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Editorial

Animal Nutrition and Welfare in Sustainable Production Systems

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The production of food animals today requires large amounts of energy, land, chemicals, and water—all of which are becoming increasingly scarce. To meet the present and future demand for animal products sustainably, many animal production systems must change and innovate. Feeding grains sourced from faraway places and other ingredients have enabled intensive meat, egg, and milk production systems to develop over the last four decades [1]. Production systems for ruminants and monogastric food animals have become highly capital-intensive and have created many environmental challenges [2].

Feedstuffs may even become economically and environmentally unviable if the price rises above a critical level. Food, feed, and biofuel production are becoming increasingly competitive, which may magnify these problems [3]. There have been many situations where feed has been produced, and nutrition has been balanced to maximize production, with high economic benefits. Nevertheless, methane and nitrous oxide have contributed to global warming and ecosystem degradation [4]. Additionally, intensive systems consume more energy at every step of the production process. An examination of the excessive use of resources is warranted, as well as consideration of more efficient processes.

A successful animal system relies on the quality of feed, nutrition, and welfare of the food animals. Moreover, they affect land use, land-use change, animal productivity, health and welfare, product quality, safety, and greenhouse gas emissions in the animal production sector [5]. Developing animal production across production systems requires a sustainable approach to food animal nutrition and welfare. Without sustainable animal nutrition and welfare, it will not be possible to increase animal productivity sufficiently to meet the massive demand for animal-origin products [6].

In addition to benefiting the animal, society, and the environment, sustainable animal nutrition and welfare are expected to have a positive effect on society and the environment [7]. Furthermore, they will contribute to poverty alleviation and food security by generating socio-economic benefits. For this to be achieved, we need scientists, extension workers, science managers, policymakers, industry, and farmers.

This Special Issue entitled "Animal Nutrition and Welfare in Sustainable Production Systems" welcomes papers focused on the latest knowledge and innovations in sustainable animal production, animal nutrition, animal welfare, animal behaviour, agricultural economy, policy and management, sustainable feedstuff technology, and food safety principles [8].

Several groups of authors present their review and research articles in this Special Issue which, overall, has published a total of eight high-quality papers. Ullah et al. [9] have described and elaborated why microelements such as selenium are important in cow production for future sustainable development, while on the contrary, Lika et al. [7] in

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Citation: Puvača, N.; Tufarelli, V.; Voslarova, E. Animal Nutrition and Welfare in Sustainable Production Systems. *Sustainability* **2022**, *14*, 9371. https://doi.org/10.3390/su14159371

Received: 19 July 2022
Accepted: 28 July 2022
Published: 31 July 2022

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their review paper have shown the significance of the dietary addition of plant products and honeybee products as an alternative for antibiotics in poultry production, health, and overall welfare. As an alternative to soybean in cattle diets, Salami et al. [10] have shown several positive results of the usage of commercial slow-release urea products. Later on, Salemi et al. [11] based on their research showed the influence of sunflower meal dietary addition to daily laying-hen's nutrition as a corresponding protein source on productive performance, egg quality, and nutrient digestibility.

On the other hand, feed quality and safety, nowadays, have gained significant attention, so Puvača et al. [12] in their research have shown the important and easy way of characterization of *Alternaria* spp. toxins in wheat by optical methods, as well as the influence of the usage of contaminated grains in broiler chickens' nutrition on oxidative stress. Addeo et al. [13], in their interesting work, have demonstrated the possibilities of substituting maize with the earliest wheat lines' by-products in organic poultry production and their influences on intestinal morphology and enzymatic activity. Furthermore, commercial corn hybrids as a single source of dietary carotenoids and their influence on egg yolk were investigated by Kljak et al. [14] with positive outcomes regarding the yolk carotenoid profile and pigmentation. Hartung et al. [15] have presented the influence of farm-grown forage as a component in the liquid diet for gestating sows with positive effects on body condition development and productive results, respectively.

Altogether, the papers of this Special Issue present valuable data on the nutrition, feed quality and safety, health and overall welfare of food animals, and agricultural sustainable production.

Author Contributions: Conceptualization, N.P., V.T. and E.V.; writing—original draft preparation, N.P.; writing—review and editing, V.T. and E.V. All authors have contributed equally to this Editorial. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Acknowledgments: We would like to thank all authors for their excellent papers in this Special Issue "Animal Nutrition and Welfare in Sustainable Production Systems". We also thank the reviewers for their valuable recommendations leading to the improvement in all manuscripts, before publication. We are also grateful to all members of the *Sustainability* Editorial Office for providing us with this opportunity and for continuous support in managing and organizing this Special Issue.

Conflicts of Interest: The authors declare no conflict of interest.

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