Early lactation hyperketonemia impacts whole-lactation milk and reproductive performance in Holstein cattle

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Background

Optimal health and performance is dependent on a successful transition period. However, metabolic diseases, most notably hyperketonemia, characterized by elevated levels of β-hydroxybutyrate (BHB), has a relatively high prevalence of 22% on Canadian farms (Santschi et al., 2016; Tatone et al., 2017). Although levels of BHB have been traditionally measured in blood and urine samples, recent advances have made it possible to reliably measure BHB in milk by FTIR, making it amenable to routine monitoring through regular DHI testing. We have also demonstrated that milk BHB is highly correlated to blood BHB (Denis-Robichaud et al., 2014).

The objective of this study was to identify the consequences of elevated milk BHB on 305-day lactation performance, reproductive success and culling rate. Analysis was also performed according to cow production level.

Methods

• 505,412 Holstein cow test-day records (5-35 DIM) from 3,551 herds (Valacta database 2011 – 2017)
  • 159,525 1st lactation, 132,694 2nd lactation and 213,193 3rd+ lactation
  • Cows were grouped based on 1st test day milk BHB as follows:

| Conclusion

High BHB at first test day was associated with higher 305-d energy-corrected milk yield, reduced pregnancy rates, longer days open, increased 1st service to conception interval, increased number of services, higher culling rates by 60 DIM. Overall, high producing cows were more likely to have elevated BHB levels and were more affected by the impact of high BHB.