

## **First study into the temporal relationship between metabolic disorders and lameness events over the course of a lactation**

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Lameness in dairy cows is an issue that can vary greatly in severity, and is of concern for both producers and consumers. Metabolic disorders are a major problem in themselves, and, next to this, can cause lameness. Indeed, lameness is an often occurring consequence of various metabolic disorders, such as sub acute ruminal acidosis (SARA), ketosis or milk fever. The caused lameness event can occur weeks to months after the metabolic disorder making the detection of causality difficult. Moreover, detection of many metabolic disorders is very challenging and not straightforward. Mid-infrared (MIR) technology is already used for the prediction of major milk components, such as fat or protein, during routine milk recording and for milk payment. It was recently shown that this technology can also be used to predict novel components, linked to metabolic disorders of cows, such as ketone bodies, citrate and minerals. In the context of limiting the occurrence and severity of lameness, early prediction of lameness could help indicate the need to adapt the management and the environment of a cow at risk of lameness. Therefore, the aim of this study was to analyze the temporal link between metabolic disorders and lameness events, using locomotion scores of the cow and MIR based milk biomarkers for different metabolic disorders of her milk from previous test days. Data recorded between, July 2014 and December 2014, consisted of 9324 records, from 3895 cows and 122 farms. Correct definition of the response variable is an important aspect as extremes in lameness severity, expressed on lameness scales, were more easily predictable. First results were obtained using covariance functions on correlations computed between averaged metabolites and lameness scores, per animal, across the lactation stage classes. Correlations tended to be higher when comparing predicted metabolites with lameness in the three following months, rather than the same one, hinting at a temporal relationship.

### **KEYWORDS**

mid-infrared spectroscopy  
covariance functions  
milk composition