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Effects of feeding rumen-protected methionine and calcium salts enriched in omega-3 fatty acids on lactation in periparturient dairy cows.

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The objective of this study was to investigate the effects of feeding rumen-protected (RP)-methionine (Met) and calcium salts (CS) of fatty acids (FA) enriched without or with C20:5 and C22:6 (i.e., n3FA) on milk production in periparturient cows. In a study with a randomized complete block design, 79 multiparous Holstein cows were assigned to 1 of 4 treatments (n = 19–20/diet): 1) Met unsupplemented (-Met) with CS palm oil not enriched in n3FA (-n3FA; 0% n3FA; EnerGII; Virtus Nutrition, USA), 2) Met supplemented (+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 −4 before 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 /Mcal metabolizable energy for -Met and +Met, respectively. CS were fed at 1.5% FA (% ration dry matter). Pre and post-calving data were analyzed using PROC MIXED of SASv9.4. Pre-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). Although prepartum dry matter intake (DMI) was not modified by diet, +Met and +n3FA cows had greater postpartum DMI, relative to -Met and -n3FA, respectively ($P < 0.05$). Yields of energy-corrected milk (58.5 vs. 55.3 kg/d; ECM) and fat-corrected milk (FCM), milk protein % and yields were greater in +Met, relative to -Met ($P < 0.05$); milk fat yield and milk lactose % tended to be greater in +Met ($P \leq 0.08$). Yields of ECM (58.1 vs. 55.7 kg/d), and milk fat, protein, and lactose yields, and lactose % were greater in +n3FA, relative to -n3FA ($P < 0.05$); FCM yields tended to be greater in +n3FA. Milk protein % and fold-change increase in ECM (wk 1 to 4) were greater ($P \leq 0.02$), and milk fat % tended to be greater ($P = 0.10$), in +Met/+n3FA, relative to +Met/-n3FA and -Met/+n3FA. In conclusion, feeding transition cows RP-Met and CS enriched in n3FA enhanced ECM yields and milk composition.

Keywords: methionine, omega-3, transition.

Biography: Tanya France is from Lindenhurst, Illinois. She completed her bachelor’s degree in animal science at Iowa State University in 2017. Following graduation, she was a summer intern at Omaha’s Henry Doorly Zoo in their animal nutrition department. She received her master’s degree in animal science at the University of Kentucky in 2020 where her research focused on dairy cattle bedding management and milk quality. Tanya joined the McFadden Lab at Cornell University in January 2020. Her research focuses on methyl donor and fatty acid nutrition and metabolism and its effects on milk production and liver function in transition dairy cattle.