INFLUENCE OF WEANING DATE (EARLY OR NORMAL) ON PERFORMANCE, HEALTH, AND CARCASS CHARACTERISTICS OF MAY BORN ANGUS CALVES

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BACKGROUND

- Cow-calf production (ranching) is an important ag enterprise (ND and SD)

- Estimate > 5.23 million head cattle worth over $5.4 billion (USDA NASS, 2005)

- Calves produced in early spring months and sold at weaning

- Region has been impacted by drought past 6 years
• Regional producers use early weaning as a management tool in times of drought

• Other reasons for early weaning (Myers et al., 1999):
  – Feed in short supply or poor quality
  – Cows are poor milkers or first calf heifers
  – Cows calve late

• Past early weaning research focused on March calving cow herds

• Little research on May-June calving cow herds
ADVANTAGES OF EARLY WEANING

• Lowers nutrient requirements for cow
• Increases pasture carrying capacity
  reduced forage demand by cow
• Gives cow time to regain body condition
• May improve cow reproductive performance if
  weaned early enough
• Improves efficiency of gain on EW calf
• May improve quality grade of EW calf
• Can market cull cows before seasonal market
  lows
DISADVANTAGES OF EARLY WEANING

- Requires more labor
- Higher nutritional requirements
- Requires facilities and feed for calves
- Greater focus on vaccinations and health program
- Possible increased health problems
- Possible EW calves may have lower carcass weights or become fatter at lighter weights
- Increased cash costs up front
EARLY WEANING CONSIDERATIONS

→ Complete castration, dehorning, and branding at least 10-14 days prior to weaning
→ Vaccinate calves against clostridial and viral infections prior to weaning (1 month)
→ Treat for internal and external parasites
→ Provide protection from flies
→ Consider use of growth implants
→ Fence line wean to reduce stress?
→ Does it fit my production system?
EARLY WEANING
CONSIDERATIONS

→ Decide destination for calves:
  • Sell straight off cow
  • Background
  • Retained ownership
→ Creep feed calves to aid in starting calves on feed
→ Provide access to good quality, clean water
→ Monitor calves frequently (2-3X/day) for signs
  • Respiratory disease
  • Digestive disturbances
  • Scours
  • Coccidiosis
  • Intake level
CALF BACKGROUNDING STUDY

OBJECTIVE

Evaluate effects of early or normal weaning practices on May born calves:

• Calf growth
• Calf health
• Carcass characteristics
EXPERIMENTAL PROTOCOLS

48 Angus steer and heifer calves

Randomly assigned to weaning date: EW = Sept. 19 or NW = Nov. 15; 24 steers and heifers per wean date
EW calves = 417 lbs, 139 d of age; NW calves = 559 lbs, 197 d of age

Calves stratified by BW, sex and randomly allotted to 12 pens (4 calves/pen; 6 reps/wean date)

Dry hay receiving ration 14d
Growing diet composed of barley silage, whole shell corn, oat hay, 27% CP supplement containing Rumensin®, calcium carbonate, 44% SBM, and Deccox® medicated crumbles.
Target gain = 2.5 lbs
EXPERIMENTAL PROTOCOLS

• Calves vaccinated with 7 way clostridial (1x), 5 way ML viral (2x), Mannheimia hemolytica (1x), and Hemophilus somnus (1x)

• Calves implanted with Ralgro® implant

• Calves observed daily for signs of respiratory disease (2-3X/d)

• 2 d weights taken on individual calves at start and end of performance trial; interim weights taken d 36, 52 and 64 to evaluate calf growth performance and health status
• Diet samples collected d 14, 32, 54, 67, and 78

• Data measured: Weight Gain (ADG), Feed intake, Feed: gain, Cost of gain. Nutritional components measured: DM, Ash, CP, NDF, ADF, Ca, P, K, and Nitrate concentration

• Performance data analyzed as a randomized complete design using SAS PROC MIXED procedures with pen as experimental unit; mean separation by Least Significant Difference ($P < 0.05$ level)
### DIET INGREDIENT COMPOSITIONS FED TO EW AND NW CALVES

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Percent Dry Matter Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EW Receiving</td>
</tr>
<tr>
<td>Alfalfa-Grass hay</td>
<td>22.15</td>
</tr>
<tr>
<td>Barley hay</td>
<td>12.80</td>
</tr>
<tr>
<td>Oat hay</td>
<td>13.05</td>
</tr>
<tr>
<td>Mixed hay</td>
<td>---</td>
</tr>
<tr>
<td>Barley silage</td>
<td>---</td>
</tr>
<tr>
<td>Whole shell corn</td>
<td>43.40</td>
</tr>
<tr>
<td>Supplement pellet a</td>
<td>7.15</td>
</tr>
<tr>
<td>Deccox® med. crumbles</td>
<td>1.45</td>
</tr>
<tr>
<td>Soybean meal, 44%</td>
<td>---</td>
</tr>
<tr>
<td>Calcium carbonate</td>
<td>---</td>
</tr>
</tbody>
</table>

*a 27% Commercial supplement (as fed): 27% CP, min Ca 2.0%, min P 0.7%, min K 0.7%, min Vitamin A 27,000 IU/lb, min Vitamin D₃ 1,700 IU/lb, min Vitamin E 100 IU/lb, and Rumensin® 225 mg/lb.
## DIET NUTRIENT COMPOSITIONS FED TO EW AND NW CALVES

<table>
<thead>
<tr>
<th>Diet</th>
<th>Percent Dry Matter Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EW Receiving</td>
</tr>
<tr>
<td>DM, %</td>
<td>94.22</td>
</tr>
<tr>
<td>CP, %</td>
<td>14.30</td>
</tr>
<tr>
<td>ADF, %</td>
<td>26.20</td>
</tr>
<tr>
<td>NDF, %</td>
<td>45.60</td>
</tr>
<tr>
<td>Ca, %</td>
<td>0.87</td>
</tr>
<tr>
<td>P, %</td>
<td>0.38</td>
</tr>
<tr>
<td>K, %</td>
<td>1.79</td>
</tr>
<tr>
<td>Nitrate, ppm</td>
<td>1200</td>
</tr>
<tr>
<td>NE&lt;sub&gt;m&lt;/sub&gt;, Mcal/lb</td>
<td>0.79</td>
</tr>
<tr>
<td>NE&lt;sub&gt;g&lt;/sub&gt;, Mcal/lb</td>
<td>0.54</td>
</tr>
<tr>
<td>Rumensin ®, mg/h/d</td>
<td>256</td>
</tr>
<tr>
<td>Deccox ®, mg/h/d</td>
<td>154</td>
</tr>
</tbody>
</table>
WEANING DATE IMPACT ON BACKGROUNDING PERFORMANCE

**EW calves**
- In Wt. gain: 299 lbs
- Out Wt.: 782 lbs
- P = 0.001

**NW calves**
- In Wt. gain: 519 lbs
- Out Wt.: 736 lbs
- P < 0.0001

**Additional Data**
- P = 0.12
- P < 0.0001
WEANING DATE IMPACT ON BACKGROUNDING PERFORMANCE

**Lbs/day**

- **EW calves**: ADG = 3.24, DMI = 17.7, \( P = 0.24 \)
- **NW calves**: ADG = 3.43, DMI = 17.5, \( P = 0.71 \)
## WEANING DATE IMPACT ON BACKGROUNDING PERFORMANCE

<table>
<thead>
<tr>
<th>Item</th>
<th>EW calves</th>
<th>NW calves</th>
<th>SEM&lt;sup&gt;a&lt;/sup&gt;</th>
<th>P - value&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed: gain</td>
<td>5.51</td>
<td>5.25</td>
<td>0.18</td>
<td>0.35</td>
</tr>
<tr>
<td>Mortality, %</td>
<td>4.17</td>
<td>0</td>
<td>0.03</td>
<td>0.35</td>
</tr>
<tr>
<td>Respiratory treatment, %</td>
<td>12.50</td>
<td>33.33</td>
<td>0.08</td>
<td>&lt; 0.10</td>
</tr>
<tr>
<td>Vet Med Costs, $/h</td>
<td>15.37</td>
<td>14.50</td>
<td>3.50</td>
<td>0.86</td>
</tr>
<tr>
<td>Feed Cost of gain, $/lb</td>
<td>0.52</td>
<td>0.47</td>
<td>0.02</td>
<td>0.11</td>
</tr>
<tr>
<td>Total Cost of gain, $/lb</td>
<td>0.57</td>
<td>0.58</td>
<td>0.04</td>
<td>0.76</td>
</tr>
</tbody>
</table>

<sup>a</sup> Standard Error of Mean; n = 6.

<sup>b</sup> P-value for separation of treatment means.
WEANING DATE IMPACT ON CARCASS CHARACTERISTICS

- EW calves: Live wt. = 1075 lbs, HCW = 649 lbs, $P = 0.24$
- NW calves: Live wt. = 1042 lbs, HCW = 625 lbs, $P = 0.23$
WEANING DATE IMPACT ON CARCASS CHARACTERISTICS

<table>
<thead>
<tr>
<th>Item</th>
<th>EW calves</th>
<th>NW calves</th>
<th>SEM\textsuperscript{a}</th>
<th>P-value\textsuperscript{b}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marbling Number</td>
<td>483</td>
<td>465</td>
<td>14.8</td>
<td>0.43</td>
</tr>
<tr>
<td>Backfat, in.</td>
<td>0.56</td>
<td>0.53</td>
<td>0.05</td>
<td>0.68</td>
</tr>
<tr>
<td>REA, in.\textsuperscript{2}</td>
<td>11.8</td>
<td>11.08</td>
<td>0.43</td>
<td>0.27</td>
</tr>
<tr>
<td>KPH, %</td>
<td>2.41</td>
<td>2.50</td>
<td>0.53</td>
<td>0.29</td>
</tr>
<tr>
<td>USDA YG (adjusted)</td>
<td>3.04</td>
<td>3.19</td>
<td>0.22</td>
<td>0.65</td>
</tr>
</tbody>
</table>

\textsuperscript{a} Standard Error of Mean; n = 6.
\textsuperscript{b} P-value for separation of treatment means.
IMPLICATIONS

• EW calves were younger and lighter BW at weaning; EW calves heavier at study end

• Weaning date did not affect ADG, DMI, or feed conversions of EW Calves

• Weaning date did not influence calf health, mortality, or carcass characteristics

• Early weaning of calves born between April 15 and June 15 viable option

• More research needed to assess EW effects on backgrounding and finishing phases of late spring born calves