

ON-FARM DEMONSTRATION 2021

Smartamine[®] M vs. a competitor methionine product

Summary

01. A demonstration was conducted on a 1130-milking cows farm in Wisconsin replacing a competitor methionine product with Smartamine M, maintaining diet cost.
02. Smartamine M improved milk protein and fat. In a year, replacing this competitor product with Smartamine M can generate more than \$90 thousand dollars of extra income.
03. Smartamine M raised plasma methionine concentration by 12.4% relative to the competitor product.
04. At similar inclusion cost, it was confirmed Smartamine M supplies greater amount of methionine compared to competitor product. The dairy continues using Smartamine M.

INTRODUCTION

An on-farm demonstration was conducted on a 1130-milking cows dairy farm in Wisconsin. Dairy cows were supplemented with a competitor methionine product (CMP) and the nutritionist proposed to replace it with Smartamine M (SMM) in the following month, maintaining diet cost. Using bioavailability claimed by the CMP company, at a same cost per cow, CMP supplies greater amount of metabolizable methionine (mMET) and therefore CMP-fed cows should outperform SMM-fed cows. But, using bioavailability measured in in vivo experiments, SMM should outperform CMP.

Methods

Plasma methionine concentration from 20 mid-lactation cows and milk tank data were used to determine which product was more successful in this on-farm demonstration. Blood samples were taken at beginning and at the end of the demonstration.

Table 1 (see reverse) shows inclusion rate, cost of supplementation, and methionine supply from the reference diet, diet supplemented with CMP (bioavailability claimed by CMP company), diet supplemented with CMP (bioavailability adjusted based on in vivo research), and diet supplemented with SMM. In summary, 0.035 lb/cow/d of CMP was fed to the entire herd in February 2021 and replaced with 0.026 lb/cow/d of SMM in March 2021. Smartamine M inclusion rate was determined so supplementation costs were the same for both products on a per cow per day basis. Income was calculated using the Federal Milk Market Order prices for March 2021.

Table 1. Methionine supply and cost from competitor methionine product (CMP) or Smartamine M (SMM)

	Reference Diet	Diet + CMP	Diet + CMP	Diet + SMM
		Company claim	Based on in vivo trial	
Rumen protected methionine, lbs/cow/d	0	0.035	0.035	0.026
Nutrition model output				
mMET supply, g/d	67.0	76.9	70.1	74.1
mMET:Energy, g/Mcal ME	0.94	1.07	0.98	1.04
Costs				
Supplementation cost, \$/cow/d	\$0.00	\$0.18	\$0.18	\$0.18

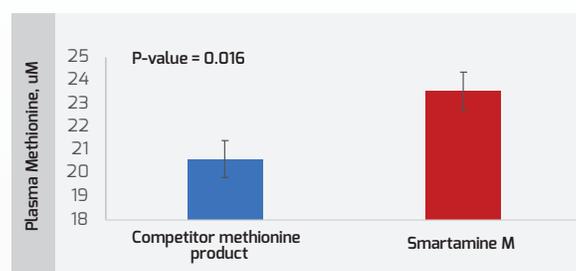
Results

Using bioavailability claimed by both companies, at these inclusion rates, CMP supplied 9.9 grams of mMET and SMM supplied 7.1 grams of mMET. But according to bioavailability measured in in vivo experiments (University of New Hampshire; plasma AA dose response technique), CMP supplied 3.1 grams of mMET and SMM supplied 7.1 grams of mMET (Table 1).

Smartamine M-fed cows generated a greater income (+\$0.22 cow/d) relative to CMP-fed cows by improving both milk fat and protein output (Table 2). In a year, this greater daily income represents more than \$90 thousand dollars of extra income in a dairy of this size. One limitation of this on-farm demonstration is that its design does not control for seasonality and because CMP was fed in February and SMM in March, seasonality may have partially blunted the improvement in milk solids when SMM replaced CMP. Using USDA milk composition compiled data from 2000 to 2015, Salfer et al. (2019) demonstrated that seasonality from December to July negatively affects milk protein and fat by on average 0.03% and 0.04%-units, respectively, per month.

Table 2. Milk performance and economics for dairy cows fed competitor methionine product (CMP) and Smartamine M (SMM)

	CMP	SMM	Difference
Milk components yield, lbs/cow/d			
Protein	2.89	2.92	+ 0.03 lbs
Fat	3.7	3.78	+ 0.08 lbs
Economics, \$/cow/d			
Gross income with protein	\$7.77	\$7.85	+ \$0.08
Gross income with fat	\$6.36	\$6.50	+ \$0.14
Total income	\$14.14	\$14.36	+ \$0.22

Figure 1. Plasma methionine concentration for competitor methionine product and Smartamine M.

Plasma methionine concentration for SMM-fed cows were 12.4% greater compared to same cows fed with CMP in the previous month (Figure 1).

Conclusion

Together with greater milk performance, greater plasma methionine concentration for SMM-fed cows compared with CMP confirms that at similar inclusion cost SMM supplies greater amount of mMET relative to CMP. The dairy farm continues using Smartamine M.

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