

*The following information is provided as a resource for understanding the details and management strategies for the most common mastitis-causing bacteria. This information is summarized from information provided by QMPS (Quality Milk Production Services). "Environmental" organisms are present in the environment and "Contagious" organisms are considered contagious to other cows in the herd during the milking procedure.*

## **MASTITIS-CAUSING BACTERIA:**

### **Streptococcus Agalactia (Strep. Ag) (CONTAGIOUS)**

- Most common cause of illegal SCC counts
- Does not usually cause clinically abnormal milk
- These bacteria live only in the udder but can survive for short periods on skin and milking machine parts
- Infections spread from infected animals to herd mates on contaminated hands, inflations, common towels and other milking items.
- Cross-suckling calves can spread this disease
- Purchased, contaminated animals can bring this bug into the herd.
- Use of common milking equipment at fairs can introduce this infection into herds.

#### ***Management interventions:***

- Treat culture positive cows in all 4 quarters at the same time with an approved intramammary treatment. Penicillin based products are usually effective.
- Milk treated cows last until follow-up cultures are negative.
- Use approved post-dip products
- Eliminate use of common wash towels.
- Wear latex or nitrile gloves while milking, frequently disinfecting when contaminated with milk or manure.
- If feeding discard milk to calves; separate them to prevent cross-suckling.
- Milk purchased animals separately and culture for mastitis before mixing these animals with the existing herd.
- Dry treat cows with an approved dry-cow intramammary product.
- Cull positive cows that fail to respond to treatment.
- Perform follow-up bulk tank cultures monthly for 6 months to ensure herd is clear of this infection.

### **Staphylococcus Aureus (CONTAGIOUS)**

- Most common cause of "contagious" mastitis in NY herds
- Bacteria most commonly spread from infected udders at milking time but also exist on the skin of most cows and also exist in the environment.

- Bacteria are intermittently shed and may cause recurrent bouts of mastitis.
- Infections damage milk-producing tissue and may become “walled off” with scar tissue making treatment efforts ineffective.
- Primarily spread during milking by contaminated milking equipment, milker’s hands, common towels and other items used in the milking process.
- Teat injuries or chapping may predispose animals to the infection.
- Cross-suckling calves may also spread this disease.
- Chronic infections that persist from one lactation to another are common.

***Management interventions:***

- Milk infected animals last or with separate unit for as long as they are in the herd.
- Use approved post-dip product. During winter use teat dips containing emollients to prevent chapping of teats.
- Wear latex or nitrile gloves while milking, frequently disinfecting when contaminated with milk or manure.
- Maintain milking equipment at proper vacuum levels, avoid overmilking, and liner slips.
- Change inflations every 800 cow milkings.
- Use effective lactating and dry-cow mastitis treatments based on culture results.
- If feeding discard milk to calves; separate them to prevent cross-suckling.
- Cull positive cows that fail to respond to treatment.
- Milk purchased animals separately and culture for mastitis before mixing these animals with the existing herd.

**Cornebacterium Bovis (CONTAGIOUS)**

- Bacteria inhabit infected udders and teat canals
- Often found in low numbers in bulk tank cultures but rarely affect total bacteria counts.
- Rarely cause clinical mastitis.
- Most infections are self-limiting and do not require antibiotic treatment.

***Management interventions:***

- Use approved pre-dip and dry teat with individual towel.
- Use approved post-dip.
- Dry cow therapy will eliminate C. Bovis infections.

**Streptococcus species (Environmental)**

- Bacteria are commonly found in bedding, manure, and mud.
- May cause clinical or sub-clinical mastitis. The cow may have inflamed quarter and a fever or may appear normal.
- Individual SCC are usually elevated.

- Most infections self-cure or are effectively treated with antibiotics within 60 days. Approx 18% of infections will become chronic.

***Management interventions:***

- Cows should be clean and dry and stalls should be bedded and cleaned appropriately.
- Ponds, streams and shady areas should be fenced off.
- Teats should be clean and dry before unit attachment. Teats should be pre-dipped with an approved product and wiped dry with a single use towel.
- Fore-stripping prior to milking will allow quicker identification of clinical mastitis.
- Wear latex or nitrile gloves while milking, frequently disinfecting when contaminated with milk or manure.
- Maintain milking equipment at proper vacuum levels, avoid overmilking, and liner slips.
- Use a commercial internal teat sealant (Orbeseal) after dry-treating at dry-off.
- Ensure milking and dry cows are properly supplemented with Vitamin E and Selenium in the diet.

**Coagulase-negative Staphylococcus (species) (Environmental)**

- Bacteria are commonly found on cow's skin or in the cow's environment (bedding, manure, mud, etc.).
- Infections commonly occur between milkings and are not normally contagious.
- Infections usually cause sub-clinical mastitis and only moderate SCC elevations.
- These infections can be resistant to antibiotic therapy and most infections self-cure.
- Persistent infections usually cure during the dry period.

***Management interventions:***

- Ponds, streams and shady areas should be fenced off.
- Teats should be clean and dry before unit attachment. Teats should be pre-dipped with an approved product and wiped dry with a single use towel.
- Fore-stripping prior to milking will allow quicker identification of clinical mastitis.
- Wear latex or nitrile gloves while milking, frequently disinfecting when contaminated with milk or manure.
- Maintain milking equipment at proper vacuum levels, avoid overmilking, and liner slips.
- Use a commercial internal teat sealant (Orbeseal) after dry-treating at dry-off.
- Ensure milking and dry cows are properly supplemented with Vitamin E and Selenium in the diet.

### **Esherichia Coli (E. coli) (Environmental)**

- Bacteria commonly found in manure, bedding, water, and soil.
- May cause a life-threatening illness associated with the endotoxins released by the affecting bacteria.
- Most infections occur within 2 weeks of calving and within the first 60 days in milk.
- Most infections are of short duration but a chronic state of infection is now known to occur.
- Sudden onset fever, decreased production, decreased feed intake and dehydration may occur and the cow may be down and unable to rise.
- Commercial vaccines are available to reduce the incidence and severity of this type of mastitis.

#### ***Management interventions:***

- Most effective prevention measure is to keep cows clean and dry, especially during the dry and pre-fresh periods.
- Avoid overcrowding and prevent access to muddy areas and standing water.
- Teats should be clean and dry before unit attachment. Teats should be pre-dipped with an approved product and wiped dry with a single use towel.
- Maintain milking equipment at proper vacuum levels, avoid overmilking, and liner slips.
- Consider vaccinating with a commercial coliform mastitis vaccine (J-5, Endovac Bovi) during the dry period and early lactation.
- For cases of severely sick cows follow established treatment protocols or discuss with veterinarian.

### **Klebsiella species (Environmental)**

- Commonly found in organic bedding (particularly green sawdust or recycled manure bedding), manure and soil.
- Higher infection rates are seen in summer months.
- Most infections seen 2 weeks prior to freshening or within first 60 days of milk.
- Infections are typically difficult and unresponsive to therapy. Affected quarters may need to be dried-off or infected animals may need to be culled.
- Sudden onset fever, decreased production, decreased feed intake and dehydration may occur and the cow may be down and unable to rise.
- May cause a life-threatening illness associated with the endotoxins released by the affecting bacteria.

#### ***Management interventions:***

- Most effective prevention measure is to keep cows clean and dry, especially during the dry and pre-fresh periods.
- Avoid overcrowding and prevent access to muddy areas and standing water.

- Teats should be clean and dry before unit attachment. Teats should be pre-dipped with an approved product and wiped dry with a single use towel.
- Maintain milking equipment at proper vacuum levels, avoid overmilking, and liner slips.
- Avoid use of green sawdust, wet wood or recycled manure bedding.
- Consider vaccinating with a commercial coliform mastitis vaccine (J-5, Endovac Bovi) during the dry period and early lactation.
- For cases of severely sick cows follow established treatment protocols or discuss with veterinarian.

### **Arcanobacterium Pyogenes (Environmental)**

- Sources for this bacteria are wounds, abscesses, and damaged teat ends.
- Infections may be spread by flies, or teat end contact with contaminated surfaces.
- Infections are usually unresponsive to treatment.
- Clinical infections are typically have a thick, yellow, foul-smelling discharge.
- Small amounts of teat-end discharge contain enormous amounts of bacteria and somatic cells.

#### ***Management interventions:***

- Maintain clean, dry, well-bedded stalls. Stalls should be well maintained and comfortable to avoid teat injuries.
- Fly control methods should be instituted.
- Calves should be separated to prevent cross-suckling.
- Infected quarters should be dried-off permanently and chronic cows should be culled.
- Teats should be clean and dry before unit attachment. Teats should be pre-dipped with an approved product and wiped dry with a single use towel.
- Maintain milking equipment at proper vacuum levels, avoid overmilking, and liner slips.

### **Yeast (Environmental)**

- Yeasts are microorganisms found in soil, plants, decaying organic matter, and bedding. Other sources include contaminated multi-Dose bottles of medication or re-used teat cannulas or syringes.
- Primary means of infection is from improperly applied technique of intramammary infusion.
- Infected cows may exhibit gland swelling, fever or a severe drop in milk production.
- Clinical signs often worsen after antibiotic treatment.

### **Management interventions:**

- Use sterile technique when performing intramammary infusions. Use only single treatment tubes.
- Frequently strip out affected quarters and milk infected cows last or with a separate unit.
- Clip or flame udder hair.
- Avoid liner slips or unit fall-offs.

### **Prototheca (Algae) (Environmental)**

- Usually causes severe, clinical mastitis which then becomes chronic.
- Usual source for this organism is contaminated standing water but cow to cow spread is also suspected.
- Antibiotic therapy is ineffective and infected animals should be culled.
- Management interventions:
  - Keep cows from access to standing, stagnant water.
  - Teats should be disinfected prior to intramammary infusion and only single use treatment tubes should be used.
  - Avoid using multi-**Dose** bottles of medication for udder treatments.
  - Frequently strip out affected quarters and milk infected cows last or with a separate unit.
  - Cull infected animals from the herd.

### **Mycoplasma (Environmental)**

- These organisms are highly contagious organisms that may be found in infected udders, joints, urogenital tracts and respiratory system. It may also be found in ear infections.
- May be spread during milking on milker's hands, equipment and common towels. If associated with pneumonia may be spread by nose to nose contact between animals.
- Multi-**Dose** treatment bottles, syringes and teat cannulas may also be a source of infection.
- Infections often begin with a sub-clinical infection and may spread from one infected quarter to all 4 quarters.
- Mastitic infections do not respond to antibiotic therapy and infected animals often are infected for life and should be immediately culled.
- Mycoplasma does not grow on a standard plate and must be cultured on a special culture plate.

### **Management interventions:**

- Culture all newly introduced animals, including heifers. If buying animals get multiple bulk tank cultures performed from the herd of origin.
- Culture all animals with clinical mastitis or with chronic high SCC.
- Cull infected animals.
- Avoid feeding waste milk to calves.

- Teats should be clean and dry before unit attachment. Teats should be pre-dipped with an approved product and wiped dry with a single use towel.
- Maintain milking equipment at proper vacuum levels, avoid overmilking, and liner slips.
- Wear latex or nitrile gloves while milking, frequently disinfecting when contaminated with milk or manure.
- Use approved post-dip product after milking.
- Avoid using multi-dose bottles of medication for udder treatments.