

## **Association between lameness and indicators of dairy cow welfare based on locomotion scoring, body and hock condition, leg hygiene and lying behaviour**

### **ABSTRACT**

Dairy cow welfare is an important consideration for optimal production in the dairy industry. Lameness affects the welfare of dairy herds by limiting productivity. Whilst the application of LS systems helps in identifying lame cows, the technique meets with certain constraints, ranging from the detection of mild gait changes to on-farm practical applications. Recent studies have shown that certain animal-based measures considered in welfare assessment, such as body condition, hock condition and leg hygiene, are associated with lameness in dairy cows. Furthermore, behavioural changes inherent in lame cows, especially the comfort in resting and lying down, have been shown to be vital indicators of cow welfare. Highlighting the relationship between lameness and these welfare indicators could assist in better understanding their role, either as risk factors or as consequences of lameness. Nevertheless, since the conditions predisposing a cow to lameness are multifaceted, it is vital to cite the factors that could influence the on-farm practical application of such welfare indicators in lameness studies. This review begins with the welfare consequences of lameness by comparing normal and abnormal gait as well as the use of LS system in detecting lame cows. Animal-based measures related to cow welfare and links with changes in locomotion as employed in lameness research are discussed. Finally, alterations in lying behaviour are also presented as indicators of lameness with the corresponding welfare implication in lame cows.

**Keyword:** Animal welfare; Body condition; Dairy cows; Lameness; Locomotion; Lying behaviour