Dry Cow Management

“Management by Neglect”
- Marginal quality feeds
- Unbalanced rations
- Inadequate housing

Deficient Dry Cow Care
- Decreased milk yield
- Increased incidence of postpartum health disorders
- Impaired fertility
- The end result

DECREASED PROFITABILITY

Dry Period Ideologies
- Characterized as a resting phase
- Period of lowest nutritional requirements
- Low nutrient requirements should not be equated to:
  - poor quality feeds and management
- The dry period should be viewed as:
  - Preparation for the subsequent lactation

Nutrient Requirements
- Maintenance of the Cow
- Gravid Uterus
  - fetus
  - placenta
  - fetal fluids
  - uterus

Fetal Growth is Exponential

Week of Gestation

- Gravid Uterus
- Fetus

- 0
- 40
- 80
- 120
- 160

1 4 7 10 13 16 19 22 25 28 31 34 37 40
Dry Cow Grouping

- Far-off
  - First 30 days of dry period
- Close-up
  - Last 30 days of dry period
- Optimum milk yield occurs when dry period length is 50 - 70 days

Far-off Dry Cows

<table>
<thead>
<tr>
<th></th>
<th>NRC</th>
<th>P. French</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEL, Mcal/lb</td>
<td>0.44</td>
<td>0.57 - 0.64</td>
</tr>
<tr>
<td>CP, %</td>
<td>10</td>
<td>12 - 13</td>
</tr>
<tr>
<td>ADF</td>
<td>32 - 40</td>
<td></td>
</tr>
<tr>
<td>NDF</td>
<td>45 - 60</td>
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</table>

Far-off Ration

<table>
<thead>
<tr>
<th></th>
<th>AF lb.</th>
<th>Mcal/lb</th>
<th>CP %</th>
<th>ADF%</th>
<th>NDF%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grass Hay</td>
<td>20.0</td>
<td>0.53</td>
<td>10</td>
<td>45</td>
<td>72</td>
</tr>
<tr>
<td>Corn Silage</td>
<td>12.0</td>
<td>0.68</td>
<td>9</td>
<td>28</td>
<td>45</td>
</tr>
<tr>
<td>Ground Corn</td>
<td>1.5</td>
<td>0.88</td>
<td>10</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>SBM</td>
<td>1.5</td>
<td>0.89</td>
<td>48</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Avg</td>
<td>1.5</td>
<td>0.89</td>
<td>48</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>DMI = 24.6</td>
<td></td>
<td></td>
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Far-off Feeds

- Moderate quality grass hay
- Corn Silage
  - inexpensive
  - avoid overfeeding
- 1 to 2 lbs grain
  - carrier for vitamins and minerals

Close-up Physiological Changes

- Hormonal Shifts
  - Insulin & progesterone
  - GH & estrogen
- Initiation of lactation
- Shift from tissue deposition to tissue mobilization

“It’s Too Late”

- Majority of metabolic upheaval occurs by 1 day postpartum
  - metabolic problems have taken place or will occur over next several weeks
- Hepatic triglyceride has | and glycogen |
  - magnitude of ketosis
- If DA is related to rumen fill
  - extent of prepartum DMI decrease is important
Close-up Requirements

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<tr>
<td>NEL, Mcal/lb</td>
<td>0.70 – 0.74</td>
<td>0.68 -0.72</td>
</tr>
<tr>
<td>CP, %</td>
<td>12</td>
<td>13 - 15</td>
</tr>
<tr>
<td>ADF</td>
<td>19 - 25</td>
<td></td>
</tr>
<tr>
<td>NDF</td>
<td>27 - 35</td>
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<td>0.88</td>
<td>10</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>SBM</td>
<td>3.5</td>
<td>0.89</td>
<td>48</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Avg</td>
<td>0.70</td>
<td>13.4</td>
<td>26</td>
<td>43</td>
<td></td>
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</tbody>
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DMI = 27

Close-up Feeds

- 1/4 to 1/3 lactating ration
- Moderate grass hay or legume hay
- Corn Silage
- Corn grain
- Protein supplement
- Vitamins & Minerals

Conceptus Growth & Intake

Pre/Post DMI Relationship

Ruminal Adaptations

- Four week period is needed for ruminal mucosa to adapt to high energy diets
- Ruminal microbes adapt to high grain diets over several weeks
- Increasing energy concentration during the close-up dry period gives us a headstart

Holstein Post DMI = 6.9 + 0.72 x Pre-DMI (r = 0.52; n = 32; P < 0.01)
Jersey Post DMI = 6.1 + 0.75 x Pre-DMI (r = 0.54; n = 30; P < 0.01)
**Breed DMI Differences**

![Graph showing DMI differences between Holstein and Jersey breeds over prepartum days.](image)

(Breed x Day \( P < 0.05 \))

**Breed NEFA Differences**

![Graph showing NEFA levels over days relative to parturition.](image)

**Pre-DMI Decline & NEFA**

![Graph showing average NEFA levels prepartum and DMI decline.](image)

Holstein NEFA = 227 - 5.6 x Decline + 0.33 x Decline^2 \((n = 47)\)

Jersey NEFA = 149 + 0.48 x Decline + 0.16 x Decline^2 \((n = 41)\)

**DMI Depression**

- 0 - 35% final week of gestation
- Very variable
- Breed dependent
- May be endocrine related
  - Estrogen, progesterone, GH, Cortisol
- May be metabolite related
  - Free fatty acids
- Postpartum DMI is positively correlated to prepartum DMI

**Close-up Rations**

- Need to increase nutrient density
- Fetal nutrient demand increases
- DMI decreases
- Ruminal adaptation

**Body Condition Scoring**

- Subjective method of estimating energy stores
- Use 1 – 5 point scale
  - 1 being very thin
  - 5 being very fat
- Appraisal of two key locations
  - Between the hooks
  - Between the hooks and pins
BCS Goals

- Dry off at 3.5 and maintain during dry period
- Do not take condition off overconditioned cows
- Put condition on those cows not meeting goal
- Two far-off dry cow groups

Body Reserves

- Cows mobilize body reserves, mainly fat, during early lactation
- Replace during late lactation
- Monitor mobilization/accretion through body condition scoring
- Dairy uses 1 – 5 scale
- One body condition score = 80 kg

Efficiency of ME Conversion to NE<sub>L</sub>

```
Lactation 75%  
Dry 50%  
Feed 64%  
Milk 82%
```

Body Condition

- One-half BCS = 88 lbs
- Early lactation - 1 - 2 lbs/d to support 7 - 14 lbs additional milk
- 10 additional lbs milk at peak can mean an extra 2,000 lbs over the lactation
- Each lb body weight = 2.12 Mcal NEI
  - 88 lbs * 2.12 = 187 Mcal NEI
  - 187 Mcal/(0.33 Mcal/lb milk) = 565 lbs milk

Body Reserves

<table>
<thead>
<tr>
<th>BCS</th>
<th>% of Empty Body Weight</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fat</td>
<td>Protein</td>
</tr>
<tr>
<td>1</td>
<td>3.77</td>
<td>19.42</td>
</tr>
<tr>
<td>2</td>
<td>11.30</td>
<td>18.09</td>
</tr>
<tr>
<td>3</td>
<td>18.84</td>
<td>16.75</td>
</tr>
<tr>
<td>4</td>
<td>26.38</td>
<td>15.42</td>
</tr>
<tr>
<td>5</td>
<td>33.91</td>
<td>14.08</td>
</tr>
</tbody>
</table>

NE<sub>L</sub> – Weight Loss and Gain

<table>
<thead>
<tr>
<th>BCS</th>
<th>Mcal NE&lt;sub&gt;L&lt;/sub&gt;/kg of LW Loss</th>
<th>Mcal NE&lt;sub&gt;L&lt;/sub&gt;/kg of LW Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-</td>
<td>3.60</td>
</tr>
<tr>
<td>2</td>
<td>3.83</td>
<td>4.50</td>
</tr>
<tr>
<td>3</td>
<td>4.68</td>
<td>5.34</td>
</tr>
<tr>
<td>4</td>
<td>5.57</td>
<td>6.23</td>
</tr>
<tr>
<td>5</td>
<td>6.43</td>
<td>-</td>
</tr>
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- Subjective method of estimating energy stores
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Overconditioned Cows

- Prepartum DMI decline greater
- Incidence of ketosis greater
- More likely to have difficulties associated with parturition
  - dystocia
  - retained placenta