Clinical and Subclinical Mastitis Causing Pathogens in Tennessee Dairy Cattle
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Introduction
- Mastitis is the most prevalent and costly disease affecting the dairy industry.
- It occurs when bacteria or other organisms invade the mammary gland causing inflammation and decreasing milk quality that affects multiple levels of the industry.
- Subclinical mastitis - infection without any visible clinical signs (Photo A).
- Clinical mastitis - infection resulting in visible abnormalities in the milk or udder (Photo B).
- Example of an udder infected with mastitis (Photo C).
- Primary subclinical: Streptococcus agalactiae, Staphylococcus aureus, Streptococcus dysgalactiae, Streptococcus uberis, and other coagulase negative Staphylococci.
- Primary clinical: Streptococci, Staphylococci, or coliforms. Coliforms most common cause of severe clinical mastitis.
- Limited research available identifying the most frequently isolated mastitis pathogens in Tennessee. Knowing the types of pathogens present allows for effective changes in management practices as well as development of treatment plans.

Hypothesis
- I hypothesize that the most frequently isolated subclinical mastitis pathogens in Tennessee will be coagulase-negative Staphylococci and Staphylococcus aureus and the most frequently isolated clinical mastitis pathogens will be coliforms such as Escherichia coli. Furthermore, I hypothesize that major pathogens will occur more frequently in Spring than Fall.

Objective
- To identify the most frequent mastitis pathogens for each type of mastitis, per farm, and between seasons.

Experimental Design
1. Milk samples (n=1231 subclinical, n=245 clinical) were obtained from 9 Tennessee dairy farms participating in the Southeast Quality Milk Initiative.
2. Subclinical samples from 10-20 cows per herd per visit producing milk with somatic cell counts over 400,000 cells/ml (somatic cell count >200,000 cells/ml = active infection).
3. Subclinical samples were first taken in February/March 2016 and then September/October 2016.
4. Clinical mastitis samples were submitted by the farmers.

2. Milk samples were plated on BBL TSA II agar plates with 5% sheep’s blood and BBL MacConkey agar plates to obtain bacterial colonies (Blood agar pictured on left).

3. Gram staining and various biochemical tests were performed to determine the types of organisms present using National Mastitis Council guidelines.

Results & Discussion
- Top three clinical mastitis organisms isolated were coagulase-negative Staphylococci (8.85%), Escherichia coli (7.96%), and Staphylococcus aureus; Streptococcus dysgalactiae (6.19%) each. The most common result was no growth (48%) and typically suggests the infection was eliminated by the cow.
- Overall, 43.14% of quarters had subclinical infections. The top three subclinical pathogens isolated were coagulase-negative Staphylococci (38.42%), Staphylococcus aureus (18.16%), and Streptococcus dysgalactiae (8.16%).
- Regardless of the type of infection, the most frequently isolated pathogen overall was coagulase-negative Staphylococci.

Acknowledgements
- NMC, N. M. C. 1999. Laboratory handbook on bovine mastitis. 2nd ed. National Mastitis Council, Madison, WI

References
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