

**2021**

Smartamine[®] ML : The most cost-effective rumen-protected source of lysine for dairy cows

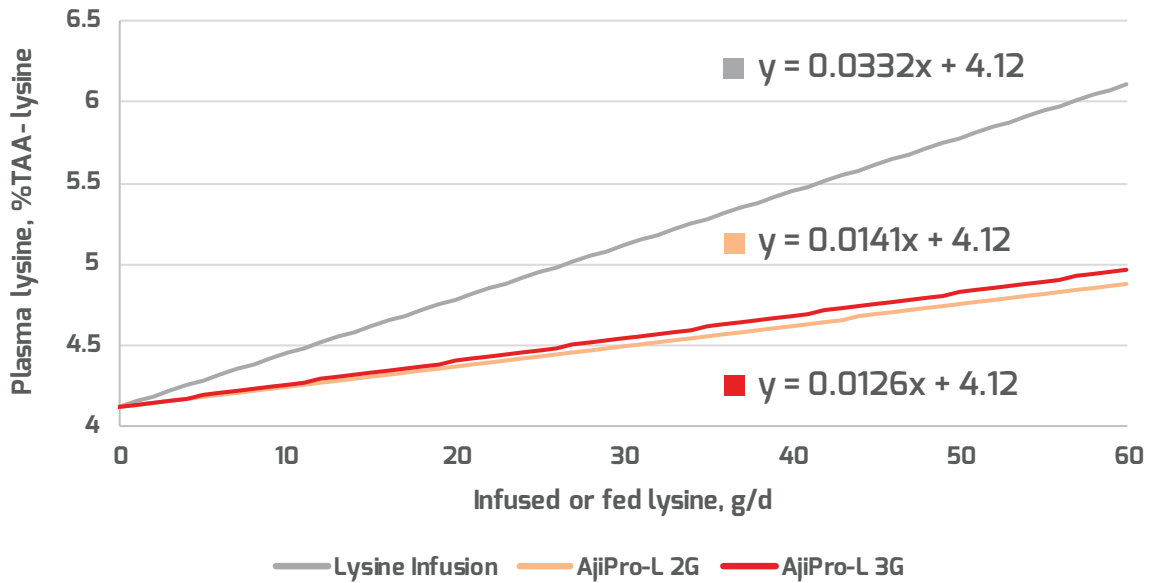
Milk protein and Class III milk prices have bolstered interest in amino acid balancing as a feeding strategy for dairy cows to promote greater milk component and energy-corrected milk yields. Lysine and methionine are co-limiting amino acids in most dairy cow rations. This necessitates lysine supplementation, often with a rumen-protected lysine product.

But what is the most bioavailable and the most cost-effective rumen-protected lysine product available?

Researchers at the University of New Hampshire in conjunction with Ajinomoto estimated the bioavailability of lysine for both the second and third generations of AjiPro-L using the **plasma amino acid dose-response technique**. Lysine bioavailability was determined by dividing the slopes of changes in plasma free lysine concentration for the AjiPro-L 3G treatment by the lysine abomasal infusion treatment (Figure 1; Whitehouse et al., 2017). Lysine bioavailability of AjiPro-L 3G was measured at 42.5% [0.0141/0.0332].

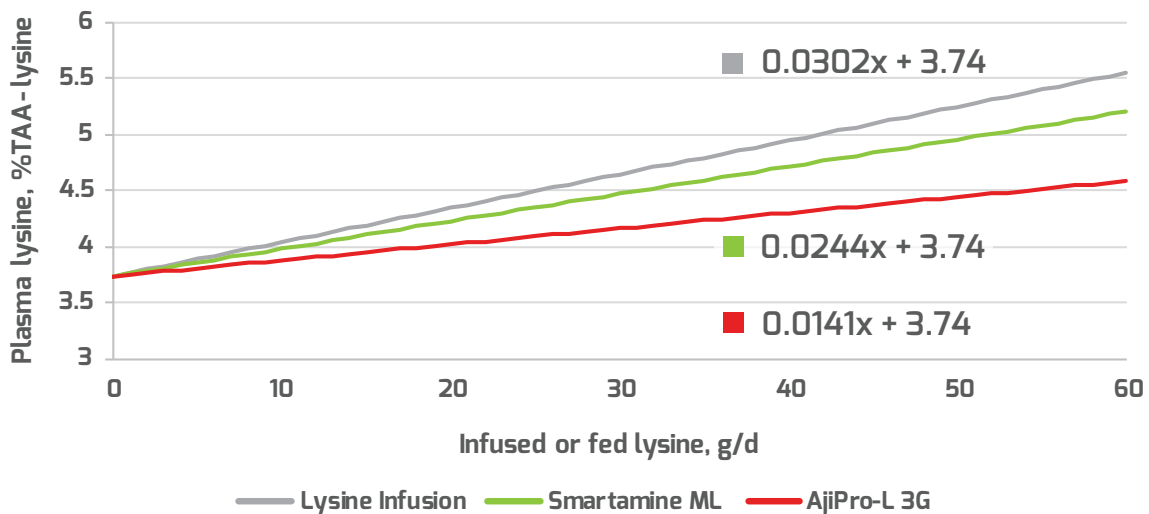


Figure 1. Changes in plasma free lysine concentration with increasing amounts of infused or fed lysine (2017)



The same researchers at the University of New Hampshire in conjunction with Adisseo employing the same methodology, measured the bioavailability of lysine in both Smartamine ML and AjiPro-L 3G (Figure 2; Whitehouse et al., 2020). Bioavailability of the lysine in Smartamine ML was 80.4% [0.0243/0.0302] versus 46.7% for AjiPro-L 3G [0.0141/0.0302].

Figure 2. Changes in plasma free lysine concentration with increasing amounts of infused or fed lysine (2020)



The bioavailability values for AjiPro-L 3G from these two experiments are lower than the current 62.5% provided by Ajinomoto and incorporated in feed formulation software. Feed formulation software nutritional specifications issued by Adisseo states that Smartamine ML contains 44% lysine and 15% methionine, with an 80% bioavailability for both amino acids, based on data using the plasma amino acid dose-response technique.

Although bioavailability is an important factor when evaluating rumen-protected amino acids, the most important factor is the cost per unit of metabolizable amino acid. Unlike most other rumen-protected lysine sources, Smartamine ML contains a significant amount of methionine (15%) and the value of this must be considered when making comparisons to other rumen-protected lysine products.

Using a 44.6% average lysine bioavailability value for AjiPro-L 3G from both experiments (42.5 & 46.7%), the metabolizable lysine contribution is 17.8% [40.0% lysine content × 44.6% bioavailability]. The metabolizable lysine contribution of Smartamine ML is 35.2% [44.0% lysine content × 80.0% bioavailability], or twice as much as AjiPro-L 3G.

The cost in formulation of the metabolizable lysine in Smartamine ML is about 1.6 cents/gram, whereas the cost in formulation of metabolizable lysine in AjiPro-L 3G is about 2.0 cents/gram, resulting in a 25% cost advantage for metabolizable lysine in Smartamine ML. Due to the increased metabolizable lysine content, reduced price per gram of metabolizable lysine, and the value of metabolizable methionine all in Smartamine ML, **AjiPro-L should be priced at about 1/3 the cost of Smartamine ML** to remain a competitive substitute.

How do prices of rumen-protected lysine products compare in your rations?

Have questions?

Contact your local Adisseo representative to learn more about the **SmartLine™** of amino acid products.

