

Research: The role of methionine in dairy production:

Increased milk production, milk protein, and milkfat

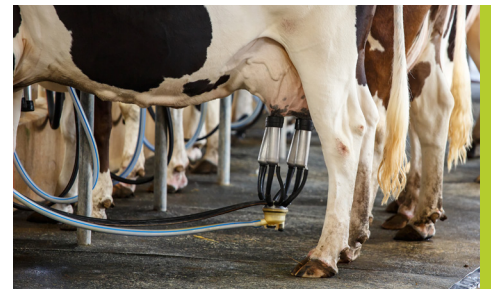


Extensive research during four decades shows that feeding supplemental, encapsulated methionine increases milk, milk protein, and milkfat. Precisely balancing amino acid levels in the ration allows nutritionists to economize the total protein level fed.

In today's dairy rations, methionine is typically the first limiting amino acid. Methionine is also now recognized as an essential nutrient for dairy cattle. Dairy cows cannot synthesize methionine in the quantity required for health and reproduction. Feedstuffs cannot totally fill the nutritional requirement even when protein is overfed.

The unique role of methionine in biochemistry has led to it being dubbed the enabler of all protein synthesis and, thus, the origin of life. Methionine is heavily involved in a multitude of key metabolic pathways in dairy cows.

Rumen-protected methionine was introduced during the 1990s to support increases in production. In 2001, the National Research Council (NRC) in its publication *Nutrient Requirements of Dairy Cattle* concluded that methionine and lysine were the two most limiting amino acids in dairy diets. The NRC recommended a 3:1 lysine-to-methionine ratio and a metabolizable protein concentration of 7.2 percent lysine and 2.4 percent methionine for optimal maintenance and milk protein production.



This early focus on milk protein content evolved with additional research. Its role expanded and now goes beyond the production of milk and milk components to include longer-term health and reproduction benefits.

An innovation in methionine supplementation was introduced with MetaSmart® the isopropyl ester of the analogue of methionine. It uniquely provides a solution for incorporating methionine into pelleted and liquid feeds. The chemical structure provides two sources of methionine activity for increased milk yield, fat, and protein. Half is absorbed across the rumen wall, is hydrolyzed to the analogue of methionine (HMTBa), enters the blood stream, and travels to the liver where it is converted to methionine for use by the animal. The other half is hydrolyzed to HMTBa in the rumen and remains in the rumen. Here it promotes rumen function by helping to mitigate milkfat depression. Supplementing with MetaSmart increases milk yield, fat, and protein. HMTBa does not serve as a source of metabolizable methionine for dairy cows.

Nutritionists today balance the amino acid levels in rations by using ration formulation software. This software is capable of delivering least-cost, non-linear solutions. It provides the nutritionists with the tool necessary to cost effectively focus on providing individual amino acids to meet requirements rather than overfeeding protein.

Amino Acid Balancing. It's Just Smart.

