



Editorial: The Importance of “Livestock Research Today” in Food Security and Safety

Md Shariful Islam^{1*}, Syed Sarwar Jahan¹

Introduction

Livestock research is pivotal in addressing the dual challenge of meeting rising global demand for animal-source foods and ensuring environmental sustainability. Animal-source foods, such as milk, meat, and eggs, are critical for human health, providing essential nutrients that support growth and well-being, particularly for vulnerable populations. Advanced genomic technologies like CRISPR and precision livestock farming (PLF) are transforming productivity by enabling the breeding of disease-resistant livestock and optimizing resource use through AI-driven systems. Food safety remains a critical focus, with innovations in vaccines, antimicrobial alternatives, and blockchain-powered traceability systems reducing risks and enhancing transparency.

Addressing the environmental impact of livestock farming, particularly its contribution to greenhouse gas emissions, research has demonstrated the efficacy of alternative feed sources, circular agricultural methods, and conservation of climate-resilient local breeds. Socioeconomic impacts, particularly for smallholder farmers and women, underscore the transformative potential of targeted interventions such as affordable vaccines and participatory breeding programs. Collaborative global initiatives and policies play a crucial role in translating research outcomes into actionable solutions.

The Livestock Research Today (our Journal) aims to catalyze advancements in animal health, genetics, nutrition, sustainable systems, and ethical practices, emphasizing innovation to address global challenges. Continued investment in livestock research is essential for achieving food security, public health, and environmental sustainability in the face of a growing population and climate change.

2. Enhancing Productivity for Global Nutrition

Milk, meat, eggs, and other animal-source foods are concentrated dietary sources of macro- and micronutrients (Daphna and Lindsay, 2011). Livestock supplies essential nutrients, including high-quality proteins, vitamin B12, and iron, which are crucial for human health. Research highlights that nutrients derived from animals are especially crucial for the physical and cognitive growth of children and the well-being of pregnant women (Neumann et al., 2010). As the world population is anticipated to reach 9.7 billion by 2050, livestock research must confront the issue of satisfying the rising demand for animal products. The changing diets of people in various nations globally, notably in Asia, India, and South America would boost the worldwide demand for animal products (meat, eggs, and milk) by 70% by 2050 (Berckmans, 2017). Progress in genetic enhancement, particularly via genome editing technologies like CRISPR, has facilitated the creation of disease-resistant and high-yield cattle breeds. Researchers have successfully bred pigs that are immune to the Porcine Reproductive and Respiratory Syndrome Virus (PRRSV), which results in substantial economic losses globally (Burkard et al., 2017). Moreover, precision livestock farming (PLF) technology, such as automated sensors and artificial intelligence, enables real-time animal health and production monitoring, optimizing resource utilization and decreasing waste (Berckmans, 2017). Integrating digital technologies with conventional agricultural methods provides scalable options for sustainably improving cattle production.

3. Ensuring Food Safety and Public Health

Food safety is crucial to food security. Contaminated animal products are a significant cause of foodborne diseases, impacting over 600 million people yearly (WHO, 2020). Research into

*Correspondence. Md Shariful Islam, Department of Veterinary and Animal Sciences, University of Rajshahi, Rajshahi-6205, Bangladesh.
E-mail: Md. Shariful Islam: msips06@ru.ac.bd

Author Affiliation.

¹ Department of Veterinary and Animal Sciences, University of Rajshahi, Rajshahi-6205, Bangladesh.

Please Cite This:

Islam, M. S., Jahan, S. S. (2023). "Editorial: The Importance of “Livestock Research Today” in Food Security and Safety", *Livestock Research Today*, 1(1),1-2,10080

Accepted by the Editorial Board January 01, 2023 (received for review December 10, 2022)

© 2023 LIVESTOCK RESEARCH TODAY, a publication of Eman Research, USA.
This is an open access article under the CC BY-NC-ND license.
(<http://creativecommons.org/licenses/by-nc-nd/4.0/>).
(<https://publishing.emanresearch.org>).

antimicrobial resistance (AMR) has been especially essential since the abuse of antibiotics in farm animal production for foods leads to the rise of resistant bacteria. Innovations in vaccine research and other therapies, such as phage therapy, provide potential possibilities for lowering dependency on antibiotics in animal husbandry (Clavijo et al., 2019). Additionally, traceability solutions employing blockchain technology are altering the way food safety is monitored. Blockchain enables animal products may be monitored along the supply chain, boosting transparency and lowering the risk of contamination (Kamilaris et al., 2019).

4. Livestock and Environmental Sustainability

The environmental footprint of cattle production is enormous, with the industry producing around 14.5% of global greenhouse gas emissions (Gerber et al., 2013). Research into alternate feed alternatives, such as algae-based supplements, has indicated the potential to cut methane emissions from ruminants by up to 80% (Kinley et al., 2020). Circular agricultural methods, which combine livestock with crop cultivation, also offer potential. For instance, employing manure as organic fertilizer not only minimizes chemical inputs but also enhances soil health and carbon sequestration (Garnett et al., 2013). Further, conservation-focused research attempts to protect animal genetic resources. Local breeds, generally more tolerant to climatic stresses, are being examined for their potential to boost adaptive ability in locations confronting severe weather conditions (Hoffmann, 2010).

5. Socioeconomic Impacts of Livestock Research

Livestock farming is a main livelihood for over 1.3 billion people worldwide, with women and smallholder farmers playing key roles (Thornton et al., 2018). Research that targets resource-poor farmers, such as economical vaccinations and low-cost feed alternatives, has a direct influence on poverty reduction. Programs like the International Livestock Research Institute's (ILRI) programs in Africa have proved the transformational power of participatory research. For instance, community-based breeding initiatives have boosted production in small ruminants while retaining genetic variety (Haile et al., 18).

6. The Role of Policy and Collaboration

Effective livestock research involves cooperation across industries and geographies. Multilateral programs, such as the Global Agenda for Sustainable Livestock, encourage cooperation between academics, governments, and business sectors to overcome complicated issues. Investment in extension services is also vital to ensuring that research outputs are converted into practical strategies for farmers.

Livestock research has historically been fundamental to the progress of global agriculture. Given the pressures of a burgeoning

population, the climate emergency, and shifting socio-economic issues, this sector's role in guaranteeing food security, promoting sustainability, and driving innovation is more vital. In this essential environment, we are pleased to present The *Livestock Research Today* a peer reviewed Journal committed to enhancing knowledge, disseminating innovations, and promoting cooperation within the livestock research community.

Therefore, The *Livestock Research Today* aims to serve as a comprehensive archive for high-quality research on all areas of livestock production, health, welfare, and economics. Its scope comprises, but is not limited to:

6.1 Animal Health and Disease Management: With zoonotic illnesses and antibiotic resistance presenting worldwide risks, this sector stresses novel diagnostic techniques, vaccinations, and sustainable disease management systems.

6.2 Genetics and Breeding: Genetic advancements are altering cattle agriculture. The magazine will emphasize developments in genomic technologies, selective breeding techniques, and the integration of biotechnology to boost production and resilience.

6.3 Nutrition and Feeding Systems: Effective nutrition is crucial for optimizing productivity and avoiding environmental consequences. Research into innovative feed supplies, precision feeding technology, and microbiome interactions will be a key area.

6.4 Sustainable Livestock Systems: Addressing environmental sustainability is non-negotiable. Studies on emissions reduction, circular bio-economy techniques, and environmental services in cattle systems are significant concerns.

6.5 Welfare and Ethical Practices Ethical issues in animal production are garnering heightened attention. Contributions addressing welfare indicators, moral frameworks, and consumer perceptions are crucial for aligning cattle operations with society's expectations.

7. Conclusion

Livestock research stands at the intersection of global challenges and opportunities, offering transformative solutions to address pressing issues in nutrition, sustainability, and public health. As the demand for animal-source foods surges, driven by population growth and changing dietary patterns, the academic community's role in fostering innovation has never been more critical. By advancing productivity through genetic enhancements, ensuring food safety with cutting-edge technologies, and reducing environmental impacts via sustainable practices, livestock research can redefine the future of agriculture.

Furthermore, this field holds immense potential to uplift vulnerable populations by enhancing livelihoods, promoting gender equity, and reducing poverty. The socioeconomic benefits of livestock farming, especially for smallholder farmers, underscore the importance of inclusive, community-driven approaches.

Collaboration among policymakers, researchers, and industry leaders is paramount to converting scientific advancements into actionable strategies that address local and global needs.

Livestock Research Today is committed to catalyzing this progress by providing a robust platform for disseminating groundbreaking studies and fostering interdisciplinary dialogue. As we navigate the complexities of food security, climate resilience, and ethical considerations, the journal will serve as a beacon for high-quality research that drives impactful change.

In uniting the academic community under a shared vision, we can build resilient livestock systems that not only meet the nutritional demands of a growing population but also ensure a sustainable and equitable future for all.

https://www.who.int/foodsafety/publications/foodborne_disease/fergreport/en/

(accessed on 1 June 2020)

References

- Berckmans, D. (2017). General introduction to precision livestock farming. *Animal Frontiers*, 7(1), 6-11.
- Burkard, C., Opriessnig, T., & Mileham, A. J. (2017). Pigs lacking the scavenger receptor CD163 are resistant to PRRSV infection. *Nature Biotechnology*, 35(6), 600–605.
- Clavijo, V., Baquero, D., & Figueroa, L. (2019). Phage therapy in food animal production. *Frontiers in Microbiology*, 10, 1106.
- Daphna K. Dror and Lindsay H. Allen (2011). The importance of milk and other animal-source foods for children in low-income countries. *Food and Nutrition Bulletin*, 32 (3).
- Garnett, T., Appleby, M. C., & Balmford, A. (2013). Sustainable intensification in agriculture: premises and policies. *Science*, 341(6141), 33-34.
- Gerber, P. J., Steinfeld, H., Henderson, B., et al. (2013). Tackling climate change through livestock: A global assessment of emissions and mitigation opportunities. Rome: FAO.
- Haile, A., Wurzinger, M., Mueller, J., Mirkena, T., Duguma, G., Reikik, M., et al. (2018). Guidelines for Setting up community-based small ruminants breeding programs in Ethiopia. Beirut, Lebanon: ICARDA. Available at: <http://hdl.handle.net/20.500.11766/6236>.
- Hoffmann, I. (2010). Climate change and the characterization, breeding and conservation of animal genetic resources. *Animal Genetics*, 41(s1), 32-46.
- Kamilaris, A., Fonts, A., & Prenafeta-Boldú, F. X. (2019). The rise of blockchain technology in agriculture and food supply chains. *Trends in Food Science & Technology*, 91, 640-652.
- Kinley, R. D., et al. (2020). The red seaweed *Asparagopsis taxiformis* reduces enteric methane in sheep. *Animal Production Science*, 60(8), 1395-1399.
- Neumann, C. G., et al. (2010). Animal source foods to improve micronutrient nutrition and human function in developing countries. *The Journal of Nutrition*, 130(11), 3965-3968.
- Thornton, P. K., et al. (2018). Livestock and climate change: Impacts, adaptation, and mitigation. *Animal*, 12(s2), s146-s156.
- WHO (World Health Organization). WHO Estimates of the Global Burden of Foodborne Diseases: Foodborne Disease Burden Epidemiology Reference Group 2007–2015. Available online: