Ken Mitchell, DVM
Valley Veterinarians, Inc. Milk Quality Laboratory

Environmental Mastitis organisms

-exposure occurs primarily between milking, when teats contact environmental sources. (bedding, flush water, wash water, poor hygiene in milk barn, etc.)
-primary reservoir is the cow's environment, not infected mammary glands.
-the most common mastitis problem in well managed, high producing dairy herds.
-High environmental counts in a BTM culture indicate a breakdown in milking procedures or equipment cleaning.
-Good milking procedures and environmental cleanliness are the basis for prevention for all mastitis, and particularly for environmental mastitis .

environmental management:

-Keep environment clean and dry.
-Change bedding often.
- Remove manure from free stalls frequently.
-maintain slope and firmness of outside corral base (coal ash, etc.)
-trim or dock tails. Burn excess hair on udders and legs.

good milking procedures:

-Do NOT milk wet udders! Allow adequate drip dry time after wash.
-Never apply machine to a dirty udder or dirty teat end.
-Pre-dip to sanitize teat end prior to milking.
-Post dip cows regularly and completely after milking. Have feed available upon exit so they do not lie down right away, allowing teat ends to close.

1) Coliforms (gram negative bacteria)

-loose term to cover all coliform-like bacteria. Can be typed further to include:
Escherichia coli (E. Coli)
Klebsiella spp.
Enterobacter spp.
Pseudomonas spp.
-commonly found in manure, bedding, water supplies, and soil.
-intra-mammary treatment usually not effective. Often associated with systemic disease, in which the bacteria rapidly overwhelm the cows defenses, producing severe toxins.
-Must be treated aggressively with anti-inflammatory therapy, frequent milk out, and fluid replacement/supportive therapy.
-increased incidence at dry-off (2 weeks), close-ups (2 weeks), and at freshening.
-prevention by clean, comfortable, uncrowded environment in dry pen, closeups and fresh pen. Maternity pen should have fresh, dry bedding constantly.
-J-5 vaccine used at dry, closeup, and fresh is a must for prevention.
-contamination of milk by dirty teats/wet cows is a more likely explanation for high bacteria or coli counts than are infected cows. Coli usually results in acute clinical mastitis, so cows shedding high numbers of coli are unlikely to still be in the milk string.
-Klebsiella associated with bedding (sawdust), Pseudomonas associated with contaminated
water and parlor hoses.

Ken Mitchell, DVM
Valley Veterinarians, Inc. Milk Quality Laboratory

2) Environmental Strep (Strep Non-Ag)

-Primary non-contagious streptococcus species in bovine mastitis are:
Strep Uberis
Strep Dysagalactiae
Strep Bovis
-commonly found in dairy environment and on non-disinfected teat skin.
-commonly found in BTM, can be source of elevated SPC.
-may be associated with infected quarters, teat sanitation problems, or bedding.
-Strep. Uberis infection can result in extremely high bacteria counts for short periods of time in infected quarters. Such cows can actually become "carrier" cows and contaminate or re-seed the environment. High concentrations of bacteria contaminate teat ends of other cows exposed to that environment and can lead to new infections, creating an almost infectious-like cycle of environmental mastitis.
-Strep Uberis grows VERY well in poorly managed straw bedding. Such an environment can allow envt. strep to proliferate and cause an envt. strep mastitis "outbreak".
-treatment is variable. Some cases may spontaneously cure, and some infections are short-lived. Treatment cure rates are variable between herds due to bacterial resistance and sensitivity. However, we believe that left untreated, envt. strep mastitis can develop into chronic infections with long-term increases in SCC. In general, envt. strep mastitis should be treated using penicillin-like intra-mammary treatment (hetacin-k, albacillin, dari-clox, or pirsue). Success will vary and laboratory antibiotic sensitivity can be unreliable, so each dairy may have to experiment to determine their tube of choice.
-Dry cow treatment is helpful in eliminating current infections, but cows can become re-infected late in the dry period, in close-up, or in contaminated maternity pens.

3) Environmental Staph (CNS, coagulase negative staph)

-CNS are the microorganisms most commonly isolated from mammary glands, but are usually associated with subclinical infections and only moderate increases in SCC. Only 10% show as clinical cases, so is usually not the culprit in large mastitis problems.
-include: *staph chromogenes*
staph epidermidis
staph intermedius and *staph hyicus* (can be coagulase +)
-CNS are found on the teat skin of all cows.
-considered a minor pathogen. A high level of CNS clinicals can result from poor milk procedured, such as teats not being cleaned and sanitized (pre-dip).

4) Other environmentals

-*cornyebacterium bovis*--source is infected quarters. Incidence is very low in herds with proper post-dipping routines.
- *a. pyogenes* -- infrequent in milk. Produces very abnormal milk and high bacteria count. Associated with abcess formation and contaminated environment.

-proteus	*-yeasts and molds*	*-mycobacterium*	*-bacillus*
-prototheca	*-nocardia*	*-serratia*	*-candida*