Tuesday June 27th: Ruminant Nutrition: Protein and Amino Acids 2

Feeding rumen-protected methionine and calcium salts enriched in omega-3 fatty acids increase fatty acid and methionine intakes, increase plasma methionine concentrations, and alter milk fatty acid profiles in periparturient dairy cows.

T. L. France*, K. Juarez-Leon, A. Javaid, N. D. Seneviratne, A. F. Ortega, and J. W. McFadden,

Cornell University, Ithaca, NY.

POSTER 1527T

The objective of this study was to investigate the effects of feeding rumen-protected (RP)-Met and calcium salts (CS) of fatty acids (FA) enriched without or with eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA; i.e., n3FA) in periparturient cows. In a randomized complete block study design, 75 multiparous Holstein cows were assigned to 1 of 4 treatments (n = 18-19/diet): 1) Met deficient (-Met) with CS not enriched in n3FA (-n3FA; 0% n3FA; EnerGII; Virtus Nutrition, USA), 2) Met adequate (+Met; Smartamine M; Adisseo Inc., France) with -n3FA, 3) -Met with CS enriched in n3FA (+n3FA; 4% n3FA; EnerG-3; Virtus Nutrition), or 4) +Met with +n3FA from wk -3 prior to expected calving through wk 4 of lactation. Cows were fed corn silage-based total mixed rations, pre- and postpartum, which were formulated to provide Met at ≤0.96 or ≥1.13 g per Mcal metabolizable energy (ME) for -Met and +Met, respectively. CS were fed at 1.5% ration dry matter pre- and postpartum. Feed samples were collected weekly. Milk samples were collected twice weekly following a thrice daily milking schedule. Pre- and postpartum data were analyzed separately using PROC MIXED of SASv9.4. Planned contrasts included: 1) effect of Met (-Met vs. +Met), 2) effect of n3FA (-n3FA vs. +n3FA), and 3) effect of co-supplementation (+Met/+n3FA vs. +Met/-n3FA and -Met/+n3FA). Pre- and postpartum Met intakes (g Met/Mcal ME) were greater in +Met/+n3FA ($P < 0.001$), relative to +Met/-n3FA and -Met/+n3FA. Intakes of EPA and DHA in both pre- and postpartum cows were greater in +Met/+n3FA ($P < 0.001$), relative to +Met/-n3FA and -Met/-n3FA. Milk EPA and DHA percentages were greater in +Met/+n3FA, relative to +Met/-n3FA and -Met/+n3FA ($P \leq 0.01$). Similarly, milk EPA and DHA yields were greater in +Met/+n3FA, relative to +Met/-n3FA and -Met/+n3FA ($P \leq 0.001$). In conclusion, feeding transition cows RP-Met and CS

enriched in n3FA altered amino acid and fatty acid intake and increased milk n3FA percentages and yields

Keywords: methionine, omega-3, transition period

Adisseo Message:

Supplying methionine to dairy cows has been observed to improve milk fat production. Additionally, supplying dietary fatty acids is known to alter the fatty acid profile of milk. This abstract therefore was focused on the milk fatty acid composition of cows fed rumen-protected methionine (RP-Met) and calcium salts (CS) enriched in omega-3 fatty acids. Offering RP-Met and CS enriched in n3FA improved the fatty acid profile of milk. The n-3FA eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) are known to have beneficial effects on metabolism in both animals and humans. Thus, producing milk with higher EPA and DHA can have health benefits for the consumer.