Heifer Nutritional Development
And the Target Weight Debate

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A pregnant heifer is not the same as an early pregnant heifer

Early Calving Is Important

• Heifers becoming pregnant in the first 21 d weaned heavier calves through first 6 lactations.

Cushman et al., 2013
Preweaning growth and ADG

- Weaning weight is negatively correlated with age at puberty. (Patterson et al., 1992)
- Increasing ADG preweaning decreased age at puberty (Arjie and Wiltbank, 1971).

Preweaning ADG and Precocious Puberty

<table>
<thead>
<tr>
<th>Year</th>
<th>ADG (lb/d)</th>
<th>Precocious puberty (%)</th>
<th>Age at precocious puberty (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>1.7 ± 0.07</td>
<td>25</td>
<td>206 ± 14.8</td>
</tr>
<tr>
<td>1991</td>
<td>1.3 ± 0.04</td>
<td>16</td>
<td>158 ± 14.2</td>
</tr>
</tbody>
</table>

Wehrman et al., 1996

Preweaning nutritional management can affect subsequent heifer reproductive performance.

Managers need to make decisions on when and if to employ weaning or supplementation strategies.

Day et al., 2001; Sexton et al., 2005; Waterman et al., 2012

Effect of weaning age (P < 0.09); ±(P < 0.05)
Impact of pattern of gain on pregnancy rates in replacement beef heifers

<table>
<thead>
<tr>
<th>Study</th>
<th>No. of heifers</th>
<th>Even gain</th>
<th>Slow - Fast</th>
<th>Fast - Slow</th>
<th>Fast-Slow - Fast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clanton et al., 1983</td>
<td>180</td>
<td>82.0 %</td>
<td>75.0 %</td>
<td>73.0 %</td>
<td>--</td>
</tr>
<tr>
<td>Lynch et al., 1987</td>
<td>160</td>
<td>87.4 %</td>
<td>87.2 %</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Poland et al., 1998</td>
<td>96</td>
<td>75.0 %</td>
<td>--</td>
<td>--</td>
<td>89.6 %</td>
</tr>
<tr>
<td>Grings et al., 1999</td>
<td>210</td>
<td>81.8 %</td>
<td>--</td>
<td>--</td>
<td>86.6 %</td>
</tr>
</tbody>
</table>

Adapted from Short and Bellows, 1971

— Heifers should gain 1.25 – 1.75 lb per day from weaning until breeding

Impact of Sorting for Winter Feeding

Delaying gain until closer to breeding

• Decreases feed costs 10%
• Still have similar prebreeding weights
• Similar % cycling and pregnant
• May increase follicular reserve/longevity

Impact of RUP During Development on Cow Longevity

C17:31COOH

UIP

ARSBC 2016, Des Moines, IA
Ionophores
• Bovatec, Rumensin
• Increase feed efficiency
• Decrease age at puberty by 14 to 21 days

Minerals
• Calcium and Phosphorus – 2:1
• Trace minerals extremely important
  – Cu, Mn, Se, Zn
  – Portion organic or chelated
  – Be careful of antagonisms
• Need to be formulated for your ranch/area
• Injectable minerals have value

There is considerable flexibility in designing postweaning development systems.

Nutritional shifts pre- or post-breeding may alter pregnancy rates
Previous experience with grazing situations or types of forage may improve reproductive performance

The Target Weight Debate

65% VS 55%
Why a 65% Target?

- Greater dystocia in 55% target wt heifers. (Patterson et al., 1991)
- Large framed heifers developed under restricted conditions have poor reproduction. (Buttram and Wilham, 1987)

Argument for 65%

**Pro**
- Works! (Breed, biotype, environment)
- Less calving difficulty
- Advantageous if:
  - Heifer values high
  - Feed costs low
  - Pasture costs high
- "Forgiveness"

**Con**
- High feed prices
- Reduced selection pressure for early puberty
- Overconditioning
- "Pasture crash" risk

Impact of 55% Target Weight

- No significant decrease in pregnancy rates
- Average calving date equal
- Longevity similar through 3 calvings

**Why a 55% Target?**

- Reduced feed cost by $22 per pregnant heifer

Impact of 55% Target Weight

- No significant decrease in pregnancy rates
- Average calving date equal
- Longevity similar through 3 calvings

**Effect of target weight, P < 0.01**

Funston and Deutscher, 2004

**Why a 65% Target?**

- Greater dystocia in 55% target wt heifers. (Patterson et al., 1991)
- Large framed heifers developed under restricted conditions have poor reproduction. (Buttram and Wilham, 1987)
Cautions with 55% Target

- Heifers must gain weight during the breeding season.
- Going below 55% may be detrimental
  - Decreased WW as 2yr old
  - Delayed calving as 3yr old
  - Offset of reduced development costs

Creighton et al., 2005

Lower Target Weight and AI

- Restriction tended (P<0.08) to decrease AI pregnancy rate
- Partially influenced by preweaning and pre-trial ADG
- May delay date of conception

Roberts et al., 2009

Argument for 55%

<table>
<thead>
<tr>
<th>Pro</th>
<th>Con</th>
</tr>
</thead>
<tbody>
<tr>
<td>Works!</td>
<td>Data from early maturing composites</td>
</tr>
<tr>
<td>Need to gain weight during breeding</td>
<td>&lt; 55% risky</td>
</tr>
<tr>
<td>Reduced development costs</td>
<td>May not be compatible with AI</td>
</tr>
<tr>
<td>Reproduction similar</td>
<td>No forgiveness</td>
</tr>
</tbody>
</table>

Factors in Selecting Target Weight

- 65% of Mature Weight
  - Purebred or straightbred heifers
  - Later maturing breeds
  - Large frame cows
  - Limited cow numbers
  - Good forage resources
  - High replacement heifer value
  - Limited marketing options for open heifers

- 55% Mature Weight
  - Crossbred heifers
  - Earlier maturing breeds
  - Moderate framed cows
  - Large herd (>200 cows)
  - Limited forage resources
  - Average replacement heifer value
  - Ability to retain ownership on heifers in feedlot

Summary

- Select early born replacements
- Monitor pre-weaning environment
- Choose target weight for your operation
- Develop post-weaning nutritional plan
- Feed for the cow environment
- Use reproductive technologies

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