Designing and Managing a Feed Center for Efficiency

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Dairy Field Technical Specialist

Why is this important?
- Feed costs are 50%+ of your total expenses
- The actions of the feeding operation have to be consistent and deliberate
- Those actions have a cost, are you managing or monitoring them as efficiently as possible?
  - We often consider them as the cost of doing business and not manage them with detail

Agenda
- Ways to maximize feeding operation efficiency
- What type feed center is best for you?
- Designs that maximize efficiency
- Don’t forget the shrink
- Other things to think about
  - Safety
  - Contingency plans
- Cow performance/efficiency

How can you maximize efficiency?
Ways to Gain Efficiency

- Have all ingredients in the feed center when making loads (make loads in 8 - 10 minutes)
- Use stationary mixers and delivery boxes when distance or high volume is present
- Have loading area lower than loader travel area (less loader cycle time)
- Make on farm premixes (reduce amount of ingredients per load)
- Staging loads will increase feeding efficiency
Ways to Gain Efficiency

- Size your mixer to match your needs (bigger is not always better)
- Mix and deliver full loads when possible (this reduces number of trips for loader and mixer)
- Use your feeding software to it fullest (not just to make loads)
- Size your loader bucket to best address your operation

### Total Cost per Ton: Loading, Mixing & Delivering TMR

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Formulation Amount (lbs)</th>
<th>TMR Amount (lbs)</th>
<th>Loading Deviation (lbs)</th>
<th>Ingredient Cost (ton)</th>
<th>Total Cost</th>
<th>Cost of Deviation</th>
<th>Total Deviation Cost per Day</th>
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</thead>
<tbody>
<tr>
<td>Steamed Corn</td>
<td>11.76</td>
<td>12030</td>
<td>30</td>
<td>$296.00</td>
<td>$1,898.84</td>
<td>$4.44</td>
<td>$172.36</td>
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<tr>
<td>Canola</td>
<td>6.67</td>
<td>1720</td>
<td>30</td>
<td>$385.00</td>
<td>$1,399.48</td>
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<tr>
<td>DIO</td>
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<td>3600</td>
<td>30</td>
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<tr>
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<td>$555.00</td>
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<tr>
<td>Beet Pulp</td>
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<tr>
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<tr>
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### Total Ownership Expense

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Formulation Amount (lbs)</th>
<th>TMR Amount (lbs)</th>
<th>Loading Deviation (lbs)</th>
<th>Ingredient Cost (ton)</th>
<th>Total Cost</th>
<th>Cost of Deviation</th>
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<tr>
<td>Steamed Corn</td>
<td>11.76</td>
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<td>30</td>
<td>$385.00</td>
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<td>$550.00</td>
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<td>30</td>
<td>$235.00</td>
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<td>$3.53</td>
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</table>

### Average, Percent of Total Cost

<table>
<thead>
<tr>
<th>Quartile</th>
<th>Tons Fed</th>
<th>Labor $ (Total)</th>
<th>Fuel &amp; Utilities $ (Total)</th>
<th>Repairs $ (Total)</th>
<th>Total Operating Expense $</th>
<th>Total Ownership Expense $</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>88.4</td>
<td>$2.34</td>
<td>$0.99</td>
<td>$0.57</td>
<td>$3.90</td>
<td>$1.30</td>
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<tr>
<td>2nd</td>
<td>153.0</td>
<td>$2.77</td>
<td>$1.92</td>
<td>$0.61</td>
<td>$4.38</td>
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<tr>
<td>3rd</td>
<td>64.6</td>
<td>$1.27</td>
<td>$0.80</td>
<td>$0.45</td>
<td>$2.30</td>
<td>$0.85</td>
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<td>4th</td>
<td>82.6</td>
<td>$1.86</td>
<td>$1.09</td>
<td>$0.48</td>
<td>$3.83</td>
<td>$1.48</td>
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<tr>
<td>Average</td>
<td>74.3%</td>
<td>$2.30</td>
<td>$1.49</td>
<td>$0.49</td>
<td>$3.32</td>
<td>$1.64</td>
</tr>
</tbody>
</table>

Annual cost range for 500 cows eating 110 lbs. as fed is $31,618.00 to $81,906.00 for a variation opportunity of $50,288.00
**Total Cost per Ton: Loading, Mixing & Delivering TMR**

26 Dairy Farms, Sorted by Total Cost per Ton Fed

<table>
<thead>
<tr>
<th>2014-2015</th>
<th>Average Percent of Total 1st Quartile 2nd Quartile 3rd Quartile 4th Quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tons Fed per Day</td>
<td>88.4 153.0 64.6 82.6 36.0</td>
</tr>
</tbody>
</table>

**Summary Statistics**

- Tons Fed per Labor Hour: 8.30 12.07 8.64 7.54 5.01
- Loads per Labor Hour: 1.31 1.21 1.47 1.58 0.93
- Cows Fed per Labor Hour: 119.1 152.5 125.9 113.4 80.0
- Fuel per Load, Gallons: 2.9 3.2 2.4 2.2 3.8
- Fuel per Ton, Gallons: 0.45 0.31 0.39 0.39 0.73
- % Of Mixer Capacity: 65% 77% 68% 60% 56%
- Cost per Worker Equivalent: $44,623 $41,594 $42,247 $47,921 $46,685
- Calculated Length of Feeding:
  - 1 Person, Hours: 10.24 13.11 8.14 10.56 8.63
  - Time per Load, Minutes: 44.62 43.21 35.07 39.07 62.30
  - Cost per Gallon, Fuel: $2.06 $2.02 $2.05 $2.13 $2.02
- Investment per Ton Fed:
  - Truck/Tractor & Mixer: $5.35 $4.55 $4.76 $5.02 $7.24
  - Loader: $4.40 $2.59 $4.65 $5.78 $4.68

**Cows Fed per Labor Hour vs Cost per Ton Fed**

26 Dairy Farms, 2014 - 2015

**Average Load Size, Tons vs Cost per Ton Fed**

26 Dairy Farms, 2014 - 2015
Variance decreases as mixer loads are more at full capacity

Is this better?

Or is this better?

Take Away Message

- Size your mixer and feeding equipment properly for your operation
- Track these key numbers to maximize your efficiency
- As loads get larger, there seems to be more efficiency realized
- Loader bucket size may not be as important as the proximity of ingredients to mixer (layout and design can save $$)
**Take Away Message**

- There is a lot of room for opportunity to maximize efficiency in the actions around feeding our herds if we measure and monitor it.

**What type feed center?**

- An automated system?
- Minimal mechanization?
- A combination?

What type works for your operation and your management style?

**Key Things to Remember**

- Always keep off farm traffic separate from on farm mixing traffic
- Have a platform truck scale system in place
- Adequately size the bays, not too big or too small
- Always have one to two “flex bays”
- Be able to unload from various delivery truck types
The side ingredients can be stored in upright bins or live bottom bays or a combination to feed the weigh hopper. There can be as many as needed. The weigh hopper/load-out area is all under roof.

Side dump or Clam shell Dump will work.
Stationary vs. Mobile Mixers

Stationary Mixers

- More efficient when further distances have to be covered and sometimes in close proximity
- Allow for better consistency as one employee does mixing
- Allows for feed to be delivered in a lighter more efficient piece of equipment
- Mixers will have a better longevity because of no harsh travel
- Have to have a transfer system to a delivery truck
- What is your Plan B when something breaks