Application of Artificial Intelligence (AI) in Animal Husbandry

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INTRODUCTION

Applying artificial intelligence to modern animal husbandry and aquaculture technology can intelligently identify animals of different weights and stages, feed differently, and improve the output rate of high-quality feeding animals. With the huge growth in the world population, the farmers are transferring to smarter techniques that can aid in regulating the appropriate use of land, water, and energy to feed the planet and elude the global food disaster. Researchers believe that the answer lies in sensors, robots and artificial intelligence. The AI technology has been successfully adopted by several industries, and now it is set to revolutionize the future of farming with drones, robots and intelligent monitoring systems. A technique for monitoring the health of farm animals and dairy cattle with a high degree of accuracy uses a camera and artificial intelligence (AI) to achieve a “smart” cow house. AI for detailed observation, powered image analysis could enable early detection of injuries and illnesses that could impact the quantity and quality of milk production. In the

ABSTRACT

Artificial Intelligence (AI) is one such technology which needs immediate implementation in the livestock industry. AI has emerged as a tool that empowers farmers in monitoring, forecasting, optimizing the farm animal growth, tackling parasites, biosecurity, and diseases, monitoring farm animal along with farm management are some of the thrust areas in livestock industry where the use of AI technology can pay rich dividends. Artificial Intelligence will help livestock farms accumulate and analyse data to accurately predict consumer behaviour, like buying patterns, leading trends, etc. With increased investments, farms will be enabled to automate processes, reduce major costs and improve the quality of livestock products like milk.

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recent times, with requirements of the better yield of farm animals.

**Various uses of AI**

1. **Artificial Intelligence in automated milking**: Milk booth is a section of animal husbandry which has an increasing application of artificial intelligence system. With AI enabled smart sensors, the automated milking units can analyze the milk quality and flag for abnormalities in the product.

2. **Precision livestock farming**: Latest Dairy is implementing cow, milk and herd intelligence through their sensors and artificial intelligence technologies. They offer sensors ranging from heat detection and calving to health monitoring sensors-including the Sense Time Solution sensor, which detects and charts a cow’s daily activities, such as ruminating, eating and walking patterns. Today, there are numerous sensors available that can help farmers track alterations in animal movements, food intake, sleep cycles and even air quality in animal shelters. When paired with artificial intelligence software, this sensor provides users with early, proactive solutions to problems. Along with the capability to record information about reproduction, health and nutrition, the sensor also provides farmers with solutions for each individual cow.

3. **Artificial Intelligence for health monitoring**: The AI also sends alerts to the farmer about the change in the cow’s behaviour allowing human intervention where needed. Without AI, it would be almost difficult for the farmer to keep a attentive eye on every cow in the herd. By using advanced AI and machine learning algorithms to predict deviations or abnormalities, farmers can now identify, predict and prevent disease outbreaks, even before a large-scale outbreak.

4. **Artificial Intelligence for Detection of Oestrus**: The collar (with motion sensors) tied to on the cow neck for collects all types of data related to cow 24 hours a day. Artificial Intelligence components of the dairy automation system process the collected data to provide insights on the heat stress, change in feeding efficiency and the oestrus of the cow. The occurrence of oestrus cycle results in the release of special hormones that affect the cow’s behaviour and movement.

5. **Robotic System to Deliver Vaccines**: For a sustainable economic future of dairy farms and to achieve 100 per cent compliance rate, modern dairy farms use a robotic injection system to deliver vaccines and reproductive medicines to domestic animals on the dairy farm. The robotic system is incorporated with a dairy automation system, now a day. The robotic injection system reads the RFID tags attached to the cow’s ear and gets health-related information and vaccination record for the cow. If the cow needs an injection, it is directed to the injection site and the injection mechanism position itself to deliver the medication in the cow’s neck.

6. **Artificial Intelligence in food supply chain**: Blockchain can connect all aspects of the supply chain from producer to consumer and allow for food traceability and safety. From an agriculture and food perspective, proposing this type of evidence to consumers will become a competitive advantage and may not prove as challenging in dairy as in other areas of agriculture, such as beef, which exchanges ownership more frequently.

7. **Artificial Intelligence in data collection**: Previously, collected data was generalized for an entire dairy farm. Through the use of sensors, AI and other technologies can provide individual data for each cow, allowing farmers to improve precision and accuracy when making managerial decisions.

8. **Artificial Intelligence in improvement of feed quality**: With the use of robotics is quite efficient and speeds up harvesting time, when compared to traditional harvesting by hands. Moreover, the automated machinery indefinitely calculates moisture in the cereals harvest as well as overall yield.
9. **Improving animal health using facial recognition systems:** Several useful applications, such as helping us learn more about the animal's emotional and attentional state. For example, by studying the ear and eye movements of an animal, we can now understand its mood and excitement level with reasonable accuracy. It might help us regulate pain symptoms of animals. On further exploration, we may find injuries, diseases or even signal of predator attacks.

10. **Gains in optimizing feed efficiency & energy intake:** RGB-D camera can help farmers measure feed intake for individual cows and optimize feed expenses according to their animal needs. Technology can help us estimate performance of farm animals accurately. Their energy expenditure during lactation can be assessed based on parity, milk yield component, and body condition score.

![Diagram of animal health monitoring](image)

**CONCLUSION:**

We can conclude that artificial intelligence allows easy data entry on farm records, monitoring farm activities, analysing economic performance, improving animals’ health, improving soil richness. All these features and solutions endeavour towards ‘smart farming’. Artificial intelligence will use data to improve the quality and clarity of decision making across all levels of the agricultural industry. Artificial intelligence has the potential to be better than humans at determining if individual animals meet market specifications through forecast of individual animal condition. However, as more farms get connected to technology, artificial intelligence and sensing technologies will start playing a more crucial role in helping farmers see patterns and solutions to tenacious problems in the modern animal farming.

**REFERENCES:**

