



Smartamine[®] M is still the most effective methionine source for your cows

Lysine, along with methionine, are limiting amino acids in rations for lactating dairy cows. The principal effect of meeting lysine requirements of dairy cows is widely recognized as an increase in milk yield, particularly in early lactation. Coupled with concentrated methionine sources in rations, lysine also improves milk component yields, transition cow metabolic health, reproductive efficiency, and herd longevity.

Lysine can be found in all feed ingredients but lysine content in blood meal is quite high relative to other feed ingredients. The positive profile of amino acids and rich lysine content in blood meal also generally make this a staple protein ingredient in US dairy rations. However, blood meal can be quite variable due to the processes by which it is manufactured. Blood meal is sensitive to overheating during the drying process which can cause excessive damage and indigestibility across all amino acids. Lysine is the amino acid most at risk of damage in dried blood meal and the range in digestible lysine content in blood meal has been measured as high as 95% to as low as 10%. While some commercial sources of blood meal and specifically dried red blood cells are consistently high in both quality and digestibility.

Incorporating alternative ingredients such as a validated rumen-protected lysine product can help to reduce dependence on blood meal and can further serve to minimize ration costs depending on price and quality of blood meal. Assuming rations are formulated to meet lysine and methionine requirements based on CNCPS recommendations, blood meal inclusion can routinely be as much as 0.5 kg per day. At current blood meal prices, replacing one-half of the blood meal amount with 25 g per day of a rumen-protected lysine product can reduce ration costs over 5 cents per cow per day.



A rumen-protected lysine product such as Smartamine® ML can help to reduce ration costs even further depending on the quality, digestibility, and price of blood meal used in rations. As the quality of blood meal is reduced or as blood meal price increases, ration cost savings will be increased when including Smartamine ML. And based on the table below, quality or digestibility of blood meal will have a greater impact on ration costs vs price of blood meal so it is important to understand the quality and digestibility of blood meal used in your rations.

Blood Meal Quality	Price, \$/ton	Base diet, \$/hd	Revised diet with Smartamine ML, \$/hd	Savings, \$/hd
Average	\$700	\$6.66	\$6.67	-\$0.01
	\$900	\$6.78	\$6.72	\$0.06
	\$1,100	\$6.90	\$6.78	\$0.12
Low	\$700	\$6.69	\$6.66	\$0.02
	\$900	\$6.85	\$6.74	\$0.11
	\$1,100	\$7.01	\$6.82	\$0.20

Rumen-protected lysine is a **SMART** formulation solution to meet lysine requirements for lactating dairy cows and can save up to 20 cents per cow per day in rations.

An example diet was developed in CNCPS to represent a typical US dairy ration with an optimal amino acid balance based on current model recommendations. Feeds specs used came directly from the default CNCPS library without editing and prices were estimated based on current markets (April 2020). This diet could be quickly duplicated by any CNCPS user to confirm the results shown here.

In this scenario, a 725 kg mature cow was described and fed an arbitrary amount of 25 kg DMI. The ME Milk support is predicted to be 42.0 kg with milk components set to 3.7% butterfat and 3.1% true protein.

The amino acid balance of the base diet was formulated to provide 1.14 grams of metabolizable methionine per Mcal of ME and 3.06 grams of metabolizable lysine per Mcal of ME, leading to the target lysine to methionine ratio of 2.68:1. This balance was achieved by including heat-treated soybean meal, blood meal (based on the average blood meal spec), and Smartamine M.



Continued ►

Using the same forage program, a very similar but lower-cost diet was developed using simple substitution by incorporating Smartamine® ML as a source of metabolizable lysine to meet the same key nutritional targets. In this substitution, bypass fat, blood meal, and Smartamine M were reduced, Smartamine ML was added, and urea and ground corn were increased. These substitutions were made in an effort to maintain energy, ruminal nitrogen, lysine, and methionine supply but alternate substitutions could be made to lead to similar nutrient supplies.

The substitution diet containing Smartamine ML was predicted to support the same volume of milk, with slightly less CP and MP, slightly more starch and NFC but the same lysine and methionine balance. The diet formulated with Smartamine ML is estimated to save \$0.056 per cow per day.

Ingredient	\$/ton	Ration change, g/d	Cost change, \$/d
Ground Corn	\$180	+ 252	+ \$0.050
Bypass fat	\$1,200	- 10	+ \$0.014
Blood meal (Average)	\$900	- 281	- \$0.279
Urea	\$600	+ 20	+ \$0.013
Smartamine ML	\$8,400	+ 25	+ \$0.231
Smartamine M	\$14,200	- 3.7	- \$0.058
NET COST CHANGE:			- \$0.056

Have questions?

Contact [Shane Fredin](#), North American Ruminant Category Director, [Mike Shearing](#), Global Ruminant Amino Acid Formulation Manager, or your local Adisseo representative to learn more about [SmartLine®](#).

