



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

Volume 106, Supplement 1

1754W Effects of highly bioavailable rumen-protected choline on energy metabolism and lactation performance in dairy cows.

T. Marques^{*1,2}, H. Monteiro¹, D. Melo¹, W. Coelho Jr¹, S. Salman¹, D. Dubey³,
F. Sun⁴, K. Leao², and F. Lima¹,

¹Department of Population Health and Reproduction, University of California, Davis, Davis, CA, ²Federal Institute Goiano, Rio Verde, Goias, Brazil, ³Kemin Europa NV, Herentals, Belgium, ⁴Kemin Industry Inc., Des Moines, IA

Choline optimizes lipid metabolism in the transition period and supports adaptation to lactation in dairy cows. However, the success of this methyl donor in improving milk yield and components and metabolism in ruminants depends on its bioavailability which in turn is affected by the type of protection used in rumen-protected choline (RPC). The current study assessed a RPC with greater intestinally available choline. Our objective was to determine the DMI (21 d pre and postpartum), milk yield and composition from calving to 150 d in milk, and the energy-related metabolites (Glucose, NEFA, and BHBA) in cows fed with a highly bioavailable RPC. Holstein cows (n = 48) at 245 d of gestation were blocked by parity and assigned to Control or RPC group within each block. Cows enrolled in the RPC group received 15 g/d of CholiGEM (Kemin Industries Inc., Des Moines, Iowa) from 21 d prepartum and 30 g/d from calving to 21 d postpartum. There were no effects of RPC on DMI (kg/d) prepartum in primiparous (Control = 14.1 ± 0.5 vs. RPC = 13.4 ± 0.5, P = 0.33) and multiparous (Control = 22.6 ± 0.6 vs. RPC = 21.5 ± 0.7, P = 0.54). Postpartum DMI in primiparous (Control = 17.1 ± 0.5 vs. RPC = 16.1 ± 0.5, P = 0.15) and multiparous (Control = 27.2 ± 0.7 vs. RPC = 26.6 ± 0.7, P = 0.33) cows was also not affected. Cows receiving RPC increased fat-corrected milk up to 150 DIM in primiparous (Control = 37.7 ± 0.2 vs. RPC = 38.8 ± 0.2, P < 0.001) and multiparous cows (Control = 50.6 ± 0.2 vs. RPC = 52.9 ± 0.2, P < 0.001). Cows receiving RPC increased milk fat yield in multiparous (Control = 1.9 ± 0.01 vs. RPC = 2.0 ± 0.01, P < 0.001) but not in primiparous (Control = 1.4 ± 0.01 vs. RPC = 1.5 ± 0.01, P > 0.05) cows and positively impacted dairy cows' metabolism. In conclusion, highly bioavailable RPC enhanced lactation performance by increasing fat-corrected milk and milk fat yield and positively impacted dairy cows' metabolism.

KEYWORDS:

energy-related metabolites, milk yield, transition period.