

Public Abstract

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Title: Optimizing beef cattle performance using rumen-protected lysine supplementation in diets balanced for predicted amino acid and effective energy requirement.

The objective of this experiment was to evaluate post-ruminal appearance and absorption of rumen-protected Lys products, and to evaluate growing steer performance when fed diets balanced for predicted Lys requirement to effective energy (EE) ratio using rumen-protected Lys. In vitro experiments were conducted to determine ruminal fermentation and degradation characteristics of several rumen-protected products. Plasma Lys concentrations were then measured in cannulated steers fed increasing levels of encapsulated rumen-protected Lys (AjiPro 3G; Ajinomoto Heartland Inc., Chicago, IL) to determine if the product increased post-ruminal Lys absorption. Finally, performance characteristics were evaluated in growing steers ($n=120$; initial BW 269 ± 23 kg) fed diets balanced for absorbable AA to EE ratio using rumen-protected Lys. For cannulated steers supplemented with encapsulated Lys, greater plasma Lys concentrations suggested post-ruminal absorption of the product. Feedlot steers fed diets balanced for absorbable AA to EE ratio using rumen-protected Lys had greater G:F and ADG during the late finishing phase. Over- or under-supplementation of rumen-protected AA resulted in steers reaching a negative value of gain to cost of gain ratio sooner than steers fed diets balanced for absorbable AA to EE ratio. The results of these studies suggest that formulating diets for absorbable AA to EE balance is important to maximize beef cattle feed efficiency and production potential.