Udder management practices for dairy cow health

Bovine mastitis is one of the most common diseases in dairy cows with a high economic impact on dairy herds. This is why good management and treatment of the disease are so important for the health of dairy cows.

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Prevalance of mastitis

On dairy farms, subclinical mastitis is much more prevalent than the clinical form. For one clinical case you will probably have five subclinical cases.

- The clinical mastitis goal should be set at <2% of new cases monthly. That is, if you milk 100 cows, 25 cases per year and two cases per month.
- The subclinical mastitis target should be <20% of animals with somatic cell counts (SCC) >200,000 cells/ml.

A 10% prevalence of subclinical mastitis will lead to an increase of 100,000 cells/ml in the SCC in the bulk tank.

Depending on the pathogens, mastitis can be either contagious or environmental. In some dairy regions, contagious pathogens have been controlled by adopting better management practices, thus the prevalence of Staphylococcus aureus is minimal and Streptococcus agalactiae has been virtually eradicated.

On the other hand, environmental pathogens have shown a tendency to become more prevalent over the last 15 years and are now the main challenge.

Animals with contagious and chronic mastitis must be milked at the end of milking to prevent the spread of infections.

Clinical diagnosis

- The most common way to identify mastitis is during forestripping in the milking routine. Abnormal milk (with flakes, clots, or other gross alterations) is an important sign of mastitis.

- An increase in the SCC in milk is used to identify intramammary infections (IMI). Interpretation of the SCC is difficult, because it is influenced by many factors, such as diurnal variation, stage of lactation, parity, and fraction of the milk sampled.

However, the most important factor influencing the increase in the SCC is IMI.

- At cow level, the optimal cut-off value to distinguish between infected and uninfected quarters has been established at 200,000 cells/ml.
- On a practical level, in Spain about 50% of dairy farms perform a monthly somatic cell count, and the results will help to study the dynamics of IMI.
- Another important concept regarding the

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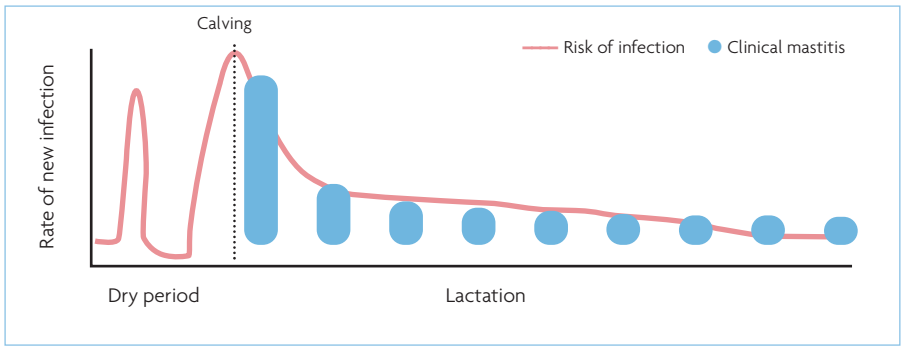
IMPORTANCE OF FORESTRIPPING:

- *Look for abnormal milk*
- *Check the udder at each milking (to identify swollen teats).*

Fig. 1. Risk of infection in a dairy cow.



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SCC is when we consider an animal to be incurable because it has had more than two cases per lactation in a quarter, and has had three SCC checks with >700,000 cells/ml.

● The alteration in electrical conductivity and a decrease in production are other signs associated with IMI. Nowadays, modern milking parlours are equipped with milk meters capable of detecting these alterations, helping farmers to detect mastitis.

● California Mastitis Test (CMT) is a qualitative measurement of the SCC. The reagent causes lysis of cell membranes and precipitation of the cell DNA and proteins, resulting in a change in viscosity of the reagent when added to milk.

Aetiological diagnosis and treatment

On-farm tests help to reduce the use of antibiotics by up to 50%, which is why with the new European regulations, after a clinical case of mastitis is diagnosed, the idea is to take a milk sample, treat with an NSAID and perform a bacterial culture. After incubation, three different results are possible:

• **No bacterial growth:**
These animals will not need an antibiotic because their immune system has already fought against the infection.

• **Gram negative:**
No need for an antibiotic because there is scientific evidence to show that these cases do not benefit from antibiotics, because they are cured spontaneously.

• **Gram positive:**
An antibiotic is beneficial in these cases.

Once the results are available after incubation, we recommend D category antibiotics, such as benzylpenicillin or sulphonamides.

However, in severe cases of E. coli mastitis, we use parenteral antibiotics to prevent septicaemia and to save the cow.

IMPORTANCE OF NSAIDS IN MASTITIS TREATMENT:

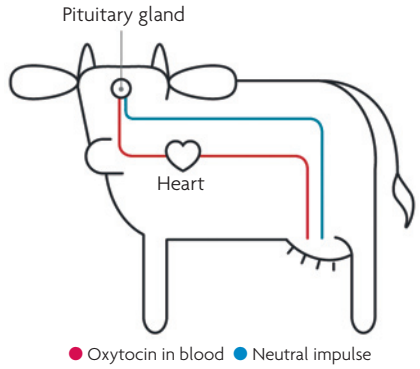
Mastitis is an infectious disease that causes inflammation and a lot of pain. In Gram positive cases, antibiotics are needed, however, in all cases it is necessary to treat with NSAIDs to reduce the inflammation and the pain.

Factors related to mastitis prevention

● **Environment:**
The idea is to reduce the pressure of infection as far as possible, by reducing environmental bacteria with excellent stocking density, cow comfort, management of heat stress and a bedding maintenance programme.

● **Milking routine:**
Good teat preparation will help to reduce bacteria.

• Forestripping the four teats. Milk stimulation by touching the cow. When a tactile stimulus is produced, oxytocin is released by the pituitary gland and transported to the alveoli. This hormone is responsible for delivering the milk into the lactiferous ducts.



• Predipping and disinfection. To kill as many bacteria as possible, the predipping product will have to act for at least 30 seconds.

• Wiping or drying teats. A common error is not paying attention to the end of the teat.

• Attaching the milking unit. A certain time has to elapse between forestripping and the attachment of the milking machines. The recommendation is between 90-120 seconds, depending on milk production and how many milkings a day. In high production dairy cows, stimulation will be quicker and probably will not take as much time.

• Detaching the milking units automatically or manually.

• Postdipping all four teats to prevent the entry of bacteria.

IMPORTANCE OF TRAINING MILKERS:

Getting healthy animals into the milking parlour and the quality of milking is part of the success of a dairy farm.

Therefore, training of milkers and having good skills are important. It is essential to clearly explain a report with Key Performance Indicators (KPIs) to the milkers.

● **Milking machine:**
New IMI due to poor milking machine performance are somewhere between 0 and 100%, depending on milking machine settings and the maintenance on each farm. Vacuum level-teat end, vacuum stability, vacuum regulation system, take off setting, pulsator setting and operation, liner design and maintenance, must all be checked to prevent mastitis.

● **Cow's immune system:**
Strong cows will be able to fight against bacteria. Factors that can strongly affect the cow's immune system are: negative energy balance, poor quality silage or water, bad management or wrong vaccination plans.

Dry-off treatment

Recently, there has been a trend towards decreasing the number of days in the dry period in order to increase the kg produced per lactation.

Even so, science says that animals need to rest before the next lactation, so the target should be 60 days, especially in first lactation animals who need additional time.

Now, with selective dry cow therapy, it is more important than ever not to forget the hygiene aspect of drying-off.

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KPIs for milking routine	Target
Average milk flow (kg/minute)	›3
Peak flow (kg/minute)	›5
Milking duration	‹ five minutes for the first 15kg. If you make 3kg extra you have to add one minute
Milk in the first two minutes (%)	›50
Milk in the first two minutes (kg)	›6.5

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Key performance indicators (KPIs)

In modern parlours there are thousands of reports to evaluate milking, however the most important thing is to focus on the main ones, achieving the objectives.

Checklist to control the quality of the milking process

First of all, it is very important never to take anything for granted. It will always be better to see how things are done in the milking parlour than believe what farmers tell you. That is why in order to have everything under control, it will be necessary to be physically there during milking time:

● **Check the milking routine:**
Some points to measure would be the quality of forestripping, coverage of predipping and postdipping, cleanliness of teat end, wet hands when forestripping, wearing of gloves and others.

● **Tour around the barns:**
Checking bedding quality and cow hygiene.

● **Milking machines:**
Dynamic test to determine how the vacuum is behaving, to make sure there is a steady vacuum down the teat with no fluctuations. Pulsation and vacuum stability must also be checked.

● **Milk filter:**
Helps to evaluate the quality of the process. If the filter is very dirty it is a sign of a lack of hygiene during the process.

● **Check data:**
• Bulk somatic cell count.
• Clinical cases of mastitis on a monthly or annual basis.
• Number of new and repeated treatments to make sure that the procedure is working as it should.
• Dynamics of infection on the farm with the monthly somatic cell count: New IMI monthly, prevalence of IMI, cured IMI monthly, animals infected during the transition period, and what animals are cured during the dry period. ■

ANIMALS WITH A HIGH RISK OF MASTITIS

The week after drying off:
After the cows are dried off, the pressure in the udder increases, and in some cases the teats open up, giving bacteria free access. This situation causes a high risk of suffering mastitis because bacteria will be in a suitable culture medium.

The week after calving:
The immune system of some cows might be compromised and with the same bacterial pressure, they will have less capacity to fight against an infection.