

COUNTDOWN

Shed Guides

PREVENT, MONITOR, ACTION



MILK QUALITY AND MASTITIS BENCHMARKS

Milk quality benchmarks

Test	Definition	Aim for	My company's premium threshold
Bulk Milk Cell Count (BMCC)	The concentration of somatic (white blood) cells in milk from all cows contributing to the vat. Does not increase after milk leaves the cow.	Less than 150,000 cells/ml	
Bactoscan	Total number of bacteria (alive or dead). Processors will usually report either Bactoscan or TPC (not both).	Less than 80,000 bacterial/ml	
Total Plate Count (TPC)	Total number of bacterial colonies that have formed (from live, viable bacteria). Processors will usually report either Bactoscan or TPC (not both).	Less than 20,000 cfu/ml	
Thermoduric	Total number of bacteria that have survived pasteurisation and have formed colonies.	Less than 2,000 cfu/ml	

Clinical mastitis benchmarks

Clinical mastitis is heat/pain/swelling/dicolouration of a quarter or quarters, or abnormal milk that persists after three squirts. **Subclinical mastitis** is when the milk or quarter appears normal but the cow has a high cell count (over 250,000 cells/ml) or is positive on a rapid mastitis (paddle) test.

Benchmark	Definition	Aim for
Clinical mastitis at calving time	Clinical mastitis in cows calved less than two weeks.	Less than five cases per 100 cows in cows calved less than two weeks per month.
Clinical mastitis during lactation	Clinical mastitis in cows calved more than two weeks.	Less than two cases per 100 cows in cows calved more than two weeks per month.

Common mastitis pathogens

	Cow associated (contagious)	Environmental
Habitat	Inside-udders or on teat skin.	The cow's environment (e.g., mud, manure).
How it is spread	Contamination from infected milk.	Contamination from environment; can be introduced with intramammary tubes if teat ends are not sterile when treatment occurs.
When it is spread	Milking time.	Often at drying off and around calving time; most cases seen at calving or early lactation.
Common bacteria	<i>Staph aureus</i> <i>Strep agalactiae</i> <i>Mycoplasma spp.</i> <i>Corynebacterium spp.</i>	<i>Strep uberis</i> <i>E. coli</i> Other environmental bacteria.
Comments	Teat disinfection and milking hygiene are most important control points.	Minimising contamination of teats with mud and manure, sterile intramammary administration and maintaining teat end health are most important control points.

Fact

Bulk milk polymerase chain reaction (PCR) is only useful for detection of *Strep agalactiae* and *Mycoplasma* as these bacteria live exclusively inside the udder. Detection of other pathogens (e.g. *Staph aureus*, *Strep uberis*) on a bulk milk PCR is not meaningful as these pathogens can be present on the teat skin without causing mastitis.



BRINGING COWS TO THE DAIRY

Cows spread out on laneway

If cows are spread out and able to drift at their own pace, stress and mud and manure splash is minimised.



Cows bunched up on laneway

This is caused by herding pressure from behind. Bunching often happens at congestion points on the laneway. The result is stress on the cows, poorer let down, higher risk of mud and manure splash on the udder, more mastitis as well as other health conditions such as lameness.



Cows spread out, heads down

Cows need space in the yard. Space allows a cow room to manoeuvre gently forward and to feel and look for a safe place to stand.



Cows bunched, heads up

Heads up suggests that the whole herd is too tightly packed. This will result in stress, reduced milk let down, more manure and urine during milking and higher risk conditions such as lameness.



PREVENTION OF MASTITIS AT MILKING TIME

ALL MILKERS SHOULD SHARE A CONSISTENT MILKING ROUTINE

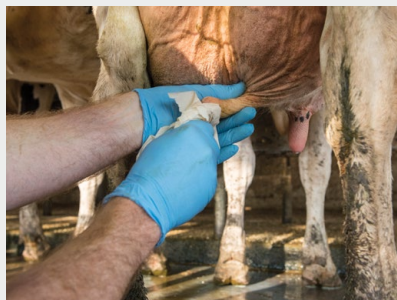
Cups on



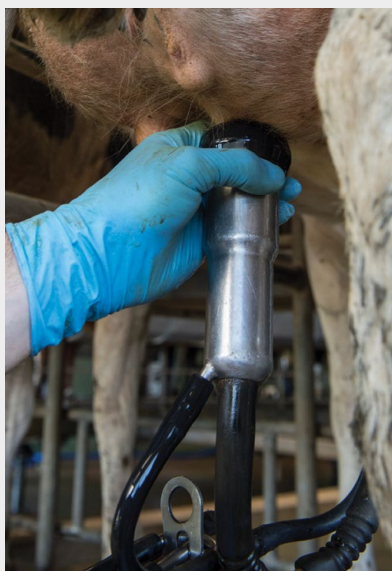
1 Cows should enter the dairy yard willingly. Avoid entering the yard or use a backing gate. With a calm and consistent routine, cows will walk onto the platform without outside pressure.



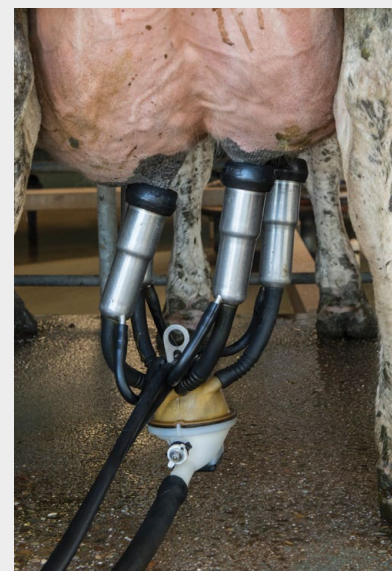
2 Check milk is suitable to go in the vat. Milk from cows that are sick or have clinical mastitis, are within a treatment withholding period or are less than eight milkings post-calving must not enter the vat.



3 Put cups on clean, dry and plump teats. Sometimes you may need to wash and dry teats. Never wet teats without drying them



4 Apply cups quietly and smoothly, ensure good alignment and avoid twisting/tangling of long pulse and milk tubes to ensure even milk out.



Cups off



4 Take cups off when milk flow is low and udder is wrinkled and even. Break vacuum by kinking the long milk tube and waiting for the cups to slip free.

Rough cup removal

Taking cups off too quickly or roughly will allow air to enter cups and force milk droplets onto the teat or into the udder. This can help any bacteria present to spread from cow to cow.

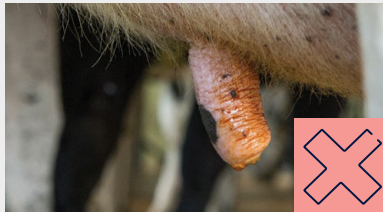


Teat spray

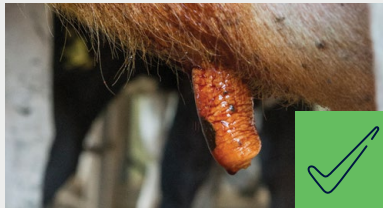


5 Cover entire surface of teats with a registered teat disinfectant after every milking.

Partial teat spray



Full teat spray

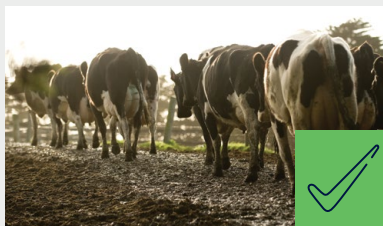
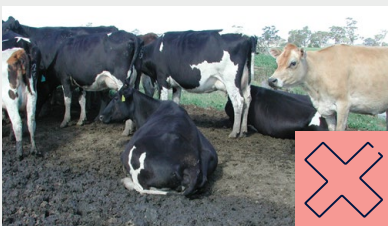


Hosing near cows

6 Use low pressure, high volume washing water to wash away manure. Do not use high pressure hoses directly beneath or around cows, to avoid creating aerosols of bacteria laden droplets.



Cows leaving



7 Cows should exit the dairy calmly, without excessive splashing of manure. Ideally cows should remain standing for one hour after milking.

Washing and drying teats

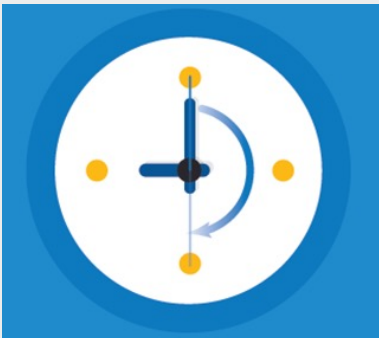
Teats contaminated with mud or manure increase the risk of environmental mastitis and high levels of bacteria in milk (e.g. elevated TPC or bactoscan). Follow the steps below to wash and dry teats if they are contaminated with mud or manure.



Step 1 Wash teats



Step 2 Disinfect teats



Step 3 Wait 30 seconds



Step 4 Dry teats

Tip

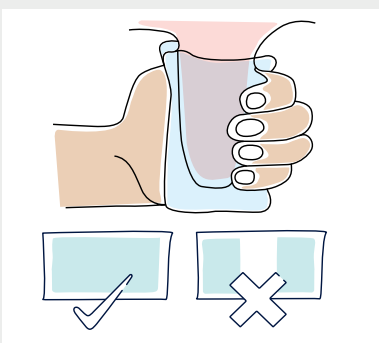
Never apply cups to wet teats. Always dry teats with a single use paper towel (one per cow) or clean reusable cloth (one per cow) after washing and/or applying teat disinfectant pre-milking.



Always ensure teat disinfectant used pre-milking is registered for that purpose. Many milk processors do not allow the use of pre-milking teat disinfectant.

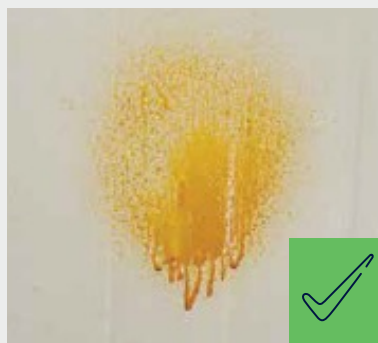


Check teat spray coverage



Check

Check occasionally to see how effective your teat spraying is. Using a clean paper towel, wrap your hand around a teat and then unroll the paper to see if all the surfaces of the teat have been sprayed.



Good

This teat sprayer has a fine spray pattern, there are no gaps and the spray is wide enough to cover all teats. No blocked nozzles.



Poor

This teat sprayer has a very narrow width of heavy spray. This will use more teat spray and will take longer to cover all teats.

Image credits: Dairy NZ.



Aim to use **20ml per cow** per milking for good coverage.

LOOKING FOR MASTITIS

RAPIDLY FIND, MARK, TREAT, RECORD AND SEPARATE CLINICAL MASTITIS CASES

How to find



1 Look for clots - on the filter after every milking. If clots are present, look more closely for mastitis during milking.



Facts

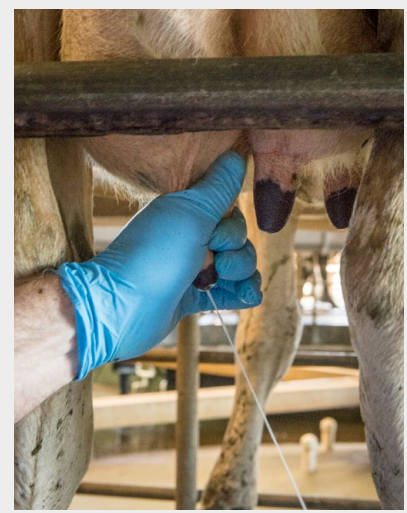
The quarter will need to be treated when there is heat, swelling or pain in the udder, or milk changes (wateriness or clots) persisting for more than 3 squirts.



2 Feel for heat and swelling.



3 Look for swollen quarters - not milked out properly.



4 Strip the quarter - look for clots or discoloured milk - avoid getting milk on your gloves.

SAMPLING

BACTERIAL CULTURE AIDS DECISION MAKING

How to sample



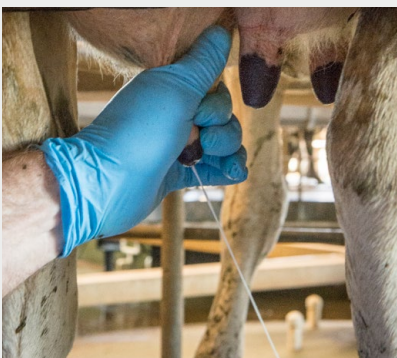
5 Rinse gloves with water then disinfect gloves with 70% alcohol.



6 Label a sterile sample bottle with cow ID, quarter and date.



7 Scrub and disinfect the teat end with 70% alcohol wipes or cotton balls soaked in 70% alcohol.



8 Discard first few squirts of milk.



9 Hold the milk sample bottle at an angle, to avoid anything falling into the sample bottle. Squirt 2-4ml of milk into bottle.



10 Replace cap quickly and cleanly. To keep the sample fresh, either refrigerate the sample if sending on the day or put in the freezer as soon as possible.

Facts

Collect milk samples before treatment for culture to identify bacteria involved.



This helps with treatment plans and identifying how mastitis is spreading.

Prevent a false diagnosis due to contaminants by using excellent hygiene when collecting a sample.

Milk samples

Milk samples can be collected from clinical cases before starting treatments, and stored frozen. A selection of these samples can be sent to the laboratory at a later date if:

- Cows are not responding to treatment eg. >20% of cases are receiving a second course of treatment.
- If you have more than three clinical cases in freshly calved cows from the last 50 calvings.
- If you have a high number of clinical cases during lactation eg. more than two clinical cases per 100 cows per month of lactation.

VETERINARY MEDICINES

Medicine	What is it?
Antibiotics	A medicine that kills or stops the growth of microbes (usually bacteria)
Anti-inflammatories	A medicine that reduces inflammation, reduces temperature and provides pain relief.

Lactating cow antibiotics should be used only if one or more of the following criteria exist:

- ✓ Milk is abnormal AND clots or abnormal milk persist for three or more squirts.
- ✓ There is swelling, discolouration and/or heat in one or more of the quarters, and,
- ✓ The cow has not been treated three or more times this lactation (recommend culling).

Always follow your farm's standard operating procedures (or treatment protocols) and carefully read the label before giving veterinary medicines.



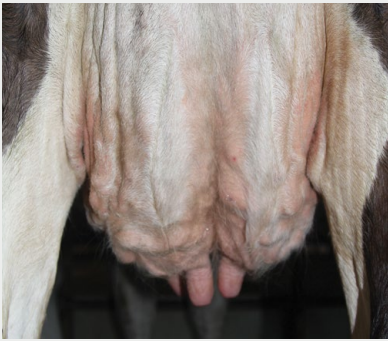
Do not use veterinary medicines more frequently, at a different dose rate, via a different route or for longer than is specified on the label without written advice from your veterinarian. This is called off-label use. It is not legal, carries a much higher risk of antibiotic violations, and may reduce treatment effectiveness.



MARKING AND TREATMENT

APPROPRIATE TREATMENT IS NECESSARY TO MAXIMISE TREATMENT SUCCESS AND MINIMISE THE RISK OF ANTIBIOTIC RESIDUES.

How to treat



1 Milk the cow out as completely as you can.



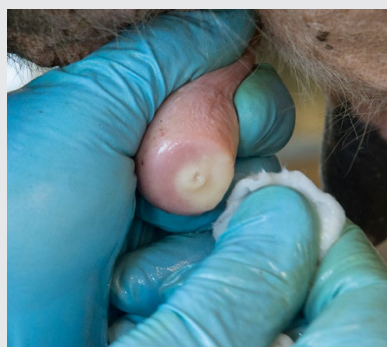
2 Mark the cow before treatment; it's better to mark and not treat the cow than to treat and not mark her.

Discard milk from all quarters of cows that receive treatment and minimise spread of bacteria from infected cows.

- Draft out clinical cases and milk last.
- Run a separate mastitis herd if you can.
- Use test buckets and rinse clusters before using on the next cow. Do this by removing the long milk tube and running water through cups and claw bowl for 30 seconds.
- Rinse gloves with water and disinfect gloves with 70% alcohol.



3 Restrain the cow safely – sometimes another person may be needed to do a tail jack.



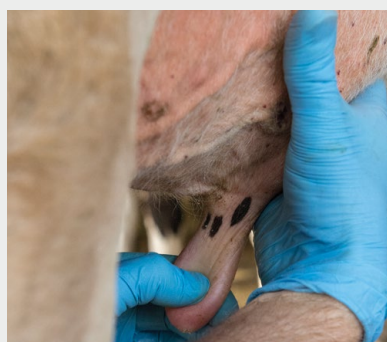
4 Scrub and disinfect the teat end with 70% alcohol wipes or cotton balls soaked in 70% alcohol to remove bacteria.



5 Remove cap carefully – nothing should touch the tip of the tube.



6 Insert tube only partially into teat end to avoid introducing bacteria or damaging the teat.

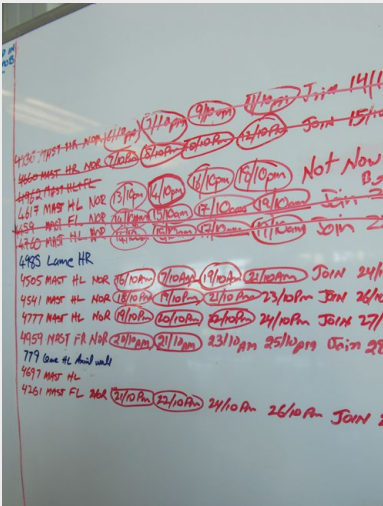


7 Massage the udder to disperse contents of tube into quarter.



8 Disinfect the teat with a registered teat disinfectant.

Record



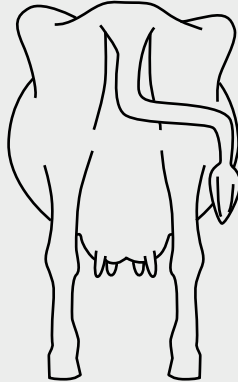
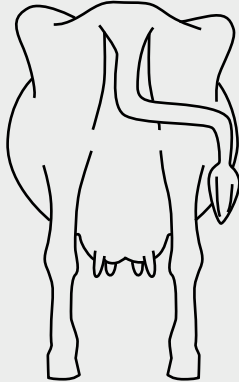
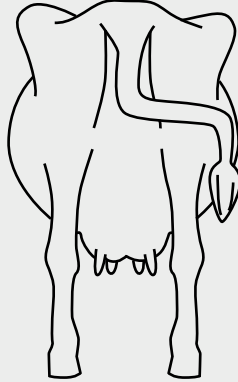
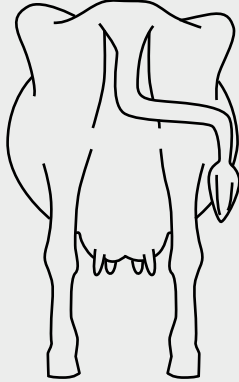
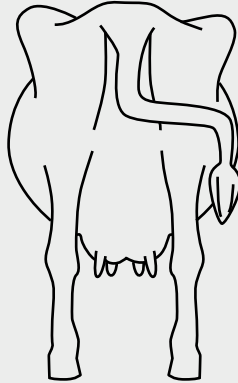
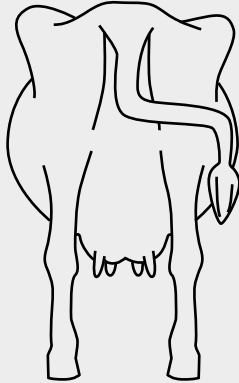
9 Record the treatment on whiteboard, computer and in the QA book. Complete the full course of treatment, following the label directions. Observe milk, meat and Export Slaughter Interval (ESI) withhold periods.

Watch a video
on treatment of clinical mastitis



IDENTIFYING TREATED STOCK ON OUR FARM

Use these diagrams to show how treated stock are identified on your farm. Treated stock should always have two forms of ID (e.g. spray paint, leg bands, tail tape, computer alert). A visual list (e.g. computer, whiteboard, blackboard) of stock under treatment should be available for milking staff during milking.

Clinical mastitis treatment	Sick/lame cow
	
Dry cow	Fresh/colostrum cow
	
Three-teater	Other (specify):
	



It is strongly recommended that **treated stock are milked separately** after the main herd to minimise the risk of disease spread and residues entering the vat.

MY TREATMENT PROTOCOLS

Use this template to write a treatment protocol with your veterinarian.

My vet's name is _____

My vet's practice is _____

My vet's phone number is _____

This protocol was written on _____

Due for review on _____

Clinical mastitis

Signs to look for

- ✓ Abnormal milk (e.g. discolouration, clots) that persists for more than three squirts; and/or
- ✓ Swelling, discolouration or heat in one or more of the quarters.
- ✓ The above signs plus a sick cow (e.g. lethargic, droopy ears, reduced appetite, abnormal gait).

Steps

1 Mark cow and record treatment on: _____ (where) ASAP.

2 Follow the protocols below:

Instructions for veterinarians: Detail product(s) to use, dose, how often, by what route and for how long in boxes below.

One quarter affected (milk only)

More than one quarter (milk only)

Swollen quarter(s)

Sick cows

3 Do not treat if:

- ✗ A cow-side or veterinary culture identifies the causative bacteria is *E. coli* and the cow is not sick.
- ✗ The cow has normal milk, with a high cell count (greater than 250,000 cells/ml) or positive rapid mastitis (paddle) **test only**.
- ✗ The cow has been treated three or more times this lactation (recommend culling).

4 If cow is getting worse or is not better at the end of the withholding period, or clinical mastitis cases are exceeding benchmarks, notify/call _____

Additional notes:

Withholding periods:

MY TEAT DISINFECTANT MIXING AND STORAGE PROCEDURE

Use this template to write a mixing protocol for your teat disinfectant.

My teat disinfectant product is

My emollient product (if applicable) is

My chemical representative's name is

My chemical representative's phone number is

This protocol was written on

Storage and mixing

- ✓ Keep container sealed at all times.
- ✓ Store in a cool place out of direct sunlight.
- ✓ Use cooled water from the hot water service.
- ✓ Always use a measuring jug.
- ✓ Teat disinfectant products should be used within three months of opening.

Mixing rates

Teat disinfectant amount (L)

Water amount (L)

Emollient amount (L)

Water source used

Make up a new batch every

Additional notes:

CLEANING THE PLANT AND PLANT MAINTENANCE



Ensure you:

- ✓ Have enough hot water (at least 6-8L per unit per cycle) for a warm rinse, hot wash and hot rinse (unless using an acid sanitiser) following each milking.
- ✓ Regularly test your water quality.
- ✓ Use the best quality water available on-farm for your wash and final rinse cycles.
- ✓ Use wash chemicals appropriate for the water quality you have available.

Daily checks

- Air admission holes are clean.
- Key surfaces of the plant (inside claw bowls, surface of receiver, surface of vat, vat outlet) are clean and free of fatty, protein or mineral residues.
- There is flow through all clusters during the wash cycle.
- Milk has cooled to 5°C within 3.5 hours of the start of milking.

Last checked on:

_____ (date) by _____ (who)

Weekly checks

- Check for twisted or split liners.
- Water temperature is at least 85°C at the start and at least 60°C end of the main wash cycle.
- Chemicals are dispensing at the correct dose rate (according to label directions).
- There are no air leaks (e.g. around jetter assemblies).
- Air injector is working correctly with strong, observable slug ('toilet flush') in receiver.
- Clean pulsation filters.

Last checked on:

_____ (date) by _____ (who)

Annual checks

- Plant, including the wash system, tested at least annually in accordance with ISO or another internationally recognised technical standard.
- Vat is serviced.

Last checked on:

_____ (date) by _____ (who)

Rubber wear

- Rubber ware replaced immediately when perished or damaged.
- Rubber ware replaced at least every 2,500 cow-milkings (liners) or annually (other rubberwear).

We need to replace our liners every:

_____ (days)

Tip

How to calculate liner life:

Number of days =

$$\frac{2,500 \times \text{number of units}}{\text{average herd size} \times \text{number of milkings per day}}$$

Liners last changed on: _____ (date) by _____ (who)

Liners due for next change on: _____ (date)

All other rubberwear last changed on: _____ (date) by _____ (who)



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