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Mycoplasma: Cattle “plague” of the 21st Century?

Introduction: During the past couple of years, we have seen an increasing number of infectious cases in the dairy industry involving one or more of the various species of *Mycoplasma*. Both adult cattle and calves are susceptible. So what are *Mycoplasma* and where do they come from? The following article will help you to become more familiar with this organism, understand the various disease manifestations seen in calves, and also provide you with ideas on how to hopefully reduce if not prevent this “disease” from occurring on the farm and in your calves.

What are they? *Mycoplasma* organisms are small “bacteria-like” organisms that lack a true cell wall. This is important because the majority of antibiotics on the market work by attacking the cell wall of bacteria. Without a cell wall, these antibiotics will not work. There are a handful of antibiotics whose mode of action is within the organism. They are mentioned below. The other negative aspect of not having a true cell wall is that the host’s immune system has a much more difficult time recognizing the invading organism. One good thing is that it is more susceptible to the environment, heat, and disinfectants. It has been documented, though, that given the right conditions (moist and warm), it can survive in manure for 37 days, on wood and steel for 2 days, and on rubber and glass for 7 days¹. There have been at least 12 different species of *Mycoplasma* identified in cattle. In calves, the most common are *Mycoplasma bovis*, *M. dispar* and *M. bovoculi*. *Mycoplasma bovis* is by far the most common species isolated and responsible for the majority of *Mycoplasma*-related infections. Like *Pasteurella*, this organism can be found as a normal inhabitant of both the upper respiratory and reproductive tracts in cattle, both young and old. One might wonder, then, how long have *Mycoplasma* been around? The first reported case of *Mycoplasma*-related infection occurred in 1843 in South Ferry, New York. Here, a single dairy cow imported from Europe brought a species known as *M. mycoides*, which caused the first U.S. explosion of Contagious Bovine Pleuropneumonia or CBPP in adult cattle. The first case of mastitis involving *Mycoplasma* was reported in 1961 on a Connecticut dairy farm².

Spreading like wildfire? Like most industries, the dairy industry continues to evolve and change. The increasing movement of cattle across this country, along with the various geographical densities of dairy farms and therefore cattle numbers has allowed “bugs” like *Mycoplasma* to proliferate. Since it can be found as a normal inhabitant in cattle, then the ways in which it spreads becomes a crucial focus of attention. In calves there are multiple routes of infection possible. Most noted is the oral route. This can occur through feeding calves with contaminated nipples and pails, feeding waste milk, contaminated colostrum, or by allowing the calf to nurse the dam (i.e. direct contact with infected animals). In warm, humid barns, the organism can travel from calf to calf through the air. Research is still ongoing, but there is concern for transfer from the dam to the calf during the birthing process as the calf passes through the birth canal. Flies are another concern as we are seeing cases of eye infections in young stock mimicking pinkeye, yet are in fact infections caused by *Mycoplasma bovoculi*.



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What type of disease manifestations are we seeing in calves? One of the most common problems reported is a calf with an apparent ear infection. Calves often display with a head tilt, droopy ear, with or without discharge from the nose and/or ear. This can be on one side or both. Some calves may have a fever, salivate excessively or even appear to have a droopy upper eyelid. Ear infections are not uncommon in young calves and not all are caused by *Mycoplasma*. Until a confirmed diagnosis is made however, *Mycoplasma* needs to be placed on the list of possible causes. The most common



species isolated to date has been *M. bovis*. Other disease manifestations include “pinkeye-like” eye infections as mentioned above as well as joint infections. Calves may have one joint infected or multiple. The leg(s) is often stiff, with the joint being hot and swollen. *Mycoplasma bovis* is most commonly implicated yet *M. canadense* is a species that has been isolated on occasion.

So what do we do? As with any disease, recognizing and making a positive identification is the first step in reducing, if not eliminating, disease from the farm. On the dairy, identifying *Mycoplasma* positive mastitis cases is crucial. Avoid feeding raw waste milk or contaminated colostrum. Do not allow direct contact between healthy animals and those suspected of harboring *Mycoplasma*. When feeding calves make sure nipples, bottles, and/or pails are adequately sanitized and not shared between animals. Work with your veterinarian in identifying positive cases. To date, there are only a handful of antibiotics that have shown some level of efficacy on *Mycoplasma*. They include: lincomycin, spectinomycin, tetracycline (Ex. LA-200®), tylosin (Ex. Tylan®), tilmicosin (Ex. Micotil®), and florfenicol (Ex. Nuflo®). Your veterinarian can help determine which drug(s) are best to use. In non-responsive cases of ear infections in calves, performing a myringotomy [incision of the tympanic membrane (ear drum)] may help. Talk to your veterinarian about this procedure. As with all diseases, good husbandry practices are key to preventing *Mycoplasma* outbreaks. Good nutrition, reducing stress, and controlling underlying immuno-suppressive diseases like Bovine Viral Diarrhea (BVD) are a must. There are several commercially-available vaccines on the market and various laboratories are capable of making autogenous vaccines. The jury is still out regarding the efficacy of using these vaccines.

¹C. Thomas, UW-SVM

²Hale, H.H., et al. *Cornell Vet* 52:582-591, 1962.