Chapter 20
Hitching Artificial Intelligence and IoT and for Livestock Management Competence:
Line Up Nature and Technology for Smart Agriculture

Bhupinder Singh
https://orcid.org/0009-0006-4779-2553
Sharda University, India

Christian Kaunert
https://orcid.org/0000-0002-4493-2235
Dublin City University, Ireland & University of South Wales, UK

ABSTRACT

Agriculture has always been a human-centered industry and technological advancements have made it possible to increase production, sustainability, and efficiency. An important area of agriculture, livestock management, has profited from the combination of AI and IoT. Farmers are able to optimize feeding, track activity, keep an eye on the health of their cattle, and anticipate possible problems before they become serious because of these technologies. The most recent developments, difficulties, and potential applications of AI and IoT integration in cattle management are covered in this chapter. This chapter scrutinizes the potential of AI and IoT technology as well as its potential for future development in the field of livestock management. Its

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goal is to give a thorough review of this field's present technological condition with an emphasis on how it might be applied to develop livestock management systems that are more productive, sustainable and efficient.

INTRODUCTION

Artificial intelligence (AI) is essential, and the livestock and agriculture sectors are progressively adopting this innovative trend (Subeesh & Mehta, 2021). The industry is continuing to have breakthroughs, and there are exciting new developments more frequently (Mehta et al., 2023). Artificial intelligence (AI) might improve the productivity, health, and reproductive efficiency of dairy farms (Gulzar et al., 2020). Sensors are used in IoT-based livestock management to gather data on the conditions, habits, and well-being of cattle (De Abreu & van Deventer, 2022). This information promotes sustainable agricultural practices, increases production, and improves animal welfare (Singh, 2024).

With the use of this technology, farmers can monitor the whereabouts and health of each animal in their herd remotely (Uddin et al., 2022). They can also receive warnings when any metrics depart from expected ranges (Rai, 2022). They can swiftly distinguish between livestock that is unwell and that is not, eliminating the need to carefully examine each animal's vital signs in order to find the spread of illness (Sivakumar et al., 2021). In addition to monitoring health, livestock monitoring systems can check temperature to ascertain the peak of the mating season or utilize GPS to gather and store previous data on preferred grazing sites (Singh, 2023). There are principal advantages of AI and IoT-powered livestock management as-

Real-time Health Monitoring: It enables farmers to cure animals quickly and stop the spread of infections by keeping tabs on the health and wellbeing of their livestock (Barasa et al., 2021).

Grazing Animal Tracking: Monitor grazing animals to identify patterns and avoid loss (Takacs-Gyorgy & Takács, 2022).

Historical Data Analysis: Compile and examine past data to spot trends in the health of cattle and track the progression of disease over time (Alreshidi, 2019).

Monitoring Mating and Birthing: With keeping an eye on an animal's readiness to mate or give birth, you may increase breeding efficiency and lower the chance of losing young calves (Singh, 2023).