

Ketosis screening in the frame of DHI testing – Usability and experience from around the globe

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Abstract

The objective of this study is describe the usage of FOSS's ketosis screening tool in dairy herd improvement (DHI) laboratories around the world and further summarise their experience on the usability of the tool for dairy farmers.

Ketosis is a costly metabolic disorder which usually occurs in dairy cows during the early lactation period when energy demands for milk production exceed energy intake. This negative energy balance results in the cow using her body fat as an energy source, leading to an excessive accumulation of ketone bodies (i.e. acetone (Ac), β -hydroxybutyrate (BHB)) in blood as the fat is broken down faster than the liver can process it.

FOSS has developed a calibration for predicting milk BHB and Ac in regular DHI samples using Fourier transform infrared (FTIR) technology. Given the low concentrations of the ketone bodies in milk, the entire range of the milk spectra is considered by the calibration. The developed calibration for measuring ketone bodies in milk indicated adequate correlations with chemical method results and was proven to be valuable for screening cows for ketosis on herd level.

FOSS's ketosis screening tool is currently routinely used in the following countries: Belgium, Canada, Denmark, Germany, Holland, France, Japan, Poland, Spain, US. Beyond that, the tool is currently under evaluation in numerous other countries.

The predicted milk BHB and/or Ac values are utilised differently among users (i.e. DHI laboratories/organisations). While in some countries merely BHB values are used, milk BHB and/or Ac information are incorporated in decision trees in others.

A proper communication of the milk BHB and Ac results back to dairy farmers turned out to be the key to success in establishing the ketosis screening service. Firstly, even though individual cow milk samples are analysed, the tool should be used for screening of ketosis on herd level rather than on cow level. This is because not all cows can be tested at the period of the highest risk for ketosis with a monthly DHI testing interval. Beyond that, the ketosis screening tool is a semi-quantitative screening method. Secondly, the communication of the ketosis screening tool based on DHI samples and its interrelation with blood BHB testing is crucial.

Data from different countries revealed clearly negative implications on the performance (e.g. milk yield) of dairy cows that were identified with a high risk for ketosis. Further, the prevalence of associated diseases such as mastitis, clinical ketosis, and displaced abomasum was higher in high risk cows compared to low risk cows. The data further provided evidence that the prevalence of ketosis could be reduced due to the availability of the ketosis screening tool and associated measures that dairy farmers and advisors could take based upon it.

In conclusion, ketosis screening in the frame of DHI testing is a valuable tool that can be offered to dairy farmers. It clearly elevates awareness and allows to manage an otherwise undetected problem on dairy farms.

Keywords: ketosis, dairy herd improvement testing, FTIR, animal welfare