FAT-PROTEIN RATIO FOR USE IN HERD HEALTH MANAGEMENT

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Objective: The objective of the present study was to evaluate fat-protein ratio at first test day, 4 to 30 days after calving, as a monitor for risk of ketosis at both cow and herd level.

Methodology: Semi-quantitative measurements of ketone bodies in urine (Ketostix®), performed by veterinarians within the same time frame after calving, were used as golden standard for ketosis status at animal level (70.295 cows) and at herd level (143 herds, 40.402 cows). Ketosis-positive cows were defined as cows with a urine ketone level ≥ 1.5 mmol/L. Ketosis-positive herds were defined as herds with > 17 % ketosis-positive cows (median of % ketosis at herd level). All data used were registered during 2008 and 2009 and drawn from the Cattle Database, Danish Cattle Federation. Methods for evaluating tests were used to test a broad interval of cut-off values of fat-protein ratios and % cows with a critical fat-protein ratio (both golden standard and fat-protein monitor on binary scale). High sensitivity and high specificity were equally weighted.

Results: Best breed specific cut-off values for critical fat-protein ratios, as monitor for cows at risk of ketosis, were determined at 1.42 for Danish Red, 1.43 for Danish Holsteins, 1.51 for Jerseys, 1.45 for Danish Red Holsteins and 1.40 for crossbreds with sensitivities of 0.61-0.64 and specificities of 0.60-0.63. Best cut-off value for percentage cows with critical fat-protein ratios in a herd, as monitor of herds at risk of being ketosis-positive herds, was determined at 42 % with a sensitivity of 0.68 and a specificity of 0.69. Continuous calculation and suggestions for presentation of herd level ketosis risk will be presented taking into account requirements for minimum number of animals necessary, when calculating reliable estimates in herds of different herd-size.

Conclusion: Based on the results of this study use of fat-protein ratio 4 to 30 days after calving in herd health management to monitor for risk of ketosis can only be recommended as a supplement to existing surveillance of early lactation performance, due to relative low sensitivities and specificities at both cow and herd level.