

Mastitis Reminders and Resources

Laura Siegle
Extension Agent
Virginia Cooperative Extension - Amelia County

Scenario—What would you do?

4 year old cow (just freshened) comes in with clinical mastitis symptoms. What do you do next?

- A. Cull now
- B. Wait for infection to clear during this lactation
- C. Treat infection right now
- D. Other?



By Julia Rubincik, Flickr El Chajon Organic Dairy Farm, CC BY 2.0, <https://commons.wikimedia.org/w/index.php?curid=17483385>

Scenario—What would you do?

How did you come to this decision?



By Julia Rubincik, Flickr El Chajon Organic Dairy Farm, CC BY 2.0, <https://commons.wikimedia.org/w/index.php?curid=17483385>

The Udder's First Line of Defense

- ▶ Teat canal sphincter
- ▶ Keratin



By Julia Rubincik, Flickr El Chajon Organic Dairy Farm, CC BY 2.0, <https://commons.wikimedia.org/w/index.php?curid=17483385>

Damaging the First Line of Defense

Trauma (damages keratin and mucous membranes)

- ▶ Incorrect use of washes and cleaning compounds; improper teat dip mixing
- ▶ Wet teats, freezing, frostbite
- ▶ Failure to prep cows and overmilking
- ▶ Insertion of mastitis tubes or treatment cannulae

High impact force on teat end (propels bacteria into teat canal)

- ▶ Liner slips: temp vacuum loss/abrupt removal without shutoff
- ▶ Vacuum fluctuations
- ▶ Poor liner condition
- ▶ ...and more


Bacterial entry during period when teat is dilated (1-2 hours following milking)

The Udder's Second Line of Defense- Inflammatory Response

- ▶ Bacteria enter and produce toxins and enzymes → stimulate response from inflammatory cells
- ▶ Signaled by damaged tissues, immune cells move from bone marrow to invading bacteria
- ▶ Somatic cell count (SCC) in udder increases (SCC=white blood cells)
- ▶ White blood cells destroy bacteria; meanwhile:
 - ▶ Clotting in milk → sometimes blockages in small ducts
 - ▶ Blockages → scar tissue and loss of function
 - ▶ SCC stays high while gland heals

When do most infections occur?

- ▶ Two weeks after dry-off
- ▶ Two weeks prior to calving
- ▶ Two weeks after calving



Scenario—What would you do?

4 year old cow (just freshened) comes in with clinical mastitis symptoms. What do you do next?

- Cull now
- Wait for infection to clear during this lactation
- Treat infection right now
- Other?

How did you make this decision?




“Know the Enemy”

Milk culturing: a good way to find out what you're dealing with
Culture at least 10-20% of herd annually

Cons:

- ▶ Can you culture in time for treatment window?
- ▶ Can't culture every cow
- ▶ Costs/time/resources for culturing
- ▶ May miss some subclinical cows

...but mastitis management is “not one-size-fits all”



Scenario: What if she had E. coli?

▶ Recommended: “Do not treat local cases” (treat systemic cases); supportive care as needed

If you...

Culled now	Left alone	Treated now
Cons: Lost milk income for rest of lactation; wasted costs of feed during last dry period; cost of replacement Gained cull income	Cons: Loss of milk yield and quality during infection; cow is contributor of higher SCC to bulk tank; cow is eating ration but less productive than healthy peers at the moment—still probably the best choice Infection cleared; fewer “wasted” costs of feed compared to cull	Cons: Costs of treatment; meanwhile, still face loss of milk yield and quality during infection; cow is contributor of higher SCC to bulk tank; cow is eating ration but less productive than healthy peers at the moment

Scenario: What if she had Staph. aureus?

▶ Recommended: “Treatment with pirlimycin in early lactation (days 5-7); do not treat chronic infections.” Culling appropriate depending on case; treatment not always effective, but recommended most often for early lactation cases and first cases in 2nd/3rd lactation; prevention is best.

If you...

Culled now	Left alone	Treated now
Cons: Lost milk income for rest of lactation; wasted costs of feed during last dry period; cost of replacement Gained cull income; if a chronic issue with a cow, made a problem go away (but you probably have other infected cows. Treatment may have been better first attempt for this particular cow)	Cons: Could be spreading S. aureus to others via milking equipment and hands ; loss of milk yield and quality during infection; cow is contributor to higher SCC in bulk tank; cow is eating ration but less productive than healthy peers at the moment	Cons: Cost of treatment; loss of milk yield and quality during infection; cow is contributor of higher SCC to bulk tank; cow is eating ration but less productive than healthy peers at the moment. Treatment may not work; depends. But...this cow MIGHT clear it (we hope) and finish out lactation, or maybe yield is high enough to justify keeping in herd

Scenario: What if she had Prototheca?

▶ Recommended: “No treatment; cull cow”

If you...

Culled now	Left alone	Treated now
Cons: Though this is the right choice, you lost milk income for rest of lactation; wasted costs of feed during last dry period; cost of replacement Gained cull income; avoided the costs of keeping cow and losing income over the long term. Milk fast while you wait to remove from herd.	Cons: Cow can spread infection to others ; cow continues to be a problem—costing feed and resources meanwhile	Cons: Cow can spread infection to others ; cost of treatment; cow continues to be a problem—costing feed and resources meanwhile

Prevention reminders: Housing and Environment

- ▶ Mitigate wet spots, manure pools in loafing areas
- ▶ Reduce contact of udders with wet/dirty organic matter
- ▶ Keep free stalls clean and dry—rebed and scrape daily or 2x
- ▶ On pasture: keep cows out of wet and swampy areas
- ▶ *Maintain dry, clean calving areas*
- ▶ Control flies: insecticides, manure removal, tip/drain water collection sites



Prevention reminders: Dry Cows

- ▶ Dry off Holsteins producing <20 lbs/day (infection risk goes up as production goes down)
- ▶ Dry cow therapy: each quarter at time of dry off
- ▶ Immunize: at dry off, 30 days into dry period, and at calving (J5 for E. coli)
- ▶ Pay attention to dry cow/heifer housing: are pastures overgrazed? Do cows congregate in certain areas?
- ▶ Vitamin E and selenium supplementation leading up to calving—work with your nutritionist/vet

Prevention Reminders: Lactating Herd

- ▶ Milk with clean hands and use gloves
- ▶ Follow good milking procedures (letdown, cleaning, drying, removal, post dip)
- ▶ Strip and check for clinical symptoms: clots, flakes, etc
- ▶ Avoid water on udders
- ▶ Milk "problem cows" last—segregate
- ▶ Double-check to ensure that treated cow milk stays out of bulk tank (records, marking, and residue testing!)
- ▶ Check first lactation cows—many new cases show up around calving
- ▶ Keep good records—Ex, do you know if this is her first round of Staph aureus, or her third?
- ▶ Check milking parlor equipment and vacuum—could be a whole host of problems tied back to these

Prevention reminders: Mammary Infusions

- "When infusing the mammary gland with a mastitis treatment or at dry off with a dry cow therapy product:
- ▶ The teats must be clean and dry.
 - ▶ After the udder is milked out, use a separate alcohol wipe for each teat. Scrub each teat thoroughly until clean.
 - ▶ Infuse the teat with a single-dose sterile tube or cannula.
 - ▶ Do not reuse teat cannulas or tubes.
 - ▶ Consider inserting the teat cannula only partially into the teat canal."


-Christina S. Petersson-Wolfe

More Resources: VT Dairy: <https://www.vtdairydasc.vt.edu/> and VCE publication page: <http://ext.vt.edu/agriculture/dairy-cattle.html> and SQMI page: <http://sequalitymilk.com/>

- ▶ Factsheets for each mastitis pathogen
- ▶ Reference guide for mastitis-causing bacteria
- ▶ VT Mastitis and Immunology Lab (cpnw@vt.edu, (540) 231-4767)
- ▶ **Culturing: detailed info about process and on-farm options-presentation for SQMI workshop from Dr. Christina Petersson-Wolfe:** <http://sequalitymilk.com/wp-content/uploads/2015/04/Dr-Petersson-Wolfe-SQMI-Workshop-2015.pdf>
- ▶ "Resources" page on SQMI site: detailed culture sample collection procedures: <http://sequalitymilk.com/>

More pubs on VCE dairy page:








- ▶ Handling a Herd Mastitis Problem
- ▶ Understanding the Basic of Mastitis
- ▶ Equipment Function Affects Milk Quality
- ▶ Proper Dry Cow Management Critical for Mastitis Control
- ▶ Guidelines to Calling Cows with Mastitis



Improving milk quality in the Southeast through enhanced knowledge on the farm

How does Virginia measure up on milk quality?


University of Tennessee
Virginia Tech
University of Kentucky
University of Georgia
Mississippi State University
University of Florida

SQMI | **Project objectives** *why? why? why?*


- Survey tool to understand the "why"
- Identify science-based recommendations to improve milk quality
 - Annual status report
 - On-farm assessments
 - On-farm demonstrations
- Develop user-friendly tools to manage milk quality
- Education (students, trainers, industry, etc...)

SQMI | **On-farm assessment**



- 4 of 6 states involved
 - VA, KY, TN, MS
- Total of 282 farms
- Single site visit
 - Parlor evaluation
 - Producer survey
 - Barn design
 - Milk quality data

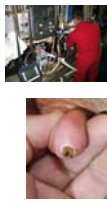
SQMI | **On Farm assessment**




- Visits equally spaced throughout the year
- Equal distribution of low, mid and high milk quality
- Analyses are underway by 4 graduate students

SQMI | **Equipment function & maintenance on BTSCS**

- Data transformed to BTSCS
- Variables of interest:
 - State
 - Herd size
 - Teat end scores
 - Presence of cracked teat ends
 - Claw vacuum
 - Pulsator function
 - Air flow capacity
 - Equipment maintenance
 - % cracked teat ends * average claw vacuum




SQMI | **Results**



- Average herd size
 - 228 ± 20
 - Range: 32 to 2500 cows
 - Majority of herds (78%) were < 250 cows
- Average BTSCS
 - 4.29 ± 0.03
 - Range: 2.78 to 5.75
 - Significant difference between states

SQMI | **Results**

- Things that were not significant:
 - Use of ATOs
 - Pulsator settings
 - How often the parlor was serviced
 - Who performed parlor service
 - Milking frequency
 - Age of the parlor



SQMI Southeast Quality Milk Initiative

Results

- Mean cracked teat ends was 60%
- Median cracked teat ends 65%
- Range 0 to 100%

Herds with majority cracked teat ends
 +
 Increased claw vacuum
 =
 Increased BTSCS

SQMI Southeast Quality Milk Initiative

Results

- Mean cracked teat ends was 60%
- Median cracked teat ends 65%
- Range 0 to 100%

Herds with majority non-cracked teat ends
 +
 Increased claw vacuum
 =
 Lower BTSCS

SQMI Southeast Quality Milk Initiative

Conclusions

- Both state and herd size impact BTSCS
 - Environmental factors
 - Management decisions
 - Resources available to producers
- Claw vacuum * % cracked teat ends impacts BTSCS
 - Maintaining healthy teat ends may allow an increase in vacuum
 - Impact on milk out is unknown

SQMI Southeast Quality Milk Initiative

Objective 2. What's left?

- Identify strategies effectively & efficiently employed in the southeast
 - Annual status report
 - Analyses of 282 on-farm assessment study
 - Intensive on-farm analyses
 - Currently on-going
 - 9 farms each from VA, KY and TN, 3 from MS