

Evaluation of a ruminally protected lysine product to increase milk protein production and plasma lysine concentration. S. E. Boucher¹, H. M. Dann¹, K. W. Cotanch¹, C. S. Ballard¹, R. J. Grant¹, and I. Shinzato², ¹*W. H. Miner Agricultural Research Institute, Chazy, NY*, ²*Ajinomoto Co., Inc., Tokyo, JAPAN*.

Fifteen multiparous Holstein cows (mean \pm SD) 122 ± 38 days in milk were used in a replicated 3 x 3 Latin square design to evaluate the efficacy of a ruminally protected Lys (RPL; Ajinomoto Co., Inc.) product to increase milk protein production and plasma Lys concentration. Experimental periods were 21 d with a 15-d adaptation. Dietary treatments were 1) control diet adequate in metabolizable protein (MP)-Lys, 2) diet deficient in MP-Lys, and 3) Lys deficient diet made adequate in MP-Lys with RPL. The RPL was assumed to contain 20% bio-available Lys and was added to the Lys deficient diet at 0.65% of dry matter (DM). The basal diets contained 50% forage and 50% concentrate. The MP-Lys content of the Lys adequate, Lys deficient, and RPL diets were 6.5, 5.7, 6.7%, respectively, and the MP-Met content of the diets was 2.3% (CNCPS v.6.1; AMTS.Dairy, AMTS LLC, Cortland, NY). Cows were fed once and milked 3 times daily. Milk samples were collected from 3 consecutive milkings on d 18 and 19 of each period. Blood was collected on d 19 and 20 of each period at 2, 4, 6, and 8 h after feeding and composited by cow and period for AA analysis. Data were analyzed using the MIXED procedure of SAS. There was no effect of diet on DM intake (mean \pm SE; 29.6 ± 0.76 kg/d), milk yield (49.9 ± 1.64 kg/d), milk fat % ($3.71 \pm 0.12\%$), milk fat yield (1.85 ± 0.07 kg/d), milk true protein (TP) % ($3.19 \pm 0.04\%$), or milk TP yield (1.59 ± 0.06 kg/d). There was an effect ($P < 0.001$) of diet on plasma Lys concentration (% of total plasma AA) with the Lys adequate diet resulting in the highest ($4.27 \pm 0.06\%$), the RPL diet was intermediate ($3.74 \pm 0.06\%$), and the Lys deficient diet was the lowest ($3.52 \pm 0.06\%$). Based on the plasma data, the Lys adequate diet and RPL increased MP-Lys supply compared with the Lys deficient diet. However, improved MP-Lys supply did not result in increased milk protein production in this experiment.

Key words: ruminally protected lysine, milk protein, plasma lysine