

Mastitis treatments – good or bad?

By Ynte Schukken

Given farm- and cow-specific influences on mastitis treatment, evaluating a protocol's success isn't easy, but you can do it

Although prevention of mastitis is the ultimate goal on every dairy, clinical cases still occur. That goes a long way to explain the number of treatment protocols available to dairies. Since not all protocols are equally valuable, with some performing better than others given farm-specific circumstances, it's helpful to evaluate each protocol's performance.

Among the farm-specific factors that influence a given protocol's success are:

- Distribution of bacteria causing mastitis cases. For example is it predominantly coliforms or *S. aureus*?
- The bacteria's antibiotic sensitivity.
- Duration of therapy.
- Actual administration of treatments, including hygiene and consistency.

Cow factors can also impact treatment outcome. These include severity of the mastitis case, a cow's age, number of quarters affected, time interval between actual infection and initiation of treatment, and previous successes or failures of a therapy.

Given all these influences, evaluating the success of a treatment protocol isn't easy. But you can do it.

Evaluate treatments

First of all, you must clearly define the criteria for treatment success. There are several options, and all provide a slightly different insight into the impact of the therapy. For example, days in the sick pen is a criterion that provides information on the speed of clinical cure and the length of the withhold period.

Actual cure rate of infection, another criterion, can be assessed through repeated culture of the quarter after treatment. The cost and logistics of this excellent strategy often prevent implementation.

A dairy can also evaluate treatment success by presence or absence of clinical signs and, more dramatically, the probability of survival.

A more realistic method to evaluate cure, or a return to healthy, is to monitor

follow-up somatic cell counts (SCC) after the occurrence of a clinical case.

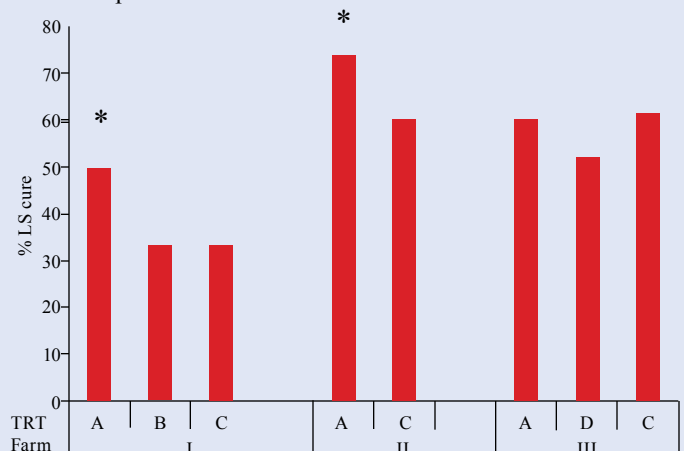
The following rules apply for good treatment evaluation using this method:

- Evaluate the first case of mastitis in a lactation.
- Analyze two cell count measures after the case of clinical mastitis.
- Only use cell count measures that are at least 14 days after the start of treatment.
- Define cure (LScore) as both a SCC below 250,000 or a linear score (LS) of 4.5. All other cases above this cutoff are non-cure.
- Calculate the percentage of cure.
- Compare the percentage of cure between lactations, seasons of the year, culture results (if available) and treatment protocols.
- Evaluate the systemically sick cows separately from the cows with non-systemic signs.

Dairy data

Quality Milk Production Services (QMPS) evaluated data from three dairy herds. Each herd had more than 100 cases of clinical mastitis in its computer and good follow-up information. The dairies record

Figure 1. Cure as defined by two low Linear Scores (LScore) after clinical mastitis on three dairies. LScore is presented by treatment protocol used on the dairies



Treatment protocols with the same letter use the same intra-mammary treatment product. As asterisk indicates that the difference between treatments is beyond chance.

Reading the record

You can use Dairy Comp (DC) 305 data for treatment evaluation. Here is a list created in DC305 where information is coded into "items" that are helpful in evaluating the success of treatments.

ID	FDAT	DMAS1	TRT	DCUL1	RCUL1	NMAST	LS1PM	LS2PM	LSCUR
1256	3/25/2007	4/11/2007	A	4/11/2007	R	5	4.4	8.2	0
3421	3/17/2007	8/4/2007	A	8/4/2007	S	2	0	5.4	0
1768	1/14/2007	9/10/2007	C	9/11/2007	S	1	2.9	0.2	1
785	8/4/2006	12/5/2006	C	12/5/2006	N	1	3.1	1.7	1

ID = cow ID, **FDAT** = fresh date, **DMAS1** = Date of first mastitis, **TRT** = treatment protocol **DCUL1** = date of first culture, **RCUL1** = result of first culture (**R** = *S. aureus*, **S** = *Streptococci*, **N** = Negative), **NMAST** = total number of mastitis cases in the lactation, **LS1PM** = first linear score post mastitis, **LS2PM** = second linear score post mastitis, **LSCUR** = cure defined by two LS values below 4.5 (1 = yes, 0 = no).

Cow 1256 had a mastitis case on April 11 and was cultured that same day with *S. aureus* (R). Her first linear score post mastitis was 4.4 and the second 8.2. Cow 1256 was defined as a non-cure. She went on to have five mastitis cases in this lactation.

In contrast, cow 1768 was treated on Sept. 10. The culture result showed the presence of streptococci (S). Post-treatment linear scores were both low, and 1768 was defined as a cure. This turned out to be the cow's only mastitis case in this lactation.

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How to reach us...

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QMPS is a program within the Animal Health Diagnostic Center, a partnership between the New York State Department of Agriculture and Markets and the College of Veterinary Medicine at Cornell.

The QMPS staff of veterinarians, technicians and researchers works with New York dairies to improve milk quality by addressing high somatic cell counts, milking equipment and procedures, and milker training in English and Spanish. QMPS also conducts research and teaching programs.

Reach the four regional QMPS laboratories at:

- Central Lab, Ithaca.
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- Eastern Lab, Cobleskill.
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- Northern Lab, Canton.
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- Western Lab, Geneseo.
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QMPS website:

<http://qmps.vet.cornell.edu>

Dairy One is an information technology cooperative, providing DHI records services and herd management software to dairies throughout the Northeast and Mid-Atlantic region. A comprehensive laboratory network provides milk quality testing as well as forage, soil, manure and water testing.

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treatment protocol, culture results and subscribe to Dairy One's cell count service. We used the rules outlined here to define treatment success. (See Figure 1 for results.)

The three dairies show a different pattern. Farm I generally has lower LScore than the other two dairies. Further investigation would be valuable.

On both Farm I and II, treatment A appears to outperform treatment B and C. On Farm III all treatments appear to work well, and treatment C is numerically the highest.

Figure 2 shows the same data split out by culture result. Farm II still has the highest LScore. This holds up across all bacterial causes. Farm I's LScore is low in cows affected with *S. aureus* and still lower in the Negatives (no growth), Gram-negatives and *Streptococci*-infected cows compared to the two other dairies.

Clearly there's no single best treatment for mastitis. If it was as easy as that, there wouldn't be so many different options. Optimizing protocols is a dairy-specific process, taking into consideration its specific conditions.

Dairy producers should be careful about drawing conclusions about mastitis treatment success or failure, just as with other on-farm comparisons of groups, treatments or individuals. A dairy may assign treatments to certain cows for specific reasons. For example, if the more severe sick animals receive treatment C on Farm I, then it may be expected to have lower treatment success.

To best evaluate treatments, just like any decision-making process on a dairy, it's helpful to have some objective data to guide decisions. Careful record keeping with subsequent analysis of collected data helps provide objective data to make these important herd decisions.

Figure 2. Cure as defined by two low Linear Scores on three farms

