urine samples were collected within an interval of up to 15 minutes. Blood samples were drawn from the coccygeal vein with vacuum tubes. Milk samples were collected after milking and urine samples from the urine stream after massage of the region underneath the vulva. One droplet of whole blood was used to load the sensor of the test-strip (Precision Xtra ß-ketone) according to the directions. The values displayed on the handheld meter were recorded onto a data capture form. Also, concentrations of BHBA in milk and urine were determined both and"with the electronic system and chemical dipsticks (Ketostix) cowside. Blood samples were centrifuged and serum was stored"Ketolac at -20°C. Within 8 days serum samples were analyzed for BHBA photometrically (Cobas Mias). Serum BHBA concentrations determined in the laboratory were regarded as the gold standard. Correlation coefficients (Pearson) were calculated between BHBA in serum and whole blood, milk and urine, respectively. Sensitivity and specificity of the different tests were determined.

Results

Coefficients of correlation between serum BHBA and whole blood, milk and urine determined with the electronic system were 95.2%, 71.9%, and 66.5%, respectively. Coefficients of correlation between serum BHBA and milk were 63.1%" and urine determined with Ketostix"determined with Ketolac and 63.9%, respectively. Based on thresholds of 1200 and 1400 ºmol/l BHBA sensitivity was 0.84 and 1.0 and specificity 0.93 and 0.91, respectively for the electronic BHBA measuring system. the positive and negative predictive values were 0.66 and 0.98 (1200 ºmol/l BHBA) and 0.51 and 1.0 (1400 ºmol/l BHBA), respectively. For both milk and urine, positive and negative predictive values were considerably lower both for the dipsticks as well as for the electronic system.

Significance

An automated electronic system to determine BHBA in whole blood is a useful and practical tool to diagnose individual cases of subclinical ketosis. Sensitivity and specificity are adequate for a cowside test. The accuracy of the electronic system was higher compared to two commonly used chemical). Additional studies are necessary to" and Ketolac"dipsticks (Ketostix further validate the electronic system for the use in dairy cattle.

Relationship between Keto-Test Results and Health and Reproduction Variables: a Retrospective Study using Data from Herd Health Visits in Private Practice

V. Caldwell[1], *DMV, MSc;* **R. Martineau**[2], *DMV, PhD*
[1] *Clinique Veterinaire de Coaticook, Coaticook, Quebec, Canada*
[2] *Agriculture and Agri-Food Canada, Sherbrooke, Quebec, Canada*

Introduction

Cows in negative energy balance (NEB) can develop subclinical ketosis (SCK) and elevated Beta-hydroxybutyrate (BHB) concentrations in milk. A milk strip cow-side test (Keto-Test; KTST) can be used to measure BHB and initiate vet-client discussions about transition cow management and energy issues during regular herd health visits. The purpose of this study was to relate KTST results to first-breeding conception rate and to the incidence of some metabolic diseases.

Materials and Methods

In 22 herds followed by a single dairy practitioner in southern Quebec, milk from cows between 4 and 21 days in milk (DIM) at the time of herd health visit was tested usnig the KTST. Keto-Test results, as well as dis-

ease incidence, reproduction and DHI data, were compiled using the herd health monitoring software DSA over a three-year period. Results of KTST was considered positive at a cut-off value of 100 μmol/L of BHB. Variables were herd (HERD), lactation number (LN), calving season (CS), DIM at 1st breeding (DIMAI1), breeding season (BS), success at 1st breeding (PREG) and occurrence of milk fever (MF), retained placenta (RP), metritis (ME), ovarian cyst (CY), clinical mastitis (MA), lameness (LA) or displaced abomasum (DA) in the same lactation. Logistic regression was used to test the effect of KTST on PREG or on metabolic diseases. Potentially confounding variables and their interaction with KTST were retained in the complete model when P was less than 0.25. The reduced model was obtained after deleting all variables that did not qualitatively change the odds ratio (OR).

Results

Results of KTST: 1034 negative cows and 394 positive cows (27.5 %). The complete logistic model for PREG included KTST, HERD, LN, MF, RP, ME, CY and DA. The reduced model contained only KTST and confirmed that KTST was not associated with PREG (P= 0,74), OR = 0.96, 95% CI (0.73 - 1.26). Percent pregant were 32.1 and 31.1 for negative and positive cows, respectively. The complete model for MA included KTST, HERD, LN, CS, MF, KTSTxMF, RP, ME, CY, and KTSTxCY. The reduced model contained only KTST and confirmed its strong association with MA (P = 0.002), OR = 1.55, 95 % CI (1.17 - 2.05) The rate of MA was 17.6 vs. 24.9% for negative and postitive cows, respectively. The complete model for DA included KTST, HERD, KTSTxHERD, LN, CS, RP, LA, KTSTxLA. The reduced model contained KTST, HERD, and KTSTxHERD and showed a strong association of KTST with DA (P = 0.001), OR = 3.81, 95 % CI (1.70 to 8.51), 3.48 vs. 7.87% DA. Odds ratio was 1.48, 1.45, and 3.81 for herds with a low (< 5%), medium (5 – 10%), and high (> 10%) incidence of DA. Other disease incidences (MF, RP, ME, CY and LA) were not significantly associated with KTST results.

Significance

This study did not prove a relationship between KTST results and 1st breeding conception rate, contrary to what was expected. Possible reasons for that are: low cut-off chosen (only 116 cows would have been positive had a 200 μmol/L cut-off een used), missing important variables in the analysis and false negative KTST results when cows were tested at the end of the 4-21 DIM interval. Other reproductive variables (days open, 2nd, 3rd-breeding conception rates) should also be analyzed. The strong relationship between occurrence of a DA and KTST result is not surprising. It must be interpreted with caution since in some cases, DA preceded KTST whereas, in other cases, DA happened after KTST. Results suggest that the risk for clinical mastitis during the lactation is significantly increased in cows with a positive KTST result between 4-21 DIM. This finding underlines the link between metabolic status during transition/early lactation and health during the rest of lactation. Routine submission of fresh cows to Keto-Test during herd health visits is an easy to implement practice which creates a "teachable moment" to discuss fresh cow nutrition and health. Evidence of a link between fresh cow Keto-Test result and health in later lactation is an additional reason to encourage Keto-Test use.