



Teat Health

A key determinant for good milk quality

One of the key challenges for vets is to help farmers to keep cell counts low and to avoid costly cases of mastitis. Finding out which bacteria are involved and then tackling the cows that are infected is important but, the real challenge is in helping to prevent udder infections in the first place. Teat skin condition is one of the cow's major defences against mastitis. Rough skin harbours more skin and environmental bacteria. A teat canal that doesn't seal properly after milking is more "open" to infection. Keeping teat skin healthy, with particular focus on teat ends, is vital and can be achieved through making minor changes to milking machines and milking technique.

INFECTIOUS CONDITIONS

It is well known that certain infectious teat conditions are associated with milking problems and increased incidence of mastitis. The three most common infectious causes of teat skin disease are the viral conditions:



Herpes mammillitis

- Bovine herpes mammillitis - a nasty erosive infectious condition that can spread from the teat barrel to the udder.
- Pseudocowpox - starts with small blisters, which heal from the centre to leave horse-shoe shaped scabs. These lesions rarely stray from teat skin.
- Teat warts - warts on teats are extremely common. There are up to six types of papilloma virus that affect cattle and the warts they cause all look slightly different. The slightly raised white plaques caused by bovine papilloma virus 5 are exceptionally common but rarely cause many problems.



Pseudocowpox

Bovine papilloma virus 6 can cause a more dramatic skin proliferation which can be confused with hyperkeratosis if they are around the teat opening. They only usually cause mastitis if they are around the teat opening or near where the liner sits at the top of the teat. Warts can often take longer than a year to regress and it is thought that they are acquired around six months before problems are observed. Infection requires damage to teat skin and some means of spread. Thistles, sunburn and flies have all been implicated.



Teat warts

MILKING MACHINE INDUCED TEAT DAMAGE



Once exposed to regular machine milking the most common observable abnormality of the teat is a build of keratin around the tip of the teat. This teat-end callous is often referred to as 'hyperkeratosis' and many people believe that some degree of callosity is a normal response to machine milking.

However recent studies have shown that while a low degree of callosity can actually be associated with less risk of intramammary infection, the infection risk rises as the teat end becomes severely calloused and roughened.

The cracks and pits of a heavily calloused teat end provide a better environment for bacterial survival outside the cow and any multiplication of bacteria will occur in extremely close proximity to the teat orifice. A heavily calloused teat end may also behave differently once infection is forced up the teat orifice and into the udder. In other words, what can be seen outside the teat may imply changes within the teat that are also associated with an increased risk of new infection.

Several machine factors have been associated with a greater degree of hyperkeratosis, all relating to the mechanical forces exerted on the teat during the regular collapse of the liner. The way in which the forces are applied to the teat, and their magnitude, are influenced by:

- the teat end vacuum during milking
- the pulsation vacuum
- the machine-on time
- the liner-shell combination
- the teat shape



Forces applied to teats during milking

Since 2006 there have been several researchers who have been using the latest scientific apparatus to measure the forces applied to a teat during milking. They have published on the 'touch-point pressure' of liners and the 'compressive load' applied across the teat. A consistent finding is that the forces applied to the teat tip are several times greater than those applied to the sides of the teat barrel. This difference in force is intentional. When a liner closes around the teat during the 'D' phase of the pulsation cycle, the purpose is to squeeze the teat from the tip such that the waste fluids of tissue metabolism can pass back into the normal circulatory system of the udder. The increased pressure applied to the curved teat end is a result of the tension along the liner length that results from it being stretched within the shell assembly

The degree of stretch and the way in which the liner delivers its force to the teat end depends on the teat shape and the characteristics of the liner and shell. Since there is little that can be done about the variety of teat end shapes within the herd, changes can be made in the degree of callosity or hyperkeratosis by using different liner and shell combinations.

Of course, the other major cause of teat damage, which is people, rather than machine related, is over milking. Reducing over milking to around 2.5 minutes after the end of milk flow or less is recommended. This is not such a challenge with automatic cup removers, or in the peak of the season, but can be difficult to achieve in the later part of lactation when milk

volumes are lower.

Pulsation failure is also an important cause of poor teat condition (and poor milk out). Rubberware with holes in it or faulty pulsators can cause teat changes.

Black spot is not a contagious disease but the result of repeated poor blood supply and damage to the end of the teat. When there are just a few cows with it, it may be an individual cow teat conformation issue, but when a significant number of cows are affected, milking machine and routine factors should be investigated.



FINAL WORD

For those farms that are struggling to manage cell counts or clinical mastitis, a full evaluation of the milking processes may reveal that too many cows have poor teat end scores. Milk quality can be affected well before severe 'black spot' type infections are observed. In these situations it can certainly be worth exploring the options available and experimenting with different milking machine and milking routine changes.



Milk quality can be affected well before severe 'black spot' type infections are observed.

For more information contact your local XLVets practice:



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