

Mastitis and Somatic Cell Count in Raw Milk

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What is mastitis?

Mastitis simply means “mammary inflammation”.

Most farmers associate mastitis with an inflamed area along with a change in the appearance of the milk. These changes it depends on the effect of the inflammatory response of the cow to the infection. Mastitis and somatic cell count in raw milk, it is an important indicator of cows udder health and milk quality.

Three categories of mastitis were assumed in this study: mild, severe and fatal. The most common form of mastitis is the mild case, which responds quickly to farmer treatment. The costs here include intramammary tubes, discarded milk and reduced yield for the remainder of the lactation. While a severe case of mastitis requires veterinary treatment, not only does a fatal case of mastitis require veterinary treatment, but the cow will never return to the milking herd.

However, mastitis can also occur in subclinical form. This means that although there is an infection in the breast, there are no visible changes to indicate its presence.

Mastitis resulting from the destruction of the tissue formed by the microorganism called *Staphylococcus aureus* is called infectious mastitis or subclinical mastitis.

Staphylococcus aureus is known as “the germ that dries out the udder”. However, *Streptococcus agalactiae* and *Mycoplasma bovis* can cause subclinical udder inflammation. In subclinical mastitis, the udders of the cows do not swell clinical signs such as redness, pain and warmth not observed. The appearance of the milk is normal. This is called occult mastitis.

Somatic cells are white blood cells, that fight germs in the udder. White blood cells (Leukocytes-WBC) are defense cells composed mostly of neutrophils and lymphocytes. These epithelial cells mixed into the milk are also counted as somatic cells. The fact that their numbers are high in raw milk documents the invasion. If the infection is not understood by the veterinarian, the udder dies (Veterinarians must comply with observations, tests and hygiene rules in farms).

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We can provide a good mastitis infection control in the herd with monthly tests.

In addition to pathogenic microbes that increase the number of somatic cells, there are many factors that lead to an increase in the number of somatic cells.

Let's start with the cow-related factors; wounds in the teat and udder orifice, hyperkeratosis around the udder, udder structure, other diseases of the cow (e.g. Metritis).

Factors not related to cows; unhygienic environment, incomplete emptying of the udder, milker technical errors, hot and humid environment, frequent change of place and feed, presence of healthy people and patients in some environments (including not healthy cows).

Cows that come to the parlor with dirty udders and feet and wet and dirty milking parlor floors cause infection. On the other hand, it is known that the number of somatic cells is higher at older cows.

California mastitis test (CMT)

The test can be carried out by the milker in the parlour and it gives an immediate result, this result is not a numerical result but rather an indication as to whether the cell count is high or low. The CMT will only show changes in cell counts above approximately 400.000 cell/ml.

The advantage of the CMT over individual cow cell count is that it assesses the level of infection of each quarter rather than an overall udder result.

There are number of ways to score the CMT, but dividing the result into four categories is the most straight forward. Score of 3, the highest, is when the solution almost solidifies.

- 0 CMT score, negative
- T CMT score, trace
- 1 CMT score, weak positive
- 2 CMT score, distinct positive
- 3 CMT score, strong positive.

Result for infected quarters on each animal tested, should be recorded. If there is any doubt the results of test, then it can either be repeated immediately or the next milking.

The CMT is very subjective and the results can vary depending on who is carrying out the test. It is important to make sure that the method is consistent if too much or too little reagent is added, this will effect the outcome.

If the exact results about mastitis are checked with laboratory studies.

In addition, test devices to detect cell density in raw milk belonging to private companies can be used in the field.

Research studies conducted during the Mastitis Field Experiment (MFE) trials at the National Dairy Research Institute (NIRD) in 1960 formed the basis of important mastitis control measures in use today.

Proposed plan:

1. Treat and record all clinical cases.

2. Immerse the udders in disinfectant at each milking.
3. Dry cow treatment at the end of lactation.
4. Sorting out cases of chronic mastitis.
5. Regular milking machine maintenance. In the last 40 years, great progress has been made in reducing cell numbers, mainly due to the adoption of the five-point plan by dairy farmer.

If we list the effective ones for reducing the number of somatic cells:

1. Pre-milking preparation comes to mind. Pre-dipping, 1 towel per cow, cleaning and correct use of the milking machine, dipping after milking, dry and clean towels areas, correct feeding are the main useful methods that come to mind.
2. It is also worth noting the benefit of the tracer for correct feeding. Supplements of manganese and iron, which are essential for antioxidant enzymes such as superoxide dismutase, glutathione peroxidase, copper, zinc, selenium and other trace minerals are always useful. Also, let's not forget that zinc is necessary to re-form the teat plug after milking.
3. Cows with defective udder structure, udders sagging below the knees, and unnecessarily long teats are prone to mastitis. Therefore, it is very useful to give importance to genetic improvement and to pay attention to UDC (udder score) when choosing bull seeds.
4. Identifying chronic cases and removing those cows from the herd is a recommended practice to prevent disease spread.

Summary

Providing a stress-free environment for the cows, complying with the dry and clean principle, acting in accordance with milking hygiene and feeding correctly are essential for the prevention of latent mastitis. Thus, it will be possible to continue production without sacrificing milk quantity and milk quality.

The economics of mastitis affects the farmer economically in two ways: direct costs and indirect costs.

Direct costs:

1. Discarded milk.
2. Pharmaceutical and veterinary expenses.

Indirect costs:

1. Penalties for increased cell count.
2. Decreased milk yield for the remainder of the lactation due to udder damage and/or subclinical infection.
3. Extra labour requirements for treating and nursing.
4. Higher culling and replacement rates, leading to loss of genetic potential.
5. Deaths.

For the sustainability of farms, mastitis should be followed and precautions should be taken before it is too late.

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