P442 Influence of supplementing high fiber diets with abomasally infused methionine and lysine, or isoleucine, or all three amino acids. P.H. Robinson*, W. Chalupa†, C.J. Sniffen‡, W.E. Julien†, H. Sato, K. Watanebe‡, T. Fujiyada§ and H. Suzuki†, Atlantic Dairy and Forage Institute, Fredericton Junction, NB, Canada; †Univ. of Penn., Kennett Square, PA; ‡W.H. Miner Agric. Res. Inst., Chazy, NY; ‡Julien and Assocs., 7207 Sury Hill S., Omaha, NE, 4Ajinomoto Co., Inc., Tokyo, Japan.

Numerous studies have investigated responses of dairy cows to supplementing rumen protected (RP) lysine and methionine. Isoleucine has been suggested to be such an AA under some conditions. Four multiparous Holstein cows were fed a basal ration designed to be co-limiting in intestinally absorbable supplies of methionine, lysine and isoleucine. Cows were supplemented with none of these amino acids (Control), lysine and methionine, at the intestinal absorptive site. Isoleucine was also supplemented to the Control group. This resulted in very high daily chewing times on all diets which was associated with high rumen pH values. Intake of DM and its components were not influenced by any treatment. Milk protein % tended to be higher when cows were supplemented with RP lysine and RP methionine. However production of milk and its components were not affected. Cows supplemented with all three AA, milk yield and composition did not differ from the control diet. 

P443 Ruminally protected lysine or lysine and methionine for lactating dairy cows fed to meet requirements for microbial and postruminal protein. P.H. Robinson*, W. Chalupa†, C.J. Sniffen‡, W.E. Julien†, H. Sato, K. Watanebe‡, T. Fujiyada§ and H. Suzuki†, Atlantic Dairy and Forage Institute, Fredericton Junction, NB, Canada; †Univ. of Penn., Kennett Square, PA; ‡W.H. Miner Agric. Res. Inst., Chazy, NY; ‡Julien and Assocs., 7207 Sury Hill S., Omaha, NE, 4Ajinomoto Co., Inc., Tokyo, Japan.

This study was designed to separate the effects of ruminally protected (RP) lysine (lys) from those of RP methionine (met) on performance of lactating dairy cows fed a diet 1st limiting in intestinally available (IA) lys and 2nd limiting in IA met. Multiparous Holstein cows (30) were examined in a 2×3×5 factorial design, with 5 postpartum days, all containing timothy alfalfa hay, corn silage, barley, corn, corn grain meal and soybean meal. Treatments were: no supplemented amino acids; 21 g/d IA lys; 22 g/d IA lys and 6 g/d IA met. Post-experiment calculations suggest that, in contrast to the objective, the unsupplemented diet was co-limiting in IA lys and IA met (0.98 of requirements), followed by IA protein (1.02), lysine (1.04), valine (1.07), leucine (1.05) and met (1.15). Thus the virtually identical performance of the unsupplemented and lys groups demonstrated that these cows did not respond to enhanced IA lys where lys was not calculated to be 1st limiting. In contrast, cows supplemented with both lys and met numerically increased production of milk protein and fat to an extent consistent with expected demand. These results though calculated data indicate that performance was limited by IA lys or met. This result, which, due to a lack of statistical significance, will be disputed by some, suggests that met, apparently unlike lys, may play a role in enhancing production of milk components beyond its role as a limiting amino acid.

P444 Effect of ruminally protected lysine and methionine on microbial protein production in cattle. S. Xu†, J. H. Harrison*, B. Ridley†, and M. Halstead†, P.T. Chandler‡, 1WSU Dairy Forage Facility, Puyallup, 4Ajinomoto Inc., Tokyo, Japan, 5Julien & Associates, Detroit, TN.

Six lactating Holstein cows fitted with ruminal and duodenal cannulas were used to determine the effect of ruminally protected lysine and methionine (RPLys and RPMet) on microbial yield, amino acid flow to duodenum, and milk production and composition. The experimental design was a 3×3 Latin square design. Cows were averaged 96 DIM at the beginning of the experiment. Two basal diets were formulated to provide either 96 and 90% required lysine and methionine (Neg) or 112 and 103% (Pos), using corn distillers grist or blood meal, fish meal, and meat bone meal as by-pass amino acid sources, respectively. The RPLys and RPMet were added as a top-dress to the Neg diet to provide 8 g/d methionine and 27 g/d lysine. Yb was used as a particular marker food and the concentration of purines in the duodenal digesta was determined for estimation of microbial N. Milk protein, microbial synthesis in the rumen, and total EAA flow to duodenum were significantly improved by supplementation of RPLys-Met.