Finding More Profit Margin

- Two ways to increase profitability
  - Increase milk yield
  - Reduce costs
- Is the higher milk yield profitable?
  - Exchange dollars
  - Health and longevity effects
## Milk Fat and Milk Protein Relationships

(Source: Hoard’s Dairyman)

<table>
<thead>
<tr>
<th>Breed</th>
<th>Fat %</th>
<th>Protein %</th>
<th>Protein vs Fat</th>
<th>Fat vs Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ayrshire</td>
<td>3.85</td>
<td>3.15</td>
<td>82%</td>
<td>1.23</td>
</tr>
<tr>
<td>Brown Swiss</td>
<td>3.97</td>
<td>3.30</td>
<td>83%</td>
<td>1.22</td>
</tr>
<tr>
<td>Guernsey</td>
<td>4.46</td>
<td>3.31</td>
<td>74%</td>
<td>1.35</td>
</tr>
<tr>
<td>Holstein</td>
<td>3.70</td>
<td>3.02</td>
<td>82%</td>
<td>1.23</td>
</tr>
<tr>
<td>Jersey</td>
<td>4.59</td>
<td>3.58</td>
<td>78%</td>
<td>1.28</td>
</tr>
</tbody>
</table>
Value of Milk Components
(Prices for December, 2013)

- Holstein herd: 70 lb milk, 3.5% fat, and 2.9% true protein corrected to 3.7% fat and 3.0% true protein
- $0.25
- Profit potential: $0.50/ cow / day
<table>
<thead>
<tr>
<th>Item</th>
<th>Added Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk fat is 3.9%</td>
<td>+ 23 cents</td>
</tr>
<tr>
<td>Milk true protein is 3.1%</td>
<td>+ 25 cents</td>
</tr>
<tr>
<td>Milk quality premium</td>
<td>+ 83 cents</td>
</tr>
<tr>
<td>rBST premium not to use</td>
<td>+ 59 cents</td>
</tr>
</tbody>
</table>
Focus: Fecal Starch
**Apparent digestibility of feed starch and fecal starch (%DM)**

The apparent digestibility of feed starch can be described by the equation:

\[ y = -0.0176x + 0.9872 \]

with an \( R^2 \) value of 0.7345. The graph illustrates the relationship between fecal starch and feed starch, with data points showing a negative correlation.
<table>
<thead>
<tr>
<th>Source</th>
<th>Number Samples</th>
<th>% Fecal Starch Average</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairyland Lab</td>
<td>379</td>
<td>4.7</td>
<td>0.2-40.2</td>
</tr>
<tr>
<td>Rock River Lab</td>
<td>52</td>
<td>7.9</td>
<td>na</td>
</tr>
<tr>
<td>Cumberland Lab</td>
<td>1420</td>
<td>7.3</td>
<td>0.2-38.9</td>
</tr>
<tr>
<td>PA Vet College</td>
<td>515*</td>
<td>4.6</td>
<td>1.0-11.6</td>
</tr>
<tr>
<td>IL field herds</td>
<td>19</td>
<td>6.0</td>
<td>3.9-9.9</td>
</tr>
</tbody>
</table>

*Based 66 herds
Milk response

• Fecal starch should be less than 4.5% represents total tract apparent digestibility of 90+ percent.

• If fecal starch can be reduced 1 unit (absolute decrease from 10% to 9%), milk production could increase 0.67 pound (dry matter intake remains constant).
Focus: Adding Sugar
Replacing Corn With Sugar
(Emanuele, 2011)

• 10 University studies (2004-2009)
• Prices used Dec, 2013 national base
• 0.16 pound increase in fat (0.04 to 0.22)
• 0.106 pound increase in protein (0 to 0.26)
• Value of fat: 0.16 lb x $1.77/lb = $0.27
• Value of protein: 0.106 lb x $3.54 = $0.38
Focus
Amino Acid
Supplementation
Possible benefits of feeding rumen-protected amino acids

1. Milk protein increase
   - About 0.1 percentage unit
   - Usually occurs within 3 days

2. Milk yield increase
   - 0 to 5 lb/cow/day
   - Usually occurs only during early lactation

3. Milk fat increase
   - 0 to 0.2 % unit when RPMet is fed
Focus
Improve Feed Efficiency
## Economics of Feed Efficiency
(70 lb milk, 12 cent lb DM)

<table>
<thead>
<tr>
<th>Feed efficiency (lb milk/lb DM)</th>
<th>DMI (lb/day)</th>
<th>Difference (savings/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.30</td>
<td>54</td>
<td>$0.48</td>
</tr>
<tr>
<td>1.40</td>
<td>50</td>
<td>$0.36</td>
</tr>
<tr>
<td>1.50</td>
<td>47</td>
<td></td>
</tr>
</tbody>
</table>
Dairy Efficiency

**Dairy Efficiency:** Pounds of fat corrected milk divided by pounds of DM consumed

- High group, mature cows: $> 1.7$
- High group, 1st lactation: $> 1.6$
- Low group: $> 1.3$
- One group TMR herds: $> 1.5$
- Fresh cows: $< 1.5$
- Concern (one group): $< 1.3$

**Example:** $75 \text{ lb milk} / 50 \text{ lb DMI} = 1.5$
Focus
Corn Silage Processing
Kernel Processing

Score

ΔWorth 2 lb. Milk or 2 lb. Corn

RD Shaver UW-Madison
Focus
Forage NDFD
1.8 lb milk / 1%
increase in
NDFD
<table>
<thead>
<tr>
<th>Feedstuff</th>
<th>Average</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed Hay</td>
<td>47</td>
<td>32-62</td>
</tr>
<tr>
<td>Legume Hay</td>
<td>46</td>
<td>32-61</td>
</tr>
<tr>
<td>Grass Hay</td>
<td>55</td>
<td>38-73</td>
</tr>
<tr>
<td>Mixed Haylage</td>
<td>42</td>
<td>25-60</td>
</tr>
<tr>
<td>Legume Haylage</td>
<td>42</td>
<td>25-58</td>
</tr>
<tr>
<td>Grass Haylage</td>
<td>61</td>
<td>51-72</td>
</tr>
<tr>
<td>Corn Silage</td>
<td>60</td>
<td>48-71</td>
</tr>
</tbody>
</table>
Focus
Feed
Additives
# U.S. Feed Additive Use

(2013 Hoard’s Market Survey)

<table>
<thead>
<tr>
<th>Additive Type</th>
<th>2006</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buffers</td>
<td>41</td>
<td>39</td>
</tr>
<tr>
<td>Yeast/yeast culture</td>
<td>28</td>
<td>32</td>
</tr>
<tr>
<td>Rumensin</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>Niacin</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Probiotics</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Mycotoxin binders</td>
<td>11</td>
<td>23</td>
</tr>
<tr>
<td>Anionic products</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Don’t use</td>
<td>11</td>
<td>9</td>
</tr>
</tbody>
</table>
Additives Recommended

- Rumen buffers: 2.2 lb
- Yeast culture/yeast products: 3.1 lb
- Monensin (Rumensin): 1.5 lb
- Biotin: 4.5 lb
- Rumen protected choline: 5.0 lb
Hutjens “As Needs” List

- Propylene glycol (300 to 500 ml)
- Calcium propionate (150 grams)
- Niacin (3 g protected; 3 g unprotected)
- Mycotoxin binders (clay mineral or yeast cell MOS compounds)
- Protected choline (15 g per day)
- Anionic products / salts (amount varies)
- Acid-based preservatives (baled hay and high moisture corn (0.5 to 1%))
Focus
Calf and Heifer Management
Calf and Heifer Management

• Accelerate liquid diet:
  – 3 to 4 lb/ milk/day

• Average daily gain of 1.8 lb and calving at 23 to 24 months of age:
  – $30 per month of feed savings
  – 3 lbs more milk
Focus
Grouping Cows
# Economics of Three Production Groups

<table>
<thead>
<tr>
<th>Milk yield (lb/cow)</th>
<th>Feed cost ($/cow/day)</th>
<th>DMI (lb/day)</th>
<th>DM Cost ($/lb DM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>85</td>
<td>6.58</td>
<td>49.8</td>
<td>0.132</td>
</tr>
<tr>
<td>76</td>
<td>5.05</td>
<td>42.7</td>
<td>0.112</td>
</tr>
<tr>
<td>41</td>
<td>3.80</td>
<td>35.3</td>
<td>0.107</td>
</tr>
</tbody>
</table>
Economics of 85 lb vs. 76 lb TMR

1. Savings with two rations approach is $1.53

2. Adjusting for lower DMI $0.86
   (42.7 lb x 13.2 cent/lb = $5.64 day
   (42.7 lb x 11.2 cent lb = $4.78 day

3. Milk loss when shifting cows $0.76
   (4 lb @ 19 cents)
Focus
Reduce MUN
$0.38
MUN Values

- Oldest guidelines: 12-16 mg/dl
- Old guidelines: 10-14 mg/dl
- New guidelines: 8-12 mg/dl
- Reproductive concerns: > 16 mg/dl
- Protein losses (10 to 15): 2+ lb sbm
- Environmental concerns
Focus
Getting Cows Pregnant
Impact of Longer In Milk

- For each one day (days open or days in milk) reduces milk yield by 0.2 lb per day

- After 200 days in milk, feed efficiency drops 0.2 units per increase in 50 days
Feed Efficiency and Days in Milk

FEED EFFICIENCY - lb MILK/lb DM

\[ y = -1E-05x^2 + 0.0027x + 1.6041 \]

\[ R^2 = 0.6903 \]
Focus
Lower Somatic Cell Count
Impact of Mastitis

• Each linear decline in SCC can result in 2 to 2.5 pounds more milk per day (from 3 to 2 or 200,000 to 100,000 cells/ml)

• Less than 1 percent of lactating cows in the hospital/mastitis pen
Focus: Building Your Milk Volume
Never Give Up Milk

- 1 lb of dry matter cost $0.12
- Milk price is $0.22 per pound
- Good cows produce 2 lb of milk per 1 lb of DM
- Profit: $0.32 cents per cow per pound of DM
In Summary—Your Goals

- Milk yield: 2% increase annually
- Milk components: Exceed breed average
- Sugar level: 4 to 6% total DM
- SCC: < 2 or 150,000
- DIM: < 180 (unless seasonal)
- Calf growth: > 1.8 lb / day
- MUN: 8 to 12 mg/dl
- Hoof health: < 10% score 3
- Fecal starch: < 5%