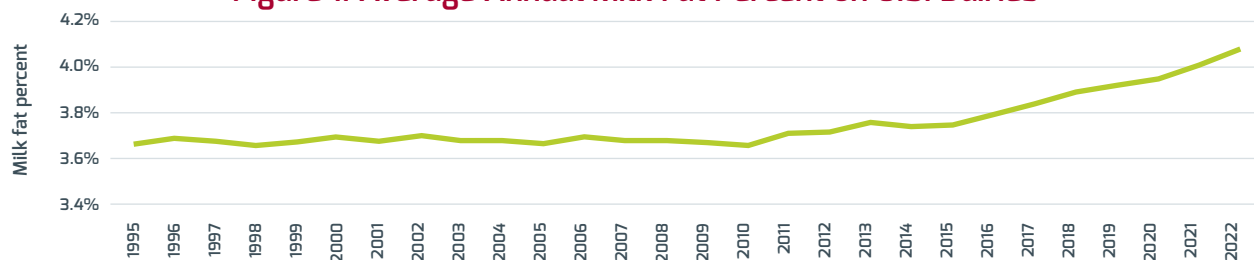


## Maximizing Milk Fat: Can Your Cows Do Even More?

When recently visiting some of our dairy clients who balance their rations for amino acids, we discovered a Holstein herd producing an impressive 117 lb of energy-corrected milk with 4.5% milk fat and 3.2% protein during mid-summer. The dairy manager showed us the data for the previous winter as well, when they recorded milk fat at 4.7% and milk protein at 3.35%. Although performance like that was unheard of not too long ago, it is now becoming more widespread. Data in Figure 1 shows the recent increase in average annual milk fat percent across United States dairies.

**Figure 1. Average Annual Milk Fat Percent on U.S. Dairies**




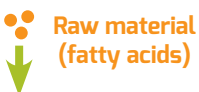
Sources: USDA, Economic Research Service (ERS) data from USDA, National Agricultural Statistics Service; USDA, Agricultural Marketing Service; and California Department of Food and Agriculture

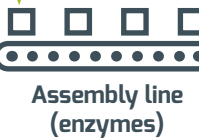
While many factors have contributed to the increase in milk fat content over the years, recent research has demonstrated how methionine supplementation is not only key for milk protein synthesis but also a factor in milk fat synthesis. Methionine was found to be one of the signaling molecules for proteins called mTOR and SREBP-1 which regulate the enzymes responsible for protein and fat production.

**Figure 2. The Mammary Gland is a Milk Factory**

↑ Insulin  
 ↑ Fatty acids  
 ↑ Methionine  
 ↑ Leucine  
 ↓ CLA


  
 Assembly line process control (mTOR & SREBP-1)


  
 Raw material (fatty acids)


  
 Assembly line (enzymes)

Milk fat

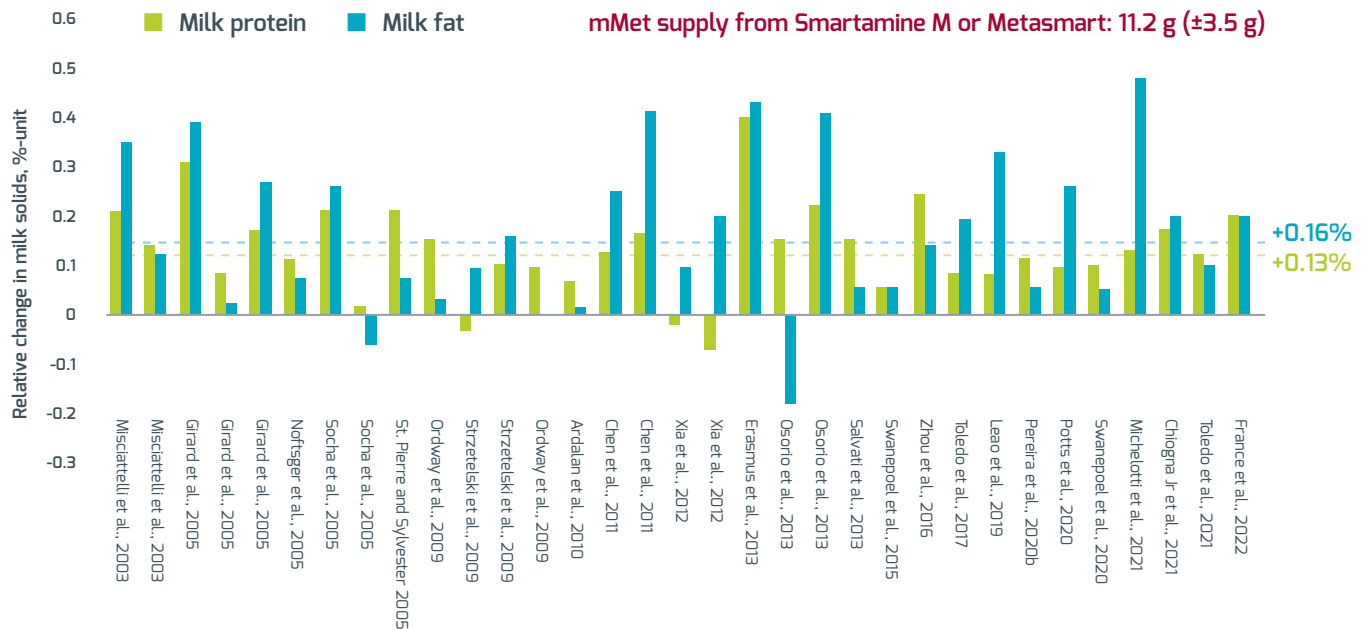
Methionine helps to regulate the assembly line process for milk fat

Using the analogy of a mammary gland being a milk factory, methionine would be the plant manager that controls the assembly line for milk fat production. This process can be sped up or slowed down depending on the balance between supply and cow's demand for key nutrients, including methionine (Figure 2).



In fact, a compilation of 25 controlled studies testing methionine supplementation in the form of Smartamine® M and MetaSmart® documents the evidence for the relative changes in milk fat. Overall responses yielded a 0.16%-unit increase in milk fat with methionine supplementation (Figure 3).

**Figure 3. Smartamine® M and MetaSmart®: 25 studies, 33 treatments**



Balancing rations for methionine are rewarded very quickly after implementation with improvements in both milk fat and protein. But the value of methionine does not stop there. As a functional amino acid, methionine exerts a role in several pathways related to growth, fertility, health, and fetal programming furthering its economic impact throughout lactation and the lifetime performance of the dairy cow.

As more nutritionists learn and fine-tune their diets for optimal performance, the closer we get to expressing the true potential of modern cows. Now that you know that 4.7 % milk fat in high producing Holstein herds is achievable, the question is, are you using all the tools to get you there?

Contact your **Adisseo** representative to learn more!



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