Teat End Health Assessing and Controlling

Paul Virkler, DVM
pdv3@cornell.edu
607-229-5985

Learning objectives

• Understand the process of performing teat scoring
• Understand the difference between short and long term changes
• Develop a basic grasp of how the results from teat scoring guide the next steps in correcting a problem
Why do we need scoring systems?

- Gives us a true picture of what is happening at the cow level that impacts the risk of mastitis
  - If these scoring systems are performed correctly and consistently they can be an objective measurement

- Helps to identify opportunity areas
  - Is there a problem with the whole system or with an individual person in the system?

Teat Scoring after Unit Detachment

- All teats are scored with 60 seconds of unit detachment using the Teat Club International guidelines

- Two main categories
  - Short/medium term effects
    - Is the cow happy with the way she was milked today?
  - Longer term effects
    - What changes are present that have happened over time?
Teat Scoring after Unit Detachment

Teat Anatomy

- Annular fold
- Gland sinus
- Teat sinus
- Furstenberg’s rosette
- Teat wall
- Teat Canal (0.31 - 0.47” or 8 - 12 mm)
- Smooth muscle
Forces on fluids within the teat during pulsation cycles

b phase (open phase)  d phase (closed phase)

Video
Liner Movement During Milking

Short and Medium-term Effects

• Why do they matter?
  • Prolonged closure of teat canal after milking
    • Traditional thought = 30-60 minutes
    • Work from Europe (Neijenhuis, F., 2001) shows it is much longer under certain conditions

• What does this mean for entry of environmental mastitis causing organisms?

Teat End

Short and Medium-term Effects

- Teat color
- Swelling at the teat base
- Hardness at the teat end
- Hemorrhage

Primarily associated with milking machine faults or poor milking management resulting in long periods of low flow (Teat Club International)
Short and Medium-term Effects

- Teat color Categories
  - Normal
  - Red
  - Blue
  - Dark Skin

Primarily associated with milking machine faults or poor milking management resulting in long periods of low flow (Teat Club International)
Short and Medium-term Effects

• Swelling at Teat Base Categories
  • Normal
  • Visible Mark
  • Swollen

Primarily associated with milking machine faults or poor milking management resulting in long periods of low flow (Teat Club International)
Short and Medium-term Effects

- Hardness at the teat end categories
  - Normal
  - Firm
  - Wedged

Primarily associated with milking machine faults or poor milking management resulting in long periods of low flow (Teat Club International)
Short and Medium-term Effects

**Wedging at Teat End**

Recent Farm Example Herd

<table>
<thead>
<tr>
<th></th>
<th>GOAL</th>
<th>Initial Teat Scoring</th>
<th>Teat Scoring after vacuum change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent of cows with one or more abnormal teats</td>
<td>Percent of cows with one or more abnormal teats</td>
<td>Percent of cows with one or more abnormal teats</td>
</tr>
<tr>
<td>Teat Color</td>
<td>&lt;20%</td>
<td>69%</td>
<td>40%</td>
</tr>
<tr>
<td>Hardness at Teat End</td>
<td>&lt;20%</td>
<td>69%</td>
<td>28%</td>
</tr>
<tr>
<td>Swelling near Teat Base</td>
<td>&lt;20%</td>
<td>&lt;1%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Hemorrhage</td>
<td>&lt;10%</td>
<td>&lt;1%</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>
Short and Medium-term Effects

Hemorrhage at Teat End

Teat Club International

Herd A

Herd B

April 27, 2020

Percent Time in Low Flow

6 months of data

Percent Time in Low Flow

6 months of data
Longer Term Effects

• The changes that have happened over a slightly longer period of time

  • Teat Skin Condition
  • Teat End Hyperkeratosis

Longer Term Effects

• Teat skin condition categories
  • Normal
  • Dry
  • Open Lesion
Longer Term Effects

Teats with Dry Skin

Teats with Open Lesions
Teat Skin Condition Challenges

- Large differences between herds in teat skin condition
  - Many of these are present even through the summer

Teat Skin Condition by Month
Teat Skin Condition by Month

Percent of Cows with Open Lesions on Teats by Month

• Teat end hyperkeratosis categories
  • Normal
  • Smooth
  • Slightly Rough
  • Rough
  • Very Rough

Longer Term Effects
<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>N (0)</td>
<td>Normal</td>
<td><img src="image1" alt="Normal Illustration" /></td>
</tr>
<tr>
<td>S (1)</td>
<td>Smooth or slightly rough ring</td>
<td><img src="image2" alt="Smooth or slightly rough ring Illustration" /></td>
</tr>
<tr>
<td>R (2)</td>
<td>Rough ring</td>
<td><img src="image3" alt="Rough ring Illustration" /></td>
</tr>
<tr>
<td>VR (3)</td>
<td>Very rough ring</td>
<td><img src="image4" alt="Very rough ring Illustration" /></td>
</tr>
</tbody>
</table>

Normal

Photo: Utrecht University: Drs A. de Man, Dr Y.H. Schukken & Drs J.P. Koeman
Smooth or Slightly Rough

Photo: Utrecht University: Drs A. de Man, Dr Y.H. Schukken & Drs J.P. Koeman

Very Rough

Photo: Utrecht University: Drs A. de Man, Dr Y.H. Schukken & Drs J.P. Koeman
How Many To Score?

• The Teat Club International says that as a general rule you need to score **80 cows** or **20% of the herd** whichever is greater.

• These cows need to be a haphazard sample of the entire herd representing all lactations and a normal distribution of days in milk.

When is There a Problem?

This is based on percentage of cows with one or more teats in the abnormal category.

• Teat color > 20% of cows with red or blue teats
• Swelling at the teat base > 20% of cows with swelling at base
• Hardness at the teat end > 20% of cows with firm or wedged
• Teat skin condition > 20% of cows with poor skin condition
• Open lesions > 5% of cows with open lesions
• Teat-end condition > 20% of cows with rough or very rough
What should you measure?

- Average claw vacuum at peak flow
- Pulsation under load
- Milkline vacuum during milking
- Full NMC evaluation if >6 months since previous
- Unit alignment scoring
- Milking routine timing
- Milk flow rate analysis
- Milking efficiency and throughput timing
- Facilities – stall maintenance, manure in alleyways, cow comfort
- Teat end cleanliness
- Teat scoring
- Strip yields
- Udder cleanliness

Potential Contribution to Mastitis

- Irregular vacuum fluctuations (liner slips)
- Teat damage
- Transfer of organisms (contagious)

G. Mein et. al, Storm in a Teatcup, NMC 2004
What do you do with the data?

- Used as one piece of the puzzle along with the other milking time data such as:
  - Vacuum and pulsation settings
  - Unit Alignment Scoring
  - Automatic Take-off settings
  - Milking routine timing
  - Milk flow rate analysis
  - Milker performance

Additional Resources

- NMC website which has a picture library for NMC members online or as an app
  - https://www.nmconline.org/