

MILK QUALITY

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Assertive Mastitis Therapy: Living in an Era of Environmental Pathogens

The following is taken from a webinar by Tiago Tomazi DVM from Merck Animal Health. Dr. Tomazi said we should care about clinical mastitis because of losses associated with the disease. Mastitis can cause losses of around \$200 per cow per year. Mastitis reduces production and increases the milk discard, reduces milk quality (SCC and TBC) and the yield of dairy products. It increases the cost with treatment and labor and increases the risk of recurrence and culling. It harms the reproduction performance and increases the antibiotic residues and antimicrobial resistance. It also reduces bonuses paid to producers. We are now living in the era of environmental pathogens.

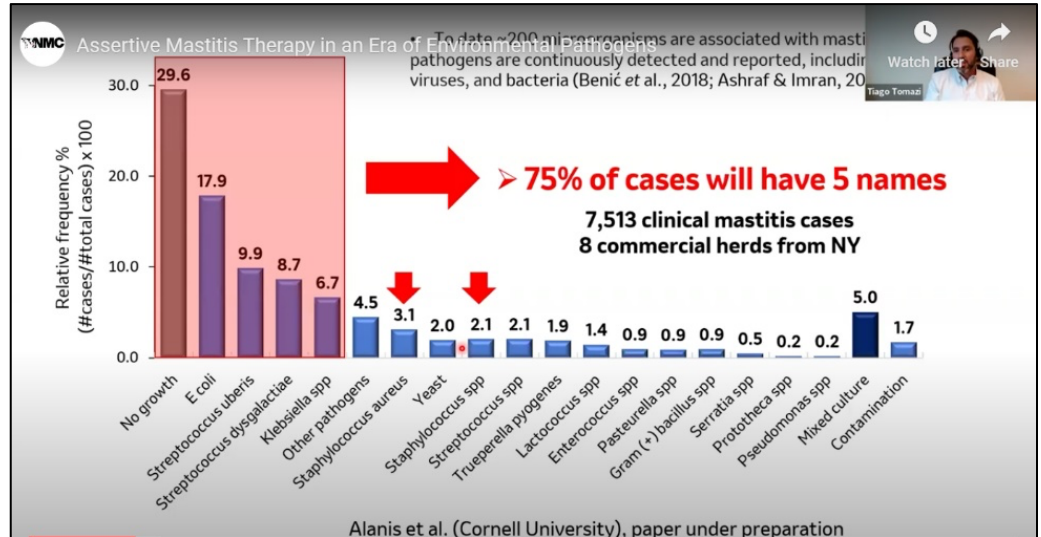
There are more than 200 micro-organisms associated with mastitis but 75% of the names come from five sources, including, no growth, E. coli, Strep uberis, Strep dysgalacticae, and Klebsiella. There is a huge difference in the distribution of pathogens on farms. **Dr. Andy Johnson says that mastitis is a disease of men transmitted to the cows.**

Different organisms cause different losses in milk production. The chart pictured in the middle shows the milk loss from different micro organisms in several New York herds.

Dr. Tomazi does not believe that we should treat subclinical mastitis in lactation unless the cows have Strep agalactica. For other causes of subclinical mastitis, we should concentrate on prevention, culling or segregating cows (Staph aureus), and dry-cow therapy.

Preventing mastitis includes taking steps to monitor nutrition, hygiene, milking routine, timely diagnosis, timely treatment, vaccination programs, data records, and employee education. More than 80% of the mastitis cases can be prevented.

To achieve good outcomes with selective treatment of clinical mastitis there are four factors that need to be done. They are to collect a clean sample, consider the clinical signs of clinical mastitis, know the mastitis causing organism, and know the factors that can affect the cure.



Total Losses kg (lbs) Up to 49 Days After

| Parity | No growth | NAS | Strep. spp. | E. coli | Klebsiella spp. | S. aureus | S. dysg. | S. uberis |
|----------------------|------------|------------|-------------|-------------|-----------------|-------------|-------------|-------------|
| 1 st lact | -41 (-91) | -58 (-129) | - | -212 (-472) | - | -257 (-572) | -234 (-520) | -94 (-210) |
| ≥2 lact | -54 (-121) | -57 (-126) | -75 (-167) | -250 (-555) | -268 (-595) | - | -203 (-452) | -137 (-304) |

Outcomes of No Growth Cultures with Treatment vs No Treatment

| Outcome - 90 days | No treatment | Spectramast - 5 days |
|--------------------|------------------|----------------------|
| Recurrence | 5% | 8% |
| Culling | 3% | 5% |
| Abnormal milk days | 4.0 | 4.2 |
| Milk Yield | 96 lbs (43.6 Kg) | 95 lbs (43.3 Kg) |
| Quarter SCC | 5.4 | 5.5 |

For treating clinical mastitis there are two options, treat every cow or selectively treat the mastitis. The overall goals of antimicrobial treatment of mastitis, is to have a clinical cure, bacteriological cure, and minimize negative health and economic consequences. The goals of selective treatment of clinical mastitis, is to reduce and refine antimicrobial treatment of mastitis. This is done by treating only clinical mastitis cases with substantially **higher odds of bacteriological cure** and not treating clinical mastitis cases that **will not benefit** from antimicrobial treatment.

| Outcome - 90 d | No treatment | Spectramast (2 d) | Spectramast (5 d) |
|-------------------|----------------|-------------------|-------------------|
| Recurrence | 32% | 34% | 32% |
| Culling | 18% | 12% | 11% |
| Abnormal milk (d) | 4.2 | 4.8 | 4.5 |
| Milk Yield | 82 lbs (37 kg) | 80 lbs (36 kg) | 83 lbs (38 kg) |
| Quarter SCC | 6.1 | 6.3 | 6.0 |

Factors that effect the cure are pathogen virulence and cow related (SCC, clinical mastitis history, reproductive status). Dr. Tomazi recommends only using intramammary tubes for mild and moderate cases of mastitis. There are currently no antibiotics approved for systemic treatment of mastitis in the United States. Compared to intramammary treatments, systemic treatment with penicillin, aminoglycosides, and cephalosporins did not improve treatment outcomes. The goal for the treatment of severe mastitis cases is to reduce the risk of sepsis, optimize hydration, and alleviate inflammation.

Approximately 40% of clinical mastitis milk culture samples in the U.S. and Canada are no growth. The cow's immune system took care of the infection by itself. These cases do not need antibiotics. About 25-35% of cultures are gram-negative organisms. Escherichia coli have high spontaneous cure rates in mild/moderate cases. Antimicrobial treatment does not improve cure rates. Klebsiella spp effect of treatment will vary with the pathogen characteristics. On some farms treatment of Klebsiella is recommended. Gram positive cases are approximately 25-35% of cases. The best approach for Staph aureus cases may be culling. If culling is not an option, the cows should be segregated and milked last. The best chance for success of treating during lactation is to treat first lactation cows, low somatic cell cows, and cows with a healthy teat end. Environmental Streps and non-aureus Staph cows respond the best to treatment. Dr. Tomazi recommends only three days of treatments on these cows. One should also look at cow factors on deciding to treat these cows. If the cows have a history of high SCC or had a previous case of mastitis the chance of curing the mastitis is diminished.

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Before grabbing a tube, an evaluation should be made on a per case basis of SCC history, CM history, and the results of culture to predict the likelihood of clinical cure for current CM case.

Dr. Tomazi recommends to only use selective treatment if the following criteria are met. Monitor program periodically!

1. Sharp identification of clinical cases and severity scores.
2. Trained and motivated employees
3. Must be able to make decisions on the cow level by looking at her history of SCC, reproductive problems, tough transition, etc.
4. Bulk tank SCC under 250,000 cells/ml.
5. Prevalence of gram positive under 35% with no Strep ag and Staph aureus under control.
6. Use of efficacious antibiotics for gram positive cases.

