



# Cattle Producer's Handbook

Animal Health Section

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## Mycoplasma Infections

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Mycoplasmas cause respiratory, joint, and ear infections in beef cattle. *Mycoplasma mastitis* is a common condition in dairy cattle. Mycoplasmas are tiny bacteria that are unique in their makeup; they do not contain a cell wall, they require cholesterol for growth, and because they lack a cell wall and the lipid (cholesterol), they are poor antigens making immunization extremely difficult.

Many different mycoplasma species have been associated with the diseases of cattle, but *M. bovis* is generally accepted as a primary pathogen in cattle. *Mycoplasma mycoides* is the causative agent for the foreign animal disease "contagious bovine pleuropneumonia" which was eradicated from the U.S. in 1895. Problematic is the multitude of mycoplasma species that are present in cattle and which are readily isolated from respiratory infections, ocular/nasal discharges, and infected joints. Diagnosis requires that the isolates be differentiated from *M. bovis*.

*Mycoplasma bovis* is difficult to identify and confirm in bovine respiratory disease but is felt to be a significant contributor to bovine respiratory disease (BRD). It is difficult to identify the disease in the early stages of infection. Left untreated, cattle may develop chronic respiratory problems leading to poor performance, ear infections (evidenced as head tilt), and lameness of one or more joints. Respiratory disease due to *Mycoplasma bovis* is indistinguishable from other infectious forms showing low-grade fever, low-grade cough, mild to marked depression, and ocular and/or nasal discharge. The common secondary problems after mycoplasma respiratory infections are lameness and middle ear infections.

Lameness generally becomes evident 2 to 3 weeks after the respiratory disease but can occur concomitantly. Animals with joint involvement

exhibit joint swelling as well as severe lameness. The affected joint is swollen and painful, and fluid-filled pockets may be felt between the bones in acute cases. In chronic cases the involved joint becomes stiff and firm due to the formation of scar tissue in the joint.

While some animals may have multiple joints swollen, the shoulder joint is most commonly affected clinically. Producers may notice the classic dropped elbow and increasing lameness. Fig. 1 shows a red Angus calf being back grounded in confinement. Note the swollen left shoulder and dropped elbow. The calf has a depressed attitude and shows lack of fill.



Fig. 1. Red Angus calf with *Mycoplasma bovis*.

Otitis, or ear infection, is also a common secondary feature of mycoplasma respiratory infection. The condition is more prevalent in calf raising units than in cow-calf operations. The chief sign of otitis is a droopy ear followed by an obvious head tilt. Typically only one ear is involved. Rarely there is a discharge from the ear. The droopy ear may develop during a respiratory infection and the head tilt becomes obvious 1 to 3 weeks after the respiratory episode. At necropsy, the middle ear and bulla are filled with a thick, caseous exudate. Animals with joint or ear infections usually do not have a fever or exhibit other symptoms.

Mycoplasma mastitis may be directly transmitted to the mammary gland from a nursing calf with either otitis or a mycoplasmal respiratory infection or it may be a sequela to respiratory infection as are arthritis and otitis. It is evident that calves nursing from cows with mycoplasma mastitis are at much greater risk to develop respiratory and ear infections. The significance of mycoplasma mastitis in beef operations is largely unknown, yet is becoming more recognized in the dairy sector.

Mycoplasma respiratory infections are often unresponsive to the standard 4- to 7-day antibiotic treatment with drugs such as penicillin, tylosin, and tetracycline. Long term (more than 21 days) antibiotic therapy has shown limited success. A newer class of drugs (DRAXXIN® or tulathromycin) recently introduced has shown enough promise to warrant a label claim in treating *Mycoplasma bovis*.

Animals with otitis generally retain the head tilt but may perform in the feedlot. Attempts to treat otitis by puncturing the eardrum with a knitting needle (syringotomy) have been of limited success due to the thickness of the material in the ear limiting drainage of the middle ear.

Diagnosis of *Mycoplasma bovis* infection requires laboratory confirmation. Lung tissues, tracheal washes, and joint fluids are the specimens of choice. While the organism requires selective media, most veterinary diagnostic laboratories can culture or isolate the organisms, although isolation routinely takes 2 weeks. Due to the multiple species and strains of mycoplasma in cattle, the isolates must be identified (typed). Many laboratories are not equipped to type or identify specific mycoplasma strains. Antibiotic sensitivity is not routinely performed on mycoplasma isolates, and only a limited number of antibiotics demonstrate effectiveness against mycoplasma.

Mycoplasma vaccination has been limited due to the difficulty of producing an adequate immune response to the organism. The organism's structure, which contains lipids, makes it a poor antigen. A reliable reproducible model of an *M. bovis* clinical syndrome is difficult to maintain, and vaccine trials have shown equivocal results in the field. A limited number of vaccines are approved for use in cattle.

The transmission of mycoplasma is generally considered to be through direct contact with an infected animal. It is also thought that transmission can be spread by infected bedding (dairy cattle) and through balling and drenching guns. The latter was found to be the case in a Utah feedlot. They were experiencing a tremendous increase in the incidence of *Mycoplasma bovis* lameness. Upon further investigation it was determined that the oral deworming guns used during processing were not disinfected between pens of cattle. Once this oversight was corrected, the incidence of *Mycoplasma bovis* lameness and respiratory cases decreased dramatically.

