

Mastitis

1. Introduction

Mastitis is worldwide one of the most important disease in dairy cattle farms with high economic impact. Mastitis induces high costs due to reduced milk yields, increased veterinary and antibiotic costs, and a higher culling rate.

Therefore, prevention of mastitis is an important issue in dairy farming. The problem is often difficult to handle, because every cause of mastitis, including the bacterial pathogens that cause mastitis, require its own specific approach and treatment. Several factors increase or reduce the risk of mastitis. Veterinarians and veterinary laboratories offer a wide range of support to combat mastitis and increased somatic cell count.

2. Symptoms

We can distinguish two types of mastitis: Clinical (visible) and subclinical mastitis (non-visible) mastitis.

Clinical mastitis can be recognized by abnormal milk. The milk contains flakes or clumps and sometimes even blood. The infected quarter may feel hot and swollen or hard. In some cases, the dairy cow shows fever and illness.

Subclinical mastitis is not visible by eye. The milk composition is different, but this cannot be observed by eye. Subclinical mastitis is detected by cell count determination, as the somatic cell count (SCC) is too high.

3. Cause of mastitis

Mastitis is an inflammation of the udder tissue, caused by bacteria that invade the udder. To combat udder problems and mastitis, it is important to know which bacteria is the cause of the clinical mastitis and the increased somatic cell count. By bacteriological examination of milk the causative pathogen can be detected. The bacteria that cause mastitis can be divided into three groups:

- Cow-associated bacteria (contagious bacteria)
- Environmental bacteria
- and other bacteria.

4. Infection route

The infections that are caused by contagious bacteria, 80% of these infections are induced during milking. These bacteria are transmitted to other cows by not properly cleaned equipment, milking towels or by hands. The other bacterial infections, caused by contagious bacteria and environmental bacteria, usually take place in the shed. Some infections occur in the meadow (transmitted by e.g. flies).

5. Damage

Mastitis induces substantial financial damages. The total loss caused by mastitis (clinical and subclinical) in the Netherlands is over more than 100 million euro. The loss due to clinical mastitis is caused by the loss of milk production (lower milk yields) and being not able to supply milk because of the use of antibiotics ("waiting time" after antibiotic treatment). In clinical mastitis, the damage per affected mastitis cow, in the first three months of lactation, is about € 275, - and in the period of four to nine months of lactation the damage is approximately € 140, -. In addition, the costs for treatment must be added to calculated losses, including the costs related to premature removal of diseased cows.

Subclinical mastitis causes damage through loss of milk production (lower yields). In addition, in many countries there is a reduction in milk price when the geometric bulk milk somatic cell count exceeds the limit of 400,000 cells per ml of milk. We also have to address the costs due to too early replacement of animals with a high SCC.

6. Diagnosis of mastitis

You can examine and analyse mastitis on your farm on herd-level and on cow-level. If you discover mastitis problems, you can proceed to develop an approach at “cow-level”.

One of the possibilities to monitor mastitis on your farm is to use the (Bulk) Tank Milk Udder Health program. This program consists of a subscription to examine your bulk milk sample on the presence of the main mastitis pathogens ten times per year. You will get information about which mastitis pathogens play a role on your farm and which new infections arise. It gives you the ability to tackle mastitis problems on time and in a proper manner.

Mastitis in individual cows, with clinical mastitis, can be determined by eye. The milk contains flakes or clumps and sometimes blood. The infected quarter often feels hot and swollen or hard. In some cases, the cow is ill. With the bacteriological examination of quarter milk samples, the cause of the mastitis can be determined and treated efficiently.

Subclinical mastitis of individual cows is not visible by eye. Cows with subclinical mastitis have increased somatic cell count (SCC), and the milk production is lower than normal. The individual cell count can be determined during the regular milk-recording program. The somatic cell count is an important parameter to examine the health of the udder. A healthy cow has a fairly constant (low) SCC during lactation, which may increase slightly at the end of lactation. Presence of bacteria in the udder, teat injuries and quarter injuries induce an increase in the number of white blood cells in the milk. In general, an increased somatic cell count is defined as greater than 200,000 cells per ml. For regular milk recording, a SCC of maximum 150,000 cells per ml for heifers, and 250,000 cells per ml for cows is defined.

Sub-clinical mastitis can be chronic, and chronic mastitis potentially can change into clinical mastitis. Therefore, it is important to address sub-clinical mastitis. Bacteriological tests are used to determine which bacteria are responsible for the increased somatic cell count.

7. Risk factors and treatment of mastitis

Mastitis is a multifactorial disease. Several factors increase or reduce the risk of mastitis.

7.1 Drying-off period

In many countries, dairy cows are given antibiotics to dry-off. The aim is to prevent new infections during the dry-off period and cure existing, non-apparent infections. It is advised to use the correct method and steps in drying-off cows.

7.2 Clinical and subclinical mastitis treat with antibiotics

Mastitis is usually treatable with antibiotics. Prerequisite for successful treatment is that you examine the sensitivity (antibiogram) of the causative bacteria. A sensitivity test (antibiogram) gives information on the effective use of antibiotics.

7.3 Clinical mastitis

Quarters with clinical (visible) mastitis are usually treatable with antibiotics. The chance of recovery of the quarter is greatly enhanced in case the treatment starts immediately after discovering the (clinical) infection. Treatment usually consists on the administration of a syringe with antibiotics into the udder. In consultation with the veterinarian, the veterinarian may decide to give the cow an extra antibiotic injection or other supportive treatments.

7.4 Subclinical mastitis

Subclinical inflamed quarters can be treated during the lactation period just like clinical mastitis. However, the probability to cure sub-clinical mastitis is lower in case the bacterium is longer present in the udder tissue. The choice of the moment of treatment depends on factors such as the level of SCC, the type of mastitis pathogen and the risks to infect other animals. A veterinarian can advise you to make this best decision.

7.5 Culling of chronic mastitis cases

It is advised to cull cows with chronic high somatic cell counts that do not respond on treatment. They are a source of infection to other cows.

7.6 Dipping / spraying teats after milking

The dipping or spraying, after milking, is an effective way to protect the udder from bacteria. The dip or spray disinfects the teat skin, and reduces the chance that bacteria invade the teat. In addition, the dip or spray contributes to a good condition of the teat skin.

It is important to choose the right dip or spray. We distinguish dips and sprays in “contact products” and “barrier products”. A “contact product” is especially suitable to prevent contagious bacteria to infect cows (often in cases with increased cell count). In case environmental bacteria cause problems (usually no increased somatic cell counts), then a “barrier product” is the most appropriate treatment. Based on the (Bulk) Tank Milk Udder Health program you can determine which (groups of) bacteria are playing a role.

7.7 Properly functioning milking machine / proper milking technique

Both in cows with mastitis, due to contagious bacteria, or in cows with mastitis, due to environmental bacteria, milking machines and milking techniques play an important role. A malfunctioning milking machine will induce mastitis problems. The “Wet Measurement Standard”, the “Advanced Wet Measurement” and “Wet measurement AMS (for robot)” programs are advised to analyse all relevant factors during milking and to measure the functioning of the milking machine during milking. Based on the results of these measurements you can receive recommendations to optimize the milking process.

8.3 Hygiene

If environmental bacteria are the cause of the mastitis problems, improvements can be achieved by the introduction of better hygiene in the stable (beddings, etc). Especially in the summer, fly control requires attention. The “Advanced Wet Measurement” program is not only based on the check of the milking machine and the milking technology, but also other factors that affect udder health, such as housing, are supervised.

In case of specific mastitis problems, the laboratory can examine the beddings of the resting boxes and / or the bedding storage barns on the presence of E. coli and Klebsiella. Klebsiella is a bacterium that can cause serious mastitis.

8.4 Climate

In a bad stable climate, for example in barns with draft, mastitis pathogens more easily cause mastitis. A good environment is important. It is advised to consult experienced climate experts to measure the climate on your farm. They can advise you in improvements.