BLOOD KETONE LEVELS OF YOUNG POSTPARTUM RANGE COWS INCREASED AFTER SUPPLEMENTATION CEASED

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Young beef cows grazing dormant native range experience weight loss and nutrient imbalances postpartum. Due to high acetate production from ruminal fermentation and low metabolic glucose supply, ruminal acetate is cleared slowly and may be converted to β-hydroxybutyrate (βHB). As a chute-side measure of nutrient status, whole-blood βHB levels of two- and three-year-old postpartum range cows (n = 45) were measured with a handheld ketone sensor (MediSense/Abbott Laboratories, Abingdon, UK). Measurements were taken in May and July when cows were grazing dormant range. In May, cows were also receiving one of three 30% CP supplements containing increasing quantities of glucogenic precursors (57, 124, or 192 g/d glucogenic potential). For each ketone reading, βHB in the blood is oxidized to acetoacetate in the presence of hydroxybutyrate dehydrogenase with the concomitant reduction of NAD^+ to NADH. The NADH is reoxidized to NAD^+ by a redox mediator. The current generated is directly proportional to the βHB concentration. After 30 s, the βHB concentration (mmol/L) is displayed on the meter. Data were analyzed using physiological state, time of measurement and their interaction in the model. Cows had higher ($P < 0.01$) βHB in July than they did in May (0.34 vs 0.16 ± 0.02 mmol/L, respectively). Levels of βHB did not approach subclinical ketosis. However, the differences between the two measurements may suggest that the glucogenic precursors in the supplements may have improved utilization of acetate arising from ruminal fermentation. Cows were at an earlier stage of lactation (avg 53 d postpartum), presumably producing more milk, but gaining weight (0.11 ± 0.10 kg/d) in May, while in July were further along the lactation curve (avg 124 d postpartum) and producing less milk, but losing weight (-0.22 ± 0.10 kg/d). Protein supplementation may have decreased βHB produced by improving acetate clearance due to a greater supply of glucogenic precursors.
Key Words: β-hydroxybutyrate, Acetate, Glucose, Lactation

GLUCOSE HALF-LIFE OF YOUNG POSTPARTUM LACTATING COWS WAS HALF THAT OF NON-LACTATING HERDMATES

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Lactation and recently diet quality have been implicated as regulators of nutrient partitioning by decreasing tissue sensitivity to insulin. Treatments were arranged as a 2 x 2 factorial to investigate the influence of lactation and season on serum glucose clearance. Glucose tolerance tests (GTT) were conducted on lactating (LACT, n = 4) and non-lactating (NLACT, n = 4) three-year-old cows grazing dormant native range in May (57 d postpartum) and July (135 d postpartum). In January, before calving, NLACT cows were heavier than LACT cows (468 ± 18 vs 414 ± 9 kg); all cows were body condition score (BCS) 4.6 ± 0.24. Calves from NLACT cows did not survive. NLACT cows gained condition after calving (May BCS 5.9 ± 0.12; July BCS 6.5 ± 0.26) while LACT cows maintained condition (May BCS 3.9 ± 0.24; July BCS 4.4 ± 0.13). For each GTT, 50% dextrose solution was infused at 0.5 mL/kg BW via jugular catheter and