

## ABSTRACT

In 2067 dairy farms in developing countries will be modernized and automated systems will replace much of the manual labour on farms. Traditionally, livestock management decisions have been based on almost entirely on observations, judgement, and experience of the farmer. However, such manual systems are inherently subjective, labour intensive, time consuming, invasive and unreliable. Today technology-oriented approaches are widely in use in animal agriculture. New data obtained using fast, real time, and affordable objective measures are becoming more readily available to aid farm level monitoring, awareness, and decision making. Computer vision technology and image analysis, digital twins, artificial intelligence, sensors, big data, and machine learning are a game changer in the livestock industry. This review aims at highlighting the main areas where digital technologies for improved animal monitoring and welfare are most applicable in dairy animals. In particular, body condition scoring, lameness detection, mastitis diagnosis, oestrus detection and pregnancy diagnosis. The environmental sustainability of digital technologies is also discussed. The application of technology offers new possibilities to realize food safety and quality, efficient and sustainable animal farming, healthy animals, guaranteed wellbeing and acceptable environmental impact of livestock production.

**Keywords:** Animal welfare, Cattle, Digital, Livestock, Farming, Technology