

# CONTROLLING ENVIRONMENTAL MASTITIS IN DAIRY COW HERDS

**ENVIRONMENTAL mastitis makes up the majority of all clinical mastitis in the dairy herd. The two most common bacteria responsible are *Escherichia coli* and *Streptococcus uberis*.**

**PETER EDMONDSON**  
 MVB, CertCHP, DipECBHM, FRCVS  
 discusses the steps that can be taken to reduce infection rates, focusing on the environmental factors at play and measures that should minimise incidence

To control clinical mastitis, it is essential to understand the individual bacteria and how they cause infection. *E coli* is a ubiquitous organism, so wherever cows come into contact with faecal material they will come into contact with this bacteria. *E coli* induces a toxin responsible for the signs of clinical mastitis. Often, sterile milk samples will be collected from clinical cases and come back culture negative. This is because the bacteria have left and it is the toxin that has been released and is responsible for the signs seen by the milker. *E coli* is associated with toxic mastitis, but it is important to remember up to 80 per cent of *E coli* infections undergo self-cure and the majority of clinical cases are mild. *E coli* is a very uncommon cause of subclinical mastitis and will not affect the herd cell count. *S uberis* has contagious and environmental proper-

ties and causes both clinical and subclinical mastitis. It is most commonly associated with the use of straw bedding and, in particular, straw yards systems. Outbreaks can also occur at pasture, especially if cows are lying in contaminated areas. Environmental bacteria can enter the udder at three different times: during milking, between milkings and during the dry period. If teat preparation is poor and the unit is attached on to dirty teats, there is a risk environmental bacteria will enter through the open teat canal when the milking unit is attached. Remember, higher yielding cows tend to have more open teat canals and will be more prone to mastitis. If cows lie down on dirty beds immediately after milking, there is a risk the bacteria will enter through the open

teat canal. Ideally, cows should stand after milking for 20 minutes to 30 minutes to allow the teat canal to close. The easiest way to achieve this is by offering fresh food. Most cows feed after milking and then lie down, by which time the teat canal has closed. If you have a cow that lies down immediately after milking and chooses not to feed, it is most likely because it is either lame or ill. On welfare grounds, this is perfectly acceptable. Some people were keeping all cows standing for 30 minutes until the last cows milked. The problem here is it meant many cows were standing for excessive periods of time and this increases the risk of solar ulcer occurring. Environmental bacteria, such as *E coli* and *S uberis*, enter the udder during the dry period. It was always thought the teat canal sealed shortly

after dry off and that antibiotic dry cow therapy protected the udder from new infections during the dry period. We now know this is not the case. Numerous trials have been carried out to show the proportion of the teats that are open throughout the dry period. At least 50 per cent of the teats are open seven to 10 days after dry off and at least one in five teats are open six weeks after dry off. An open teat allows bacteria access into the udder. When bacteria enter the dry udder, they are unable to multiply because there is no iron available. The iron has been tied up by the enzyme lactoferrin, which increases in the dry period. Bacteria are in the right place, but at the wrong time to multiply. It is only when the cow starts lactating that levels of lactoferrin start to drop off and any bacteria that entered the udder during the dry period can multiply. The majority of dry period infections cause clinical mastitis within the first 100 days of lactation. If more than one in 12 cows has clinical mastitis within 30 days of calving

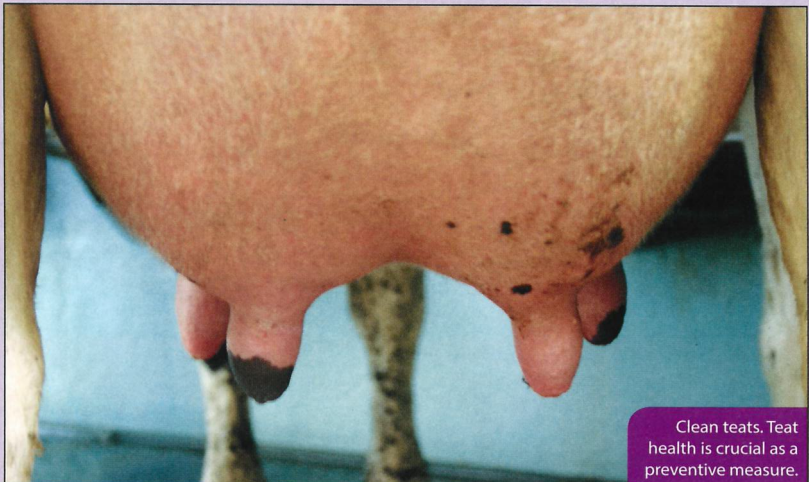
then this suggests problems with dry period infections. There are now many herds with very low levels of clinical mastitis. The target is to have a mastitis rate of 30 cases per 100 cows per year, where one case is one quarter infected once. So if a cow has mastitis in all four quarters, this counts as four cases. It is difficult to know the average mastitis incidence in the UK, but a mastitis rate of 50 to 60 has been suggested. There are herds with levels of 10 or 15 that have achieved this through excellent mastitis management and cows living in a clean environment. Likewise, some herds have mastitis levels of well more than 100, which is a welfare problem and no longer acceptable. Mastitis can seem a very complicated disease to the farmer. Some herds analyse mastitis data, but a lot of herds have no idea whether their incidence is low, average or high. All farmers should have mastitis records, although this is not the case. If no records are available then you can get a rough idea of the incidence from sales of milking cow tubes divided

by the average number of tubes used per clinical case. The only place you might get unstuck is in herds that use milking cow tubes to treat high cell count cows. The average number of tubes used per clinical case averages between four and five tubes. One of the most important factors to explain to the farmer is all mastitis bacteria enter through the teat-end. If cows are kept in dirty conditions and the teats are contaminated with faecal matter then you should expect a high incidence of mastitis. This is the area many herds have transformed through improved housing, generous use of bedding and good management. Many herds have moved to sand bedding with plenty of spare cubicles, wide passageways and loafing areas. In some of these we see spotlessly clean cows and very low levels of mastitis. One of our clients with a herd of 500 cows erected a new sand-based cubicle house and now averages one clinical case a week throughout the year – a mastitis rate of 10. There is nothing more soul

Calving pens should be well maintained.



Encourage cows to remain standing after milking by offering food.



Clean teats. Teat health is crucial as a preventive measure.



Dirty teats. The teat canal is the primary defence mechanism and if there is any damage the risk of mastitis is going to increase.

destroying to the milker than lots of dirty cows coming in for milking. This makes teat preparation challenging and difficult. It takes a long time to remove this dirt properly. If you are milking 200 to 300 cows, then your concentration and attention to detail is likely to suffer towards the end of milking. It's so much better to have clean cows entering the parlour where teat prep is easy.

### Steps to control clinical mastitis

#### Cleanliness

Keep udders and teats clean. If you do this then you immediately reduce the challenge at the teat-end and minimise risk.

#### Stocking density

Ideally, you should have five per cent to 10 per cent more cubicles than cows. This gives cows a choice of where they can lie down. The newly calved heifer is not going to lie down beside the dominant cow. Some cubicles will be in a more favoured location than others. These are some of the reasons you need options to allow cows to lie down.

However, many herds expand cow numbers to try to maximise profitability. If the stocking density in cubicle house or straw yard rises, then so might mastitis.

#### Calving pens

The freshly calved cow is immunosuppressed and so is at a greater risk of toxic mastitis occurring. Calving pens should be well-maintained, generously bedded up and cleaned out frequently to minimise the risk.

#### Straw yards

Many farms have a straw yard for their dry, calving or milking cows. For straw yard systems, you should be allowing between 9m<sup>2</sup> and 10m<sup>2</sup> of lying space for high yielding cows. These need to be bedded up daily with plenty of clean dry straw. They should be cleaned out every two to three weeks depending on the ambient temperature. Straw yards are a major risk of *S uberis* mastitis.

#### Use only dry bedding

Always put dry bedding on to the cubicles. Some farmers, especially with milk prices crashing, will look for a cheaper alternative, such as fresh sawdust. Remember fresh sawdust will ferment and you will end up with high levels of *Klebsiella* and will increase mastitis. Dry bedding will absorb the maximum amount of moisture.

#### Encourage cows to remain standing after milking

Always have fresh feed available so when cows come out of the parlour they will eat and then go and lie down. At this stage the teat canal should be closed and the risk of bacteria entering the udder should be minimised.

#### Predip teats before milking

A predip is a fast-acting disinfectant applied to the teats before milking. A contact time of 20 seconds to 30 seconds is required so the predip can soak any dirt present and help kill any bacteria on the teat. This solution must then be wiped off so that you have a clean dry teat before the milking unit is applied.

#### Training milkers

Milkers should work to a set and agreed milking routine and be trained in this area. This can have a significant impact on the consistency of milking routine.

#### Internal teat sealants should be given to every cow at dry off

We know not all teat canals seal during the dry period. An internal teat seal creates a physical barrier that significantly reduces the risk of dry period infections. Remember dry cow therapy is intended to reduce subclinical mastitis at the end of the current lactation. An internal teat sealant helps reduce clinical mastitis in the following lactation.

#### Milking machine

Fortunately, more and more farmers have good modern milking machines that can cope with the demands of

today's high-yielding dairy cow. Some machines still require attention and can introduce a risk of irregular vacuum fluctuation and liner slip. It is important the milking cluster is attached so it is sitting squarely on the udder. This will help minimise any liner slip.

#### Teat-end health

The teat canal is the primary defence mechanism and if there is any damage the risk of mastitis is going to increase. Hyperkeratosis is one of the most common causes of teat damage. It can be caused by over-milking, milking with a high vacuum level and pulsation problems.

At the time of reduced milk prices, farmers might be more inclined to reduce the frequency of servicing the machine or changing lin-



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ers. All this can increase the risk of the machine contributing to clinical mastitis.

#### Bacteriology testing

In an ideal world, all cases of clinical mastitis would be sampled and frozen. A range of these samples should be sent for bacteriology. You would choose some cases that recur, some cases with a poor response to treatment and then samples with a differing

range of severity. Once you know the bacterial cause of the problem, then you can fine tune your control measures.

Cows do not have to live with high levels of clinical mastitis and shouldn't suffer the welfare consequences of poor mastitis management. Lots of simple control measures can be put in place on dairy farms to reduce levels of clinical mastitis to target or below.

#### PETER EDMONDSON

is one of 12 dairy vets in the Shepton Vet Group in Somerset, which looks after 24,000 cows on 150 dairy herds. His main interests are mastitis, milk quality and the interaction of the milking machine and cow. He provides consultancy and tailor-made training for vets, farmers and the pharmaceutical and agri industries.



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