

Environmental Mastitis, Part 3 of 3

By Ruth Zadocks, DVM

How do we know where to look?

So how do we know where to start, if contagious mastitis cannot even be trusted to be contagious and environmental mastitis cannot even be trusted to be environmental? Since there are three factors that play a major role in the prevention or occurrence of mastitis, the cow, the environment, and the bacteria, there are three things we need to look at: the cows, their environment, and the bacteria. It is rare that any of these factors in isolation causes a mastitis problem, or can provide the solution to a mastitis problem.

Start with the cows. Where does the problem occur? Do you mainly see a problem in the dry cows or the heifers? Those animals are not exposed to milking, so transmission during milking and contagious mastitis are out of the question. Do you mainly see a problem in the milking herd? In that case, there may be contagious transmission among your milking animals, or there may be something wrong with the cows' resistance, or with the bacterial load in their environment. Is there a problem in heifers shortly before or after first calving, but not in the older cows? In that case, and especially if the heifers are managed and fed as a separate group, there may be a nutritional deficit in the heifer ration that makes them more susceptible to infections, e.g. a vitamin E/Selenium deficit. Is the problem mostly in high producing cows at the peak of lactation? In that case, energy supply (ration) may not be sufficient to meet energy demand (peak production), slowing down the immune response and making the cows more vulnerable to bacteria that are commonly present in the environment.

Look at the environment. Don't forget that the environment includes the milking machine, the people handling, feeding and milking the cows, and nutrition. Are the cows out on pasture or in a barn? If inside, what is the air quality? Is it fresh inside the barn, or dusty and muggy? When dust and moisture have a chance to accumulate, bacteria do too. Are the stalls big enough for the cows? And are their claws healthy? If not, do they animals have trouble getting up, and maybe damage their own or their neighbors' udder while doing so? A barn design or claw health problem may be the underlying cause of a mastitis problem. When the animals lie down a lot, the bedding material doesn't have a chance to dry, and circulation in the udder may be compromised. Is there any bedding in the stalls? How much? What kind? Is it clean? Sawdust and shavings may harbor Klebsiella. Straw and manure pellets may harbor lots of Streptococci. Manure contains E. coli as well as Streptococci. Look at lactating cows, dry cows and heifers. What is the milking management? Are cows forestripped to detect mastitis? Are mastitic

cows separated from others, e.g. in a sick pen, or a high cell count string that is milked last? Are cell count data available? Are they used? Evaluate the cow rations too. Is the energy and nutrient content sufficient to meet the animals' needs? Is the quantity and access time sufficient for all animals, including animals low in the social hierarchy, to eat what they need?

Submit samples to identify the main bacteria. Are clinical mastitis cases and high somatic cell counts mostly or partly caused by Staphylococci, Streptococci, E. coli, Klebsiella, Proteus, Pseudomonas, or Pasteurella? If Klebsiella is a problem, test or replace the bedding material. If Streptococci are a problem, testing of unused bedding material may be an option, to verify whether the storage of bedding material is sufficiently clean and dry. Keep in mind that for Streptococci, either the environment or infected cows can cause problems. If multiple animals in a herd have Proteus, Pseudomonas or Pasteurella, often water-borne bacteria, it is imperative to find the source of these bacteria. Herds have gone out of business due to Pseudomonas outbreaks that were the results of poorly drained and cleaned milking equipment or after use of infected udder cloths. When E. coli is the main issue, improving cow health (nutrition) and barn or milking hygiene should be considered. Simple things such as preventing the cows from lying down for an hour after milking (e.g. by providing them fresh fodder, potentially combined with locking them into head gates) allow for some closure of teat ends and can reduce the risk of environmental mastitis. Bacteria can be identified in milk samples, but also in bedding samples. In special cases, strain typing may be considered to determine whether a staphylococcal or streptococcal problem is of environmental or contagious origin. When a predominant strain is found, the problem is probably contagious. If a large variety of strains are found, the source of the bacteria is in the cows' environment.

Many factors contribute to the health and disease of dairy cows, and many factors may need to be considered for the solution or prevention of mastitis problems. Invariably, cows, their environment and bacteria play a role. As long as those three components are considered, and expert advice is solicited in all three areas when necessary, a lot of so-called environmental mastitis problems can be prevented or reduced to an acceptable level.

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