Feeding Heifers from Weaning to Calving

Patrick French

Post - Weaning Feeding

- Critical period for calves
  - Coccidiosis - bovatec, rumensin, deccox, Corrid in starter
  - Stresses – diet and behavior
- Calf starter to 5 - 6 lb./day
  - Then supplement with good hay
- Shift to cheaper concentrate after 3 - 4 months
  - Balance to meet needs based on forages

Feeding the Heifer - 3 to 13 mo

- Rate of gain critical
- Mammary development
  - Excessive gains detrimental on milk yield
  - Holstein - 1.5 - 2.0 lb. of gain/day
  - Regulate rate of gain by controlling energy concentration - fiber concentration
- Age at breeding
  - Puberty depends on BW (Holstein = 700 lb)

Nutrients

- Energy (units = Mcal)
  - Net energy for maintenance (NEM)
  - Net energy for gain (NEG)
- TDN?
- Crude protein (CP) (units = grams)
- Minerals
- Vitamins

Nutrient Requirements Energy

- Maintenance
  - Requirement for all animals is related to surface area
  - Body weight raised to the 2/3 or 3/4 power is most common
  - NEM (Mcal/d) = 0.86 x BW^{0.75}
- Growth
  - Depends on rate of gain
  - Goal = 1.7 lb/d

Nutrient Requirements Energy

- Growth
  - Goal is calve at 24 mo of age at 1300 lb
  - 1220 lb/730 days = 1.7 lb ADG (760 g/d)
  - NEG (Mcal/d) = 0.035 x BW^{0.75} x (ADG/1,000) + 1.0 x ADG/1,000
  - Requirement per unit gain increases as BW increases
Nutrient Requirements Protein

- Maintenance
  - Depends on BW

- Growth
  - Depends on rate of gain
  - Requirement per unit gain increases as BW increases

Nutrients Required/1.7 lb Gain

<table>
<thead>
<tr>
<th>Body Weight, lb</th>
<th>NE\text{G}, Mcal/d</th>
<th>Protein, g/d</th>
</tr>
</thead>
<tbody>
<tr>
<td>440</td>
<td>1.83</td>
<td>241</td>
</tr>
<tr>
<td>660</td>
<td>2.48</td>
<td>243</td>
</tr>
<tr>
<td>880</td>
<td>3.08</td>
<td>248</td>
</tr>
<tr>
<td>1100</td>
<td>3.64</td>
<td>259</td>
</tr>
</tbody>
</table>

Net Energy Requirement

![Net Energy Requirement Graph]

CP Requirement

![CP Requirement Graph]

Heifer Groups and Feeding

- No. of groups depends on herd size and facilities
  - 4 – 5 groups suggested

- Group 1 Postweaning
  - Starter/grower and dairy quality alfalfa hay

- Groups 2 and 3 - grower and hay
  - Corn/grass silage or grass hay, concentrate based on needs
  - Pre - breeding groups

Heifer Groups and Feeding

- Group 4 - Breeding age groups
  - silage, hay, grain

- Group 5 - Bred Heifers
  - Body condition and supplement
  - Poorest quality forage

- More groups = better nutrition but more labor
Forages for Heifers

- Allocate quality where it will be used the best
  - Highest quality for younger heifers
  - Older heifers must receive poorer quality!
    - 1st cut hays
    - By-product feeds
- Formulate rations for heifers to adequately supplement forages used

Complete Rations for Heifers

- Every bite is a balance ration
- All ingredients in desired proportions
- Desire ad-lib intake
  - Limit intake through fiber levels
  - Fiber sources to limit intake
    - Poorer quality silage
    - Ground hay and straw
    - Cottonseed hulls

Complete rations for heifers

- Advantages of TMR’s for heifers
  - Minimize feed competition
  - Small meals
  - Use by-product feeds
  - Feed waste
- Concerns
  - Need mix wagon
  - Heifer groups large enough to justify use of mix wagon

Growth charts

- Need to routinely monitor growth
  - Need facilities to do this
  - Gains 1.0 - 2.0 lb/day (0 – 3 lb/day)
- Most variation between growth rates attributed to environment rather than feeding program
- Must adjust feeding according to growth

Virginia

- 500 lb heifer gaining 1.8 lb/day

<table>
<thead>
<tr>
<th>Feed</th>
<th>lb (as-fed)</th>
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<tbody>
<tr>
<td>Corn Silage</td>
<td>15.0</td>
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<tr>
<td>Grass hay</td>
<td>5.0</td>
</tr>
<tr>
<td>Corn grain</td>
<td>3.5</td>
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<tr>
<td>Soybean meal</td>
<td>1.0</td>
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</table>

- 13.8 lb. DMI
- 12.0% CP
- 1.56 Mcal/kg NEM
- 0.96 Mcal/kg NEG
- 44% NDF
- $0.63/day

Texas (500 lb heifer gaining 1.8 lb/day)

<table>
<thead>
<tr>
<th>Feed</th>
<th>lb (as-fed)</th>
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<tbody>
<tr>
<td>Cotton gin trash</td>
<td>1.6</td>
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<tr>
<td>Rolled corn</td>
<td>2.8</td>
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<tr>
<td>Distillers</td>
<td>1.0</td>
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<tr>
<td>Cotton sweepings</td>
<td>0.8</td>
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<tr>
<td>Alfalfa hay</td>
<td>2.2</td>
</tr>
<tr>
<td>Wheat midds</td>
<td>3.6</td>
</tr>
<tr>
<td>Cottonseed meal</td>
<td>0.8</td>
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<tr>
<td>Sorghum silage</td>
<td>2.8</td>
</tr>
<tr>
<td>Milk</td>
<td>4.0</td>
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</tbody>
</table>

- 13.8 lb. DMI
- 17.0% CP
- 1.67 Mcal/kg NEM
- 1.06 Mcal/kg NEG
- 36% NDF
- $0.63/day
Colorado

- 500 lb heifer gaining 1.5 lb/day

<table>
<thead>
<tr>
<th>Feed</th>
<th>lb (as-fed)</th>
<th>lb DMI</th>
<th>CP</th>
<th>Mcal/kg NEM</th>
<th>Mcal/kg NEG</th>
<th>NDF</th>
<th>Cost/day</th>
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</thead>
<tbody>
<tr>
<td>Wheat straw</td>
<td>3.2</td>
<td>13.2</td>
<td>11.2%</td>
<td>1.40</td>
<td>0.82</td>
<td>46%</td>
<td>$0.44</td>
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<td>Wet brewers</td>
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<tr>
<td>Carrots</td>
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</tr>
<tr>
<td>Beet pulp</td>
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<tr>
<td>Corn screenings</td>
<td>2.4</td>
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<tr>
<td>Alfalfa silage</td>
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<td></td>
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