# The Effect of Ruminal Bypass Lysine and Methionine on Milk Yield and Composition of Lactating Cows

S. XU, J. H. HARRISON, W. CHALUPA, C. SNIFFEN, W. JULIEN, H. SATO, T. FUJIEDA, T. K. WATANABE, T. UEDA,, and H. SUZUKI,

**Abstract:** Fifty-six multiparous Holstein cows were assigned at 3 wk prepartum to rations based on grass silage with 1) corn distillers grains to provide 86 and 90% of estimated required metabolizable Lys and Met, respectively; 2) a blend of blood meal, fish meal, and meat and bone meal as amino acid (AA) sources to provide 112 and 103% of required metabolizable Lys and Met, respectively; 3) ruminally protected Lys and Met added as a top-dressing to ration 1 to provide 27 g/d of Lys and 8 g/d of Met as available AA at the duodenum postpartum; and 4) ruminally protected AA for 8 wk postpartum as a top-dressing to ration 1 to provide 40 g/d of Lys and 13 g/d of Met as available AA at the duodenum. Cows fed rations 3 and 4 were offered 13.5 g/d of duodenally available Lys and 4 g/d of duodenally available Met for 3 wk prepartum. The total length of the study was 43 wk. Cows fed ration 4 consumed 3 to 4 kg more dry matter than did cows fed the other three rations, and milk yield and the percentage of milk protein and fat were significantly increased during the first 8 wk of lactation. In early lactation, cows fed ration 3 had a greater milk fat percentage but similar dry matter intake, protein percentage, and yield of 4% fat corrected milk compared with cows fed ration 2. The concentrations of blood serum glutamic oxaloacetic transaminase, serum glutamic pyruvic transaminase, triglyceride, and nonesterified fatty acids were lower for cows fed ration 4 during the first 8 wk of lactation than they were for cows fed the other three rations. The mammary arteriovenous difference of whole blood AA indicated that Met along with His and Arg may be the most limiting AA for milk yield.

**Key words**: prepartum feeding, ruminal bypass amino acids, milk protein