Transition Cow Success: Managing Pain, Weight, & Milk

http://www.extension.iastate.edu/dairyteam/

Dr. Leo Timms
Extension Dairy Specialist
Objectives:

- Early lactation energy balance
- Controlling Inflammation Research
- Restricted milking in fresh cows
- Multiple milking fresh cows
- Prepare long before calving
Negative Energy Balance
Inflammation is associated with transition disorders

% of cows with one or more transition disorders

Degree of inflammation

Low | Int. Low | Int. High | High
Inflammation: a double-edged sword

- Acute phase markers are linked to less milk, poor fertility, and greater risk of leaving the herd
- Acute phase markers are linked with enhanced neutrophil function
How is it that fresh cows have BOTH suppressed immunity and inflammation?

One possibility: Inflammation is a counter-measure against lactation-induced immunity problems.
What can we do?

BMP

1st!!
Immediate postpartum NSAID

- Flunixin meglumine given 2 h and 24 h after calving
- Over 1,300 cows enrolled

Blocking inflammation on the day of calving can interfere with inflammatory signals needed to expel the placenta

Odds ratio relative to placebo

<table>
<thead>
<tr>
<th></th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retained placenta</td>
<td>2.8</td>
</tr>
<tr>
<td>Metritis</td>
<td>1.2</td>
</tr>
</tbody>
</table>
On-farm NSAID study

1. Na salicylate
2. Meloxicam
- Administered orally starting 24 h postpartum
- 51 multiparous cows per treatment
Anti-inflammatories in early lactation (not approved for commercial use)

ILLEGAL FOR PRODUCTION PURPOSES!!

Carpenter et al., 2016
Too much milk?

Time to Leave Herd

Con vs. Melox: $P = 0.06$

Proportion still in herd

Days in milk

Iowa State University
Carpenter et al., 2016
Dairy Extension Team
Polyphenol source improves transition

Dairy Extension Team

Winkler et al., 2015
Having your cake...

- Can we help transition cows achieve the optimal balance?
- Or do we risk shooting ourselves in the foot by tipping the scale out of balance?
Promoting energy balance in early lactation

- **Strategy #1: Decrease energy demand**
  - Sacrifice milk yield for the first 1 – 2 weeks

- **Strategy #2: Promote energy intake**
  - Dietary fat
  - Forage: concentrate ratio
1X milking decreases milk yield

Overall

$P = 0.06$

1X milking ** For 1 week

Loiselle et al., 2009

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Responses to lower week 1 milk

- No difference in intake (possible faster increase in 1x)
- Less body weight loss (56% of 2X group)
- Lower plasma NEFA, BHBA
- Higher serum calcium, phosphorus
- Sustained 8% drop in lactose yield
- No change in fat, protein yields weeks 2 - 14
Latest iteration: incomplete milking

- A randomized controlled trial with 800 cows across 13 farms recently completed in Canada.
- Incomplete milking for the first week: only collected 22 lb/day. Milking? Also 2X milking!
- Early results show a decrease in ketones in the first 2 weeks.
- Will report effects on reproduction, health, and production outcomes...stay tuned!
MILKING FRESH COWS MORE OFTEN

Leo Timms
Iowa State U.
Milk Production in Kg

<table>
<thead>
<tr>
<th>Lactation</th>
<th>Week 1-6</th>
<th>Week 7-18</th>
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</thead>
<tbody>
<tr>
<td>3X Milkings</td>
<td>35.3</td>
<td>39.3</td>
</tr>
<tr>
<td>6X Milkings</td>
<td>42.7</td>
<td>42.5</td>
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</tbody>
</table>

Bar-Peled et al.
Multiple Milkings

Milk Production

Conception Rate

Results from synchronized breeding at 69 to 76 days in milk

P < .01

P < .05

Henshaw et al.
4X Increases Milk Yield

<table>
<thead>
<tr>
<th>Week of Lactation</th>
<th>Milk (kg/day)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>15.0</td>
</tr>
<tr>
<td>3</td>
<td>17.5</td>
</tr>
<tr>
<td>5</td>
<td>20.0</td>
</tr>
<tr>
<td>7</td>
<td>22.5</td>
</tr>
<tr>
<td>9</td>
<td>25.0</td>
</tr>
<tr>
<td>11</td>
<td>27.5</td>
</tr>
<tr>
<td>13</td>
<td>30.0</td>
</tr>
<tr>
<td>Average</td>
<td>*</td>
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</table>

* SED

$P = 0.16$
Why Does Milk Production Increase with Multiple Milking?
Early lactation effects persist

- Peak early lactation then decline
- Increase survival

DRIVES DMI!!
Where Can It Go Wrong?

• **Transition Cow Program**
  – Nutrition
  – Health

• **Milking Procedures and System**
  – Proper milking procedures
    – Take-off settings
    – Teat end health

• **Time in Parlor**
  – Keep time away from bunk to a minimum
  – Do not exceed 4 hours a day
Cows with subclinical ketosis

- 1 kg DMI wk -2 to -1: 2.2X SCK
- Every 10 min decrease time @ feedbunk: 1.9X SCK!!

Goldhawk et al., JDS 2009
Figure 1. Daily rumination time over the transition period for multiparous cows that were: healthy with no other recorded illnesses (HLT; n = 87), subclinically ketotic with no other health problems (HYK; n = 76) and subclinically ketotic with other health problems (HYK+; n = 39) (adapted from Kaufman et al., 2016).

Kaufman et al., JDS 2016
Increased feedbunk space!!
Stall and housing comfort!

RATIONS: WHICH ONE?
Min. pre/ Max post DMI change!!

DMI differed between healthy cows and those with puerperal metritis ($P<0.001$) and clinical metritis ($P=0.003$) both pre and post partum.
BODY CONDITION

Not thin or fat!

3 - 3.5

- Thin: poor wt. gain efficiency
- Fat: feed intake issues!!!
WATER 2-4”/COW!!

Proper rations:
- EFFECTIVE FIBER!!!
- Energy / Protein
- Minerals / Vitamins
- FEED ALWAYS AVAILABLE!

Feed additives:
- DCAD diets!
- Yeast
- Rumensin
  - More small meals / day!
  - Better rumen health!

BUNK SPACE
30” / COW

More small meals/day
- 1X/ day v 2X feeding
- Time feeding related to milking
  - Milking vs 4 hrs post

Measuring feed intake!

85% stocking density or Adequate feed (30”) and rest space
Dry Period Transition

* Ventilation * Heat Abatement

Alleys
- Space / size
- Cleanliness
- Footing!!!

Clean & Dry
Comfortable
Roomy - space

1 stall / animal
or 100 – 125 ft²!

Iowa State University
Dairy Extension Team
Grouping & Feeding Strategies

- How many moves during this time?
- What other changes? Diet? Envir?
- All changes are disruptive!
- 2-3 day adjustment: Behavior!!!
- Heifers >>>> Cows!!!
- Split 1st calf heifers from cows??
- Ration changes: 10-14 d adjustment!
- Close up pen ration change? 10-14d!! ??
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