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Editorial

Animal Nutrition and Productions

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Animal nutrition and feeding, along with other sciences (reproduction, genetics, hygiene, management, etc.), play a major role in improving animal production. In this vein, it is unanimously accepted that animal nutrition and feeding do not create high-potential animals, but allow them reach their productive potential. It is unthinkable to breed, artificially select and genetically improve animals in inadequate feeding conditions; in the same way, the normal reproduction of animals relies, to a decisive extent, on a rational diet based on the latest scientific achievements.

The importance of nutrition in animal production is also highlighted by the weight of the cost of feed (over 50% of the costs of animal products). The attention that animal breeders pay to nutrition and feeding determines, to a large extent, the profitability of their livestock.

Animal feeding has a major influence on the quality of products of animal origin, and on the proximate composition of different components of the body (proteins, lipids, water), the sensory (colour, taste, smell) and biochemical–functional (such as the proportion of different fatty acids) properties and even on their technological qualities (in milk, meat, eggs, etc.).

Animals are biological transformers of dietary matter and energy into high-quality raw matters (meat, eggs, milk and honey) for human food, but also into raw materials (e.g., wool and leather) for human clothing and accessories. Thus, animal nutrition is a fundamental topic for all farm animal productions as well as for the health and wellbeing of companion animals.

Animal products have been essential components of human food for many centuries and in many cultures. In developed countries, the share of products of animal origin in food is important; thus, for example in the USA [1], the typical daily ration for humans provides approx. 2100 kcal, to which animal products contribute 47% and vegetable products 53%.

Moreover, at the European level, a direct relationship between infant mortality and milk production has been highlighted (the increase of 100 kg of milk production/inhabitant causes a reduction in infant mortality of 2.20/1000 inhabitants). Additionally, a direct link has been established between the increase in milk consumption and the decrease in alcoholism.

The global population was 7.4 billion in 2016 and is projected to reach 9.6 billion in 2050. With the increase in global population and the per capita human consumption of meat, milk and eggs, it is expected that the demand for animal protein and other animal products will increase by 70% globally by 2050 [2].

It is also important to mention that recent evidence suggests that a major reduction in animal production would produce both important ecological disturbances and strong economic instability worldwide. However, the increased consumption of food of animal origin requires a larger area of land to be used to feed one person (approx. 0.37 ha, compared to only 0.09–0.1 ha in the case of vegetarian food). According to the biological law of cycles

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and trophic levels, the ingested organic matter is found in the consumer's body in a ratio of 1/10; therefore, in herbivores, from a consumption of 10 kg of organic substance, only 1 kg of organic substance is deposited in the body.

Due to the continuous growth of the population and other causes, the area of land cultivated with cereals (the main source of food for non-ruminant animals), expressed in relation to the number of inhabitants, has decreased and continues to decrease.

Increasing animal productivity, possibly primarily through genetic improvements associated with appropriate feeding and a more efficient use of feed, ensures a better use of agricultural land, allowing a reduction in animal flocks without decreasing total production.

This Special Issue, "Animal Nutrition and Productions", comprises a total of 20 articles, of which one is a review, from a total of 139 researchers: 49 from Romania, 34 from Brazil, 13 from the USA, 11 from Tunisia, 8 each from Italy and Mexico, 7 from Saudi Arabia, 3 from Egypt and 1 each from Spain, Canada, Jordan, Germany, France and the Netherlands.

The published articles can be classified in nine research directions, including the influence of nutrition on the quantitative and qualitative production of milk in different species (buffaloes, camels); the influence of nutrition on the quantitative and qualitative production of meat from different species (rabbit, swordfish, European catfish), as well as the changes obtained after preservation (chicken, turkey and duck); the influence of nutrition on reproductive function; the digestibility of some animal feed sources; the influence of nutrition on egg production (hen or quail); microbiological evaluation of combined feeds intended for broiler chickens; the assessment and monitoring of pollutants from animal farms; the quality of honey production; and a phylogenetic analysis of endangered animal breeds.

The first category includes two articles that study the impact of the quality of different feed sources on milk production in camels and buffaloes. Thus, Abdelrahman M.M. et al. [3] conducted a study on the nutritional value of camel milk obtained from animals that were fed during the winter with a total mixed ration (TMR) together with alfalfa hay. Thirty-seven lactating multiparous camels were chosen for the study. The onset period of the study was mid-lactation and the geographical area of this research was Al-Kharj in Saudi Arabia. Females were divided into two groups, one fed exclusively alfalfa hay ad libitum (C), and group two (T) received an additional mixture (TMR) consisting of barley, wheat, palm kernel cake, soybean husks, vitamins and minerals at an amount of 4 kg/head/day. Milk and blood samples were collected from the studied animals in the middle of the winter season. A significantly ($p < 0.05$) higher concentration of protein and organic matter was found in the milk of group T camels. In addition, the levels of Mg, Co, Fe and Zn in milk increased significantly ($p < 0.05$) in group T compared to group C. The concentration of minerals Ca, P, Mg, Cu, I, Se, Zn and Cd in the blood of camels from group T was significantly ($p < 0.05$) higher than that of group C. Blood serum levels from the youth of group T were significantly ($p < 0.05$) higher for all minerals compared to the values recorded in the comparison group (C), the exception was iodine. In youth, there were significant signals and correlations between Co and Mn and most of the other minerals investigated. In conclusion, supplementation with TMR in the T group of camels during lactation, in the winter season, can be recommended because it leads to improvements in the chemical composition and mineral profile of camel milk.

In another case study, Serrapica F. et al. [4] analysed the effect of raising buffaloes outside traditional breeding areas in Italy. Thus, in their study, researchers from Italy chose 20 pregnant buffaloes (*Bubalus bubalis*) that were moved from the traditional breeding lot area, on the southern coast of Italy, to a farm in the interior of the peninsula located in a hilly area. After the buffaloes calved, data were collected monthly, throughout lactation, on the productive and reproductive performance of the studied animals. The applied feeding regime was also studied throughout 4–6 months of lactation to evaluate the in vivo digestibility of locally produced forages (maize silage compared to hay) and their effects of on the milk production. At the same time, the sensory properties of the mozzarella cheese obtained from the milk of the studied animals were also analysed.

In terms of the applied feeding, no significant differences were found; however, a comparison of the results obtained with the values recorded in the previous lactation revealed major differences. Milk production decreased by 37.2%, and the protein content of milk was reduced by 6.1%. At the same time, the fat content of milk improved (+4.5%). Severe deteriorations in reproductive indicators, such as decreases in gestation rate (−13.3%) and an increase in calving interval (+26.9%), were reported. The duration of lactation was less than the standard value of 270 days. Artificial insemination failure and lower environmental temperatures are likely the origin of these results, while the body condition score at the end of the observation period and data from the feeding study do not indicate feeding errors. Overall, the distinctive reproductive characteristics of buffalo, the lower environmental temperatures and the specificity of the mozzarella cheese production process are the main issues that farmers should consider when they want to expand buffalo farming outside the traditional growing areas of Italy.

The second category, the largest one, with five articles, includes studies carried out on fish (*Polyodon spathula*, *Silurus glanis*), hares and rabbits, lamb and different types of poultry meat preserved by smoking.

The first study includes data on the qualitative and nutritional evaluation of the meat production of paddlefish sturgeon of different ages, raised and fed under the conditions of some fish farms in Romania. The authors, coordinated by Simeanu D. [5], contribute detailed knowledge on the nutritional properties of the flesh of second- and third-summer paddlefish sturgeon, but also more specifically of the different muscle groups. The study included analyses of the chemical composition and cholesterol and collagen content of fillets obtained from two- or three-year-old *Polyodon spathula* sturgeons reared and fed in polyculture conditions with carp (*Cyprinus carpio*) and Asian cyprinids (*Ctenopharyngodon idella, Hypophthalmichthys molitrix* and *Aristichthys nobilis*). The nutritional analysis was even more detailed, as it calculated the nutritional value, the profile of acids and amino acids, the sanogenic indices and the biological value of proteins for the epaxial and hypaxial muscle groups. The chemical analysis of the fillets, related to age, indicated slightly higher values for three-summer-old compared to two-summer-old sturgeon fish: +5.32% dry matter, +0.89% protein, +41.21% fat, +10.94% gross energy, +2.94% collagen; in contrast, for water, minerals and W/P ratio the values were lower by 1.52%, 10.08% and 2.29%, respectively. The nutritional evaluation of *Polyodon spathula* sturgeon meat highlighted that the fats of these fish are of good quality with a significant presence of PUFA (about 22% of total fatty acids) and with good sanogenic indices values (PI = 7.01–8.77; AI = 0.57; TI = 0.38–0.39; hFA = 33.01–41.34; h/H = 1.9). Additionally, the proteins of these fish are of good quality for youth and adult consumers (EAAI (%) = 156.11; BV = 158.46; NI (%) = 28.30) and good enough for children (EAAI (%) = 96.41; BV) = 93.39; NI (%) = 17.45). The authors recommend that paddlefish sturgeons should be capitalised when they are three summers old, when they have the best nutritional quality.

In another study concerning fish meat, a group of researchers from USV Iași led by Simeanu C. [6] carried out research to evaluate the quantitative and qualitative meat of European catfish (*Silurus glanis*) from two different environments: aquaculture, where it benefited from a feeding specific to farms of this type, and in the Prut river in Romania, where it fed naturally. The samples were grouped into two groups: AG—fish from aquaculture and RG—fish from a natural environment, the Prut river. The catfish were measured, and biometric and conformational indices were calculated. The best values were found in fish from aquaculture. The Fulton coefficient reached 0.82 in RG and 0.91% in AG catfish. The fleshy index was 19.58% in AG aquaculture fish and 20.79% in wild fish, indicating better productivity capabilities in AG catfish. The yield at slaughter was calculated, and the qualitative analysis of the resulting fillets was carried out at different moments of refrigeration conservation (0–15 days). In the AG samples, water content decreased by 8.87%, protein by 27.66% and lipid by 29.58%. In the case of RG samples, the loss reached 8.59% for water, 25.16% for protein and 29% for lipids. The fatty acid profile was also studied and sanogenic indices were calculated. The studied European catfish presented

good levels of PUFA (31–35%), and the AI reached 0.35–0.41 while the TI varied between 0.22 and 0.27. In conclusion, the origin of the fish and especially the refrigeration duration influence the proximate composition of the meat and its nutritional value.

A nutritional and technological perspective on rabbit (*Oryctolagus cuniculus*) and hare (*Lepus europaeus Pallas*) meat is presented by Frunză G. et al. [7]. In this study, the authors analysed meat from 50 Flemish Giant farmed rabbits and 50 hunted hares from three regions of the carcasses; the *Longissimus dorsi* (LD), *Semimembranosus* (SM) and *Triceps brachii* (TB) muscles were harvested. The proximate composition and the fatty acid profile were evaluated, then the energy content and lipid sanogenic indices (polyunsaturated, atherogenic, thrombogenic, hypocholeroserolemic/hypercholesterolemic ratio and the nutritional index—NVI) were calculated. To highlight the technological qualities of the meat, the pH values at 24 and 48 h after slaughter, the cooking loss (CL) and the water-holding capacity (WHC) were assessed. The gross energy was higher in TB samples from rabbit compared to hare due to higher fat accumulations ($p < 0.001$). The pH value was higher for TB muscles in both categories of meat, WHC was higher in hare ($p < 0.001$) and CL was higher in rabbit ($p < 0.001$). PI values were 6.72 in hare and 4.59 in rabbit. AI reached 0.78 in hare and 0.73 in rabbit. TI was calculated at 0.66 in hare and 0.39 in rabbit. The h/H ratio reached 3.57 in hare and 1.97 in Giant Flemish rabbit, while the NVI was 1.48 in hare and 1.34 in rabbit. Meat from both species is nutritionally valuable to human consumers, with values better than other farmed mammals or other wild species of mammals or birds. The study highlighted that hare meat is healthier than rabbit meat because it has lower fat content, less energy and contains better quality lipids.

The quantitative and qualitative aspects of meat from lambs fed Tifton 85 grass (*Clynodon* sp.) in different proportions were dealt with by the team led by Corrêa Y. [8]. The authors aimed to determine the optimal ratio between fibrous and concentrated feedstuffs on the quantitative and qualitative properties of Santa Ines lamb meat. Diets were composed of Tifton 85 grass hay (*Cynodon* sp.) and concentrate mixtures (soybean meal, corn meal, urea and mineral mix) and consisted of five forage/concentrate ratios of 88:12 (C12), 69:31 (C31), 50:50 (C50), 31:69 (C69) and 12:88 (C88). After 63 days, animals were slaughtered and the carcasses, dressed yield and meat physicochemical properties were evaluated. The high proportion of concentrates in the lamb diet provided a higher intake of dry matter, better feed conversion, well-conformed carcasses, good slaughter yield and higher meat fat content. The addition of 50% concentrate improved carcass conformation and the physicochemical parameters of the meat in a similar way to the 88% concentrate diet but with leaner meat, meeting the requirements of the current consumer market.

Another article published in this Special Issue, written by Coroian C. et al. [9], deals with the presence of polycyclic aromatic hydrocarbons (PAHs) in traditionally smoked poultry. The attention of researchers has been drawn to the fact that increasing attention is being paid to the sensory, nutritional and sanogenic properties of meat in general and of poultry meat in particular. They evaluated how a traditional meat preservation method—hot smoking with natural wood smoke—adds certain polycyclic aromatic hydrocarbons (PAHs) to chicken, duck and turkey. A one-day versus two-day smoking period and three types of smoking wood (plum, cherry and beech) showed that the highest concentrations of PAHs were present in duck meat, regardless of smoking duration or type of wood. An overall higher PAH concentration was quantified when beech wood was used, followed by cherry and plum wood. Fluorene associated with beech wood gave the highest values for day 1 and day 2, followed by duck meat and turkey meat, respectively. Highly significant differences ($p < 0.001$) were usually observed for duck meat compared to chicken and turkey meat, but absolute values for anthracene, phenanthrene or fluoranthene were also easily observed. As expected, smoking for two days contributed to higher concentrations of PAHs in the meat.

In the third category, there are three articles. The first addresses the interesting topic of the effect of supplementation with *Saccharomyces cerevisiae* on the reproductive performance of rams fed a wheat-straw-based ration. The experiment led by Ben Saïd S. et al. [10]

comprised 14 Queue Fine de l'Ouest rams aged between 3 and 4 years with an average body weight of 54.7 ± 2.03 kg and an average body condition score of 3.5 ± 0.5. The study was carried out throughout a period of 80 days, during the breeding season. The rams were divided into two homogeneous groups (n = 7) and were maintained in individual floor pens. The control group was fed a daily diet containing 1 kg of wheat straw and 700 g of concentrates, and the experimental group received the same diet but supplemented with 10 g of *S. cerevisiae*/head/day. Although the supplementation did not significantly influence ram body weight, sperm volume and concentration, dry matter intake, protein digestibility and nitrogen balance, the authors found that the addition of *S. cerevisiae* improved ($p < 0.05$) the digestibility of dry matter by 7.3%, of organic matter by 11.9% and of crude fibre by 24%. In addition, the degree of sperm motility increased in the case of the group that received yeast compared to the control (3.7 ± 0.24 vs. 1.9 ± 0.27, $p < 0.05$). There was also a decrease in the total number of dead and abnormal spermatozoa for the yeast-fed group as opposed to the control group (9.28 ± 0.95 vs. 26.8 ± 3.85% and 25.5 ± 3.33%, respectively, vs. 59.2 ± 2.78%; $p < 0.05$). Therefore, the addition of *S. cerevisiae* to the diets of rams during the breeding season could improve nutrient digestibility and reproductive performance.

The influence of nutrition on the reproductive performance of sheep was also approached by Nechifor I. et al. [11], who studied females from the Karakul de Botoșani breed. Two groups, L1 (control) and L2 (experimental), were formed of adult females aged between two and six years. Group L2 received supplemental feeding 25 days before mating. Improvements in body condition and significant increases in live weight occurred up to the time of mating in ewes receiving the booster feed (L2) ($p < 0.01$ vs. L1). The number of lambs at calving was influenced by body condition score (BCS), especially in ewes with a BCS of 2. The total number of lambs weaned by ewes with a BCS of 2 was different compared to that of ewes with a BCS of 2.5 or 3.0. All results showed that supplementary feeding applied to ewes before mating influenced their reproductive and economic performance, and increased the live weight of lambs at weaning in group L2 ($p < 0.01$ in lambs from ewes with BCS 2 and $p < 0.001$ in lambs from ewes with BCS 2.5 to 3.5). Stimulative feeding applied to ewes positively influenced their reproductive performance and generated better economic results (23–27% better live weight in lambs from supplemented ewes with only 1.3% additional feed costs), thus supporting its applicability in farm conditions.

Reproductive performance influenced by animal feeding was also studied by the research team led by Edmunds C.E. [12], who studied the effect of increasing manganese intake from an organic source on the reproductive performance of sows. Sows (n = 39; 231 ± 8 kg) were randomly assigned to one of three dietary Mn inclusion levels (CON: 0 ppm Mn; PRO20: 20 ppm Mn; PRO40: 40 ppm Mn). Groups PRO20 and PRO40 were initiated at breeding and continued through two parturitions. Sows were grouped by parity within each farrowing group. Data were analysed as a completely randomized block design using the MIXED procedure of SAS with diet as a fixed effect and group as a random effect. Feed intake for lactation increased in PRO20 sows compared to CON and PRO40 sows ($p < 0.05$). PRO20 and PRO40 sows farrowed piglets that achieved an improved average daily gain from birth to weaning (CON 214 g/d; PRO20 237 g/d; 220 g/d; $p < 0.05$) compared to CON sows. Milk fat content was lower in PRO20 (5.5%) and PRO40 (6.1%; $p < 0.05$) compared to CON (7.8%) sows, possibly due to increased milk demand for suckling. The introduction of supplementary Mn during two cycles of gestation and lactation resulted in the improved birth weight and growth rate of piglets until weaning.

Another direction of research addressed in this Special Issue is the digestibility of some feed sources for animals. Thus, the group of authors led by Ammar H. [13] studied the nutritional value of *Ajuga iva* (*A. iva*) harvested from three distinct altitude regions in Tunisia (Dougga, Mograne and Nabeul). Proximate composition, phenolic concentration, gas production and in vitro dry matter digestibility were assessed. The highest concentrations of neutral detergent fibres and acid detergent fibres were found in *A. iva* cultivated in Nabeul. In contrast, the highest concentration of crude protein was observed in plants from Mograne and the lowest one ($p < 0.01$) was measured in Dougga samples. In addition, cultivation

regions affected the concentrations of free radical scavenging activity, total flavonoids and total polyphenols ($p < 0.01$). The highest free radical scavenging activity was observed in *A. iva* grown in Dougga and Mograne. The highest gas production rate ($p < 0.05$) and lag time were observed in *A. iva* grown in the Mograne and Nabeul regions. Dry matter digestibility differed between regions and analytical methods. The highest ($p < 0.01$) DM degradability was observed in plants harvested from Mograne and Dougga, while the lowest value ($p < 0.01$) was recorded for those from Nabeul. Additionally, metabolizable energy (ME) and protein digestibility values were higher in *A. iva* harvested from Mograne compared to those collected from the other areas. In conclusion, the nutritional value of *A. iva* differed between regions and care should be taken when developing recommendations for the use of *A. iva* as feed, including the adoption of season- and region-specific feeding strategies.

In another study dealing with the digestibility of some feedstuffs, Zúñiga-Serrano A. et al. [14] carried out an extensive bibliographic study on the antimicrobial and digestive effects of *Yucca schidigera* extracts on animal production and their consequences for the environment. Plant extracts have been used throughout time in traditional medicine, mainly for their antimicrobial activity and medicinal effects. Plant-derived products contain secondary metabolites that inhibit pathogenic microbial growth, similar to conventional drugs. These secondary metabolites can improve animal health and production in a more natural or organic way and help reduce the use of pharmacological drugs in animal feed, which is a major concern for emerging microbial resistance. Plant secondary metabolites can be cost-effective while improving the production efficiency of ruminants, non-ruminants and fish. Among the plant-derived products, *Yucca schidigera* extract (YSE) contains steroidal saponins as the main active component. YSE has multiple biological effects, including the inhibition of some pathogenic bacteria, protozoa and nematodes. YSE is used to control odours and ammonia and consistently improve poultry production. In pigs, the results are still inconclusive. In ruminants, YSE acts against protozoa, has selective action against bacteria and reduces archaea populations; all these effects are reflected in a reduction in polluting gas emissions, mainly methane, although they are not observed in all fuel conditions. These effects of YSE are discussed in this review. YSE has potential as a natural feed additive for sustainable animal production while contributing to the mitigation of pollutant gas emissions.

The final study that falls within the research area of feed digestibility in farm animals is that of Zanine A. et al. [15], who investigated the effect of cotton lint consumption on feed intake, nutrient digestibility, nitrogen balance and blood parameters in rams. Twenty rams weighing 30.2 $\pm$ 3.7 kg and aged 12 $\pm$ 1.3 months were studied and distributed in a completely randomized design with four treatments and five replications. The diets consist of 50% forages and 50% concentrates. Treatments consisted of replacing dietary corn with cotton lint at levels of 0, 70, 140 and 210 g/kg dry matter (DM). The feed intake of the rams was determined during the last three days of the experimental period. The linear effect decrease ($p < 0.05$) was observed for the nutritional fraction intake; however, neutral detergent fibre (NDF) intake and plasma urea-N were not affected ($p > 0.05$) by cotton consumption levels. The apparent digestibility of DM, crude protein, fat and non-nitrogen extractives were affected ($p < 0.05$), except for total carbohydrate. There was a low effect ($p < 0.05$) on the efficiency of SM and NDF intake. Nitrogen balance (g/day) and glucose levels (mg/dL) were reduced following the administration of cotton in the diets. Up to 70 g/kg of cotton fluff (lint) can be added to ram feed without adversely affecting DM intake and without altering digestibility, nitrogen balance, plasma urea and glucose concentrations; however, negative effects can be recorded when using larger amounts of cotton fluff, as a decrease in dry matter intake has been noted.

The category dealing with egg production includes two papers. In one of the articles, Usturoi A. et al. [16] studied the correlations between the health status of laying hens and their productivity. The study was conducted on the ISA Brown hybrid, monitored over a period of 25–55 weeks. The groups were represented by fowl raised differently in halls equipped with aviary or improved cage batteries, under real production conditions. The

blood biochemical traits of hens, as well as quantitative indicators of egg production, were studied. A cumulative production of 199.24 eggs/week/head was achieved in birds reared in the aviary compared to 199.98 from the improved cage batteries, which led to an average laying intensity of 91.82% and 92.17%, respectively. Flock casualties reached 4.14% (aviary) and 2.98% (cages). Daily average feed intake reached 122.20 g feed/head in the aviary and 115.87 g feed/head in cages, while the feed conversion ratio was 133.09 g feed/egg in aviary versus 125.69 in cages. The aviary rearing system has proven to provide optimal conditions for the expression of the natural behaviours of fowl, and it had a positive impact on metabolic functions, resulting in good health and high productive levels, comparable to those of birds exploited in cages.

The second article by Carvalho L.C. et al. [17] highlights a very interesting topic, and the authors provide a substantial contribution to the determination of the optimal amino acid ratio for Japanese quail based on the quality of egg production. A completely randomized design was used, with 120 Japanese quails, 12 treatments and 10 replicates per treatment. The treatments consisted of a basal balanced protein (BP) and the 11 combined feed diets that were obtained by reducing BP by 40%, using a specific test for Lys, Met + Cys, Thr, Trp, Arg, Gly + Ser, Val, Ile, Leu, His and Phr + Tyr. The study lasted 25 days. At the end, egg weight (EW), albumen height, albumen diameter, albumen index, yolk height, yolk diameter, yolk index, Haugh units, mineral shell weight (ESW) and egg shell participation percentage were measured. The ideal ratio was calculated when a statistical difference was detected using Dunnett's test. Only the variables EW and ESW were different in relation with BP. The ideal amino acid ratios considering Lys as 100 for EW and ESW were Met + Cys 82 and 83, Thr 60 and 68, Trp 18 and 21, Arg 109 and 112, Gly + Ser 99 and 102, Val 77 and 87, Ile 61 and 67, Leu 155 and 141, His 34 and 37, and Phe + Try 134 and 133, respectively. Applying the reduction method with a 40% limitation of dietary amino acid depletion allowed the EW and ESW variables to be sensitive for all amino acids tested. Thus, it was possible to simultaneously establish the ideal profile of essential amino acids in the diet, focusing on target traits (which in this study were EW and ESW).

The microbiological evaluation of chicken broiler feed was handled by a group of researchers from USV Iași led by Lăpușneanu D. [18], who conducted a case study in a combined feed factory in Romania. The study was carried out between 2019 and 2020 and 334 samples of raw materials and 601 samples of combined feed were collected and analysed. The raw materials (corn, wheat, soybean meal and sunflower) were tested for the presence of yeasts and moulds with the following results: 1.3×10^3, 9.5×10^2, 6.4×10^2 and 7, 4×10^2 cfu/g in 2019 and 1.5×10^2, 1.0×10^3, 5.2×10^2 and 7.1×10^2 cfu/g in 2020. Combined feed samples (starter, grower and finisher) revealed the following mean values: 5.9×10^2, 4.2×10^2 and 4.2×10^2 cfu/g in 2019 and 5.3×10^2, 6.5×10^2 and 5.8×10^2 cfu/g in 2020. Potentially toxigenic fungi of the genera *Aspergillus*, *Penicillium* and *Fusarium* occurred most frequently in all samples. For raw materials, the highest numbers of positive samples for *Aspergillus* were recorded in both years: 66.6% in 2019 and 100% in 2020 for maize, 50% in 2019 and 75% in 2020 for wheat, 76% in 2019 and 87.5% in 2020 for soybean meal and 71.4% in 2019 and 100% in 2020 for sunflower meal. In starter combined feeds, *Aspergillus* predominated in 2019 (46.6%), while in 2020, *Penicillium* and *Cladosporium* were identified in most samples (50%); in grower and finisher feeds, *Aspergillus* was predominantly identified in 2019 (60% and 72.2% of the samples, respectively) and in 2020 (61.5% and 46.6%, respectively). All bacteriological analyses to identify possible contamination with *Salmonella spp.*, *E. coli* and *Clostridium perfringens* produced negative results. Based on the results obtained in this study, it could be concluded that the monitoring and analysis of microbiological hazards in a feed factory are necessary to be able to prevent contaminations of this type because they can have a direct impact on feed and food safety.

Another side of obtaining animal products is its polluting potential. This topic was a concern of researchers from USAMV Bucharest, led by Popa R.A. [19], who carried out a comparative assessment of the resulting air pollutant dynamics in a dairy farm using

an LoT platform. The study is based on the necessity of the awareness and permanent monitoring of sources of pollution to ensure the efficient management of the farm. The authors conducted a case study of air pollutants in a cattle farm in different seasons (winter and summer) and the assessed the correlation between their variations and microclimate parameters. In this study, a further comparison was carried out between values estimated using the EMEP methodology (European Monitoring and Evaluation Programme, 2019) for air pollutant emissions and values measured by sensors in a hybrid farm decision support platform. Interactions between microclimate and pollutant emissions were found that can provide a model for farm activities, which is useful as managing tool for farmers. Starting from the fact that the estimates using the EMEP methodology do not consider the natural and artificial ventilation of the stable, as they are used for a global assessment of atmospheric air quality, the authors recommend the use of sensors and alert systems that analyse pollutant concentrations in real time to ensure animal welfare.

Another type of study included in this Special Issue was related to the quality of honey. Albu A. et al. [20] analysed the phenolic and flavonoid contents and also the raw chemical composition of Romanian monofloral honey. In this study, 28 samples (acacia, linden, rapeseed, sunflower and mint) were analysed. Pearson's test revealed a strong positive correlation between total phenolic content and total flavonoids (r = 0.76) and color intensity (r = 0.72). For total flavonoid content, correlations were strongly positive with colour intensity (r = 0.81), ash content (r = 0.76) and electrical conductivity (r = 0.73). The relevant levels of polyphenols and flavonoids identified in the types of honey analysed demonstrate its antioxidant potential, with essential nutritional and sanogenic characteristics in human nutrition.

The second article dealing with the quality of honey offers us a profile of several varieties of monofloral honey from Romania. Thus, Pop I.M. et al. [21] evaluated 7 monofloral honey varieties (linden, acacia, rapeseed, sunflower, mint, raspberry and chestnut) from a physical-chemical point of view (moisture, specific gravity, pH, free acidity, ash, electrical conductivity, total phenols and total flavonoid content, K, Ca, Mg, Na and P). The quality parameters that were investigated fell within the recommended limits established by the regulated standards. Sample analyses indicated the presence of antioxidants such as total phenols content (TPC) (17.9–73.2 mg GAE/100 g) and total flavonoids content (TFC) (0.84–4.81 mg QE/100 g) and high amounts of K (101–1462 mg kg^{-1}), Ca (58.3–167.5 mg kg^{-1}), Mg (24.8–330.6 mg kg^{-1}), Na (94.5–233.3 mg kg^{-1}) and P (34.1–137.2 mg kg^{-1}). Pearson's correlations between certain parameters (such as colour × TFC, colour × Mg, colour × P, electrical conductivity × ash, mm Pfund × TFC, TPC × TFC, K × Ash, P × Mg) along with principal component analysis, hierarchical clusters analysis and ANOVA statistics reveal three main factors that explain the variability of the data set and could be attributed to stability: minerals and colour/antioxidant contributions. FTIR spectra confirmed the authenticity of all monofloral honeys. The experimental data confirmed the influence of environmental elements (soil, water, air) on the composition of honey and highlighted the quality of honey as a complete food and therapeutic product.

For the end of this editorial, we have saved an article that presented a phylogenetic analysis of the genetic diversity of the Romanian cattle breed named Steppe Grey, a breed that is on the way to extinction. Since 2000, FAO has been drawing attention to the significant decline in the Podolian cattle population group, which also includes the Romanian Steppe Grey. Currently, this breed is on the verge of extinction, counting less than 100 heads throughout the country. Due to its qualities of resilience, adaptability and increased resistance to diseases and severe climatic conditions, the Steppe Grey is considered a valuable genetic pool for improving livestock production. The study carried out by Davidescu M.A. et al. [22] aimed to quantify the genetic diversity of a population of 32 cattle from northeastern Romania (historical province of Moldova) by analysing two mitochondrial markers, Cytochrome B and Loop D, that proved to be relevant for studies of genetic diversity and phylogeny. The results obtained, based on statistical data analysis derived from nucleotide sequencing analysis software (DnaSP, SeaView, MegaX, PopArt, etc.), demonstrated that

the breed belonged to the ancestral haplogroup P′QT, with direct ancestry from *Bos taurus primigenius*. Within this haplogroup, five cattle were identified that could be used in artificial selection and mating, with the aim of preserving valuable genetic resources, improving the biological resilience of other cattle breeds against various adverse environmental factors and protecting biodiversity.

This Special Issue of *Agriculture*, focused on animal nutrition and productions, includes articles that are diversified in approach and represent some of the latest preoccupations of specialised research, aiming at continuously developing knowledge in the targeted fields. The authors of this editorial are pleased to have completed this Special Issue, underlining the valuable contributions of researchers from all over the world, many of which are young people representing the future of research in their respective fields. We hope that Series II will be as successful and will give us the opportunity to write a second editorial.

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