BLOOD PARAMETERS IN SWEDISH DAIRY HERDS WITH A HIGH INCIDENCE OF DISPLACED ABOMASUM OR KETOSIS

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Diseases related to energy metabolism are most common in the transition period and there is a need for effective monitoring tools to secure animal health, welfare, and productivity. In this observational study, we investigated associations between a long-term high incidence of displaced abomasum (DA) or ketosis, and body condition score (BCS), glucose, insulin, nonesterified fatty acids (NEFA) β-hydroxybutyrate (BHBA), cholesterol, aspartate aminotransferase (AST), glutamate dehydrogenase (GD), haptoglobin, and a metabolic index (RQUICKI) used in humans to assess insulin sensitivity. Nineteen herds (326 cows) with a 2 to 3-year history of a high veterinary-reported incidence of DA or ketosis (≥4 cases/100 cow-years), and 15 herds (208 cows) with a low incidence (≤1 case/100 cow-years) were compared. Cows were blood sampled from 4 weeks ante partum (ap) to 8 weeks postpartum (pp). Each outcome variable was analysed in a linear mixed model with high/low incidence, parity, time of sampling, and the interaction between high/low and sample time as fixed effects, and herd as a random effect. Weekly estimates were combined into three periods: 4-1 weeks ap (AP), 1-3 weeks pp (PP1) and 4-7 weeks pp (PP2). P < 0.05 was considered significant and P < 0.1 as a tendency. High herds were larger (mean ±SD; 123 ±71) than low herds (74 ±29) and produced more milk (10,471 ±866 and 9,077 ±847 kg ECM/cow and year, respectively). There were more dry cows with a BCS ≥4 in high herds (20 of 98 cows) than in low herds (4 of 52 cows). Cows in high herds had higher glucose AP than in low herds (least squares mean 3.42, CI 3.36-3.47 vs. 3.25, 3.18-3.31 mmol/L), lower RQUICKI pp (0.47, 0.46-0.48 vs. 0.52, 0.51-0.54 in PP1 and 0.49, 0.48-0.51 vs. 0.53, 0.52-0.55 in PP2), and higher cholesterol pp (2.96, 2.89-3.04 vs. 2.70, 2.62-2.78 mmol/L in PP1 and 5.34, 5.21-5.48 vs. 4.81, 4.67-4.96 mmol/L in PP2). Tendencies for higher glucose, insulin and NEFA in the high herds were found in PP. No significant differences were found in BHBA, parameters reflecting liver cell damage, or an inflammatory response. The differences in the energy related blood parameters between high and low herds indicate that there was a difference in metabolism, which along with differences in feed, housing and management, might be part of the explanation for the higher incidence of DA and ketosis in high herds. The results for RQUICKI were promising and the index could serve as a monitoring tool on herd level.