

Staph. aureus: *Staph. aureus* is most commonly associated with cases of subclinical mastitis. This organism is able to live in the udder without showing any physical (clinical) signs of mastitis. Cows with chronic *Staph aureus* infections may show occasional clinical flare-ups of mastitis (abnormal milk). *Staph. aureus* is contagious (can spread from cow to cow, frequently on milking units or by milkers' hands), so efforts should be made to limit contact between cows. Good milking hygiene including use of post-milking teat disinfection is effective at reducing spread of *Staph aureus*. Culture can be an important component of *Staph aureus* mastitis control. For example, in tie-stall barns *Staph aureus* cows can be milked last (i.e. 'segregated' from other cows during milking).

Strep. species: These non-ag streps include *Streptococcus uberis* and *Streptococcus dysgalactiae*, as well as many other species of streptococci and enterococci. These organisms come primarily from the environment. Major sources of these bacteria are bedding material, manure, mud and infected cows. Infections with "environmental streps" frequently occur during the dry period, especially during the first 2 weeks following dry off and during the 2-3 weeks prior to calving. These bacteria may cause subclinical mastitis with no apparent signs, or clinical mastitis with abnormal milk, swelling of the udder, and fever. Individual cow somatic cell counts are frequently elevated. Most of the infections caused by Strep species are eliminated by the cow's immune system or by antibiotic therapy if a clinical case of mastitis occurs. However, some environmental Strep. infections (18%) will become chronic and refractory or poorly responsive to treatment. Minimizing exposure to the bacteria is essential for the prevention of environmental mastitis caused by non-ag. streps. Steps to achieve this include adequate amounts of clean, dry bedding in all stalls. Well-managed inorganic bedding (sand) is associated with fewer pathogens than organic bedding (straw, shavings, sawdust, etc.).

Staph species: Coagulase-negative Staph (CNS, or Staph species other than *Staph aureus*) can be normal inhabitants of bovine skin or can be found in the environment in bedding and manure. They frequently gain access to the udder between milking and are normally not contagious. "Staph species" is one of the most common organisms cultured from dairy cows, although may often be a skin contaminant and not a cause of infection. Staph species infections are usually associated with subclinical mastitis resulting in moderate increases in somatic cell counts. If a herd is experiencing a high incidence of Staph species infections, post-milking teat dip products and their application should be re-evaluated. Staph species can be quite resistant to antibiotic therapy. However, most infections will resolve without treatment, given enough time. Persistent infections can often clear during the dry period. Staph species infections can be managed by minimizing exposure to dirty environmental conditions, and providing adequate amounts of clean, dry bedding in all stalls.

***Corynebacterium* species:** *Corynebacterium* species (Most frequently *C. bovis*) is a contagious, Gram-positive pathogen that occasionally causes intramammary infections. This organism is commonly found in the environment and soil. *C. bovis* will usually cause only a mild increase in somatic cell count and a slight reduction in milk production. *C. bovis* will colonize the teat canal, so the teat canal as well as infected udders can act as reservoirs for infection. This pathogen is contagious and will therefore spread from cow to cow at milking. Proper milking procedures, including the use of effective post-milking teat disinfectants, will help to reduce the number of new infections. After unit detachment, the application of a proven post-milking teat disinfectant should be applied with coverage over at least two-thirds of the teat barrel. The exception to this are post-dips with the active ingredient linear dodecylbenzene sulfonic acid, which are not effective against *C. bovis* . These infections often self-resolve during the dry period. New infections can occur at any time during lactation.

Gram-negative organisms: This group includes *E. coli*, *Klebsiella*, *Citrobacter*, *Enterobacter*, and other related gram-negative organisms. Gram-negative bacterium are commonly found in bedding, manure, water, and soil. *Klebsiella* in particular may be associated with the use of green sawdust or recycled manure bedding and rates of new infections are higher in the summer than in other seasons. Mammary gland infections with coliforms can cause life-threatening illness. Most of these infections occur during the first two weeks prior to calving through the first 60 days of lactation. Infection occurs when the teat end contacts contaminated material between milking. Most *E. coli* infections are of short duration; approximately 50% last less than 10 day, but some may become chronic and last more than 100 days. *Klebsiella* infections are typically very difficult to treat, and the infected animals, or individual quarters, usually have to be culled. *Enterobacter* and *Citrobacter* are other coliforms found in bedding, manure and soil. Clinically, most severe coliform mastitis cases will look similar, with a sudden onset of fever, markedly decreased milk production, loss of appetite, and dehydration. Often these cows will go down and be unable to rise. Milk from the affected quarter may have large clots or be watery or bloody. Immunization with J5 vaccine can reduce the incidence of coliform mastitis and severity of clinical cases if administered appropriately.