



USA Lysine® Particle Size and Specific Gravity Results in Rapid Movement Through the Rumen, Leading to Reduced Microbial Degradation and Increased Intestinal Digestibility

Specific gravity (SG) and particle size are the primary factors in determining the rumen retention time in dairy cows. USA Lysine® is manufactured to have the precise specific gravity and particle size, which leads to rapid transit through the rumen, reducing microbial exposure. The result is a concentrated product that does not need to be “over protected” to withstand extended retention time in the rumen. USA Lysine has the ideal size and specific gravity, resulting in a combination of a high level of rumen escape with industry leading intestinal digestibility.

Effects of Specific Gravity

A study to determine the kinetics of feed particles with SG higher or lower than the particles found in the reticulum or omasum (SG=1.02, and 1.03) was conducted at the University of Idaho.¹ It was found that particles with a SG higher than 1.02 passed through the rumen more rapidly than particles with a SG less than 1.02. The mean retention time in the rumen for the particles with a SG under 1.02 was over 30 hours longer than those particles with a higher SG.¹ The SG for USA Lysine (1.1) exceeds this threshold, thereby reducing its retention time in the rumen.

Effects of Particle Size

Numerous studies indicate the likelihood of a particle moving from the reticulum into the abomasum is reduced as the size of the particle increases.^{2,3} Bigger particles, those above the threshold size of 1-2 mm, rarely move out of the reticulum.³ The specified particle size of USA Lysine (0.5 mm < 90% < 2.0 mm) allows for rapid exit into the abomasum.

The lysine provided in USA Lysine begins to appear in blood plasma two hours after feeding and peak levels are seen 4-6 hours after being consumed (Figure 1). **These data support that the unique combination of SG and particle size found in USA Lysine results in rapid movement through the rumen. Kemin technology enables the product to provide an optimal level of protection needed to escape ruminal degradation, while at the same time, exhibit a high intestinal digestibility.**

Other rumen protected lysine products on the market may present an adequate SG or particle size, but USA Lysine combines both. The results indicate manufacturing specifications for USA Lysine result in a product with the physical characteristics needed to provide the highest efficacy of any rumen protected lysine product in the market.

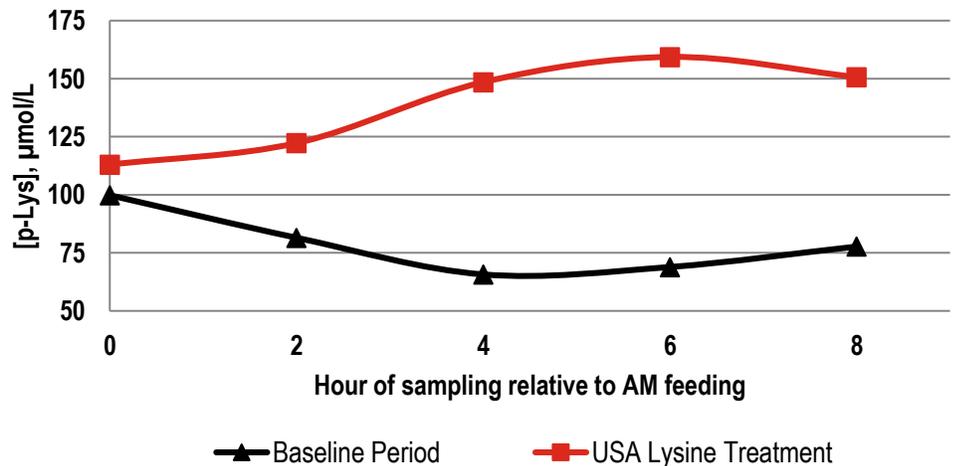


Figure 1. Least square means of plasma lysine concentrations relative to sampling hour.



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References

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