

Principles of preventing mastitis as taught in the “Cups on Cups off” workshops



Dairy Australia’s two-day Cups On Cups Off course provides an easy to understand, common sense approach to controlling mastitis and milk quality on the farm. At a farm gate price of 60 c/L of milk, each clinical case of mastitis costs the farmer around \$300 in antibiotics, deaths, vet fees, discarded milk, lost production from a dried off quarter, labour, culling and plant costs. Over a year and throughout a typical herd, this adds to a considerable sum.

The principles of preventing mastitis can be summarised as follows:

1. Teat biology

The teat is where it all happens. It is thick, keratinised and has no glands and is therefore susceptible to drying out. The teat canal is about one cm long and should be closed when not milking and open when milking. Cells grow from the inside to the outside and then slough off and then trap the sticky bacteria. When the milk comes out it also flushes bacteria out. If a cow misses a milking, the bacteria and cells are not stripped away and infection builds.

- More infection occurs when there are more bacteria near the teat end.
- More infection also occurs when the teat canals ability to resist infection is compromised.

Maintaining control of mastitis can be summed up by maintaining healthy teat ends and reducing the number of bacteria on the teats.

2. Mastitis control should be seen as building a wall of defence

Take one brick out of the wall and the wall may not break down but it will weaken. Remove too many bricks out of the wall and it will fall. Don’t do the practices properly and the mortar between the bricks will dissolve, rather than the bricks themselves being removed.

A section of the Mastitis Defence Wall



3. Identifying clinical cases

Check for abnormal milk: the in-line strainer will trap clots and should be checked after each cow; swollen quarters; foremilk stripping; checking suspect cows; sample milk for culturing; increased

Bulk Milk Cell Count (BMCC).

The BMCC in milk is actually from the animals own white-blood cells building up in a fight with the bacterial infection in the udder. If there are lots of individually infected cows in the herd, the BMCC will show high counts.

- Normal cows have a cell count between 20,000 and 200,000 cells/mL.

- Above 250,000 cells/mL usually indicates that there are mastitis infections in the udders.
- Above 400,000 cells/mL indicates that this milk is unfit for human consumption.

Each 100,000 cells/mL indicates that 10% of the herd has some sort of subclinical mastitis, so a herd with a BMCC of 240,000 cells/mL is likely to have about 24% of the herd with subclinical mastitis or 240 cows out of a 1000 cow herd.

4. Teat disinfection

Teat disinfection is a major brick in the wall – it reduces bacteria and keeps the teats soft and supple (when an emollient [up to 10%] is used in the disinfectant).

20 mls of disinfectant/cow/milking is required when using a spray, if teats are dipped then about 10 mls of disinfectant/cow/milking is required. This number should be multiplied by the number of cows being milked and the times milked per day in order that an appropriate amount can be mixed fresh each day. Gold standard disinfectant is made fresh daily, with high quality water and at the right concentration. High mineral and sediments in the water inactivate the iodine.

5. Maintain milking machines

Machines that are not functioning correctly can contribute to new mastitis infections by:

- Spreading bacteria from teat to teat and cow to cow
- Damaging the teat ends and the natural defence mechanism of the teat canal
- Causing ‘impact’ of bacteria-laden droplets which hang on the bottom of the teat (or in the milking cups), into the teat canal, especially towards the end of milking.

Milk machine maintenance – Check:

- vacuum gauges
- oil in the pump
- pulsators
- condition of the liners
- air filters
- vacuum regulators
- cow behaviour – kicks,
- steps
- teats – colour, haemorrhages, ends
- air admission holes
- tubes – check arrows line up

6. Practical ways to prevent mastitis:

- Stress free cows, gentle handling
- Clean laneways, clean teats
- Routine, cows love it
- Training heifers
- Maintain the order that cows come in
- Clean dry teats (wet teats cause ‘impact’, also the cups ride too high on wet teats and restrict milk flow)
- No splashing water on the teats
- Avoid milk on the gloves
- Stimulate cows to let down by pre-stripping
- Teat disinfection (need to check the spray coverage and spray pattern using paper towel; 20 mls disinfectant/cow should be used when spraying, 10 mls disinfectant/cow when dipping teats)
- Milking out
- Milking technique (Calmness, clean dry teats, foremilk stripping)
- Milking hygiene (Avoid splashes or sprays of milk.



Never get milk on your hands. Draft out clinical cases and milk them last. Run a separate mastitis herd if you can. Use a separate cluster for clinical mastitis cows and clean thoroughly between cows)

- Teat management (Disinfection mix, clean water, machinery checks, mud problems, washing teats – just wet the teats, not the udder, with clean low-pressure water. Dry the teats)
- Shorten milking time (doesn't affect long term production, will reduce mastitis by leaving teat ends in better condition)

7. Prevent new infections by:

- Decreasing the number of bacteria at the teat end and maintaining a healthy teat end (dirty teats increase the amount of bacteria near the teat ends)
- Pre-stripping
- Cups on when plump, clean and dry
- Wear gloves
- No weight on the cluster to finish milking to minimise impact
- Release vacuum by kinking the long milk tube

8. Triggers for action – what do we need to watch for, how can we improve our milking routine

Clinical case triggers:

- A spike in cell count over 200,000.
- More than 20% of cows with clinical mastitis is too many
- More than 5% of cows with clinical mastitis in the first month after calving is too many
- Check the % responding to treatment

Triggers during milking:

- Cow discomfort
- Delayed cup removal
- Too much milk at the end of milking with more than 20% of quarters (more than 100 mls stripped)
- Condition of rubbers
- Cluster filling
- Milking sounds
- Cup slipping causing impact
- Milk in the pulsator line
- Twisted liners / liner slippage
- Delayed letdown

After milking:

- Remove cups only with vacuum off
- Cups should fall off within 2 seconds of their release
- If not check the air admission hole
- Also check air admission hole if claw is full of milk

- Try to keep cows standing for half an hour after milking to keep teat end clean before they close
- Cups should be removed within 30-60 seconds after milk flow stops otherwise overmilking will stress the teat end. If cows produce 10L/milking, 80% of cows should have completed milking in about 6 minutes.
- Incomplete milk-out only exists if more than 20% of quarters produce strip yields of 100 mls or more

9. Reasons for unsuccessful treatments

Treatments may not be successful due to:

- Not milking the quarter out proper before treatment
- Chronic scar tissue in the teat/udder so the antibiotics doesn't reach the bacteria
- Unhygienic treatment
- Treatment time too short
- An inflamed quarter (need to use an injectable antibiotic)
- Sometimes using the wrong antibiotic, possibly due to resistance

If not treated successfully the quarter should be dried off and the records on the history of the cow should be checked. ■■

For more information visit: www.dairyaustralia.com.au/farm/animal-management/mastitis