Mastitis and Milk Hygiene

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. Tackling the cows that are infected is important but, the real challenge is preventing udder infections in the first place. Simply put, prevention is about keeping pathogenic bacteria away from the teat and making sure teat defences are healthy enough to keep bacteria out of the udder. Teat skin condition is one of the cow's major defences against mastitis. Rough skin harbours more pathgenic bacteria. Teat canals that don't seal properly after milking are more "open" to infection. Keeping teat skin healthy, with 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



Pseudocowpox



Teat warts

• 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.

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.

Spraying or dipping the whole barrel of every teat after every milking with an effective teat sanitizer and appropriate levels of emollient, is the single most effective management

tool for keeping teats supple and for reducing new intramammary infections during lactation.

MILKING MACHINE INDUCED TEAT DAMAGE

Once exposed to regular machine milking the most

commonly observed abnormality of the teat is a build-up of keratin around the tip of the teat. This teat-end callous is often referred to as 'hyperkeratosis'. While a low degree of hyperkeratosis, graded as a smooth ring or less, is a normal response to machine milking, increased hyperkeratosis is associated with an increased risk of intramammary infection.

The cracks and pits of a heavily calloused teat-end, graded as rough and very rough levels of hyperkeratosis, provide a place for bacteria to survive and multiply outside the udder and yet remain in close proximity to the teat orifice.

Very rough teat ends may also behave differently. Amongst other concerns, reductions in elasticity of the teat orifice hampering teat closure after milking and extensions of keratin channels directly into the udder are possible consequences of hyperkeratosis. These and other mechanisms may increase the risk of new infection. Several machine and milking management factors are associated with a greater degree of hyperkeratosis, all relating to the mechanical forces exerted on the teat while cups are on. The most common and clearly understood of these factors include:

- The vacuum in the milk line at the teat end during milk flow.
- The vacuum in the milk line at the teat end following the cessation of milk flow.
- The liner-shell combination.
- The fit of the liner-shell combination to the teat shape.
- The cups-on time, and particularly the overmilking time.
- The suppleness of teat skin.



XLVets Teat Health

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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.

Over milking, which is people, rather than machine related, exacerbates any flaws present in the machine-cow setup. Once milk flow slows to a dribble, teat-end vacuum in the milk line rises to approximate the vacuum of the milking plant. This is typically six to ten kPa higher than during the milking phase putting a lot more pressure on the teatend at the end of milking. Reducing over milking to 2 minutes or less after the end of milk flow 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.

Other, changes can also identify risks to new intramammary infections. These include oedematous teats, colour changes, teat haemorrhages, open orifices and skin condition. An accredited veterinarian will be able to help identify if any of these issues exist and provide advice to remedy them.







FINAL WORD

For those farms that are struggling to manage cell counts or clinical mastitis, identification of the bacteria involved and a full evaluation of the milking machine and processes by an accredited veterinarian is recommended. Milk quality can be affected well before obvious and severe teat-end lesions are observed. Identifying issues early in the season can make for fewer cows treated, less headaches and increased days in milk as the season progresses.



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

For more information contact your local XLVets practice:



