Winter Feeding Based on a Forage Test

MARK MAULDIN
FEBRUARY 2016
NW FL BEEF CONFERENCE
Strategic Winter Feeding

- Determine nutrient demands of cattle
- Determine nutrient content of forage
- Pair cattle and forages based on nutrient content and demand
- Supplement to fill nutritional gaps
Determining Nutrient Demands of Cattle

- Cattle require specific amounts of specific nutrients
  - TDN (energy), CP (protein), etc.
- Cattle can/will only eat so much each day (DMI)
- The DM consumed must contain adequate amounts of the required nutrients (Nutrient Density)
Determining Nutrient Demands of Cattle

- Factors Effecting Nutrient Demand
  - Size/weight
  - Gestation
  - Lactation
  - Growth
Determining Nutrient Demands of Cattle

Nutritional Requirements are known, assuming you know your cows...

Chart from Basic Nutrient Requirements of Beef Cows By: Hersom; [https://edis.ifas.ufl.edu/an190](https://edis.ifas.ufl.edu/an190)
Determining Nutrient Demands of Cattle

- Individual requirements vs. Herd requirements
- Management (i.e. defined calving season)
- Grouping (heifers, pairs, etc.)
Determining Nutrient Content of Forages

- Forage quality is highly variable
  - Maturity
  - Species/Variety
  - Rain Damage
  - Storage
  - Fertilization
Determining Nutrient Content of Forages

- Nutrient content of a bale is even harder to determine

- What is a bale?
  - Size?
  - Weight?
  - Moisture Content?

- Forage Variability + Bale Variability = Confusion
Determining Nutrient Content of Forages

- To determine the nutrient content of a bale, you must...
  - Determine bale weight
    - Scale
  - Determine nutrient content
    - Laboratory forage analysis
- Together, you can determine pounds of specific nutrients per bale
Forage Analysis

Feed and Forage Analysis Report

Crop: BERMUDA GRASS
Use: Hay
Species: BERMUDA GRASS
Class/Weight: LACTATING COWS

Near Infrared Reflectance (NIR) Analysis

<table>
<thead>
<tr>
<th>Component</th>
<th>Analyzed</th>
<th>Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Protein (Estimated)</td>
<td>10.1 %</td>
<td>12.1 %</td>
</tr>
<tr>
<td>Crude Fiber</td>
<td>26.1 %</td>
<td>31.2 %</td>
</tr>
<tr>
<td>Neutral Detergent Fiber</td>
<td>57.4 %</td>
<td>66.8 %</td>
</tr>
<tr>
<td>Acid Detergent Fiber</td>
<td>34.0 %</td>
<td>37.0 %</td>
</tr>
<tr>
<td>Ash</td>
<td>4.21 %</td>
<td>5.04 %</td>
</tr>
<tr>
<td>Non-Starch Carbohydrates</td>
<td>12.77 %</td>
<td>15.16 %</td>
</tr>
<tr>
<td>All-Natural Detergent Fiber</td>
<td>35.29 %</td>
<td>38.19 %</td>
</tr>
<tr>
<td>Neutral Detergent Fiber Crude Protein</td>
<td>44.07 %</td>
<td>52.72 %</td>
</tr>
<tr>
<td>Digestible Dry Matter</td>
<td>70.00 %</td>
<td>68.83 %</td>
</tr>
</tbody>
</table>

Other Analyses

<table>
<thead>
<tr>
<th>Constituent</th>
<th>As Sampled</th>
<th>Dry Matter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrate</td>
<td>1947 ppm</td>
<td>1905 ppm</td>
</tr>
</tbody>
</table>

Contact
Food and Environmental Water Laboratory
2200 College Station Road
Athens, GA 30602
p. 706-542-7699
Fax: 706-542-7699
Email: forage@uga.edu

Cooperative Extension is an equal opportunity/affirmative action program provider. It is assumed the information presented is correct and complete to the best of the author’s knowledge and belief.
Forage Analysis

- Collect representative sample
- Submit sample to laboratory
  - IFAS
  - UGA
  - Dairy One
  - Waters
- Receive / Interpret Results

Your county Ag Agent can help with all of this
## Feed and Forage Analysis Report

### Client Information
- **Crop:** BAHIA
- **Use:** Hay
- **Species:** BEEF
- **Class/Weight:** DRY COWS

### Lab Information
- **Lab #:** 3540
- **Completed:** Oct 14, 2013
- **Printed:** Oct 14, 2013

### Contact
- **Feed and Environmental Water Lab**
  - 2300 College Station Road
  - Athens, GA 30602
- **ph:** 706-542-7690
- **e-mail:** solitest@uga.edu

### Variety
- **Relative Forage Quality (RFQ):** 98.0
- **Dry Matter Intake (DMI):** 2.12% Live Body Weight

### Near Infrared Reflectance (NIR) Analysis

<table>
<thead>
<tr>
<th>Component</th>
<th>As-Sampled</th>
<th>Dry-Matter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Protein</td>
<td>6.3 %</td>
<td>8.7 %</td>
</tr>
<tr>
<td>Crude Fiber (Estimated)</td>
<td>24.0 %</td>
<td>31.0 %</td>
</tr>
<tr>
<td>Neutral Detergent Fiber</td>
<td>54.2 %</td>
<td>68.2 %</td>
</tr>
<tr>
<td>Acid Detergent Fiber</td>
<td>32.52 %</td>
<td>40.90 %</td>
</tr>
<tr>
<td>Lignin</td>
<td>3.41 %</td>
<td>4.29 %</td>
</tr>
<tr>
<td>Non-fibrous Carbohydrates</td>
<td>12.88 %</td>
<td>16.20 %</td>
</tr>
<tr>
<td>Water-Soluble Carbohydrates</td>
<td>5.25 %</td>
<td>6.60 %</td>
</tr>
<tr>
<td>Digestible Neutral Detergent Fiber</td>
<td>25.81 %</td>
<td>32.46 %</td>
</tr>
<tr>
<td>Neutral Detergent Fiber Digestibility</td>
<td>37.84 %</td>
<td>47.60 %</td>
</tr>
<tr>
<td>Digestible Dry Matter</td>
<td>56.68 %</td>
<td>71.29 %</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Component</th>
<th>As-Sampled</th>
<th>Dry-Matter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Digestible Nutrients</td>
<td>40.6 %</td>
<td>51.1 %</td>
</tr>
<tr>
<td>Net Energy of Lactation</td>
<td>0.409 MC/lb</td>
<td>0.514 MC/lb</td>
</tr>
<tr>
<td>Net Energy of Maintenance</td>
<td>0.430 MC/lb</td>
<td>0.541 MC/lb</td>
</tr>
<tr>
<td>Net Energy of Gain</td>
<td>0.171 MC/lb</td>
<td>0.215 MC/lb</td>
</tr>
<tr>
<td>Metabolizable Energy</td>
<td>787 KC/lb</td>
<td>986 KC/lb</td>
</tr>
<tr>
<td>Moisture</td>
<td>20.5 %</td>
<td>0 %</td>
</tr>
<tr>
<td>Dry Matter</td>
<td>79.5 %</td>
<td>100 %</td>
</tr>
</tbody>
</table>
# Feed and Forage Analysis Report

## Client Information
- **Agent:** Mark Mauldin
- **Crop:** BAHIA
- **Use:** Hay
- **Species:** BEEF
- **Class/Weight:** LACTATING COWS

## Lab Information
- **Lab:** #3558
- **Received:** Sep 28, 2015
- **Completed:** Sep 30, 2015
- **Printed:** Sep 30, 2015
- **Tests:** F2C

## Contact
- **Feed and Environmental Water Lab**
- **2300 College Station Road**
- **Athens, GA 30602**
- **Phone:** 706-542-7690
- **Email:** fewlab@uga.edu

## Near Infrared Reflectance (NIR) Analysis

<table>
<thead>
<tr>
<th></th>
<th>As-Sampled</th>
<th>Dry-Matter</th>
<th>Total Digestible Nutrients</th>
<th>As-Sampled</th>
<th>Dry-Matter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Protein</td>
<td>9.7 %</td>
<td>11.4 %</td>
<td>48.1 %</td>
<td>56.9 %</td>
<td></td>
</tr>
<tr>
<td>Crude Fiber (Estimated)</td>
<td>25.9 %</td>
<td>30.0 %</td>
<td>0.489 MC/lb</td>
<td>0.573 MC/lb</td>
<td></td>
</tr>
<tr>
<td>Neutral Detergent Fiber</td>
<td>55.4 %</td>
<td>65.6 %</td>
<td>0.522 MC/lb</td>
<td>0.517 MC/lb</td>
<td></td>
</tr>
<tr>
<td>Acid Detergent Fiber</td>
<td>34.61 %</td>
<td>40.96 %</td>
<td>0.246 MC/lb</td>
<td>0.291 MC/lb</td>
<td></td>
</tr>
<tr>
<td>Lignin</td>
<td>3.41 %</td>
<td>4.03 %</td>
<td>908 KC/1lb</td>
<td>1068 KC/1lb</td>
<td></td>
</tr>
<tr>
<td>Non-fibrous Carbohydrates</td>
<td>16.75 %</td>
<td>19.83 %</td>
<td>Moisture: 15.5 %</td>
<td>0 %</td>
<td></td>
</tr>
<tr>
<td>48-hour Digestibility Parameters</td>
<td>31.82 %</td>
<td>37.65 %</td>
<td>Dry Matter: 84.5 %</td>
<td>100 %</td>
<td></td>
</tr>
<tr>
<td>Digestible Neutral Detergent Fiber</td>
<td>48.49 %</td>
<td>57.39 %</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neutral Detergent Fiber Digestibility</td>
<td>62.19 %</td>
<td>73.60 %</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Variety:**
- **Relative Forage Quality (RFQ):** 110.6
- **Dry Matter Intake (DMI):** 2.39% Live Body Weight

**Ration Formulation:** No
Comparing / Evaluating Forages

Figure 6. The Relative Forage Quality (RFQ) ranges that are suitable to various livestock classes. Adapted from Undersander et al., 2011.

Figure are from Understanding and Improving Forage Quality by: Hancock, et.al. http://extension.uga.edu/publications/files/pdf/B%201425_1.PDF
1,200lbs cow, Moderate Milk, 3mo. Post Calving

- Requirements = 16.36lbs/day TDN
  2.82lbs/day CP
- Ex.1 = 2.12% DMI or 25.44lbs/day DMI
  - 25.44 x 51.1% = 12.99lbs/day TDN (-3.37lbs)
  - 25.44 x 8.7% = 2.21lbs/day CP (-0.61lbs)
1,200 lbs cow, Moderate Milk, 3 mo. Post Calving

- Requirements = 16.36 lbs/day TDN
  2.82 lbs/day CP

- Ex.2 = 2.39% DMI or 28.68 lbs/day DMI
  - 28.68 x 56.9% = 16.31 lbs/day TDN (-0.05 lbs)
  - 28.68 x 11.4% = 3.27 lbs/day TDN (0.45 lbs)
Supplementation

- Make sure you are feeding the right hay to the right cows
  - Match nutrient demand with nutrient content
- Supplement to fill nutritional gaps not cows
Supplementation

- Products used for supplements should have a known nutritional content
- Do the math determine how much they need
- \((-3.37\text{lbs TDN})\), Supplement is 78% TDN
- \(3.37 / 78\% = 4.32\text{lbs need to fill gap}\)*
Supplementation

- Once you know how much of a supplement will be needed then you can start looking at options based on $$$

- (-3.37lbs TDN), Supplement is 78% TDN 4.32lbs needed @ $0.13/lbs.
  - Cost $0.56/hd./day

- Supplement is 64% TDN 5.27lbs needed @ $0.11/lbs.
  - Cost $0.58/hd./day
Supplementation

- Storage & Feeding Costs
- Waste
- Convenience
- Consumption (herd & individual)
  - If they are not eating enough what’s the point
  - If they are eating more than they need re-do the math based on actual consumption and see where you are
Winter Feeding Based on a Forage Test **Key Points**

- You must know and manage your cattle
- Forage analysis allows you to quantify the nutritional value of hay (don’t forget bale weight)
- Match cattle and forage
- Supplement to fill nutritional gaps
- Monitor consumption (hay and supplement)
Winter Feeding Based on a Forage Test

**Key Points**

- Each lot of hay is different and should be tested separately
- Supplement options and prices change frequently
- Don’t be scared of the math, we’re here to help
Questions