2009 Georgia Grazing School:
Grazing herd management issues for beef cattle

Pasture-Based Nutrition Considerations for Beef Cattle

Lawton Stewart
Extension Animal Scientist
April 15, 2009

Developing a Feeding Strategy

1. Understand your production system
   – Fall Calving
   – Spring Calving
2. Understand your forage system
   – Pasture
   – Conserved forage
3. Develop an economical supplement

Reproductive Efficiency

• The most important factor affecting profitability
• Highly dependent on proper nutrition

Nutrient Priorities

1. Maintenance
2. Growth (Steers & Heifers)
3. Lactation
4. Reproduction

Energy Requirements
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**Available Forages**

- Hay produced?
  - Storage
  - Testing
  - Inventory

**Hay Cutting**

- CP 14% TDN 60%
- CP 10% TDN 55%
- CP 6% TDN 47%

**Production Phase**

- Dry Cow
- Late Gestation
- Early Lactation

**Byproduct Feeding**

- What's available
- Price
  - Evaluate on DM basis
  - Look at $/nutrient
- Handling / Storage
- Minerals???

**Potential Byproducts**

1. Grain
   - Corn gluten feed
   - Distiller's grains
   - Soy hulls
   - Wheat middlings

2. Cotton
   - Whole seed
   - Gin trash
   - Hulls

3. Sugar and starch production
   - Cane, beet & corn molasses
   - Salvage candy

4. Vegetable
   - Cull vegetables

**Corn**

- Grain is about 10% CP and 90% TDN
- Can also be high moisture or ground ear corn
- Most popular concentrate
- High starch

**Corn Gluten Feed**

- Results from wet milling of corn to produce corn starch, oil and syrup. Probably 6 million tons per year.
- About 24% CP and 80% TDN
- Low Calcium; High Phosphorus
- Low starch
- High sulfur
- LIMIT TO 30% of intake

**Distiller's Grains**

- Byproduct of ethanol production
- Available:
  - Wet (~47% DM)
  - Dry (~90% DM)
- Very similar to corn gluten feed (↑CR, ↑TDN, ↑P, ↑S)
- Higher rumen undegradable protein (bypass protein)
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**Wheat**
- 105% value of corn
- May pack in stomach if ground too fine
- Generally not over 50% of ration

**Wheat Middlings**
- Seven million tons of flour by-products available
- 18% CP, 83% TDN (20 – 30% starch)
- Do not store well – readily absorbs moisture from the air
- Feed with caution due to the rapidly fermentable starch content
- Low Calcium, High Phosphorus

**Whole Cottonseed**
- High energy due to oil content
- Doesn’t have to be processed
- Doesn’t flow well in feeders; should be fed in troughs

**Cottonseed Hulls**
- Low TDN and CP
- Good source of roughage
- Doesn’t flow

**Soy Hulls**
- Excellent palatability
- Less starch content than grains; therefore, less negative effect on forage utilization
- Safer, less incidence of founder

### Effect of Increasing Corn on Hay Intake and Digestibility

<table>
<thead>
<tr>
<th></th>
<th>Corn, lbs/day</th>
<th>2.2</th>
<th>4.4</th>
<th>6.6</th>
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<tbody>
<tr>
<td>Hay DMI</td>
<td>lbs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>19.3</td>
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<tr>
<td>Total DMI</td>
<td>lbs</td>
<td>20.9</td>
<td>21.1</td>
<td>18.6</td>
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<tr>
<td>DOMI, lbs</td>
<td></td>
<td>7.5</td>
<td>8.4</td>
<td>7.1</td>
</tr>
<tr>
<td>Hay OM Digest, %</td>
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<td>36.5</td>
<td>35.1</td>
<td>23.6</td>
</tr>
</tbody>
</table>

JAS 65:557

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Effect of Increasing Soybean Hulls on Hay Intake

<table>
<thead>
<tr>
<th>SH, lbs/day</th>
<th>None</th>
<th>2.2</th>
<th>4.4</th>
<th>6.6</th>
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<tbody>
<tr>
<td>Hay, OMI, lbs</td>
<td>21.4</td>
<td>22.3</td>
<td>21.6</td>
<td>19.9</td>
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<tr>
<td>DOMI, lbs</td>
<td>10.6</td>
<td>11.8</td>
<td>12.3</td>
<td>12.7</td>
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</table>

Byproduct Pricing

"I can get a ton of DDGS for $155 and/or cull carrots for $25 a ton. Which one do I get?"

<table>
<thead>
<tr>
<th>Item</th>
<th>DDGS</th>
<th>Carrots</th>
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<tbody>
<tr>
<td>Moisture, %</td>
<td>10</td>
<td>88</td>
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<tr>
<td>DM, lb/ton</td>
<td>1800</td>
<td>240</td>
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<td>Price, $/lb DM</td>
<td>0.086</td>
<td>0.105</td>
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</table>

Byproduct Pricing

<table>
<thead>
<tr>
<th>Ingredient</th>
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<th>% CP</th>
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<tr>
<td>SBM 48</td>
<td>$ 350.00</td>
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<td>47.7</td>
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<td>$ 0.229</td>
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$/ton of nutrient / % DM / % nutrient / 2000 lb = $/lb of nutrient

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<td>Corn Gluten Feed</td>
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<td>25.6</td>
<td>83.0</td>
<td>$ 0.304</td>
<td>$ 0.093</td>
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<td>Distillers Grain</td>
<td>$ 165.00</td>
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<td>10.0</td>
<td>90.0</td>
<td>$ 0.917</td>
<td>$ 0.162</td>
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<tr>
<td>Soyhulls</td>
<td>$ 140.00</td>
<td>90.0</td>
<td>12.1</td>
<td>77.0</td>
<td>$ 0.642</td>
<td>$ 0.101</td>
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<tr>
<td>Wheat Middlings</td>
<td>$ 175.00</td>
<td>90.0</td>
<td>18.4</td>
<td>83.0</td>
<td>$ 0.528</td>
<td>$ 0.117</td>
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<tr>
<td>Whole Cottonseed</td>
<td>$ 250.00</td>
<td>90.0</td>
<td>23.0</td>
<td>95.0</td>
<td>$ 0.604</td>
<td>$ 0.146</td>
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Byproduct Handling/Storage

Byproduct Minerals

- Supplement Ca to for proper Ca:P ratio
  - Avoid urinary calculi
- Monitor sulfur levels
  - Avoid polioencephalomalacia
  - Cu deficiency
- N and P excretion
  - Environmental impact

How much do I feed?

<table>
<thead>
<tr>
<th>Stage of Productive Requirement</th>
<th>Poor Forage, 7% CP, 45% TDN</th>
<th>Average Forage, 10% CP, 50% TDN</th>
<th>Excellent Forage, 13% CP, 55% TDN</th>
<th>Supplement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Cow</td>
<td>350.00, 55% TDN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Late Gestation</td>
<td>450.00, 50% TDN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early Lactation</td>
<td>550.00, 45% TDN</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| -5:50 mix of corn gluten feed and soyhulls

Take Home Message

- Understand changing nutrient needs throughout production cycle.
- Know your forages.
- Use economic strategies when supplementation is needed.
- NOT ALL FEEDS ARE CREATED EQUAL

Questions?

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