

The impact of lameness on dairy cattle welfare: growing need for objective methods of detecting lame cows and assessment of associated pain

ABSTRACT

Dairy cows are the major animals reared for milk production worldwide. Lameness is a manifestation of painful condition due to injury or disease in the foot, regarded as a major welfare problem in dairy cows. An effective lameness management requires prompt identification of lame cows. The objectives of this systematic review were to discuss the various techniques of detecting lameness, assessment of the associated pain, and the impact of lameness on dairy cow welfare. Results from the literature search yielded 534 papers, with 102 papers meeting the inclusion criteria. The eligible studies were discussed in two sections which were; (1) lameness detection systems and their application in pain assessment using four methods: gait and behavioral variables, physiological parameters, pressure nociceptive threshold and blood biomarkers; (2) impact of lameness on animal-based welfare measures. Despite the limitations in the use of automated locomotion scoring systems, results showed the technique remains a promising tool for the prompt detection of lame cows compared with manual systems (MLSS). More investigation of such systems could aid the validation of pain in cows with various degree of lameness. Further studies are required for early lameness detection and minimizing the welfare implications in dairy herds.

Keyword: lameness; Iocomotion; Pain; Claw lesions; Animal welfare; Behavior; Dairy cows