Feed Efficiency in Growing Heifers

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Why improve heifer feed efficiency?

- Lower feed intake for similar gains
  - Reduced feed costs
    - Fewer days to payback heifer rearing cost
  - Less manure and nutrient output
    - Lower environmental impact
Heifer feed efficiency

- Typical values
  - 5 – 14 lb DM / lb gain
  - Older, larger heifers --> more feed for same gain

- Strategies to improve feed efficiency in dairy heifers
  - Limit-feeding
    - 10-30% improvement
  - Ionophore use
    - 5-10% improvement
  - Genetics/Genomics
Residual Feed Intake in Dairy Heifers?

- Australian research (Williams, 2011)
  - 900 heifers (5-7 months old)
  - Top 10% most efficient heifers (low RFI) ate 3.7 pounds less DM than bottom 10% (high RFI) for same rate of gain
Genomic RFI

USDA-NIFA feed efficiency project

- Genomic RFI predictions as lactating cow
  - Effects on heifer growth and feed efficiency??
Genomic Research in Heifers

Research at Marshfield ARS

- Relationship of RFI predicted as lactating cow with feed efficiency as heifers

  - Pre-bred and bred heifers
    - 128 heifers each group (256 total heifers)

  - RFI treatments
    - High vs. Low RFI

  - Diet treatments
    - High vs Moderate Energy (2015)
    - Ad-lib vs. Limit feeding (2016)
Measurements

• Daily pen intakes
• Initial & final weight & height
• Feed efficiency
• Rump fat and kidney fat depth
• Manure excretion and nutrient digestibility
Weights and Ultrasounding
# Preliminary Results - Bred Heifers

<table>
<thead>
<tr>
<th>Genomic RFI</th>
<th>Low</th>
<th>High</th>
<th>Diet</th>
<th>RFI x Diet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control</td>
<td>Straw</td>
<td>Control</td>
<td>Straw</td>
</tr>
<tr>
<td>DMI, lb/day</td>
<td>24.3</td>
<td>22.0</td>
<td>24.2</td>
<td>21.9</td>
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<tr>
<td>ADG, lb/day</td>
<td>2.55</td>
<td>2.07</td>
<td>2.61</td>
<td>1.86</td>
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<tr>
<td>Efficiency, lb DMI/lb gain</td>
<td>9.53</td>
<td>10.63</td>
<td>9.36</td>
<td>11.85</td>
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</tbody>
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Mooving Forward.
DAIRY SCIENCE AT WISCONSIN

Questions?