Milking Machines and how they influence mastitis

The Dairy Group
Milking Machines and mastitis

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Milking Machines and how they influence mastitis

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1. Changing the number of bacteria on the teat or teat orifice
   • Appropriate shed management
   • Milking -time hygiene techniques to lower bacterial exposure.
   • Infection rates are increased when equipment is contaminated.
Start with a clean cow
Hygiene scoring

- Objectivity
- Scores 3 & 4 are 1.5x more likely to become infected.
- <20% score 3 & 4

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Teat preparation method
Teat disinfection reduces pathogen numbers on teat ends before and after milking.
Teat dipping better than spraying?
## Teat spraying

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Minimum: 3.20, Maximum: 4.00
Milk pipeline cleaning

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Equipment cleaning

- Clean water pre-rinse
- Require 16 litres/unit of hot water at 85°C
- Pre-warm plant to 55°C
- Recirculate 10 litres/unit for 6-8 minutes
- Final rinse with disinfectant
- Pre-milking rinse

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Automatic cleaning

New Parlours 2014 - 2017

- Installed with automatic cleaners (86%)
- Installed without automatic cleaners (14%)

Installation and commission

- Correct (19%)
- Incorrect (81%)

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Regular monitoring

• Don’t assume automatic washers are correct.
• Observe cleaning
• Chemical concentrations
• Temperature
• Wash distribution

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Practical issues
2. Changing the resistance of the teat canal to bacterial invasion
William Murchland 1891

The Sydney Mail January 1891

The diagram illustrates the Murchland Milking Machine, with a cow inside the machine. The text discusses the machine and its operations, emphasizing the need for proper hygiene and the importance of maintaining cleanliness to prevent disease in dairy operations.
Managing vacuum exposure

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Liner compression
Benefits of liner compression

- Remove fluids from teat end tissues
  - Faster milk flow during b-phase
- Promotes canal keratin growth

David Williams
Negative effects of excessive liner compression

- Increased teat-end hyperkeratosis
- Excessive keratin removal from canal
Hyperkeratosis

TEAT CONDITION SCORING CHART

Score at least 80 cows or 20% of the Herd — This page will score 200 teats (using a \ for the first cow and / for the second ) use multiple pages

Use a Flashlight to observe teats

SCORE N
No RING

SCORE S
Smooth or Slight Ring

SCORE R
Rough Ring

SCORE VR
Very Rough Ring

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Factors affecting HK

- Cups on time
- Vacuum level
- Pulsation
- Skin condition
- Liner over pressure
Over-pressure

- Over-pressure is the compressive pressure, above that required to start or stop milk flow from the teat, applied to the teat by the liner during the liner closed (d-phase)
Liner compression

- Liner compression increases with vacuum level
- Need compression to relieve congestion and maintain milking speed
- Higher liner overpressure results in increased hyperkeratosis

MilkRite & UWMRL 2012

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Relative compression of commercial US/EU Liners
Reduce cups on time – Faster cows!
Timing of unit attachment

Bimodal milk flow

J A Wallace et al., 2003
Timing of unit attachment

• Prep-lag time - varies with stage of lactation
  - 60 - 90 sec 2x milking
  - 90 - 120 sec for 3x milking
• Length of stimulation
• Intensity of stimulation
• Early cup take off
ACR settings (typical)

- 2x herds
  - 350 - 500g/min
- 3x herds
  - 600 - 900g/min
- 4x herds
  - 1200g/min
3. Providing forces to overcome the resistance of the teat canal
Liner slip

• Incompatibility between teat and liner
• Low vacuum level
• Inadequate effective reserve
• Worn liners
• Poor cluster position
Cluster presentation
Cluster presentation

- Faster milking
- Less slippage
- More complete milking
- Less cleaning
- Less damage
Milking Machines and how they influence mastitis

• Changing number of bacteria on the teat or teat orifice
• Changing the resistance of the teat canal to bacterial invasion
• Providing forces to overcome the resistance of the teat canal

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Failing to understand the machine you use can lead to problems.