Nutritional Programs and Implants for Vac45 Programs

Paul Beck, Department of Animal and Food Sciences
Poll questions

1. Where do you keep calves when preconditioning post-weaning?
2. What is your preferred feeding system?
3. How long do you keep your calves post-weaning?
4. When do you give the first implant to your calves?
When you try something new.
Growth and Development

• As animals grow and mature
  • Protein growth increases at a decreasing rate
  • Fat laydown begins to increase as a percentage of growth rate

• Extended periods of low growth or growth promoting implants
  • Delay “physiological maturity”
    • Shift protein curve to left
    • Increase protein gain
    • Decrease fat gain
Growth Promoting Technologies

• Ionophores
  • Widely used since 1970’s
  • Targeted antibiotic (not medically important to humans) to increase ruminal microbe protein and energetic efficiency.
  • Coccidiostat – important for receiving/weaning steers
  • Increase gains of growing/finishing calves by 0.1 to 0.2 lbs/day
Growth Promoting Technologies

• Anabolic Steroids
  • Widely used since 1950’s
  • Safe effective growth promoting agents
    • > 90% of all feedlot cattle receive one or more in lifetime
    • Much lower with stocker operations
      • 78% large operations implant
      • 56% small operations implant
  • Enhance lean tissue and reduce fat deposition
    • Increase growth rate 10 – 30%
    • Increase feed efficiency 5 – 20%
    • Increase carcass weight 5 – 10%
Estrogen Content per Serving

Estrogen ng/pound

Unimplanted beef
Implanted beef
Open cow
Estrogen Content per Serving

<table>
<thead>
<tr>
<th>Food</th>
<th>Estrogen ng/pound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unimplanted beef</td>
<td>Very low</td>
</tr>
<tr>
<td>Implanted beef</td>
<td>Very low</td>
</tr>
<tr>
<td>Open cow</td>
<td>Low</td>
</tr>
<tr>
<td>Potatoes</td>
<td>Moderate</td>
</tr>
<tr>
<td>Peas</td>
<td>High</td>
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</tbody>
</table>
Estrogen Content per Serving

![Graph showing estrogen content per serving of various foods. Cabbage has significantly higher estrogen content compared to other foods.](image-url)
Estrogen Content per Serving

Estrogen ng/pound

- Unimplanted beef
- Implanted beef
- Open cow
- Potatoes
- Peas
- Cabbage
- 1 cup Soy Milk
Implanting on Wheat Pasture

Effect of Level of Gain on Response to Implant

- **Low Gain**
  - 0.28 lb/d increase = 20%

- **High Gain**
  - 0.34 lb/d increase = 15%

Bar chart showing average daily gain with different levels of implant gain.
Implant response with weaning calves

- Implanting during preconditioning or receiving
  - Consistently increases ADG during preconditioning by 0.2 lbs/day
    - Mader et al., 1985; Ralgro = +0.22 lbs/day during precon...no impact later
    - Mader et al., 1994; Ralgro = +0.23 lbs/day during precon...increased gains during finishing
    - Ball et al., 2019; Revalor-G = +0.27 lbs/day during precon/stocker...increase gains during finishing.
    - Poe et al., 2010; Ralgro = +0.04 lbs/day during receiving...80% sickpulls
    - Richeson et al., 2015; Synovex-S = +0.2 lbs/day during receiving...no impact during stocker phase
Implant Timing and Performance during Receiving and Grazing

### Receiving

<table>
<thead>
<tr>
<th>Category 1</th>
<th>Control</th>
<th>Impl 0</th>
<th>Impl 14</th>
<th>Impl 28</th>
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<tbody>
<tr>
<td></td>
<td>2.5</td>
<td>2.45</td>
<td>2.38</td>
<td>2.35</td>
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</table>

### Grazing + Overall

<table>
<thead>
<tr>
<th>Grazing + Overall</th>
<th>Control</th>
<th>Impl 0</th>
<th>Impl 14</th>
<th>Impl 28</th>
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<tr>
<td>Overall</td>
<td>2.5</td>
<td>2.45</td>
<td>2.38</td>
<td>2.35</td>
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</tbody>
</table>
Feeding Programs

- Multiple ways to get to the same result.
  - Drylot vs pasture
    - Supplement vs feeding
  - Hay with supplement vs total mixed rations
- What are the impacts of targeted gain?
  - 500 pound calves 45-day preconditioning
  - Fed vegetative bermudagrass hay (11% CP & 57% TDN) ($90/ton)
  - 14% CP supplement 32.5% SBH/CGF/Corn & 2.5% mineral premix ($235/ton)
  - Look at feeding for 1, 1.5 and 2 lbs/day gain
    - With or without ionophores and implants
## Feeding for Specified Performance

<table>
<thead>
<tr>
<th></th>
<th>1.0 lb/day</th>
<th>1.5 lb/day</th>
<th>2.0 lb/day</th>
<th>2.5 lb/day</th>
<th>3.0 lb/day</th>
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</thead>
<tbody>
<tr>
<td>No Technology</td>
<td>1</td>
<td>1.5</td>
<td>2</td>
<td>2</td>
<td>2.39</td>
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<tr>
<td>Ionophore</td>
<td>1.14</td>
<td>1.64</td>
<td>2.15</td>
<td>2.6</td>
<td>2.39</td>
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<tr>
<td>Implant</td>
<td>1.22</td>
<td>1.83</td>
<td>2.24</td>
<td>9.1</td>
<td></td>
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<tr>
<td>Implant + Ionophore</td>
<td>1.36</td>
<td>1.98</td>
<td>2.39</td>
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</tbody>
</table>

- 2.6 lbs of supplement
- 6.2 lbs of supplement
- 9.1 lbs of supplement
Feed Cost of Gain

<table>
<thead>
<tr>
<th>Average Daily Gain</th>
<th>No Technology</th>
<th>Implant + Ionophore</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>0.73</td>
<td>0.66</td>
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<tr>
<td>1.5</td>
<td>0.66</td>
<td>0.62</td>
</tr>
<tr>
<td>2</td>
<td>0.64</td>
<td>0.6</td>
</tr>
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</table>
Implications of Preconditioning Gain

• Use of DGS in Preconditioning Programs – Winterholler et al., 2009
• 128 weaned calves
• Fed free choice prairie hay (5.5% CP & 53% TDN) with 0.3, 0.75, 1.2, or 1.65% of BW DDGS
  • 1.5, 3.6, 5.8, 7.7 lbs DDG/day
  • 56-days preconditioning
  • wheat pasture for 128 days
  • Feedlot for 97 days
DDG and Hay Intake

Intake, lb/day

<table>
<thead>
<tr>
<th></th>
<th>Hay Intake</th>
<th>DDG Intake</th>
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</thead>
<tbody>
<tr>
<td>0.3</td>
<td>9.3</td>
<td>1.5</td>
</tr>
<tr>
<td>0.75</td>
<td>9.2</td>
<td>3.6</td>
</tr>
<tr>
<td>1.2</td>
<td>7.8</td>
<td>5.8</td>
</tr>
<tr>
<td>1.65</td>
<td>7.4</td>
<td>7.7</td>
</tr>
</tbody>
</table>

- 10.8 lb/d
- 12.8 lb/d
- 13.6 lb/d
- 15.1 lb/d

0.6 lb replacement
0.2 lb replacement
Use of DGS in Preconditioning Programs – Steer Gains

Total compensatory gain 22 to 60% of difference at end of precon
Feeding Level TMR during Preconditioning

• Fed calves post-weaning in drylot 40 days.
• TMR restricted limit-fed or full-feed (14% CP, 50 mcal NEg/lb)
  • 30% grass hay
  • 33% corn
  • 32% soybean hulls
  • 4% protein/mineral premix
  • 1% water
• Placed on small grain pasture for restricted or unrestricted performance.
## Restriction during preconditioning

<table>
<thead>
<tr>
<th>Item</th>
<th>RSTR – No Impl</th>
<th>RSTR - Impl</th>
<th>Unrstr – No Impl</th>
<th>Unrstr - Impl</th>
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</thead>
<tbody>
<tr>
<td>Precon ADG</td>
<td>1.80</td>
<td>1.70</td>
<td>2.27</td>
<td>2.84</td>
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<tr>
<td>Grazing ADG</td>
<td>1.73</td>
<td>2.10</td>
<td>2.21</td>
<td>2.41</td>
</tr>
<tr>
<td>Prefinishing ADG</td>
<td>1.75</td>
<td>1.90</td>
<td>2.25</td>
<td>2.62</td>
</tr>
<tr>
<td>Finishing ADG</td>
<td>3.40</td>
<td>3.40</td>
<td>3.42</td>
<td>3.42</td>
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</tbody>
</table>
Conclusions

• Targeted performance should be based on the cattle type
  • Heifers and small frame steers start fattening earlier than large-frame steers
    • High growth/Large frame or implanted cattle can be fed for higher performance before getting into ‘fleshy’ discounts.
    • 1.75 to 2 lb/day seems to be a good target.

• Supplement type and supplementation rates should match forage resources
  • 0.75 to 1% of bodyweight to get 2 lbs/day average daily gain

• Total mixed rations should be designed to hit targeted performance
  • Adequate fiber levels – gut health
  • Balanced protein and mineral concentrations
  • Feed management is key to success – bunk reading, on-time delivery...
Do you have to do everything right?