Measuring the prevalence and impact of subclinical ketosis on lactation performance in U.S. dairy herds.

A.D. Coburn[1], H.A. Adams[2], T.L. Chandler[3], G.R. Oetzel[3], H.M. White[3], and R.H. Fourdraine[2]

[1]*AgSource Cooperative Services/CRI, 135 Enterprise Drive, Verona, WI 53593, United States* (*adcoburn@crinet.com*)
[2]*CRI International Center for Biotechnology, Mount Horeb, WI, USA* (*hadams@crinet.com,* *rfourdraine@crinet.com*)
[3]*University of Wisconsin-Madison, Madison, WI, USA* (*tchandler@wisc.edu,* *gary.oetzel@wisc.edu,* *heather.white@wisc.edu*)

Abstract

Subclinical (SCK) have negative impacts on milk production, first conception, and an increased likelihood to develop a displaced abomasum (DA); however, few data are available documenting the prevalence of SCK and the scale of the negative impacts across commercial dairy herds. In 2015, together with the University of Wisconsin Department of Dairy Science and School of Veterinary Medicine, AgSource launched KetoMonitor™, using monthly milk sample information with other cow-based parameters to predict a blood BHBA value on fresh cows. The predicted blood BHBA values are used to estimate herd- and lactation-based prevalence levels of clinical and subclinical ketosis. Since December 2014, KetoMonitor™ data on over 2,000 US Holstein herds in the Midwest region of the country have been collected. Cows with a predicted blood BHBA value of 1.2 or higher were categorized as positive (SCK=1) and those below as negative (SCK=0) for SCK. Subsequent lactation performance, including peak milk, average somatic cell count (SCC), culling rates and first breeding conception rates, were analyzed. Predicted herd prevalence was 18.1%; with 6.4% prevalence in primiparous animals and 25.1% prevalence in multiparous cows. For cows predicted as positive, peak milk production decreased (P<0.0001) in both primiparous and multiparous groups. Average peak milk for multiparous cows was 46.86 kg (SCK=1) vs. 50.57 kg (SCK=0), and for primiparous cows was 36.35 kg (SCK=1) vs. 37.99 kg (SCK=0). Average linear SCC and culling rate were greater (P<0.0001), and conception rate at first breeding was decreased (P<0.0001) for cows predicted positive for SCK.

A follow-up study was conducted analyzing the frequency of observed clinical ketosis and DAs recorded in farm software programs in comparison with individual cow BHBA values. Records used for analysis were required to have a milk sample collected between 5-11 days in milk (DIM), a health event recorded during the first 40 DIM, and the corresponding milk sample had to be collected prior to the recorded health event (n=312 herds and 122,352 cows). Positive SCK primiparous and multiparous cows had a 3.2% and 4.2% higher frequency of observed clinical ketosis, respectively, when compared with negative SCK cows. Furthermore, a pattern of higher frequency of DAs was present at 2.8% for primiparous cows and 4.0% for multiparous cows.

The findings stress the importance of early detection of SCK to prevent negative effects on lactation performance. Data suggests BHBA values are a useful indicator of cows at high risk for a future metabolic disease. There is considerable value in collecting milk samples on all cows under 20 DIM to monitor herd prevalence of SCK and for identification of animals for preventive

metabolic stress therapies. Herds that implement a milk sampling frequency of no less than bi-weekly may realize the most benefit.