Long-term reticuloruminal pH dynamics and markers of liver health in early-lactating cows of various parities fed diets differing in grain processing

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Abstract:

The present study aimed to investigate the long-term effect of feeding barley grain steeped in lactic acid (LA) with or without thermal treatment on reticuloruminal pH dynamics and metabolic activity of the liver in 12 primiparous and 18 multiparous early-lactating dairy cows. All cows were included on d 21 postpartum and sampled until d 90 postpartum. Cows were fed a diet based on differently processed ground barley grain: untreated grain (control diet, CON), or grain treated with 1% LA alone for 24 h before feeding (LA), or with an additional oven-heating at 55°C for 12 h (LAH). The reticuloruminal pH and temperature were measured via indwelling sensors that allowed for continuous (every 10 min) and long-term measurement from d 21 to 80 postpartum. Blood samples were taken on d 21, 40, and 90 of lactation and analyzed for liver enzymes aspartate aminotransferase (AST), gamma-glutamyltransferase, and glutamate dehydrogenase, as well as bilirubin, bile acids, and serum amyloid A. Dry matter intake was higher in multiparous cows (20.7 ± 0.27 kg/d) compared with primiparous cows (18.2 ± 0.33 kg/d), but was not affected by dietary treatment. Overall, the relatively short duration (51 ± 5 min/d) of reticuloruminal pH

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