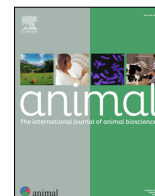




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Editorial: Selected keynote lectures of the 75th Annual Meeting of the European Federation of Animal Science (Florence, Italy) [☆]



L.E. Hernández-Castellano ^{a,*}, A. Suárez-Trujillo ^b, E. Sell-Kubiak ^c, A. Cannas ^d, N. Castro ^a

^a IUSA-ONEHEALTH 4. Animal Production and Biotechnology, Institute of Animal Health and Food Safety, Universidad de Las Palmas de Gran Canaria, 35413 Arucas, Spain

^b Department of Animal Science, Berry College, Mount Berry, GA 30149, United States of America

^c Department of Genetics and Animal Breeding, Poznań University of Life Sciences, 60 637 Poznań, Poland

^d Department of Agricultural Sciences, University of Sassari 07100 Sassari, Italy

Introduction

The European Federation for Animal Science (EAAP) works to promote the latest findings in animal science as well as foster a better understanding of all scientific fields related to animal science, including insects. Its Annual Meeting stands out as a key global event focused on livestock production. This scientific association offers an outstanding platform for researchers and professionals to exchange knowledge, showcase innovations, and engage in scientific debate about the most novel findings in animal science. Attendees can participate in a variety of activities, including plenary and parallel sessions, poster exhibitions, and scientific discussions.

Global agriculture faces multiple challenges ranging from climate change and feed–food competition to animal welfare and economic viability. Consequently, the livestock sector is under constant pressure to innovate and adapt to these challenges. To address some of these issues, especially those related to sustainability, animal health, productivity, and technology, this supplement introduces seven review articles, carefully chosen by the different EAAP study commissions from among the invited speakers at the 75th Annual Meeting held in Florence, Italy.

Introduction to the review papers of this issue

Three review papers in this supplement highlight the importance of precision and data analytics in modern livestock research. Lee et al. (2025) provide a review paper about wearable sensor validation in dairy cattle, highlighting critical gaps in how precision livestock farming technologies report precision, bias, and reproducibility. This review emphasises that robust validation standards must be adopted to ensure that sensor data provide reliable information for taking appropriate welfare and management decisions. Billah et al. (2025) review several aspects of using digital pheno-

typing, combining computer vision and machine learning for genomic selection. The authors describe that these technologies will not only enhance trait accuracy and accelerate genetic gains but also contribute to the ongoing challenges in integrating large-scale, image-based data into breeding programmes. Together, these reviews signal a transition towards livestock systems characterised by continuous, real-time phenotyping and genomic precision, contributing to the next-generation sustainability indices. Such sustainability considerations are reviewed by Richardson et al. (2025), who describe the development of a greenhouse gas selection index in dairy cattle. This review describes how genomic selection can influence direct and indirect methane-related traits (i.e., feed efficiency, maintenance, among others), contributing to reducing methane emissions without compromising productivity. This synergistic use of phenomic and genomic data is essential for shaping environmentally adapted high-yielding dairy cattle.

A second thematic thread in this issue emphasises nutritional and management strategies that can improve livestock resilience and reduce the susceptibility of infectious diseases in the offspring. Caton et al. (2025) report the effect of maternal micronutrient supplementation on offspring physiology, metabolism, and gene expression. This review encompasses evidence on targeted nutrient interventions during pregnancy that can improve livestock performance and longevity, particularly in extensive and climatically variable systems. In addition, González-Cabrera et al. (2025) review different aspects around parturition, including colostrum synthesis in dairy goats. The review encompasses endocrine and immune processes that regulate colostrum synthesis, highlighting practical management and dietary strategies to enhance colostrum quality and passive immune transfer. Together, these review papers focus on the period around parturition, demonstrating that both prenatal and perinatal nutrition hold transformative potential for herd-level resilience.

Two reviews in this supplement address the sustainable use of alternative feed resources in ruminant production systems. Nudda et al. (2025) conduct a meta-analysis on agro-industrial by-products rich in polyphenols on small ruminant diets. These findings indicate significant improvements in milk fatty acid composition, especially increased levels of mono- and polyunsaturated fatty acids without affecting milk yield. This work highlights the rele-

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* Corresponding author.

E-mail address: lorenzo.hernandez@ulpgc.es (L.E. Hernández-Castellano).

vance of circular economy strategies, enhancing the use of local plant-based waste streams in small ruminant nutrition. Tretola et al. (2025) also describe nutritional, safety, and regulatory aspects of incorporating former foodstuff products into ruminant diets. This review includes a holistic analysis of nutritional value, microbial risks, packaging residues, and environmental benefits of using former foodstuff products in animals, highlighting that their use can reduce both the carbon footprint and the economic cost of livestock feeding. These feed-based solutions align with the European Green Deal and other global calls for climate-smart agriculture. Importantly, they also support animal health by providing bioactive compounds that can modulate rumen fermentation and reduce methane emissions.

On behalf of the editorial team and the European Federation of Animal Science, we extend our appreciation to the authors for their scholarly contributions and to the reviewers for their rigorous evaluations. We hope this collection of articles will stimulate further interdisciplinary research and innovation in animal science.

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Data and model availability statement

Not applicable.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) did not use any AI and AI-assisted technologies.

Author ORCIDs

Lorenzo E. Hernández-Castellano: <https://orcid.org/0000-0003-2729-0434>.

Aridany Suárez-Trujillo: <https://orcid.org/0000-0002-9343-5016>.

Ewa Sell-Kubiak: <https://orcid.org/0000-0002-7642-0787>.

Antonello Cannas: <https://orcid.org/0000-0001-6297-1556>.

Noemí Castro: <https://orcid.org/0000-0002-3026-2031>.

CRedit authorship contribution statement

L.E. Hernández-Castellano: Writing – review & editing, Writing – original draft. **A. Suárez-Trujillo:** Writing – review & editing. **E.**

Sell-Kubiak: Writing – review & editing. **A. Cannas:** Writing – review & editing. **N. Castro:** Writing – review & editing.

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Transparency Declaration

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