Smartamine® M

THE ENCAPSULATED METHIONINE FOR RUMINANTS

METHIONINE

MORE THAN MILK
Smartamine® M
Methionine - More than Milk

ESSENTIAL FOR MILK PROTEIN SYNTHESIS

In all dairy rations, there is a shortfall in the amount of methionine available compared to the methionine requirement.

Smartamine® M is the industry standard for encapsulated methionine.

OFFERS EXCELLENT BIO-AVAILABILITY

The three keys to the success of Smartamine® M:

• High level of rumen protection
• Complete release in the abomasum
• Total absorption in the small intestine

Smartamine® M coating protects the methionine from rumen fermentation. When exposed to the acidic conditions in the abomasum, the pH-sensitive coating releases the methionine to be absorbed in the small intestine.
Rumen protection is necessary because DL-methionine is degraded in the rumen. The Smartamine® M technology is adapted to ruminant digestive processes. The methionine is protected in the rumen, then absorbed in the small intestine, ensuring high methionine bio-availability.

- Protection - Rumen
- Release - Abomasum
- Absorption - Small intestine

Smartamine® M leaves the rumen undegraded.

The acid pH of the abomasum releases the methionine for absorption in the small intestine.

Smartamine® M:
- is easily mixed into base, protein and grain mixes*
- cannot be pelleted

* See User’s Guide for detailed mixing procedures
MEETING METHIONINE REQUIREMENTS
Milk is Just the Tip of the Iceberg

ENERGY CORRECTED MILK (ECM)
Optimal ration concentrations of MET and LYS maximizes milk volume, protein and fat

PROTEIN SYNTHESIS
Methionine is the key AA needed to initiate protein synthesis

LIVER HEALTH
Methionine plays a key role in the formation of VLDLs to export fat out of the liver

ANTIOXIDANT
Methionine is the precursor of taurine and glutathione, a very important antioxidant

EPIGENETICS
Methionine influences genetic expression through methylation of DNA

MORE THAN MILK

Adisseo
A Bluestar Company
MORE THAN MILK

Elevating blood plasma methionine levels promotes better liver function, increases antioxidant levels, decreases inflammation and improves oxidative stress capacity.

<table>
<thead>
<tr>
<th>Liver Function and Antioxidant</th>
<th>Control</th>
<th>Smartamine®</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carnitine, nmol/g tissue</td>
<td>37.5</td>
<td>66.0</td>
<td>.01</td>
</tr>
<tr>
<td>Glutathione, mM</td>
<td>1.27</td>
<td>1.73</td>
<td>.09</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inflammation and APP</th>
<th>Control</th>
<th>Smartamine®</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceruloplasmin, umol/L</td>
<td>3.02</td>
<td>2.71</td>
<td>.03</td>
</tr>
<tr>
<td>Serum Amyloid A, mg/mL</td>
<td>61</td>
<td>43.5</td>
<td>.17</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Oxidative Stress</th>
<th>Control</th>
<th>Smartamine®</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxygen Radical Absorbance Capacity, mmol/L</td>
<td>11.9</td>
<td>12.4</td>
<td>.05</td>
</tr>
</tbody>
</table>

(Chen et al., 2011 Journal of Dairy Science 94:1978)
Feed a balanced ration that provides a blend of fermentable carbohydrates and physically effective fiber to optimize yield of microbial protein and optimize rumen health.

Minimize Rumen Undegradable Protein inclusion, as on average, RUP has lower concentrations of both Lys and Met than microbial protein.

A rumen protected methionine source will need to be included to achieve the optimal ratio of LYS to MET.

Feed adequate, but not excessive, levels of Rumen Degradable Protein to meet rumen microbial needs for amino acids and ammonia.

To reach the target formulation level of LYS as a % of MP, include high LYS protein ingredients and a rumen protected lysine as needed.

Only use rumen protected sources of MET or LYS whose efficacy has been validated by the Plasma-Free Amino Acid Dose-Response Method.

Respecting the target formulation LYS and MET concentrations allows daily metabolizable protein supply to be decreased by 100 to 150 gs economizing on expensive RUP and creating formulation space for other nutrients that can further enhance the cows performance.

Smartamine® M