EnerGII Research Review
It’s a Renaissance!

AGENDA

• What is Driving Demand?
• The Peer Reviewed Results: Then & Now
• A Closer Look at the Profile
• Digestibility Differences that Matter
More herds feeding EnerGII to support milk & milkfat, body condition and reproduction.

Higher feeding rates on average (.75–1 lb. more common)

Renewed (or new) focus on efficiency of production
<table>
<thead>
<tr>
<th>Point</th>
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<tbody>
<tr>
<td>Consistent value since 1996</td>
</tr>
<tr>
<td>The <strong>same</strong> fatty acid profile every time</td>
</tr>
<tr>
<td>Increased milk and milkfat</td>
</tr>
<tr>
<td>Improved production efficiency</td>
</tr>
<tr>
<td>Improved body condition</td>
</tr>
</tbody>
</table>
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The Studies

1. Sniffen & Chalupa 2004
   - 12-18 Studies
   - Feeding Rate: 1 lb.

2. Lean, et al. 2011
   - 21-28 Studies
   - Feeding Rate: 1 lb.

   - UC Davis
   - 380 cows/treatment
   - Feeding Rate: 1 lb. adj.
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The Results: Milk Per Day

<table>
<thead>
<tr>
<th>Study</th>
<th>Increase in lb/cow/day</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>THEN: Sniffen, 2004</td>
<td>5.2</td>
<td>* P&lt;0.01</td>
</tr>
<tr>
<td>THEN: Lean, 2011</td>
<td>3.4</td>
<td>*</td>
</tr>
<tr>
<td>NOW: Havlin, 2014</td>
<td>5</td>
<td>*</td>
</tr>
</tbody>
</table>

* P<0.01
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The Results

Milkfat %

% Increase in milkfat

THEN: Sniffen, 2004

0.04

THEN: Lean, 2011

0.10

* P<0.01

NOW: Havlin, 2014

0.13

*
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The Results Fat Corrected Milk

- **THEN:** Sniffen, 2004
- **THEN:** Lean, 2011
- **NOW:** Havlin, 2014

Increase in lb./cow/day

- **THEN: Sniffen, 2004:** 5.8
- **THEN: Lean, 2011:** 4.6
- **NOW: Havlin, 2014:** 7.8

* P<0.01
The Results: Dry Matter Intake

**EnerGII Research Review**

THEN: Sniffen, 2004

THEN: Lean, 2011

NOW: Havlin, 2014

* P<0.01

<table>
<thead>
<tr>
<th>Difference in lb/cow/day</th>
<th>0</th>
<th>-1.2</th>
<th>-1.41</th>
<th>0.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>THEN: Sniffen, 2004</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>THEN: Lean, 2011</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOW: Havlin, 2014</td>
<td>*</td>
<td></td>
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<td>*</td>
</tr>
</tbody>
</table>
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The Results Feed Efficiency

THEN: Sniffen, 2004
1.77

THEN: Lean, 2011
1.75

NOW: Havlin, 2014
1.75

FCM (lb./cow/day)

No Added Fat Control
1.66
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The Results

Body Condition

Change in BCS (16 weeks)

0.3
0.25
0.2
0.15
0.1
0.05
0

* P<0.01

THEN: Sniffen, 2004
THEN: Lean, 2011
NOW: Havlin, 2014

NR
NR

No Added Fat Control
0.26
0.06

VIRTUS NUTRITION™ Makers of EnerGII®

Research Review by
Each fatty acid plays a unique role in the cow!
- Palmitic (16:0) & stearic (18:0) acids provide energy to the cow.
- Oleic (18:1) delivered to small intestine supports improved absorption of all fatty acids, including saturated.
- The balance of omega-6s vs. omega-3s is a key driver in immune regulation & energetics.

THE BOTTOM LINE:
- Differing profiles are utilized differently depending on amount and stage of lactation.
EnerGII Research Review
The Profile of EnerGII

- 50% Palmitic
- 4% Stearic
- 35% Oleic
- 8% Linoleic
Why Profile Matters:
Different Roles for Different Fatty Acids
Balance is Key!

**PALMITIC ACID**

- 50%
- It is well established\* that Palmitic supports milkfat, and to a greater extent than milk flow.
- Balance is key as milkfat is not the only goal.

**OLEIC ACID**

- 35%
- Oleic acid enhances the digestibility of all fatty acids via micelle formation****, supporting milk flow, reproduction and body condition replenishment.

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\* Steele and Moore, 1968; Noble, 1969; Steele, 1969; Mosley, 2007; Warnjes, 2008; Rico, 2011; Lock, 2013; Piantoni, 2013

** Adapted from Lock & Bauman, 2006; Sniffen, 2004.
Why Profile Matters:
Oleic Increases Digestibility of All Fatty Acids

How it Works

SHAPE MATTERS!
The bend in the unsaturated Oleic allows it to form micelle structures, increasing digestibility of all of the fatty acids in the small intestine (saturated and unsaturated).

• Adapted from Lock & Bauman, 2006; Sniffen, 2004.
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Digestibility Differences

<table>
<thead>
<tr>
<th></th>
<th>Palmitic</th>
<th>Stearic</th>
<th>Oleic</th>
<th>Linoleic</th>
<th>Linolenic</th>
</tr>
</thead>
<tbody>
<tr>
<td>16:0 Palmitic</td>
<td>75</td>
<td>72</td>
<td>80</td>
<td>78</td>
<td>77</td>
</tr>
<tr>
<td>18:0 Stearic</td>
<td></td>
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<tr>
<td>18:1 Oleic</td>
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<td>18:2 Linoleic</td>
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<td>18:03 Linolenic</td>
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- Lock et al., 2005
- Doreau and Ferley, 1994
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Points to Remember

- EnerGII has a balanced fatty acid profile with palmitic and oleic that consistently delivers more milk, milkfat and body condition.
- The consistent gains in production efficiency are due primarily to the greater digestibility of ALL fatty acids in the EnerGII diet, enhanced by the delivery of more oleic to the small intestine.
- While milkfat is an easy indicator of responses on farm, be sure to account for energy corrected milk and production efficiency as they are critical in determining true profitability of dietary changes.