Monitoring Transition Programs

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Purpose of monitoring

• To detect the occurrence of an unintended disruption in performance under existing management conditions.

• To measure the impact of an implemented intervention or management change.

• To help motivate management or employee behavioral change on the dairy.
Purpose of monitoring

- Monitoring should support management
- Monitoring is intended to make sure that performance matches expectations.
  - expectations about what is done day-to-day
    - implementation monitors
      - TMR shaker box testing
  - expectations about the results of day-to-day efforts
    - results or outcome monitors
      - incidence of milk fever
Monitoring

Monitoring is the

• routine,
• systematic,
• evaluation,
  of a dairy's
• status and
• trends.
Monitoring to support management

• What do we want to know and how would we use the information if we had it?
  - What measure will be used to compare results and expectation?
  - What parameter or observation will be used?
  - How will it be collected and is it accurate?
  - Who will collect it?
  - When will the data be collected?
  - How will it be reported, calculated, stored?
  - Who will use it and how?
    • If you will not use the information, do not collect it.
Good monitors

- Minimum delay between cause and effect (**lag**)
- Use of historical data does not hide recent changes (**momentum**)
- Summary does not conceal problem deviations (**detects variation**)
- Information is not misleading (**avoids bias**)
- Sensitively detects problems
- Specifically identifies the problem
- Applicable to practical constraints
- It is not possible to achieve all of these with a particular monitor; be aware of the limits of your monitoring approach
Monitoring

• There are many approaches to monitoring the transition program
  - No dairy will use them all

• Pick the methods that seem most useful to the general goals or problems on the dairy to use as routine monitors
  - Which parameters monitor the flow through a bottleneck on this dairy?

• Apply other monitors on an “as needed” basis
Monitoring the transition period

1. Dairy observations
2. Feeds, feeding and dry matter intake
3. Fresh cow health screening
4. Health and disease events
5. Milk production in early lactation
6. Mastitis: clinical and somatic cell count
7. Culling and death of adult cows
1. Dairy observations

- Cow comfort and cleanliness
  - Hock scoring
- Stocking density and bunk space for dry and fresh cows
- Manure scores
- Body condition scores
Cow comfort
what do the cows tell you?

• Are cows using their beds?
• Is bedding adequate?
• Are beds and cows clean?
• Stall dimensions?
• Ventilation?
• Cooling?
• Over-crowding?
Hock Scoring

at least 80% of cows with a score of 1.

Few or none with a score of 3.

Score 1: normal

Score 2: hair loss

Score 3: swelling with or without hair loss
Stocking density and bunk space

• Dry cows and just fresh cows must not be overcrowded!
  - Far-off dry cows: 100% of beds maximum
  - Close-up dry cows: 90%
  - Fresh cows: 90%

• Feed bunk space is key
  - Minimum 60 cm per cow
  - 75 cm of bunk space is better
Effect of crowding on close-up DMI

Dry matter intake in dry cows is crucial to the success of the transition program.
Manure scoring consistency and consistency

- Manure scores: consistency (thickness): 3- to 3 for milking cows
- Should be consistent (the same) from cow to cow
- Bubbles or mucus: hind gut fermentation
- Screen representative sample(s) for grain or fiber if necessary
Manure: manure screening

Wash manure sample.

Look for undigested concentrates, overly long fiber. Assess effective rumen mat and starch digestion.
Body Condition Scoring

• For transition cow programs, the change in BCS from pre-fresh to one month fresh may be the most useful parameter to monitor.

• Body condition scoring provides a view of the herd’s status, but the dairy should NOT feed dry cows to change their body condition scores.
  - Dry cows should change no more than 0.25 points of BCS

• Ideal body condition scores:
  - Early dry: 2.75 - 3.5
  - Calving: 2.75 - 3.5
  - Two months after calving: 2.5 - 3.25
2. Feeds, feeding, and intakes

• Feed quality, consistency, nutrient content, free from mold and contamination
• Water
• Feed delivery, mixing, bunks, push-up, sorting
• Pre-fresh cow urine pH
• Ration specifications and testing
Feed quality

• Feeds themselves, particularly forages and byproducts, must be examined frequently
  - Dry matter tested at least weekly
  - More often if forages change, rain, etc.
  - Nutrient testing regularly

• Purchased feeds
  - Consistent appearance, reliable source

• All feeds free from contamination, mold, or spoilage
Water

- What are the sources of water?
- Is the water clean?
- Is there enough water space per cow?
  - Goal 7 - 10 cm of water space per cow
- Do all pens have at least 2 waterers?
- Do cows have water at calving?
- Are extra waterers used in summer?
Feeding management

• More feeding programs fail in delivery and feeding management than fail because a faulty ration was formulated
  - Feed storage and feed out
  - Bunk face management
  - Feed mixing
  - Quantity delivered
  - Delivery and feed bunk management
  - Push up of ration
  - Sorting of the ration by the cows
Monitoring feeding management

• Look at the ration as delivered
  - Shaker box testing

• Monitor the amount of refusals just prior to the next feeding: goal 3 - 5 %

• Observe the bunk between feedings
  - Feed pushed up?
  - Evidence of sorting?

• Observe cow feeding behavior
  - Goal: > 60% of lying cows chewing their cud

• Observe the feed loading and mixing
Feeding monitor observations

Feed delivered, eating behavior

Dry matter testing and shaker box

Feed push up?

Sorting?
Shaker box testing

- **Corn Silage (kernel processed)**
  - 3 – 8 % upper
  - 45 – 65 % middle
  - 30 – 40 % bottom

- **Alfalfa haylage**
  - 10 – 20 % upper
  - 45 – 75 % middle
  - 20 – 30 % bottom

- **TMR**
  - 6 – 10 % upper
  - 30 – 50 % middle
  - 30 – 50 % bottom
  - For most milk cow TMR rations, the bottom box should be less than 50% of the as fed weight

Taken from Penn State Web site
http://www.das.psu.edu/dcn/CATFORG/PARTICLE/pdf/DAS0242.pdf
Urine pH in close-up dry cows

- Used to monitor the effectiveness of negative DCAD feeding programs to prevent hypocalcemia
  - $> 7.0$ inadequate
  - $6.0-6.8$ Holsteins
  - $5.8-6.3$ Jersey
  - $<5.8$ excessive acidification
A cow’s principal three tasks in the housing areas.

Appropriate Eating Behavior

Sleeping

Cud Chewing
Feeding Related Behavior

Michigan State information (73 lbs milk)

• Eating
  - 5 hours/day. 19,000 chews
  - 11 “meals”; 2 kg dry matter; 4 kg as fed

• Drinking
  - 14 times/day; 80 liters/day; 20 minutes total

• Cud Chewing
  - 14 “episodes” @33 minutes = 7.6 hours
  - 30,000 chews.
Desired Eating Behavior

- Aggressive eating
- Eat down thru pile
- Take big mouthfuls
- Raise head to chew
- No rooting around
- No sorting
- Clean bunk thoroughly at least once per day
Sorting Behavior

• All cows will try to sort
  - cows probably have some “natural” tendency to engage in sorting behavior

• From a feeding management perspective, sorting is an undesirable behavior
  - The goal is to minimize sorting
    • Moist rations
    • Proper particle sizes and proper mixing
    • Feed push-up
    • Feeding extra to provide ~ 3 - 5% refusals
3. Fresh cow screening

- Routine daily screening of cows in the first two weeks after calving
- Identify and quickly treat individual fresh cows that are sick
- Recognize changes or trends in disease events
  - Respond quickly and fix transition management problems
A quiet walk-through will spot problem cows.
Screening fresh cows

- Cows less than two weeks after calving are restrained after morning milking
- Walk down the front
  - Scan for problems, nasal discharge, poor attitude, sunken eyes, eating
  - Mark cows for later treatment or special examination
- Treat cows that need follow-up treatment for problems identified on previous days
  - Good records are critical!
  - Needs highly skilled people.

Screening procedures will depend on the dairy and group size. Do NOT keep cows locked up for more than 45 minutes!
Is the cow eating? What is her attitude? Eyes? Any nasal or ocular discharges?
Screening cows: equipment

- Tool belt
- Digital thermometer
- Urine ketone test strips
- Rectal sleeves
- Stethoscope
- Marking crayons
- Records
Look for rumen fill, bloat, or more often tucked up abdomen on the cow’s left side.
Observing cows, taking temperatures, checking for smell or discharges, stimulating for urine if needed.
Check for left displaced abomasum and rumen motility if needed.
Rectal examination if needed.
4. Disease events in fresh cows

- Monitoring disease events in cows at calving and in the first several weeks of lactation provides a useful window into how effectively transition management is supporting cows through this difficult stage.
- Watching trends in the incidence of disease will often highlight problems early after problems arise.
- The type of disease can also point toward the likely underlying metabolic or management problem.
Disease events in fresh cows

- **Dystocia**: hypocalcemia, genetics, cow BCS, size
- **Stillbirth**: dystocia, worker skill
- **Milk fever**: dry cow feeding and comfort
- **Retained placenta**: dry cow feeding and comfort
- **Metritis**: dry cow & fresh feeding, hygiene, dystocia
- **Displaced abomasum**: dry cow & fresh feeding
- **Ketosis**: dry cow & fresh feeding, cow comfort
- **Pneumonia**: dry cow & fresh feeding, vaccination, ventilation, crowding, biosecurity, calf and heifer history
## Postpartum disease

<table>
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<tr>
<th></th>
<th>Goal</th>
<th>Negative energy balance</th>
<th>Hypocalcemia</th>
<th>Immune suppression</th>
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<tbody>
<tr>
<td>Dystocia</td>
<td>&lt; 6%</td>
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<tr>
<td>Stillbirth</td>
<td>&lt; 3%</td>
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<td>X</td>
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<tr>
<td>Milk fever</td>
<td>&lt; 2%</td>
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<tr>
<td>Retained placenta</td>
<td>&lt; 5%</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Metritis</td>
<td>&lt; 6%</td>
<td>X</td>
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<td>Displaced abomasum</td>
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<td>Ketosis</td>
<td>Depends on diagnosis</td>
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<td>X</td>
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<tr>
<td>Pneumonia</td>
<td>&lt; 2%</td>
<td>X</td>
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5. Milk production in early lactation

• The dairy must have either milk meters or some sort of testing service that measures milk production

• Summaries may identify trends or recent changes

• Always look at the underlying individual cow data to watch for outlier groups
  - Particularly important for early fresh cows
    • Pay particular attention to first lactation
  - Scatter graphs
Milk production in early lactation

Peak production?
60 - 100 days in milk

Look for problem cows in early lactation
6. Mastitis

- The two periods of highest infection rate for cows is the beginning of the dry period and the start of the next lactation
  - Clinical mastitis
    - Clinical mastitis cases in the first month of lactation
  - Somatic cell counts and subclinical mastitis
    - $SCC > 200,000 \ (\log_{10}SCC > 4.0)$ is a cow likely subclinically infected
      - Can also use the California Mastitis Test shortly after calving
    - Monitor by considering the number of cows in the first month of lactation with a high somatic cell count
      - Scatterplots are useful
    - Dry cow program and dry cow treatment effectiveness
      - Change in somatic cell count status across the dry period
Graph of log SCC by days in milk for cows in early lactation
Somatic cell count at beginning of lactation:

- **Clean**
  - Low infections
  - Somatic cell count when dried off:
    - Low
    - Chronic
    - Cures
    - High infections
7. Culling and death in adult cows

• When in lactation?
  - Particularly in the first 60 days of lactation

• Which lactation group?
  - 1\textsuperscript{st}, lactation, 2\textsuperscript{nd}, etc.

• What are the reasons why cows are culled or die?
  - It is very important that the record system establish a consistent set of reasons and record these event carefully
Monitoring cows sold or died in early lactation

### Table of Events

<table>
<thead>
<tr>
<th>ID</th>
<th>MILK</th>
<th>ME30S</th>
<th>LACT</th>
<th>DIM</th>
<th>Event</th>
<th>DNM</th>
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### Event Total

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<th>Aug09</th>
<th>Sep09</th>
<th>Oct09</th>
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<td>5</td>
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