

Mode of action: How MetaSmart® improves milk protein and fat

Article Provided By:



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Mode-of-action:

How **MetaSmart®** improves milk protein and fat

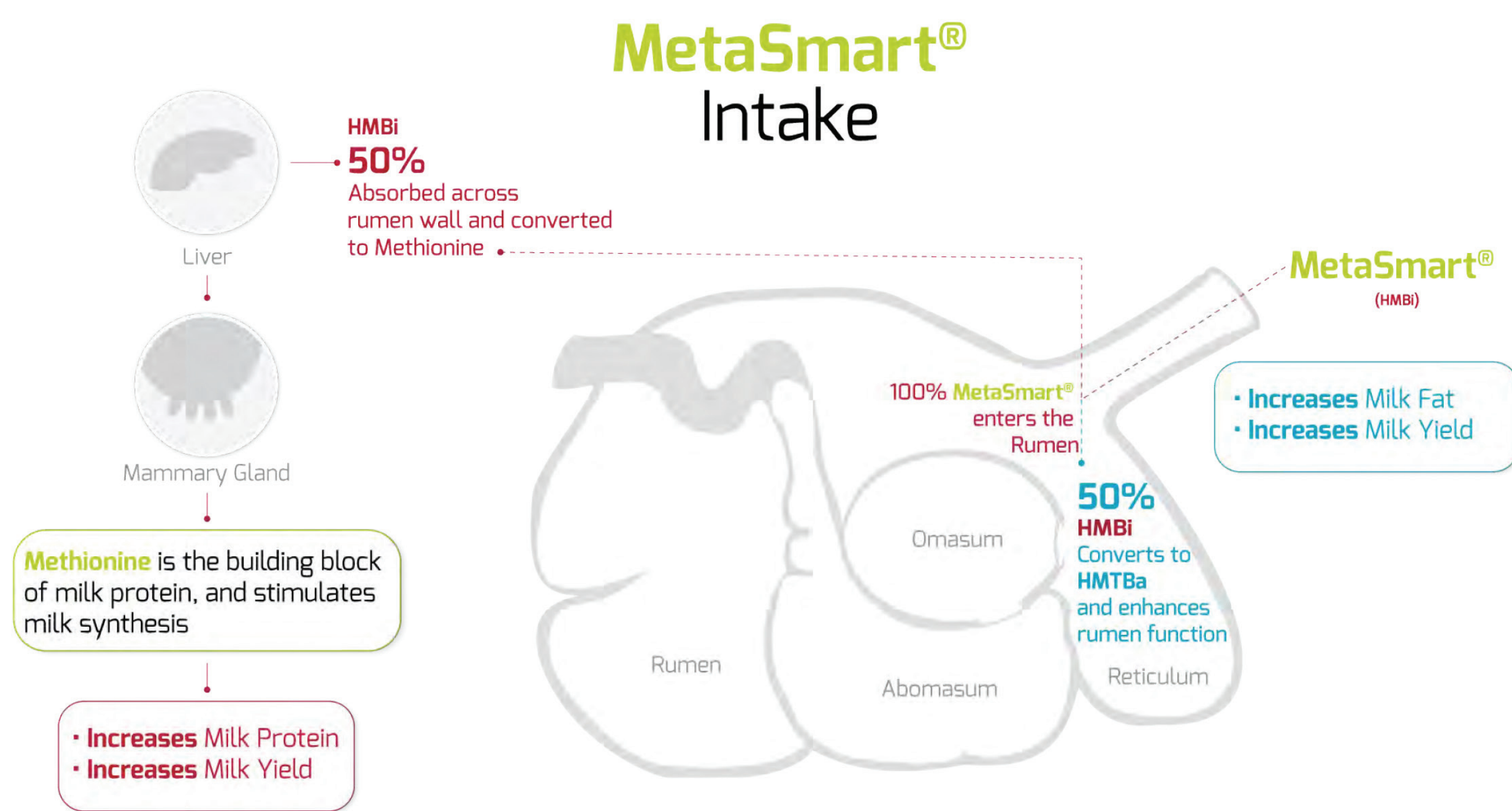
This is the first SmartMail in a three-part MetaSmart series. The other parts will highlight 2) Research responses; and 3) On-farm demonstration responses.

Methionine (Met) is an essential nutrient for growing and lactating ruminants. However, Met is a limiting amino acid for lactating dairy cows in most North American diets. Diets can be deficient in Met by as much as 25% relative to Met requirements needed to optimize milk protein output. Amino acid balancing serves as a successful feeding strategy to increase the supply of Met as well as minimize the need to feed excess dietary protein. Amino acid balancing improves lactation performance while reducing excess nitrogen excretion and improving environmental sustainability.

AMINO ACID BALANCING

- ↑ Improves Lactation Performance
- ↓ Reduces Excess Nitrogen Excretion
- ↑ Improves Environmental Sustainability

MetaSmart® is a source of metabolizable Met for dairy cows. MetaSmart differs from traditional rumen-protected Met products. MetaSmart, also called HMBi, differs from traditional rumen-protected Met products. MetaSmart is a unique molecule, which 50% is absorbed directly through the rumen epithelium, in a similar manner as volatile fatty acids.



MetaSmart is the isopropyl ester of methionine hydroxy analogue. Once consumed, ruminal microorganisms will degrade 50% of MetaSmart to hydroxy analogue of methionine (HMTBa) while the other 50% of MetaSmart is absorbed across the rumen epithelium into the blood stream. Once absorbed, the isopropyl ester is cleaved and used as an energy source. The HMTBa portion is converted to Met by the liver. Since Met is a limiting amino acid for protein synthesis in lactating dairy cows, MetaSmart can serve as a crucial source of Met to be used as a building block for protein including milk protein. Typical responses to MetaSmart supplementation result in a 0.1 to 0.15 %-unit increase in milk protein content.

HMTBa itself is also an effective feed additive for dairy cows. It is normally fed to increase milk fat output. HMTBa helps improve the rate of biohydrogenation of deleterious trans-fatty acids involved in milk fat depression. As the rate of biohydrogenation of trans-fatty acids increases, the absorption of trans-fatty acids are reduced, limiting milk fat depression. Typical responses to MetaSmart supplementation also result in a 0.1 to 1.15 %-unit increase in milk fat content. The milk fat response for MetaSmart is similar to the response with HMTBa supplementation alone.

When evaluating strategies to increase herd milk protein and fat output, MetaSmart offers a unique, cost-effective solution.

[For more information, visit our website.](#)