

# Livestock Health Monitoring Device

## Technical Brief

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### Technology Summary

MOOSense is an AI-powered livestock management Cyber-Physical System (CPS) designed to monitor and analyze the behavior of cattle in real-time. It tracks key activity metrics such as standing/lying duration, feed intake and feeding duration, and rumination duration, enabling data-driven decisions for herd health, productivity, and welfare. Developed as a collaborative project between IIT Ropar – Technology and Innovation Foundation (AWaDH), Guru Angad Dev Veterinary and Animal Sciences University (GADVASU), Ludhiana, and NABARD, MOOSense combines low-cost hardware with advanced analytics to deliver actionable insights to farmers. With a Technology Readiness Level (TRL) above 9, the technology has been transferred to MoooFarm Pvt. Ltd., positively impacting over 150,000 farmers in India.

### Background

Livestock productivity in India is often affected by undetected illnesses, poor feeding practices, and stress due to environmental and management factors. Early detection of behavioral changes can help prevent productivity loss and improve animal welfare. However, existing livestock monitoring systems are expensive, with devices costing ₹15,000–₹18,000 per animal, making them inaccessible to small and medium scale farmers. MOOSense addresses this gap by offering an affordable, scalable, and AI-driven livestock monitoring solution tailored for the Indian dairy sector.

### Technology Description

MOOSense uses a low-cost sensor collar (₹3,000 per unit) worn by livestock to collect behavioral data. The sensors communicate wirelessly with a Bluetooth Low Energy (BLE) Gateway (₹50,000 per unit) capable of handling up to 300 collars simultaneously. Data is transmitted to the cloud for AI-powered processing, which analyzes activity patterns to detect anomalies in feeding, rumination, and rest. Farmers can access reports and alerts via a mobile app or web dashboard, enabling timely intervention. The system is energy-efficient, durable for field conditions, and suitable for both smallholder and commercial farms.

### Market Potential / Proposed Deployment

- Global Livestock Monitoring Market: USD 1.65B (2025) → USD 2.57B (2031) | CAGR ~7.7%
- Target Segments:
  - Small to large-scale dairy farmers
  - Veterinary hospitals and research institutions
  - Dairy cooperatives and agri-tech platforms
- Socio-economic Impact:
  - Health Benefits: Reduced disease incidence and mortality
  - Economic Gains: Higher milk yields and better herd productivity
  - Affordability: Brings advanced livestock monitoring within reach of smallholder farmers

### Applications

- Dairy Farms: Improve milk yield and reproductive health through behavior-based monitoring.
- Veterinary Use: Support early diagnosis of metabolic and digestive disorders.
- Livestock Research: Enable data collection for academic and commercial studies.
- Large-Scale Herd Management: Monitor hundreds of animals simultaneously with a single BLE Gateway.

### Value Proposition

- Cost-Effective: Collar at ₹3,000 and BLE Gateway at ₹50,000 for 300 channels – far below the market average.
- Scalable: One gateway supports large herds, reducing infrastructure cost.
- AI-Powered Insights: Accurate detection of behavioral anomalies.
- Health & Welfare: Early alerts help reduce illness and improve animal productivity.
- Field-Proven: Successfully deployed with measurable impact on over 150,000 farmers.

### Technology Status

- Technology Readiness Level (TRL): >9 – Commercialized and in large-scale use
- Testing: Field-validated in collaboration with GADVASU and NABARD
- IP Status: Technology transferred to MoooFarm Pvt. Ltd.
- Adoption: Commercially deployed, benefiting >150,000 farmers across India

