

64 Fatty acid composition and thermal properties of lipid from milk and butter from lactating Holstein cows fed a supplemental lipid either high or low in palmitic acid. M. K. Beam*¹, L. W. Lassonde², B. C. Veltri¹, S. J. Taylor¹, R. Jimenez-Flores², and E. J. DePeters¹, ¹*University of California, Davis*, ²*California Polytechnic State University, San Luis Obispo*.

Milk fat offers new roles as a functional-food ingredient in many foods. Modification of the fatty acid (FA) composition of the triacylglycerol (TG) and phospholipid (PL) components impacts the nutritional value and physio-chemical properties of milk lipids. The objectives were to determine the impact of feeding either a low (LP) or a high (HP) palmitic acid supplemental fat to lactating cows on the (1) FA composition of lipids in milk fat and the subsequent butter and buttermilk and (2) thermal properties of the butter. Multiparous (8) and primiparous (4) Holstein cows were used in a cross-over design. Diets were similar in composition with the only difference the supplemental fat included at 2% of diet dry matter used to alter the palmitic acid intake of cows. The HP supplement was Energizer-RP10, and the LP supplement was yellow grease. Milk yield did not differ, but dry matter intake tended ($P < 0.06$) to be lower for HP (24.8 kg/d) than LP (25.1 kg/d). Yields of 4% fat-corrected milk (44.1 vs 41.2 kg/d) and fat (1.8 vs 1.6 kg/d) were significantly greater for HP than LP. Changes in the FA composition of TG and PL occurred. C16:0 in TG was higher for HP than LP (41.9 vs 28.2 g/100 g fat) while C18:1 *cis* was lower (18.1 vs 23.1 g/100 g fat). Total C18:1 *trans* was lower for HP (2.63 g/100g fat) than LP (4.82 g/100 g fat). Buttermilk PL was high in unsaturated FA. Butter from each cow was noticeably harder when cows were fed HP than LP. Textural analysis found that anhydrous milk fat (AMF) from HP was harder at both ambient and 10°C temperatures than AMF from LP. Diet of the cow can be used to modify the FA composition of the TG and PL components of milk lipids as an approach to enhance milk fat's potential role as a functional-food ingredient.

Key Words: Fatty acid, Milk fat, Palmitic acid