ruminant Res. - Small Ruminant Research
Tierärztl. Umsch. - Tierärztliche Umschau
Vet. Hum. Toxicol. - Veterinary and Human Toxicology
Vet. Immunol. Immunopathol. - Veterinary Immunology and Immunopathology
Vet. Ital. - Veterinaria Italiana
Vet. Pathol. - Veterinary Pathology
Vet. Rec. - (The) Veterinary Record
Vet. Res. Commun. - Veterinary Research Communications
World Rev. Anim. Prod. - World Review of Animal Production
Zbl. Bakt. - Zentralblatt für Bakteriologie
Zool. Anz. - Zoologischer Anzeiger
Zootec. Nutr. Anim. - Zootecnia e Nutrizione Animale



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