

RANDOMISED SANITARY STATUS OF ARGENTINEAN RABBITRY

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ABSTRACT : A short description of sanitary problems among argentinean rabbit farms (25 familiar and 41 commercial units), is presented. This randomized survey was compiled with information provided over the last 5 years by diverse diagnostic laboratories, centres and private farmers engaged

in this activity. The pathological findings in the 426 autopsied animals, are similar to those described in the literature. Classical digestive and respiratory infections accounted for the most important causes of death : 43,2 and 25,8 %, respectively.

RESUME : Etat sanitaire des élevages de lapins en Argentine.

Cet article décrit les conditions sanitaires dans les élevages cunicoles en Argentine au cours des cinq dernières années. Ces observations sont le fruit d'un travail commun de plusieurs chercheurs appartenant à divers laboratoires de diagnostic et des producteurs des lapins (25 élevages

familiaux et 41 élevages commerciaux). Les observations obtenues sur les 426 lapins de tous âges autopsiés, étaient semblables à celles qui ont été décrites dans la littérature. Les classiques infections intestinales et pulmonaires furent sans conteste les principales causes de mortalité, à savoir 43,2 et 25,8 %, respectivement.

INTRODUCTION

Argentinean production ranges from families who raise some rabbits to intensive and semi-intensive farms, with New Zealand White and Californian as the most common breeds. Thirteen percent of producers produce meat only for self-consumption. The total monthly production in the country, still expanding, could be estimated in around 15,000 of 1,7-2,5 kg/rabbits, which is concentrated between 28° and 40° of south-latitude. Mortality at weaning age could be estimated around 21 %. Diets are fed in the form of commercial pellets plus alfalfa and grass forages.

The following survey was carried out in order to investigate both the causes of death amongst the rabbits submitted for autopsy and their relative prevalence during the last 5 years. The field coverage and period of time of the data collection is considered sufficient to give an approximate picture of disease problems in Argentina.

MATERIAL AND METHODS

Animals (n = 426) used in this survey (mostly adult animals) belonged to different familiar (n = 25) and commercial farms (n = 41) from the geographical area of the rabbitries. Nearly all these carcasses submitted to 6 private and governmental laboratories were examined bacteriologically and histopathologically. Age of animals was primarily determined from dentition, body length and from records of the owners. After a complete autopsy, observations of *post mortem* examinations and gross pathology were recorded and samples of major organs were taken for routine bacteriological and histopathological studies. Sometimes, the interpretation of necropsy findings was limited by two factors: the lack of adequate *ante-mortem* data and the delay

between death and autopsy. Because necropsies were oriented towards determining the primary cause of mortality, diagnostic procedures varied among submissions. Samples for histology were fixed in 10 % buffered formol saline and processed routinely. Sections were cut at 3-4 µm and stained with haematoxylin-eosin (HE). Specimens for bacteriology were cultured immediately on arrival at the laboratory or were stored at -20°C. Plates were incubated aerobically, anaerobically and in a microaerophilic atmosphere at 4°C and 37°C, and examined for bacterial growth at 24 h intervals for 15 days. Isolated bacteria were identified by standard diagnostic keys (HOLT 1984 and 1986, LENNETTE *et al.*, 1986). Primary bacteriological cultures were made by streaking on 7 % defibrinated bovine blood agar and on Mac Conkey agar. Bacterioscopic examination of gram stained caecum smears was usually performed. The isolation and the serotyping of the *Escherichia coli* strains were performed as described by PEETERS *et al.*, 1988. Pathogenicity of the *Pasteurella multocida* isolated strains was investigated by the biochemical (ornithine-decarboxylase test: ODC +/-) and phenotype features (diameter size of colonies). *Toxoplasma* infection was detected by immuno-histopathology and by serology. Attempts to demonstrate viral particles in tissues of selected cases with different pathologies were done according to routine techniques. The diagnosis of the cases of Myxomatosis was made taking into account clinical signs (mostly the respiratory pattern instead of the classical nodular lesions) and by Elisa serological test.

The causes of death were mainly classified as infectious (classical enteritis, other enteritis, bronchopneumonia, other respiratory diseases, other infections) and non-infectious diseases (nutritional or metabolic disorders, starvation, trauma, malformations).

Classical enteritis included those fatal cases in which *Escherichia coli* was identified as the main agent recovered mostly from catarrhal enteropathies. Gastro-enteric infections due to other pathogens like Enterotoxemic colitis by *Clostridium perfringens*, haemorrhagic typhlo-colitis by *Klebsiella pneumoniae*, post weaning dysentery and non-specific colitis by *Salmonella typhimurium* and *S. enteritidis*, neonatal enteritis by *Staphylococcus aureus* and coccidiosis (mostly by *Eimeria magna* and *Eimeria perforans*) were summarized in the "other enteritis" group.

"Enzootic bronchopneumonia" includes those fatal cases in which *Pasteurella multocida* and *Bordetella bronchiseptica* were the more common pathogens isolated, mainly from lungs but also from other organs like those of the upper respiratory system. The "other respiratory diseases" summarized the cases in which *Haemophilus* spp, *Staphylococcus aureus* and *Myxovirus* were implicated as the main agents of pneumonia, pleuresy and pericarditis altogether with fatal cases of choriza by *Corynebacterium pyogenes*.

The "Other infections" group included losses due to localized or generalized bacterial infections such as septicaemia by cocci and *Clostridium novy*, head abscesses and infected wounds, fatal cases of mastitis, and Toxoplasmosis cases.

The "non-infectious diseases" group included those losses by starvation (with loss of weight, dehydration and with no gastrointestinal contents), dramatic cases of overgrown incisors and gastric obstruction by hairballs, traumatised animals by other rabbits or killed by carnivores (i.e. dog), and those losses by metabolic or nutritional disorders.

RESULTS AND DISCUSSION

Although this survey expresses only the findings of the autopsied rabbits submitted to our laboratories, these data were collected from a field wide enough and over a period and in number sufficient to give an accurate picture of disease problems in Argentina.

The incidence of different causes of death (infectious and non-infectious diseases) expressed as a percentage of the total cases investigated and their distribution by age (immature: up to 10 months, aged: more than 10 months) were summarised in the Table I.

Classical enteritis was the most commonly diagnosed infection, (43 % of the cases brought to laboratories) by *Escherichia coli* enteropathic serotypes (i.e. O103). One

Table 1 : Distribution of dead rabbits by cause of death

Causes of death	Number of dead rabbits observed			Total observed per cause as % of grand total
	Adults	Immatures	Total	
Infectious Diseases				
Classical Enteritis	52	132	184	43.2
Other enteritis	5	38	43	10.1
Bronchopneumonia	54	35	89	20.9
Other respiratory diseases	13	8	21	4.9
Other Infections	3	9	12	2.8
sub-total	114	235	349	81.9
Non-Infectious Diseases				
Starvation	2	13	15	3.5
Nutritional problems	13	15	28	6.6
Malformations	7	5	12	2.8
Trauma	15	7	22	5.2
Sub-total	37	40	77	18.1
Total	151	275	426	100.0

centre described an outbreak of *E coli* enteritis in which the owners failed to use the vaccine. Other enteritis cases by *Clostridium perfringens*, *Salmonella typhimurium*, *S. enteritidis*, *Pasteurella multocida*, *Yersinia enterocolitica* or *Staphylococcus aureus* were recorded by all the centres, some of them dramatic like a fatal incident where *S. typhimurium* phage type 204c was isolated from growing rabbits showing scours (PATTON *et al.*, 1978 ; PEETERS, 1985). Two centres also reported the presence of *rotavirus* by electron microscopy from 4 sporadic cases of fatal diarrhoea meanwhile almost all the animals also showed heavy infestation of *coccidia*, with poor housing being the trigger factor.

Common contributory factors for these pathologies were inadequate diets (high caloric content, excess of protein or fibre), inbreeding and stress of weaning (CHEEKE, 1987 ; MAERTENS, 1992). Moreover, prevalence of Coccidiosis is rather high among the colonies and was demonstrated regularly in weaning rabbits. In fact, there was an upsurge of this infection in the last 2 years including outbreaks manifested either as rabbit intestinal adenomatosis or acute intestinal haemorrhage.

Pasteurella multocida (mostly ODC/+ strains) and *Bordetella bronchiseptica* were the more common pathogens of enzootic bronchopneumonia which was commonly recorded by the laboratories consulted (DEEB *et al.*, 1990) as the second most important cause of casualties. Mortality during the outbreaks was often more than 17 %, but one laboratory reported 24 % in a herd that had been moved and vaccinated two weeks previously. The disease could be controlled by continuous medication. The mild, wet May weather, high stock density and poor ventilation coincided with a marked increase in pneumonia in young kits.

Among other respiratory conditions, one centre declared the isolation of *Corynebacterium pyogenes* consistently from fatal cases of choriya and dyspnea in one farm with no history of pneumonia infection. It was also reported an infection in a large commercial rabbitry where one adult buck died and infection spread rapidly through the herd which was undersized at 28 days old, causing a sudden drop in general performance traits, high temperatures, tracheitis, and nasal/ocular discharge. *Pasteurella multocida* was the immediate cause. Autovaccination in the face of the outbreak appeared to control its spread. Classical and atypical sporadic cases of *Mixovirus* infection were reported in unvaccinated populations, more especially in larger rabbits taken beyond the market stage which tended to have higher mortality rates, while laboratories continued receiving inquiries about the control and eradication of the infection. These episodes indicated that environmental/husbandry conditions were poor and probably contributed to the problem. Other infectious diseases were less common (2.8 %) like two cases of ulcerative *Clostridium novyi* infection, and 6 cases of marked fibrinous meningitis due to *Pasteurella multocida* coming from two herds of three-week-old rabbits with nervous signs as main features and which did not respond to antibiotics.

Toxoplasmosis was diagnosed in 7 sporadic occasions in a group of does with a history of returning to service and abortions, nervous signs and cerebrocortical necrosis. Most of the nulliparous does tested were seropositive. Although a moderate incidence of Toxoplasmosis infection was serologically detected in some farms, the prevalence of this condition is probably underestimated. In another abortion incident in the same area, several lactating and pregnant does showed seroconversion to toxoplasmosis and *Salmonella typhimurium* was isolated from abortion material and stillborns.

No reliable information is available on the incidence of noseematosis within the country but is probable that some colonies have some degree of infection. On the other hand, Viral Rabbit Haemorrhagic Disease (RHD), has never been diagnosed in Argentinean territory, as in major areas of its neighbour Brazil (FERREIRA, 1998).

The non-infectious cases were also significant (18 %), preferably coming from familiar origin instead of commercial. The most interesting incidents among this group were : 6 cases of spontaneous haemorrhage in the thoracic cavity, intestines and major muscle masses in growing rabbits which had low vitamin E levels and a high fat diet, and 3 cases of an acute respiratory distress syndrome with pyrexia and dehydration that appeared in 20 % of a herd that fed high quality cereal feed with little or no roughage. Contributory factors for the losses were

presumably a deficiency of energy intake, acidosis and poor quality of the pelleted diet (CHEEKE, 1987). These conditions did not respond to antibiotic therapy but appeared to resolve on its own by corrections on the diets.

This survey doesn't include those cases in which causes of death was unknown because no abnormalities were detected at *post-mortem* examination.

CONCLUSIONS

This survey, carried out in order to investigate both the causes of death amongst our rabbitries and their relative prevalence, was largely explorative, but it seems that the modest observations made are compatible, and fit with the characteristic pathology largely described in the literature (LEBAS *et al.*, 1986 ; MORISSE, 1986).

Despite the economical relevance that rabbit production has in the third-world-countries, basic research suffers of a significant decrease in funding, and a further study is recommended to rule out a change in the breeding and pathologic problems that may result from the local structures.

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