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## Effects of feeding controlled-energy and high-energy diets with rumen-protected lysine and methionine prepartum on metabolic markers of Holstein cows

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This study aimed to determine the effects of rumen-protected lysine (RPL) and methionine (RPM) fed in the same AA to metabolizable energy (ME) ratio in periparturient diets with different net energy of lactation (NEL) concentrations on metabolic markers of Holstein cows. Sixty-two multiparous Holstein cows, blocked by parity, previous 305-d mature-equivalent milk production, and body condition score during the far-off dry period were assigned to 1 of 3 dietary treatments. Prepartum (-21 d to expected calving), animals were fed a controlled-energy diet (1.45 NEL, Mcal/kg of DM) with RPL (Kemin Industries Inc., Des Moines, IA) and RPM (Kemin Industries Inc., Des Moines, IA) [CEAA; 0.15% RPL and 0.09% RPM of dry matter intake (DMI)], controlled-energy diet without RPL and RPM (control; CENAA), or high-energy diet (1.71 NEL, Mcal/kg of DM) with RPL and RPM (HEAA; RPL 0.22% and RPM 0.12% of DMI). Postpartum, cows received the same lactation TMR (1.73 NEL, Mcal/kg of DM) without RPL and RPM (CENAA, n=19) or with RPL and RPM [CEAA, n=21; and HEAA, n=21; 0.38% RPL and 0.15% RPM of DMI] until 70 days relative to calving (DRC). Blood samples were taken on -7±4.7, 3±1.1, 28±1.6, and 70±2.1 DRC. Statistical analyses were performed using the MIXED procedure of SAS. Two treatment contrasts CENAA vs. CEAA and CEAA vs. HEAA were compared. Cows in CEAA had greater (P<0.04) serum concentrations of glutamate dehydrogenase (16.7 U/L), aspartate aminotransferase (57.1 U/L), and gamma-glutamyl transferase (20.5 U/L) than cows in CENAA (11.6 U/L, 48.8 U/L, 17.3 U/L, respectively) prepartum. Serum urea nitrogen was greater (P=0.02) for cows in CEAA (10.5 g/dL) compared to cows in CENAA (9.58 g/dL) postpartum. Cows in HEAA had greater (P< 0.05) total protein (6.97 g/dL) and globulin (3.32 g/dL) concentrations than cows in CEAA (6.71 g/dL and 3.11 g/dL, respectively) postpartum. In conclusion, cows in CEAA seemed to have increased protein metabolism prepartum and cows in HEAA had increased inflammatory markers postpartum.

### KEYWORDS:

Methionine, Lysine, liver