American Dairy Science Association® Annual Meeting Journal of Dairy Science®

1787W Effects of feeding controlled-energy and high-energy diets with rumen-protected lysine and methionine prepartum on muscle and adipose tissue depth of Holstein cows.

E. O'Meara*[1], Martinez del Olmo, D[2], J. Aguado[2], F. Valdez[2], J. Drackley[1], F. Cardoso[1],
[1]University of Illinois Urbana, IL, [2]Kemin Industries, Inc Des Moines, IA.

The aim of this study was to determine cows' muscle and adipose tissue depth when rumen-protected methionine (RPM) and lysine (RPL) were fed in the same amino acid to metabolizable energy (ME) ratio in prepartum diets (1.21g of digestible methionine/Mcal of dietary ME and 3.21g of lysine digestible /Mcal of dietary ME) with different net energy of lactation (NEL) concentrations. Sixty-two multiparous Holstein cows, blocked by parity, previous 305-d mature-equivalent milk production, and body condition score (BCS) 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 (straw-based diet, 1.45 NEL, Mcal/kg of DM) with RPL and RPM (Kemin Industries Inc., Des Moines, IA) [CEAA; 0.15% RPL and 0.09% RPM of dietary dry matter intake (DMI)], controlled-energy diet without RPL and RPM (control; CENAA), or high-energy diet (corn silage based diet, 1.71 NEL, Mcal/kg of DM) with RPL and RPM (HEAA; RPL 0.22% and RPM 0.12% of dietary DMI). Tissue depth was determined by ultrasound (Ibex Pro, E.I. Medical Imaging). Measurements were taken on days –28 (as a covariate), –14, –7, and at calving. Statistical analyses were performed using the MIXED procedure of SAS. A contrast (CONT1; average of CEAA and HEAA vs. CENAA) along with the treatment effects were compared. Tukey's adjustment was used for comparison of means. There was no treatment effects for adipose tissue ($P > 0.35$; CENAA = 0.64; CEAA = 0.73; and HEAA = 0.71 cm; SEM = 0.73) and muscle tissue depth ($P > 0.52$; CENAA = 5.3; CEAA = 5.5; and HEAA = 5.5 cm; SEM = 0.18). Cows in CENAA had greater (–0.09 cm; CONT1; $P = 0.05$) adipose tissue depth change than cows in CEAA (0.02 cm) and HEAA (0.04 cm; SEM = 0.05). Cows in CENAA tended to have greater (–0.63 cm; CONT1; $P = 0.07$) muscle tissue depth change (–28 to 0 d) than cows in CEAA (0.05 cm) and HEAA (0.06 cm; SEM = 0.3). In conclusion, feeding RPM and RPL prepartum appeared to reduce muscle and adipose tissue loss prepartum independently from dietary energy content.

KEYWORDS:
muscle depth, back fat, amino acids.