Feeding Hungry Cows

Karla H. Wilke, Ph.D.
Cow/Calf Management
University of Nebraska – Panhandle Research and Extension

What is Body Condition and Why is it Important?

• Body Condition refers to the fat cover over a cow’s ribs, tail head, pin bones, brisket

• Beef scale is 1-9 with 1 being emaciated and 9 being obese

• It is important because it can be used as a gauge to determine how to manage feeding programs and when to make a change
When is it Easiest to Change BCS
When to Assess Body Condition Score

- 120 days after calving – are there situations or cows that warrant early weaning

- At weaning – what are the feed resources available now and do the cows need to maintain or gain

- 60-90 days prior to calving – do we need to increase feed or start the lactation diet early

- Just prior to breeding – what feed resources do we have for breeding

When to Decide to Change BCS

- Be careful not to make a decision change for the whole herd based on the condition of a few cows

- Consider separating off thinner cows into a separate pen or pasture (often youngest and oldest cows are the thinner ones)
How Much Feed Does a Pregnant Cow Need?

A 1200 pound gestating, non-lactating mature cow requires about 10 pounds of TDN and 1.8 pounds of crude protein per day (*We are assuming it is Jan. and she calves in April*)
She would require approximately 0.88 pounds of RDP/d.

Hollingsworth-Jenkins, et al. 1996 JAS 74:1343
What is RDP?

• RDP is rumen degradable protein – this is protein that is degraded in the rumen and is available to the microorganisms in the rumen as a nitrogen source so they can digest forages

• RUP is rumen undegradable protein – this protein escapes or bypasses being digested by the microbes in the rumen and is available to be absorbed in the small intestine and used at the tissue level by the animal for skeletal, muscle, or fetal development or lactation

• This is what makes cattle so ENVIRONMENTALLY FRIENDLY

Is it Enough?

• Analysis on the hay sample came back as containing 6.5% CP and 50% TDN.

• At this TDN it is feasible for this cow to eat 22 lbs of dry matter (this is 1.8% of her body weight)

• Is that enough to meet her protein and energy demands?
Doing a Little Math 😊

• 22 * 0.065 = 1.43 lb CP

• The requirement was assumed to be 1.8 lb of crude protein

• The NRBC has this grass hay listed as 62% RDP

• So 1.43 * 0.62 = 0.887 lb of RDP which is what this cow’s requirement is estimated to be

Doing a Little Math 😊

• 22 lb * .5 = 11 lb TDN

• This cow’s TDN requirement was 10 lb of TDN

• To maintain this cow, additional supplement was not needed*
Feeding that Pregnant Cow on Range

The cow’s needs for maintenance are met through the dormant range right before the last trimester – barring adverse weather.

Conversely, because maintenance is so easily met, if the cow needs to gain weight (BCS 4 or less) this is an easy time to put weight on the cow.

Crop Residue Grazing
### Suppl. late gestation cows grazing cornstalks (Warner et al., 2012)

<table>
<thead>
<tr>
<th>Item</th>
<th>SUPPa</th>
<th>CONb</th>
<th>SEM</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in BW, Oct.-Feb., lb</td>
<td>89</td>
<td>62</td>
<td>15.0</td>
<td>0.20</td>
</tr>
<tr>
<td>Change in BCS, Oct.-Feb.</td>
<td>0.19d</td>
<td>0.03e</td>
<td>0.05</td>
<td>0.03</td>
</tr>
<tr>
<td>BCS Oct.</td>
<td>5.4</td>
<td>5.4</td>
<td>0.09</td>
<td>0.89</td>
</tr>
<tr>
<td>BCS Feb.</td>
<td>5.6d</td>
<td>5.4e</td>
<td>0.08</td>
<td>0.02</td>
</tr>
<tr>
<td>Cyclic, %</td>
<td>76</td>
<td>71</td>
<td>0.05</td>
<td>0.46</td>
</tr>
<tr>
<td>Pregnancy rate, %</td>
<td>94</td>
<td>91</td>
<td>0.02</td>
<td>0.18</td>
</tr>
<tr>
<td>Calving interval, d</td>
<td>367</td>
<td>366</td>
<td>1.6</td>
<td>0.80</td>
</tr>
<tr>
<td>Calf birth weight, lb^c</td>
<td>86</td>
<td>85</td>
<td>1.0</td>
<td>0.27</td>
</tr>
<tr>
<td>Calf weaning wt, lb^c</td>
<td>552</td>
<td>548</td>
<td>11.4</td>
<td>0.35</td>
</tr>
</tbody>
</table>

^aSUPP = cows supplemented 2.2 lb/hd/d (DM basis) while grazing cornstalks

^bCON = cows not supplemented while grazing cornstalks

### Feeding Supplement Anyway

- If a producer had 500 cows and assumed these cows needed one pound of a $400/ton protein supplement for 60 days, that producer could spend an unnecessary $6000 in two months.
Doing a Little More Math 😊

- Most lick tubs suggest cattle will eat about 1 pound per day

- Lick tubs tend to cost $650-750/ton

- So feeding 500 cows 1 pound of this supplement ($0.35/lb) for 90 days is $15,750

- Dried distillers at $150/ton at 1.5 lb/d for 500 cows for 90 days is $5,062

- Five year study suggests no reproductive or progeny differences due to cornstalk supplementation of pregnant cows

Calving Changes Everything
Body Condition at Calving

- Research has indicated mature cows in a BCS 4 at calving will have acceptable rebreeding rates when on an increasing plane of nutrition prior to and during breeding - However, immunoglobulin concentration is better at a BCS 5

- The Young Cow presents additional challenges and should be fed to provide the best chance of getting rebred with the second calf
Figure 3. Effect of cow body condition score at calving on pregnancy rate.
The Story of Big Red

Odde et. al, 1986 Colorado State University.

Figure 4. Effect of cow body condition score at calving on concentration of IgG in serum of calves 24 hours old
Maintenance isn’t Maintenance

• The young cow should not be below a BCS of 5 at the time of calving for the best changes of rebreeding

Feeding the Heifer

• A spring calving replacement heifer with a target mature weight of 1200 pounds is likely weighing about 950 pounds entering the last trimester of pregnancy and would need to gain about 2.0 pounds per day prior to calving even if she was in a moderate body condition (BCS 5).
• One pound is attributed to fetal growth.
Feeding the Heifer

• Feeding an ad libitum amount of hay containing 52% TDN and 8% CP along with 3.4 pounds of distillers grains would meet the rumen undegradable protein and energy needs of this heifer

• At the onset of lactation, this diet is now well below her energy needs

Protein Tubs as an Energy Source
Protein Tubs as an Energy Source

• If we assume this heifer needs 17-18 lb of TDN to continue to grow and for lactation will a protein tub meet this need?

• Most protein tubs limit the average intake to 1 lb/d.

• Assuming this heifer is now receiving 27 lb of hay (as is) that is 60% TDN hay, then the hay is providing 13.8 lb of TDN (23 lb DM * 0.60) and if the protein tub is 85% TDN and 65% dry matter then 1 lb as is going to provide (0.65*.85) = 0.55 lb TDN. So 13.8+0.55 = 14.4 lb of TDN which well short of her requirement.

When is Green Grass Available?
Staying on Target

• A heifer calving March 1 must be ready to breed May 22 – how much grass is available between March 1- May 22

• A heifer calving April 1 must be ready to breed June 23- how much grass is available between April 1- June 23

Staying on Target

• Research has indicated the young heifer is likely to not have a fertile first cycle after calving, so many people like to have heifers calve ahead of cows so they don’t get behind the herd

• While there can be merit to this strategy, feeding adequate nutrients is likely entirely up to the producer as grazing is likely not available for the early spring calving heifer

• Plan accordingly to keep her in the herd
Early Spring Grazing Study

- 0 AUM/ac, 0.22 AUM/ac and 0.33 AUM/ac
- Study length – 2 years – each year May 14 to June 4
- Diet Samples with esophageally fistulated cows
- Clip sampling and sorting by previous and new year’s growth

Nutrient Content of Early Grazed Pastures

<table>
<thead>
<tr>
<th>Item</th>
<th>Control</th>
<th>Light</th>
<th>Heavy</th>
<th>SEM</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IVOMD %</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d 0</td>
<td>70.2</td>
<td>71.1</td>
<td>71.0</td>
<td>1.81</td>
<td>0.60</td>
</tr>
<tr>
<td>d 7</td>
<td>73.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>65.0&lt;sup&gt;b&lt;/sup&gt;</td>
<td>65.8&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.68</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>d 14</td>
<td>74.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>65.5&lt;sup&gt;b&lt;/sup&gt;</td>
<td>63.8&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.74</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>d 21</td>
<td>71.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>63.6&lt;sup&gt;b&lt;/sup&gt;</td>
<td>63.6&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.88</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>CP%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d 0</td>
<td>15.4</td>
<td>14.6</td>
<td>14.2</td>
<td>1.51</td>
<td>0.41</td>
</tr>
<tr>
<td>d 7</td>
<td>17.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>11.1&lt;sup&gt;b&lt;/sup&gt;</td>
<td>10.1&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.41</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>d 14</td>
<td>17.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>12.6&lt;sup&gt;b&lt;/sup&gt;</td>
<td>11.1&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.42</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>d 21</td>
<td>16.9&lt;sup&gt;a&lt;/sup&gt;</td>
<td>13.0&lt;sup&gt;b&lt;/sup&gt;</td>
<td>12.0&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.38</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

Judy et al. 2015
## Current and Previous Growth

<table>
<thead>
<tr>
<th>Item</th>
<th>Control</th>
<th>Light</th>
<th>Heavy</th>
<th>SEM</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current Year forage accumulating, kg/ha</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d 0</td>
<td>127.9</td>
<td>93.7</td>
<td>120.2</td>
<td>43.48</td>
<td>0.43</td>
</tr>
<tr>
<td>d 7</td>
<td>201.2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>95.6&lt;sup&gt;b&lt;/sup&gt;</td>
<td>149.0&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>43.48</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>d 14</td>
<td>403.2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>133.8&lt;sup&gt;b&lt;/sup&gt;</td>
<td>166.4&lt;sup&gt;b&lt;/sup&gt;</td>
<td>43.48</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>d 21</td>
<td>439.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>155.4&lt;sup&gt;b&lt;/sup&gt;</td>
<td>172.3&lt;sup&gt;b&lt;/sup&gt;</td>
<td>43.48</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><strong>Previous Year forage growth, kg/ha</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d 0</td>
<td>965.6</td>
<td>862.3</td>
<td>802.5</td>
<td>173.84</td>
<td>0.35</td>
</tr>
<tr>
<td>d 7</td>
<td>781.6</td>
<td>543.2</td>
<td>720.0</td>
<td>173.84</td>
<td>0.17</td>
</tr>
<tr>
<td>d 14</td>
<td>1038.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>676.1&lt;sup&gt;b&lt;/sup&gt;</td>
<td>634.0&lt;sup&gt;b&lt;/sup&gt;</td>
<td>173.84</td>
<td>0.02</td>
</tr>
<tr>
<td>d 21</td>
<td>729.9</td>
<td>429.7</td>
<td>563.5</td>
<td>173.84</td>
<td>0.09</td>
</tr>
</tbody>
</table>

Judy et al. 2015

## Meeting the Need of the New Mom

Assuming this young heifer could find half her diet in green grass and the other half was supplied by the hay that was 8% CP and 52% TDN, she would still not be able to meet her requirement.

Supplying 2.2 lb of Distillers on top of the hay and green grass would then meet her needs.

If this young heifer could eat an ad libitum amount of green grass her needs would be met as well.
May Calving Heifer in August

- 1000 lb lactating 2 year old cow eating 22 lb of DM of Sandhills range in August
- Forage is 9.3% Crude Protein, and 53% TDN
- According to the NRBC, this heifer requires 690 g/d MP and at least 13 lb of TDN
- This diet provides 489 g/d MP and 11.7 lb of TDN
- Adding 2 lb DM of distillers grains brings the MP to 673 g/d and the TDN to 13.9 lb
May Calving Heifer Disclaimer

- Some work at GSL has gotten a reproductive response to supplementing May calving heifers during the breeding season
- Other work has not gotten that response
- Difference in grass production each year??
- Producers struggling with rebreeding those heifers who have supplemented are happier with the breed up

What is the Supplement Worth?

- While this young cow may be in at least a BCS 5, she may be on a decreasing plane of nutrition which research has indicated can have a negative effect on reproduction

- If a producer with 50 1st calf heifers fed them 2.2 lb of distillers per day for 60 days just prior to and into the breeding season this is $0.075*2.2*60*50=$495
Summary

- Knowing how to accurately assess body condition and doing it frequently will help producers supplement when necessary and improve profitability and efficiency.

- Knowing the nutrient requirements of each class of cattle at each production segment is critical to making supplement decisions.

- Evaluating the whole system and when high quality forage will be available is critical to knowing when to supplement.

- Money spent to ensure young cows have the best chance of staying in the herd is probably money well spent.

Questions?