

Teat End Health Assessing and Controlling

Paul Virkler, DVM

pdv3@cornell.edu

607-229-5985



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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



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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?



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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?



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Teat Scoring after Unit Detachment

Post milking teat assessment
July 2001

Date
Farm
Observer

* Identify quarters Left, Right, Front, Back at the top of columns
* Place cross in box (X) if an observation is missed for any reason
* If you leave 'normal' findings as blanks in table, tick here ☐

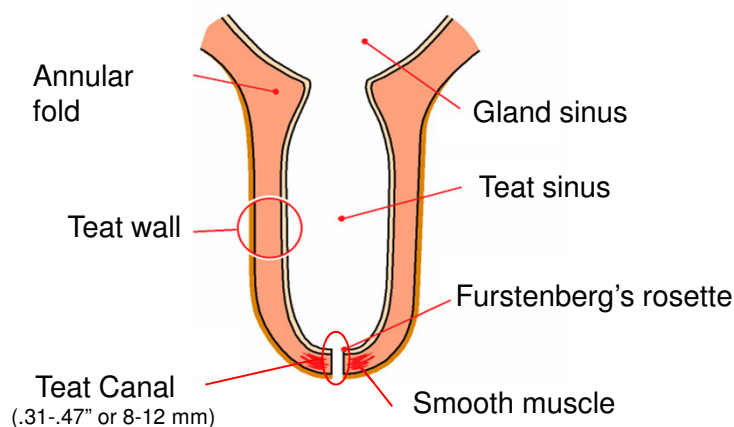
Cow ID	Teat skin condition	Teat colour	Swelling near teat base	Hardness at teat end	Openness of orifice	Teat end score
	Normal, Dry Open lesions Hemorrhages	Normal Red, Blue Dark skin	Normal Visible mark, Swollen	Normal Firm or Wedged	Closed Open (> 2mm)	Normal Smooth or Slight rough Rough, Very Rough
1						
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Teat Anatomy

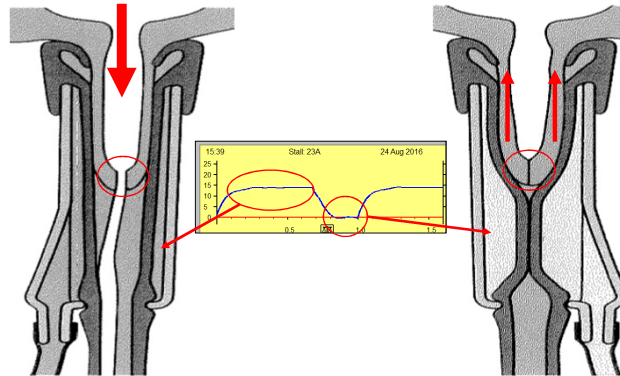


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Forces on fluids within the teat during pulsation cycles

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



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Video



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Liner Movement During Milking

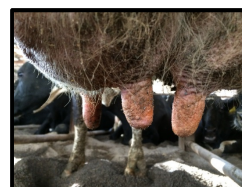


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Short and Medium-term Effects

- 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?



Neijenhuis, F., G. H. Klungel, and H. Hogeveen. 2001. Recovery of cow teats after milking as determined by ultrasonographic scanning. *Journal of Dairy Science* 84(12):2599-2606. NMC. 1999. *Laboratory Handbook on Bovine Mastitis*. Rev. ed. National Mastitis Council, Madison, WI.



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Teat End



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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)



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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)

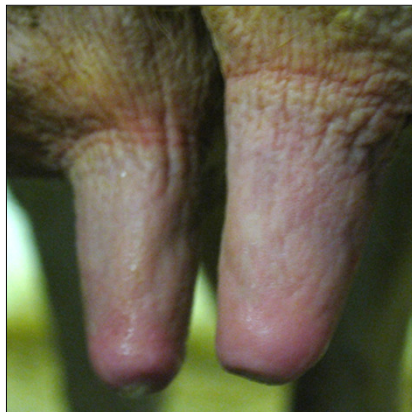


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Short and Medium-term Effects

Teat Color = Red



Teat Color = BLUE



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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)



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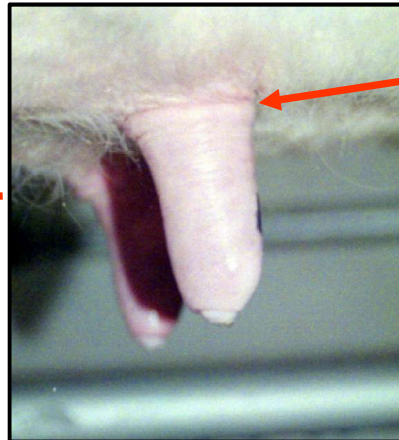


Short and Medium-term Effects

Visible Mark at teat base



Swelling at teat base



Teat Club International



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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)



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Short and Medium-term Effects

Firmness at Teat End



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Short and Medium-term Effects

Wedging at Teat End



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Recent Farm Example Herd

	GOAL Percent of cows with one or more abnormal teats	Initial Teat Scoring Percent of cows with one or more abnormal teats	Teat Scoring after vacuum change Percent of cows with one or more abnormal teats
Teat Color	<20%	69%	40%
Hardness at Teat End	<20%	69%	28%
Swelling near Teat Base	<20%	<1%	<1%
Hemorrhage	<10%	<1%	<1%



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Short and Medium-term Effects

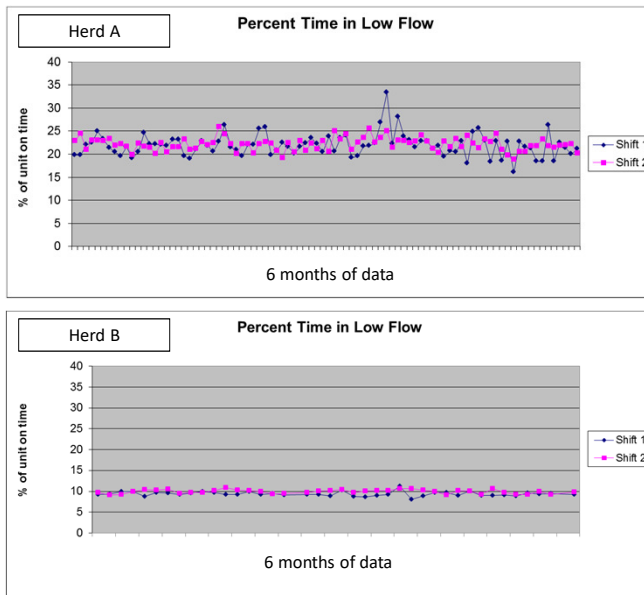
Hemorrhage at Teat End



Teat Club International



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Longer Term Effects

- The changes that have happened over a slightly longer period of time
 - Teat Skin Condition
 - Teat End Hyperkeratosis



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Longer Term Effects

- Teat skin condition categories
 - Normal
 - Dry
 - Open Lesion



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Longer Term Effects

Teats with Dry Skin



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Longer Term Effects

Teats with Open Lesions

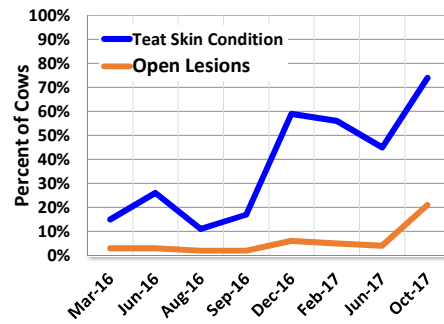
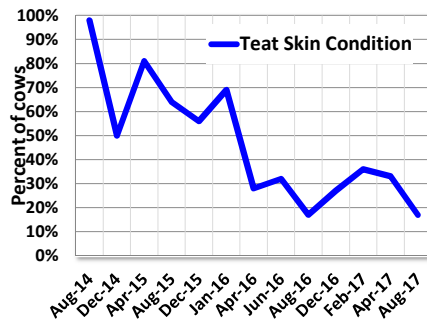


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Teat Skin Condition Challenges

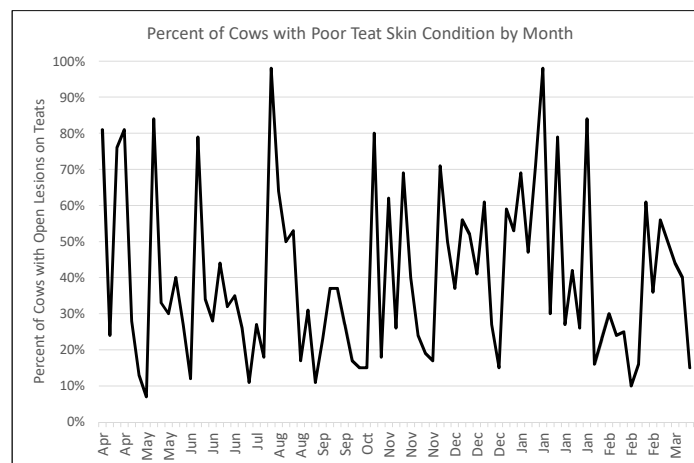
- Large differences between herds in teat skin condition
 - Many of these are present even through the summer



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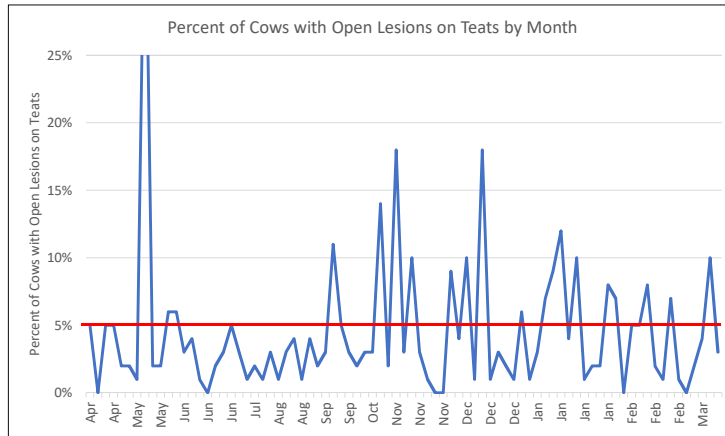
Teat Skin Condition by Month



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Teat Skin Condition by Month



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Longer Term Effects

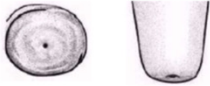



- Teat end hyperkeratosis categories
 - Normal
 - Smooth
 - Slightly Rough
 - Rough
 - Very Rough



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A scoring system for test-end condition (Mein et al. 2001)

Score	Description	Illustration
N (1)	Normal The test-end is smooth with a small, even orifice. This is a typical status for many tests soon after the start of lactation	
S (2)	Smooth or Slightly rough ring A raised ring encircles the orifice. The surface of the ring is smooth or it may feel slightly rough but fronds of old dry keratin are not evident.	
R (3)	Rough ring A raised, roughened ring with isolated fronds or mounds of old keratin extending 1 - 3 mm from the orifice.	
VR (4)	Very Rough ring A raised ring with rough fronds or mounds of old keratin extending 4 mm or more from the orifice. The rim of the ring is rough and cracked, often giving the test-end a "flowered" appearance.	



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Normal

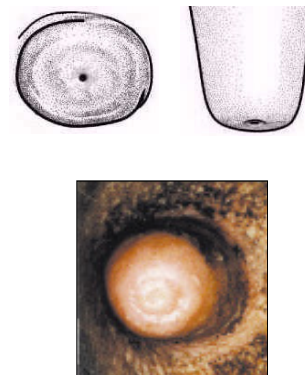
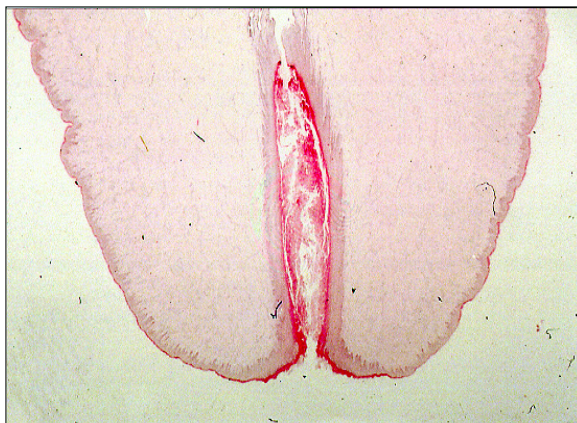


Photo: Utrecht University: Drs A. de Man, Dr Y.H. Schukken & Drs J.P. Koeman



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Smooth or Slightly Rough

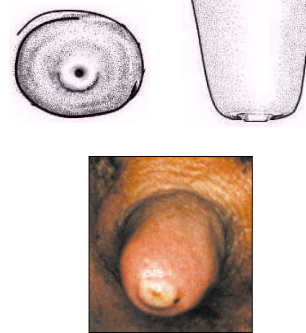


Photo: Utrecht University: Drs A. de Man, Dr Y.H. Schukken & Drs J.P. Koeman



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Very Rough

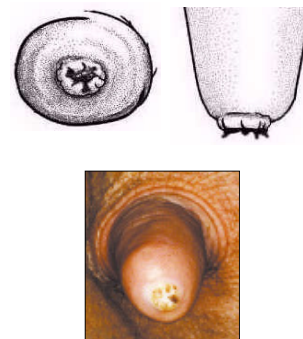
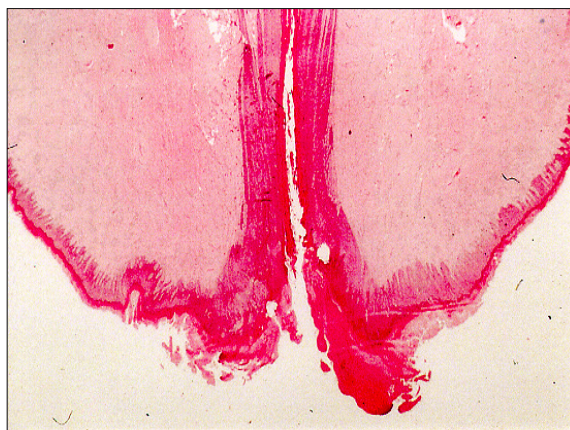


Photo: Utrecht University: Drs A. de Man, Dr Y.H. Schukken & Drs J.P. Koeman



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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.



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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 |

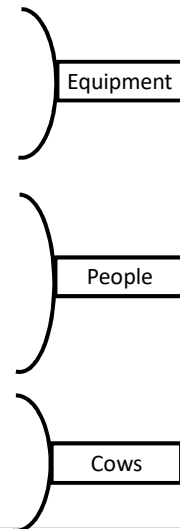


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What should you measure?

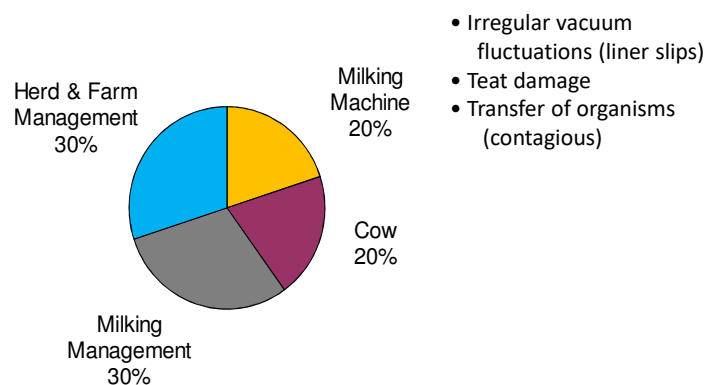
- Average claw vacuum at peak flow
- Pulsation under load
- Milkline vacuum during milking
- Full NMC evaluation if >6 months since previous
- Unit alignment scoring
- Milking routine timing
- Milk flow rate analysis
- Milking efficiency and throughput timing
- Facilities – stall maintenance, manure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



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Potential Contribution to Mastitis



G. Mein et. al, Storm in a Teatcup, NMC 2004



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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

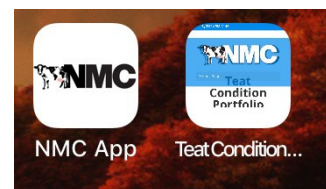
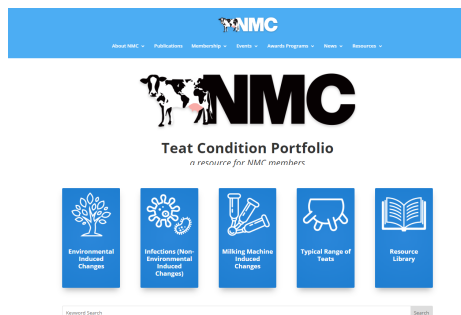


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Additional Resources

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



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Questions?



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