

**Animal Health**
Fact Sheet

CONTROLLING COLIFORM MASTITIS

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Coliform mastitis is usually considered as an acute disease although some milder forms and even chronic cases do occur. It is caused by the bacterial organism *Escherichia coli*, hence the name, coliform. Other, related organisms, *Enterobacter aerogenes* and *Klebsiella pneumoniae*, are also often called “coliforms.” All of these are classed as “environmental” agents because they grow freely and commonly in the cows habitat and infect the udder as opportunists. Multiple factors are involved in allowing development of this disease; it is not simply a matter of “bacteria present equals disease.” The coliform organisms cannot be eradicated from the cow’s environment nor can all cases of coliform mastitis be prevented. But it can be controlled and the incidence reduced.

The incidence of coliform mastitis is usually sporadic but is often related to wet milking (milking cows with excessively wet udders) or wet bedding (wet corrals and freestalls). Control efforts should be directed toward decreasing exposure of the teat end to bacteria and increasing resistance of the cow. A herd problem with coliform mastitis is usually not evidenced by an increase in the somatic cell count (SCC). However, individual cows affected by coliform mastitis often have a “bouncing” SCC.

The timing of mastitis occurrence during lactation is often correlated with the likely source of infection, as outlined below:

Days in Milk	Likely Source
0 – 5	Late dry period
6 –30	Calving and fresh area
30 +	Lounging area or wet milking

Control of coliform mastitis should be directed toward reducing the exposure of the teat end to bacteria (especially coliform bacteria) and increasing the cows’ resistance to coliform organisms.

A. REDUCING EXPOSURE OF THE TEAT END TO BACTERIA

1. Dry period:
 - dry treat all cows
 - clean up the dry pen

2. Calving and early fresh period:

- clean up calving area
- keep clean and dry, especially the last 3 weeks of gestation
- reduce “fines” in bedding
- avoid calving on a “manure pack”
- get rid of puddles in the corral
- monitor and decrease water use during milking prep
- flame (or clip) hair from udders
- reduce udder edema
- increase space per animal
- give fresh feed after milking to keep the cows standing for an hour
- use inorganic bedding (washed sand) in freestalls
 - level daily and refill as needed
- (if using organic bedding, such as sawdust or straw, clean daily and rebed 2–3 times per week)
- repair and upgrade freestalls so cows will use them
- improve ventilation
- keep cows clean, dry and comfortable

3. Later, after calving (same as #2 above)

Management of open corrals:

The producer has less control over open corral facilities than when cows are in freestalls but is not necessarily “worse” than freestalls. Consider using a “mounding” system and harrow the rest of the corral daily. Monitor cow cleanliness by observing the hocks and udders. Recognize that humidity in the bedding area may act like “puddles.” Have bedding available for repeated re-bedding during wet periods.

Milking prep procedure:

- Forestrip and observe for abnormal milk (strip cup preferred); if the teats are really dirty, wash with a small stream of water, dry and then forestrip; avoid milking wet teats.
- Predip (or spray from bottom with sanitizing teat dip).
- Rub each teat: grasp teat between the thumb and index finger and rub vigorously down and back up, twice; rub across and back on the very end of the teat.
- Re-dip each teat.
- After 15–30 seconds wipe the teats dry, using the same motions with the towel that were used previously.
- Attach milker unit.

Minimize conditions that are associated with high impact force against the teat end during milking. These include liner slips, temporary vacuum losses, low vacuum reserve, inefficient vacuum regulation, and abrupt removal of the milking unit. Shut off the vacuum before removing teat cups.

Dip teats, post milking, with a **germicidal** teat dip. Keep all teat dip cups clean; dirty (contaminated) ones provide a means of spread. If the cups can’t be kept clean, it may be better to change to a spray bottle system, but most milkers do a poor job of teat coverage with these.

Clean the outside surfaces of the claws and CIP units. Provide good drainage, so these don’t remain wet between milkings.

Regular preventive maintenance of milking equipment is essential. Clean the vacuum controller (regulator), pulsators, and air filters monthly. Replace rubber parts that are cracked, flattened, or deteriorated. Replace teat cup liners on their designated schedule. Replace milk tubes when they begin to deteriorate and especially whenever they develop cracks in them. Narrow bore liners tend to have fewer slips. Avoid high vacuum levels.

B. INCREASING COW'S RESISTANCE TO COLIFORM MASTITIS

Vaccines are available and their use will aid in prevention of Coliform mastitis but they are NOT a cure-all. The J5 vaccine by Upjohn has the most research work done on it so far, to show that it can really be of benefit. It also has a very low endotoxin content and that is important in preventing ill cows after vaccination. Follow the directions for maximum benefit and that includes giving three doses; at dry off, 30 days later and at freshening. Heifers should be vaccinated at 7 and 8 months of gestation and at freshening. This will provide the greatest protection at the time of greatest incidence and also avoid any adverse impacts of vaccination on milk production.

Look at ration levels of vitamin A (and carotene), vitamin E and selenium, especially during the dry period. Supplement if needed. Decrease other nutritional stresses at calving from metabolic diseases such as milk fever, and ketosis.

Monitor the herd status for coliform mastitis by keeping records of new clinical cases of mastitis and by culture of infected quarters.

Treatment

Antibiotics are NOT very effective against coliform mastitis. Don't get off into use of exotic antibiotics and risk drug residues; they don't help that much anyway. The clinical signs are due to the endotoxin (poison) released by the bacteria. Often the bacteria was there, released the endotoxin at its death and the signs are the result of that, even though most of the bacteria are now gone.

The treatments of greatest value are:

1. Oxytocin and frequent milk-out (4–6 times a day, or up to every 2 hours).
2. Fluids
 - IV (isotonic or hypertonic)
 - oral fluids
3. Anti-inflammatory drugs
4. Treatment for hypocalcemia and hypoglycemia, if needed
5. Recognize the problem and begin treatment early. (This is difficult, because the onset can be so acute. Milkers must realize that if they just "let it go," the 12 hours until the next milking may make the difference in whether the cow is saved or not.)

KEY POINTS

- 1. Keep cows (and their environment) clean, dry and comfortable.
- 2. Milk dry teats.
- 3. Pre and post dip.
- 4. Use inorganic bedding (such as washed sand).
- 5. Keep corrals clean.
- 6. Apply milking machine properly; adjust to prevent slips.
- 7. Shut off vacuum before removing teat cups.

- 8. Record time of infections (stage of lactation) to determine where the problem begins.
- 9. Keep areas for dry cows and calving areas clean.
- 10. Feed an adequate and balanced ration, especially vitamin E and selenium.

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