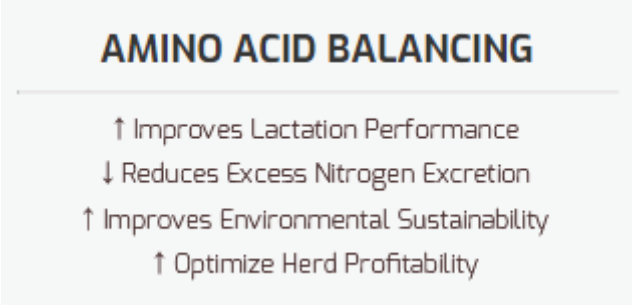
Summary of Results of Amino Acid Balanced Rations Across the USA

Balancing dairy rations for amino acids is becoming a more common practice among nutritionists for a variety of reasons. These include: a desire to increase the profitability of the farm through improved reproductive performance, herd health and higher yield of milk components; the need to reduce nitrogen excretion into the environment; and the availability of software models that increase the predictability of economical responses.



Component responses are the most quickly observable effects seen when switching a herd on to an amino acid balance (AAB) ration. Figure 1 shows how quickly the response can show up. During the 30 days prior to feeding an AAB ration milk protein had advanced 0.04 percentage units, a normal seasonal effect during the fall of the year. However, 30 days after the herd started on an AAB ration milk protein increased by 0.23 percentage units.

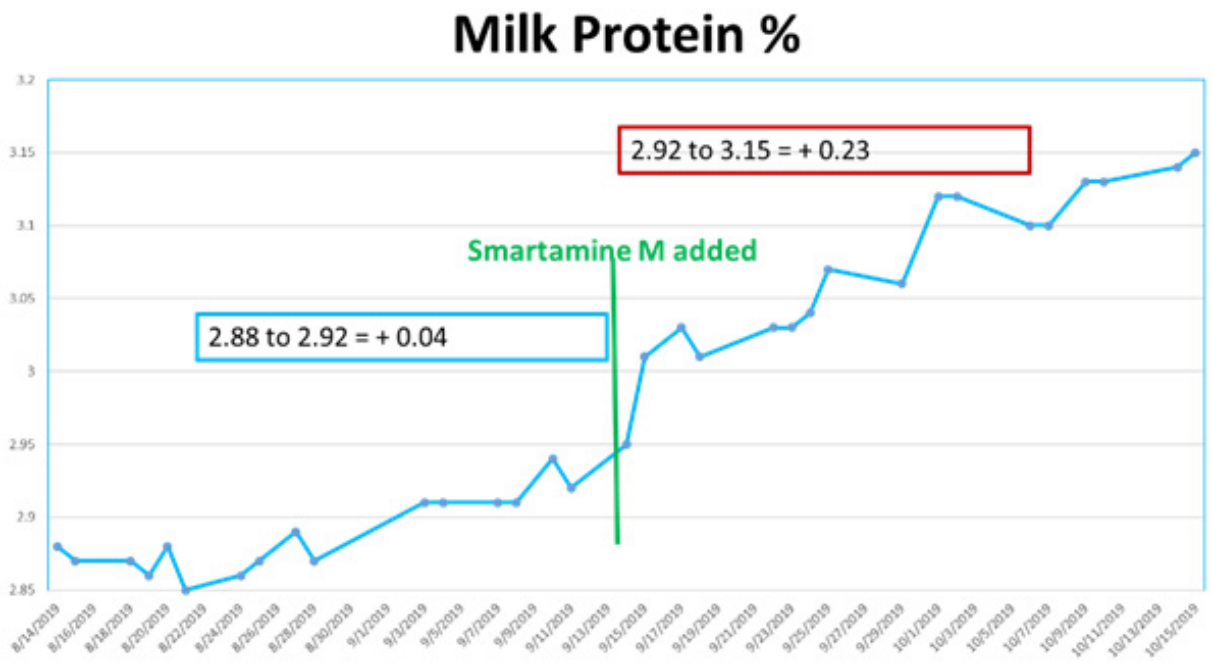


Figure 1. Milk protein response to an amino acid balanced diet.

Over the past three years Adisseo worked with several Dairy Producers and their Nutritionists across the US to showcase the effectiveness of amino acid balancing to increase farm profitability. The number of cows involved was more than 50,000 on 22 farms.

The primary on-farm measurements taken included milk protein and milk fat % and milk yield. Following the observation period, changes in component yields and ration costs were inputted in a partial budget spreadsheet (Milkpay.com) and the profitability of AAB evaluated.

Figure 2 depicts responses to AAB rations. Responses ranged from 0.0 to 0.15 percentage units for milk protein (average 0.08) and – 0.02 to 0.33 (average 0.10) percentage units for milk fat, respectively. In most cases milk yield was slightly positive to unaffected by the ration changes made.

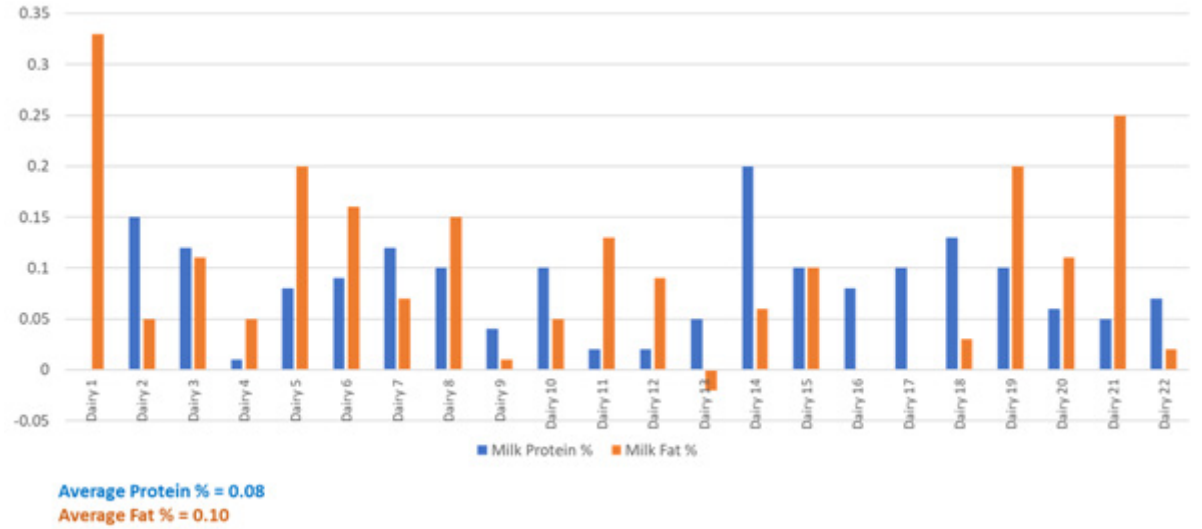


Figure 2. Responses to AA balancing on Commercial Dairies across the USA.

Figure 3 supports that the demo data is consistent with what was concluded in 24 studies of lactating cows, AAB with Smartamine M. These studies showed an average response of 0.13 percentage units for milk protein and 0.17 percentage units for milk fat.

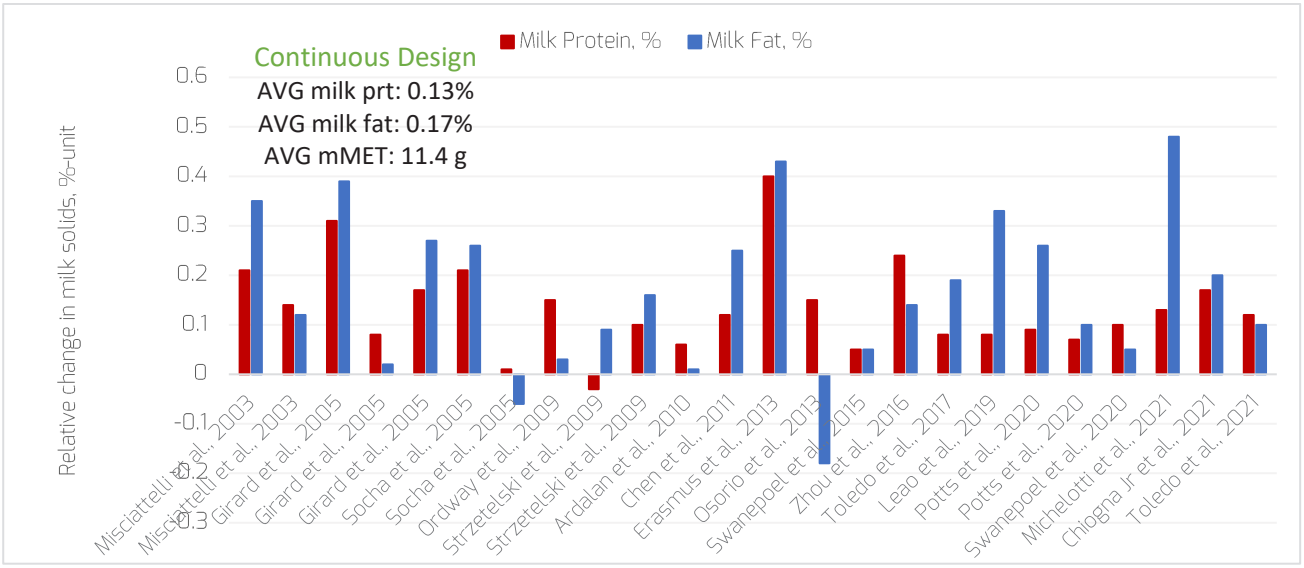


Figure 3. Responses to AA balancing in 24 studies.

Positive outcomes were determined by whether the Dairy Producer and their Nutritionist decided to stay on an AAB rations following the evaluation period. Of the participating dairies in figure 2, 17 out of 22, or 77 % decided to stay on an AAB ration.

Often people make the mistake of assuming that an AAB ration will cost significantly more than their current ration. This has been a roadblock for many nutritionists and their clients to obtaining the increased profitability an AAB ration can provide. One of the many benefits of the new modeling programs available to the industry is the ability of the software to optimize rations using a non-linear algorithm. This function allows the nutritionist to develop an AAB ration at a significantly reduced price. **In other words, the cost of an AAB ration does not equal the cost of the rumen protected amino acid (RPAA) added to the diet.** For example, it is often possible to add $0.25 worth of RPAA to an existing high cow diet and only increase ration costs by $0.10 to $0.15 by doing AAB using Smartamine M and Smartamine ML. The result is no change in milk yield but a significant increase in the yield of milk protein and fat. Figure 3 shows how a high cow diet was optimized to improve the amino acid balance. **The changes to the diet ingredients were not dramatic and we were able to add 38 cents worth of AA for a total diet cost change of 8 cents.**

Ration Specifications					
Feeds (lbs. DM)	**Original**	**AA Optimized**	**Nutrients**	**Original**	**AA Optimized**
Corn Silage	19	19.89	Dry Matter Intake, lbs.	57	56.9
Alfalfa Haylage	11.48	10	NDF, % DM	29.26	28.81
Corn, fine ground	10.32	11	Forage aNDFom, % DM	21.11	20.83
Cottonseed	3.68	3.22	uNDF intake, lbs	5.01	4.76
Whey Delac	2.8	3	Sugar Degraded, g/d	1038	1057
Canola Meal	3.25	3.1	Starch Degraded, g/d	5126	5398
Amino Plus	2.2	2	CP, % DM	17.4	16.79
DDG	1.78	2.17	MP from Bacteria, g/d	1449	1472
Calcium Carbonate	0.5	0.6	ME Allowable Milk, lbs	95.29	95.96
Sodium Bicarbonate	0.5	0.5	MP Allowable Milk, lbs	94.98	93.78
NutraCor	0.5	0.47	MET supply, g/d	63.34	72.53
Blood Meal	0.45	0.3	LYS suply, g/d	192.38	195.47
Salt	0.13	0.14	HIS supply, g/d	81.77	79
Yeast	0.11	0.125	Lys:Met	3.04	2.7
MagOx	0.1	0.1	MET:Energy (g/Mcal ME)	0.94	1.08
Min/Vit	0.12	0.1	LYS:Energy (g/Mcal ME)	2.87	2.91
Urea	0.1	0.1	Total Cost, $/c/d	6.69	6.77
Rumensin 90	0.0047	0.0048			
Smartamine ML	0	0.0466			
Smartamine M	0	0.0246			
Total	57	56.9			

Figure 4. Non-Linear Optimization to achieve an amino acid balanced high cow ration.

Our work has shown a high degree of success/profitability for AAB rations fed in a variety of situations and during substantial fluctuations in milk prices. If you are not feeding AAB rations and would be interested in investigating the potential value to your client/farm, contact your local Adisseo business manager.