

Animal Hygiene on Farms—More Important than Ever Before

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“Prevention is better than cure”. This saying, known to nearly everyone since the coronavirus disease 2019 (COVID-19) pandemic, serves as a guiding principle of hygiene. The true meaning of this proverb and the measures it encompasses has become evident through the global pandemic situation. Unlike any other zoonotic pathogen before it, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has vividly demonstrated the severe consequences that arise from disregarding pandemic risk factors and preventive hygiene measures. While the primary impact of SARS-CoV-2 was on human health, it is important to recognize that prevention and health protection extends beyond humans to include animal health as part of the “One Health” concept. The experience of the pandemic has highlighted the renewed importance of hygiene, not only during a pandemic, but also in everyday life, whether among humans or animals. The International Society of Animal Hygiene (ISAH, <https://www.isah-soc.org>, accessed on 17 July 2023) states that “Animal Hygiene includes the scientific analysis of interactions between domestic animals and abiotic and biotic factors, with the aim of developing optimization and intervention measures to prevent diseases, promote animal health, and address species-specific welfare needs while maintaining a secure and healthy environment”.

The significance of hygiene is most apparent in preventing the spread of zoonotic pathogens and addressing antimicrobial resistance. Even our ancestors were aware of the importance of animal hygiene; dirty stables and “dirty” animals were associated with the occurrence of animal diseases even then. Today, reducing antimicrobial use and antimicrobial resistance is only possible with optimal animal hygiene on farms.

The scientific field of animal hygiene encompasses expertise from various disciplines, including veterinary medicine, animal science, agricultural economics, engineering, microbiology, public health, and epidemiology. This diversity of disciplines is reflected in the articles and authors included in this Special Issue. The aim is to showcase the broad range and utmost importance of animal hygiene in livestock farming while also summarizing the successes, limitations, and ongoing challenges in implementing animal hygiene practices on farms. This Special Issue consists of eleven articles that present new research in animal hygiene covering a variety of species such as horses, cattle, pigs, goats, and poultry. The important topic of the hygienic aspects of biogas production as part of the agricultural circular economy is also addressed.

The articles employ various methodologies to gain new insights. For instance, Lühe et al. (2022) [1] assessed the bacteriological air quality of riding arenas using air hygiene measurements and concluded that air quality should be a focal point of interest, especially during training periods with high air consumption by horses. Müsse et al. (2022) [2] studied sexual dimorphism in broilers to understand its implications for bone quality and derived possible preventive consequences concerning husbandry and the separate raising of female and male broilers. Kronfeld et al. (2022) [3] generated new knowledge on the composition of vaginal and uterine microbiomes in dairy cows, which can provide useful insights for preventing uterine diseases and understanding their pathogenesis.

Assessing litter quality in broiler houses, particularly food pad dermatitis at slaughter, is a well-established indicator. Louton et al. (2022) [4] evaluated an automatic scoring



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system and recommended some adjustments to accurately classify foot pad dermatitis lesions and lower the probability of errors.

In the agricultural value chain, anaerobic digestates derived from agricultural mesophilic biogas plants are primarily used as organic fertilizers. However, animal-derived pathogens may pose an epidemiological risk. Therefore, Schilling et al. (2022) [5] examined the effects of storage, temperature, and substrate on selected pathogens and found that storage significantly improved hygienic quality and reduced the risk of introducing pathogens into the environment.

From a methodological standpoint, accurately evaluating the success of farm hygiene management procedures poses a fundamental challenge for poultry farmers. Mateus-Vargas et al. (2022) [6] analyzed the use of boot swab sampling to quantify the effects of hygiene practices in poultry barns. They found no statistical correlations between the bacterial counts obtained by boot swabs and the established agar contact plating method.

The global importance of animal hygiene is evident in the contributions of Wolde-mariyam et al. (2022) [7] and Ebwanga et al. (2022) [8], which focus on animal disease outbreaks in Africa, specifically in Ethiopia and Cameroon. These papers demonstrate that biosecurity, combined with outbreak documentation and surveillance, is an essential tool for improving animal health and prevention, regardless of the country.

The link between animal husbandry, hygiene, and behavior is the subject of the study by Wallgren and Gunnarson (2022) [9] on the provision of straw as an enrichment material in pigs. Although the implementation of straw racks did not lead to a significant interaction level with the enrichment material, the research highlights the need for future projects to explore this important topic further.

The connection to animal nutrition is represented by Hashem et al. (2021) [10]. They demonstrated the potential of supplementing lactating goats in the transition period with *Boswellia sacra* resin, which had positive effects on body lipid metabolism, udder and uterus health, colostrum IgM content, and milk yield.

Animal hygiene is not only closely linked to husbandry, behavior, and nutrition but also to advanced agricultural technology. Using the example of poultry production, Olejnik et al. (2022) [11] showcase the possibilities of the latest Precision Livestock Farming (PLF) technologies for monitoring laying hens and broilers, including the use of sensors to assess parameters in the context of animal hygiene.

Future farm animal housing systems must consider animal welfare, environmental protection, and resource efficiency. They should be animal-friendly, environmentally sound, climate-friendly, consumer-oriented, and competitive. Animal hygiene is a key factor in meeting these current and future requirements for sustainable livestock farming, effectively addressing the challenges and changes to come. The articles included in this Special Issue illustrate the strengths of this essential research field, underline its broad range, and highlight the creative and goal-oriented approach of this applied scientific discipline, which holds the utmost importance.

Conflicts of Interest: The author declares no conflict of interest.

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