

# Design and Development of Automatic Cattle Feeding System

Gawali Shubham Eknath, Daware Shubham Ramnath, Dhattrak Pravin Somnath,  
Jamkar Sanket Arun, Mr. Pratik K. Sonawane

Matoshri College of Engineering & Research Centre, Eklahare, Nashik

**Abstract:** *The efficient management of livestock feeding plays a crucial role in ensuring optimal growth, health, and productivity of cattle. Manual feeding methods often lead to inconsistencies in feed distribution, labor-intensive processes, and potential wastage of resources. To overcome these challenges, this research paper presents the design and development of an automatic cattle feeding system. The system utilizes advanced sensing technologies, precision control mechanisms, and intelligent algorithms to automate the process of feeding cattle. The research focuses on integrating various components and subsystems, including feed storage and delivery, sensing and monitoring, control mechanisms, and data analytics. A combination of weight sensors, vision systems, and proximity sensors is employed to accurately measure and assess cattle feed requirements. Based on the collected data, a control system regulates the amount and timing of feed dispensation, ensuring a balanced diet and preventing overfeeding or underfeeding. The proposed system incorporates advanced control algorithms, such as fuzzy logic or machine learning, to adaptively adjust feed portions based on factors such as cattle weight, age, breed, and environmental conditions. The control algorithms continuously optimize feed distribution to minimize feed wastage and maximize cattle nutrition. Additionally, the system provides real-time monitoring and feedback to the farmers, enabling them to remotely track feeding operations and detect any anomalies or issues. The design and development of the automatic cattle feeding system also consider factors such as ease of use, maintenance, and scalability. The research paper discusses the hardware and software architectures employed, along with the integration of communication protocols for seamless connectivity and data exchange. Moreover, economic considerations, environmental impact, and potential benefits to farmers and livestock health are analyzed. The results of this research demonstrate the effectiveness and efficiency of the automatic cattle feeding system, highlighting improved feed utilization, reduced labor costs, and enhanced cattle productivity. The system offers significant advantages over traditional manual feeding methods and can be a valuable tool for modern livestock management practices. Further research and optimization are recommended to explore the system's performance under diverse farming conditions and the potential integration with other smart farming technologies.*

**Keywords:** automatic cattle feeding system, livestock management, precision feeding, sensing technologies, control algorithms, smart farming

## REFERENCES

- [1]. Garcia, J., Smith, D., & Waldner, K. (2019). Economic analysis of implementing an automatic feeding system in a beef cattle operation. *Canadian Journal of Agricultural Economics/Revue canadienne d'agroeconomie*, 67(2), 167-181.
- [2]. Johnson, A. K., LaRuffa, A. L., & Bewley, J. M. (2019). Impact of an automated feeding system on behavior and welfare of feedlot cattle. *Journal of animal science*, 97(4), 1884-1894.
- [3]. Li, H., Sun, D. W., Pu, H., & Liu, D. (2020). Design of a computer vision-based automatic feeding system for individual pig feeding. *Computers and Electronics in Agriculture*, 178, 105748.
- [4]. Smith, M. L., Endres, M. I., Salfer, J. A., & Janni, K. A. (2018). Performance and behavior of dairy heifers