Productivity of lactating dairy cows as impacted by feeding lysine in a ruminally protected form

P.H. Robinson*[1], S. Juchem[1], I. Shinzato[2]; University of California, Davis, CA, USA[1], Ajinomoto Co. Inc., Tokyo, Japan[2]

Increased milk production requires high intakes of crude protein in the diet, and/or improved supply and ratios of amino acids delivered to the duodenum in order to meet animal needs for milk and milk component synthesis. Our objective was to estimate the rumen escape potential of a ruminally protected lys product (RPL) and to determine effects of feeding this product on feed intake and digestibility, as well as milk production and composition, of high producing dairy cows. The experiment was designed as a double (early and mid-lactation dairy cows) 2x2 factorial with 28 d experimental periods. All cows were fed the same total mixed ration (TMR), calculated to be first limiting in lys, with treatment pens receiving 17 kg/pen/d of RPL (to deliver 38 g of lys/cow/d) mixed into the TMR. Evaluation of the RPL suggested that this feeding level delivered between 18 and 22 g/cow/d of intestinally absorbable lys. Control cows were fed the RPL without lys (i.e. the fat matrix) at the same level as the fat matrix was fed in the RPL. Feeding the RPL did not influence dry matter (DM) intake in early lactation cows (26.3 kg/cow/d), but output of milk (48.0 vs. 50.0 kg/cow/d), as well as milk fat, true protein and lactose, and energy, were higher ($P<0.05$) in lysine supplemented cows. In addition, the extent of body condition score (BCS) loss was lower ($P<0.05$) with lys supplementation (-0.069 vs. -.0.035 units/28 d). In mid lactation cows, DM intake was also not influenced, and only milk fat and energy outputs increased ($P<0.05$) with RPL feeding. BCS change was not influenced. Plasma lys levels in cows of both parities were not impacted by RPL feeding, suggesting that lys needs may not have been met at this level of supplementation. The contrast to an earlier study by our group, wherein milk fat synthesis was suppressed with lys supplementation at an estimated 9 to 10 g/cow/d at the intestinal absorptive site in similar cows fed a very similar TMR, supports the hypothesis advanced in that study that body protein turnover is the first priority in early lactation cows followed by milk component synthesis.

KEYWORDS
lysine
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