**Effects of ESSENTIOM® on postpartum immune function and subsequent reproductive performance.**


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**Herd Challenge.**

Two large commercial dairies in New York were identified to demonstrate the effects of ESSENTIOM relative to postpartum immune function. Working with the dairy nutritionists, ESSENTIOM was introduced into the diet.

- Feeding rate:
  - 0.25 lbs. per head per day 21 days prepartum
  - 0.75 lbs. per head per day 100 days postpartum
  - ESSENTIOM was substituted for other supplemental dietary fat sources
  - All diets were equal in energy content

- Herd makeup:

<table>
<thead>
<tr>
<th>NUMBER OF COWS</th>
<th>BASELINE</th>
<th>ESSENTIOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>1,989</td>
<td>2,219</td>
</tr>
<tr>
<td>Herd A</td>
<td>1,015</td>
<td>1,110</td>
</tr>
<tr>
<td>Herd B</td>
<td>974</td>
<td>1,109</td>
</tr>
</tbody>
</table>

- Measurement period:
  - Herd baseline period: December 2010 – August 2011
  - ESSENTIOM treatment period: December 2011 – August 2012

- Benchmarks:
  - Adjusted first milk yield
  - First linear somatic cell score (SCS)
  - Incidence of Early Embryonic Death (EED) up to 35 days postbreeding
  - Individual cow blood β-hydroxybutyric acid (BHBA) at seven days postpartum
  - 1st service conception rate (CR)

**Improved Immune Function.**

- 12% reduction in 1st linear SCS
- 67% reduction in EED
- 44% reduction in BHBA

**Greater Reproductive Performance.**

<table>
<thead>
<tr>
<th>REPRODUCTIVE PARAMETERS IMPROVED*</th>
<th>Baseline</th>
<th>ESSENTIOM</th>
<th>P-Value</th>
<th>% Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Detection rate (%)</td>
<td>66.7</td>
<td>67.7</td>
<td>0.318</td>
<td>+1.4%</td>
</tr>
<tr>
<td>Conception Rate — All services (%)</td>
<td>35.6</td>
<td>38.2</td>
<td>0.035</td>
<td>+7.3%</td>
</tr>
<tr>
<td>Pregnancy Rate (%)</td>
<td>23.8</td>
<td>25.9</td>
<td>0.034</td>
<td>+8.8%</td>
</tr>
</tbody>
</table>

*1st service conception rates alone increased four points from 35.4% to 39.4% (P=0.08)

BHBA Level Significance:

- Peripartum concentrations of circulating BHBA are useful indicators of the ability of cows to deal with metabolic challenges in the transition period.
- Increased concentrations of BHBA at calving have been associated with increased risk of disease and impaired early reproductive performance.
- Serum concentrations of BHBA measure oxidation of fat and reflect the success of a cow in adapting to negative energy balance.

*ESSENTIOM is a renaming of MEGALAC®-R. The product has not changed in form or composition.
Increased Milk and Component Yield.

Pounds of fat and protein significantly increased in the ESSENTIOM™ treatment groups even though percent fat and protein decreased.

Economic Benefits.

Feeding ESSENTIOM on these dairies 21 days pre to 100 days postpartum translated to multiple economic advantages, and an overall 15:1 return on investment (ROI).

### SIGNIFICANT INCREASES IN MILK YIELD WITH THE ESSENTIOM TREATMENT GROUPS

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Baseline</th>
<th>Treatment</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjusted 1st Milk</td>
<td>34.7</td>
<td>36.5^*</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Milk</td>
<td>73.7</td>
<td>79.9^*</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>FCM</td>
<td>75.7</td>
<td>79.8^*</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

### SIGNIFICANT INCREASES IN COMPONENT YIELD WITH THE ESSENTIOM TREATMENT GROUPS

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Treatment</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lbs Fat/d</td>
<td>2.71</td>
<td>2.79^*</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Lbs Protein/d</td>
<td>2.27</td>
<td>2.93</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>% Fat</td>
<td>3.67</td>
<td>3.5^*</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>% Protein</td>
<td>3.09</td>
<td>2.94^*</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

The results of this on-farm demonstration are consistent with previous research in which animals with increased BHBA around parturition experienced a higher risk of milk loss at the first DHIA and impaired early lactation reproductive performance.11


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