Animal welfare: the role of milking machines and mastitis

How many times in the past 50 years have you either heard of or read 'mastitis is one of the most costly diseases in dairy cows worldwide'? That is the most common statement made in dairy industry articles and studies and is simply accepted as reality.

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That reality has grown into a range of topics relating mastitis to cull rates, conception rates, lameness, low body score and of course udder and teat end health. The economic impact of each of these has been studied and documented to show a substantial negative impact to the bottom line of every dairy in the world.

In real terms mastitis is driving the cost of production and with current milk prices it is resulting in a cost of production exceeding farm revenue leaving dairy farmers with a serious financial challenge.

One aspect of the mastitis problem often overlooked but starting to come into focus in recent years is animal welfare.

Mastitis is fundamentally an infection which brings with it many undesirable aspects other than simply lost production and the cost of treating the infection.

Animal welfare issues

Mastitis causes physical swelling of udder tissue creating both pain and physical harm to the udder that in many cases is permanent.

Dr Ynte Schukken, a Professor at Cornell University in the USA, stated "Reducing pain events in cows will certainly need to include a reduction in clinical mastitis cases and include an increase in pain-control medication. I also expect that the use of antibiotics as one of the main components of curative and preventative programmes will be further scrutinised" (International Dairy Topics Volume 10 Number 1).

Mastitis related pain was also a topic of the 49th annual NMC meeting with a presentation made by Dr Ken Leslie, a professor with the University of Guelph in Canada. Dr Leslie reported on a survey of veterinarians in the UK in which they were asked to rate the severity of pain associated with mastitis on a scale of 1-10.

The veterinarians rated severe mastitis at a pain level of seven, comparable to a fracture or foot abscess.

The information presented suggests that on any given herd on any dairy there exists 5-10% of the cows experiencing an unpleasant and uncomfortable day due to the pain of either clinical or subclinical mastitis. This excludes those in discomfort from lameness and other issues associated with mastitis.

Long term effects

The impact to the animal does not typically end after the conclusion of several days battling the infection and associated pain.

In many cases there is permanent physical harm caused to the udder tissue resulting in a reduction in production in best cases and a complete loss of function of the affected quarter in other cases. This is visually evident in the animals with udders that are uneven and with quarters that simply milk much more slowly than others.

A visual survey of a typical dairy farm during milking time will reveal the extent that the problem exists. Note the number of cows that are three quartered or have a slack quarter prior to milking.

Further observation of the cows after machine removal will yield even more examples of problem udders with a combination of slack quarters and quarters that simply do not milk out well.

This all adds up to uneven udders that were not in that condition at the time of first milking as a heifer. The cow shown in Fig. 1 below is a typical example of an udder with one quarter that is milked out while the other remains quite full.

This not only represents an animal welfare issue from a past problem but a current one as the teats asso-

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Fig. 1. A typical example of an udder with one quarter that is milked out, while the other remains quite full.

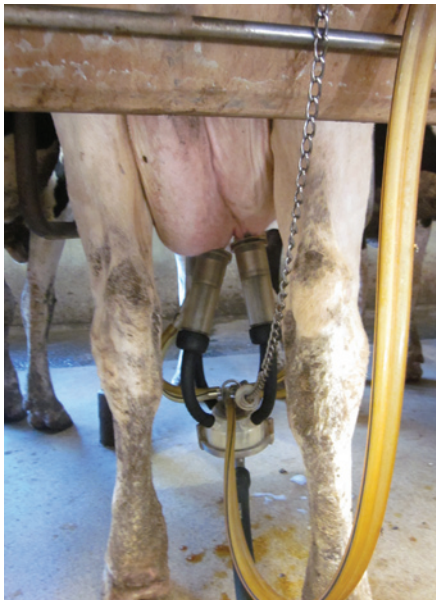

Fig. 2. An example of an udder on a heifer in which a prior mastitis event has caused permanent damage.

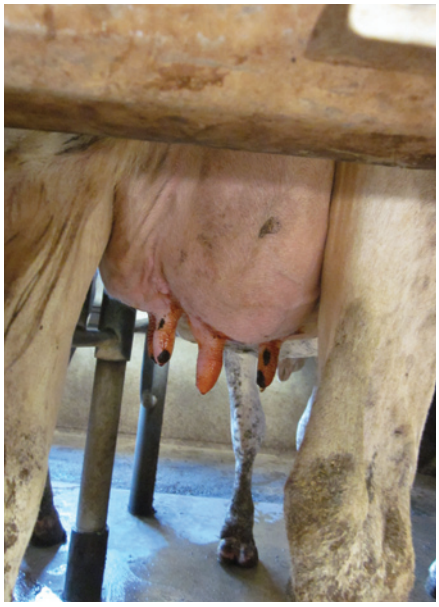

Fig. 3. The termination, or blinding, is accomplished in a variety of ways that include banding the teat to cut off blood flow.

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ciated with the empty quarter continue to be subjected to vacuum while no milk is yielded.

Fig. 2 provides another example of an udder on a heifer in which a prior mastitis event has caused permanent damage. This photo was taken shortly after machine removal and is a condition commonly noted in typical dairy herds.

The udders of these animals often look reasonably normal just prior to milking when all quarters are full provided that the udder damage is not so severe as to have resulted in significant loss of function in a quarter.

An audit of the number of cows with udders of this condition following milking will provide an indication of the extent of the problem.

A recurring problem

Mastitis is known to be a recurring problem and one in which many cows have more than one clinical case in a lactation or multiple lactations. A recurrence in the same quarter causes further damage to the inflicted quarter and can often result in a permanent loss of function of that quarter.

Many dairies will terminate the function of a quarter that experiences multiple mastitis events. The termination, or blinding, is accomplished in a variety of ways that include banding the teat to cut off blood flow (Fig. 3), cutting off the teat entirely from the udder or the use of chemicals infused into the quarter.

The use of chemicals to blind quarters was discussed by J. R. Middleton of Washington State University in the USA. That study evaluated both the use of chlorhexidine and povidone-iodine.

The motivation for that study was 'The Washington State University dairy herd experienced an outbreak of mastitis'.

The dairy had been using routine mastitis control procedures that simply failed. This suggests that even when proper procedures are followed that serious animal welfare issues exist and result in harm to udders with permanent damage occurring.

The problem of mastitis and associated udder harm is so prevalent that it can be seen everywhere. Many industry photos of udders often show evidence of damage which are seen in trade publications and even the promotion banner, literature and videos of the large dairy product suppliers.

Even the best in class cows at the World Dairy Expo are found to exhibit the same udder issues after being milked leaving no doubt of the prevalence of the issue and the extent of the animal welfare issue it creates both in visual evidence and pain for the animal.

Dr Ken Leslie authored an article in MilkProducer on the topic of pain relief noting "Ask a breastfeeding woman who has mastitis if it is painful. Her answer will be an unequivocal 'yes'. You can only imagine what her response would be if asked about the impact of mastitis resulting in a loss of function or permanent reduction in a breast. From a consumer perspective, the pain associated with mastitis is an obvious animal welfare concern."

How to address the issue?

The impact of having 10% of the herd on any given day experiencing some level of discomfort becomes more than an animal welfare concern, it represents a very serious problem.

The additional consideration of many animals having permanent physical harm inflicted as a direct result of mastitis and poor milking performance creates an animal welfare disaster in waiting for the industry.

The question is what will the industry do to address this issue?

It should be obvious that the management practices of the past 50 years are not working to address the problem.

The trend of rising slaughter and death rates in response to demands for declining bulk SCC levels is not a solution but an animal welfare issue of its own.

No rational person can claim to have resolved the mastitis 'problem' by having simply managed it with data, treatment and culling, resulting in cows with dramatically reduced life expectancies.

Perhaps the industry should focus on the machine to animal interface and explore the direct impact milking machines have on the pushing of bacteria up the teat canal and the impact they have on the teat tissue during the milking process.

A good place to start is to simply place your fingers into a working liner for the duration of time required to milk an animal and ask yourself if the experience is pleasant and if it is simply upwardly pinching about the end of the teat thereby shoving bacteria upwards.

That experience represents the start and end of the day for the animals and one that needs to be considered in addressing animal welfare. ■