

# Bacterium Battle



PHOTO BY MICKY WILSON

Cow-calf producers aren't immune to mycoplasma exposure.

by Corinne Patterson

**B**iosecurity and early detection of disease, coupled with preventative vaccinations, have helped beef producers in their quest to maintain healthy herds. But one tiny bacterium called *Mycoplasma bovis* (*M. bovis*) is unique in that it does not possess a cell wall like other bacteria, making it very difficult — if not impossible — to treat or prevent.

Mycoplasma was first isolated from cattle with pneumonia and arthritis at the Pasteur Institute 100 years ago, says John Currin, Extension veterinary specialist at Virginia Tech

University. A strain of mycoplasma called contagious bovine pleuropneumonia (CBPP) was one of the first diseases eradicated in the United States. However, many species of mycoplasma still exist.

The current manifestation of the disease,

Currin says, was identified in the United States in the 1970s. From Virginia, through the heart of the cattle feeding country and across the Rockies to Oregon, mycoplasma received more widespread press as the bacterium began to cause clinical signs in herds across the country.



Mycoplasma may be a new term to some cattlemen, says Charles Estill, Extension veterinarian at Oregon State University, but producers shouldn't let the "fear of the unknown" cause panic, he adds.

Clinical signs of mycoplasma infection are more commonly seen in the stocker and feedlot segments of the industry, Currin says, but that doesn't mean cow-calf operations are immune. When mycoplasma has been identified in a stocker program, traceback has shown the bacteria to be present at the cow-calf level.

"We have occasionally seen it in some purebred cow-calf operations, where either suckling calves or weaned calves have had mycoplasma problems," Currin says. "We have seen it in cow-calf operations after calves are weaned and went through the weaning stress — mycoplasma issues arose."

## Disease breakdown

There are many species of mycoplasma that can wreak havoc on cattle. The bacteria alone may cause respiratory disease. More commonly, the disease occurs when an initial stressor causes calves to develop traditional bovine respiratory disease complex (BRDC), also known as shipping fever. Mycoplasmosis develops about seven to 14 days later.

"It's a very common inhabitant of the upper respiratory tract of a lot of cattle. If you go out and look for it in the noses of cattle on cow-calf operations, backgrounding operations and feedlots, you'd find it in a lot of places," Currin says. "It doesn't tend to cause problems unless the animals are immune-compromised or stressed significantly."

The most likely means of spreading mycoplasma is from calf to calf. It can occur by direct contact, through the air when calves are closely confined, or even from drenching and balling guns. Although mycoplasma can live in the environment in cool, damp places for periods of time, Currin says feed troughs, trucks or barns are not considered to be an important means of transmission.

"While mycoplasma can be cultured out of a deep, dark corner of a sale barn somewhere where cattle were a week or two weeks earlier, nobody can really say whether it is an infective dose," Currin says. "By far and away the most common way to have problems with it would be from aerosol contact from other cattle."

A weakened immune system inhibits the respiratory tract's own defense against disease. Common clinical signs, Currin says, are a harsh, hacking cough; a low-grade fever; mildly increased respiratory rate; mild depression; and runny eyes.

"The most prominent sign is coughing, which is often set off by moving the animals

►**Above:** Producers often cannot identify sickness early in the game, because mycoplasma does not produce toxins like other pneumonias, and calves initially do not appear sick. They are alert and continue to come up to the bunks to eat.

around. This is why you are most likely to see coughing when calves are being loaded or unloaded or moved from pen to pen or through the salering at a public auction,” Estill notes. “In all but very severe cases they continue to eat well, which is different from what is observed with most other types of pneumonia.”

Producers often cannot identify sickness early in the game, because mycoplasma does not produce toxins like other pneumonias, and calves initially do not appear sick. They are alert and continue to come up to the bunks to eat.

Another potential complication of mycoplasmal pneumonia is an ear infection, where a calf will have a drooped ear with yellow pus draining, Currin says. In rare cases, the bacteria will invade the inner ear, causing the head to tilt, which is why a producer may observe the animal circling or falling to one side.

Some calves with mycoplasmal pneumonia develop severe arthritis two or four weeks later, Currin says. “Different strains of mycoplasma have different likelihoods of causing joint problems, so some outbreaks have many lame calves, while others have none.”

Any joint can be affected, but the knee and stifle are the most commonly affected and usually cause lameness.

“If not treated early, the animal’s condition will worsen dramatically and be much harder to treat,” Currin says. “It may take seven to 14 days after the respiratory tract is infected before calves show dramatic clinical signs, and, by this stage, significant and often permanent damage has been done to the lungs. It is important to remember that some strains of *M. bovis* may not cause lameness or dropped ears, so it is very possible to have mycoplasmosis without these additional signs.”

### Prevention

Because so many animals carry mycoplasma in their noses, Currin says quarantining an animal after a veterinarian identifies the disease in the herd won’t be very effective.

“By the time you found it in your herd, and I diagnosed a calf with it, it would be very likely that a large chunk of the other calves would also have that bacterium in their noses as well,” he says. “They might not go on and develop pneumonia or have any problems, but it would be a significant number of animals.”

It’s difficult to control whether an individual calf will be the only sickness from

the bacteria or whether the farm will experience an outbreak.

“Unfortunately, there’s not a lot a producer can do if mycoplasma is identified,” Currin says. He suggests producers do their best to make sure the overall immune health of the animals is in good shape by using proper vaccinations and keeping a good micromineral program. Since stress is an activator, keeping stress as minimal as possible is also advisable.

“Although any age cattle can become infected, 350- to 450-pound (lb.) calves are most frequently affected,” Estill adds. “When buying commingled, multiple-source calves, the chances of mycoplasma increases. The same is true when stockers are mixed with cow-calf pairs or when purchased replacements are added to a herd.

Occasionally, replacement bulls can bring mycoplasma into a herd.”

Purebred breeders market cattle by traveling to shows, participating in consignment sales or putting bulls in tests. Currin says commingling cattle in these ways will put the animals at some risk. Cattle taken to and from the ranch should be quarantined before commingling them with the home herd.

“It’s out there quite significantly in the cow-calf operations, but it is relatively rare that we see the complications with them,” he adds. “That probably has to do with the fact that, generally speaking, on most cow-calf operations those cattle are not significantly stressed, and they don’t have recent immune compromise — unless they have another disease like BVD (bovine viral diarrhea) or other disease coming through them.”

Cow-calf producers may have the opportunity to help prevent mycoplasma outbreaks.

“Since the type of mycoplasma we are seeing is an opportunist, the most important steps we can take will be those that raise the calf’s resistance to infection,” Estill says. He recommends a complete preconditioning program, including vaccination for common respiratory diseases before calves are moved through a sale or commingled with other calves.

### Long-term battle

Treatment for mycoplasma is difficult because commonly used antibiotics do not work well. Early diagnosis and prolonged treatment are critical in the battle against the disease. Penicillin, Polyflex,<sup>®</sup> Naxcel,<sup>®</sup> Excenel<sup>®</sup> and Excede<sup>®</sup> kill bacteria by destroying the cell wall. Since mycoplasma doesn’t have a normal cell wall, Currin says

these antibiotics show little or no activity against mycoplasma.

Oxytetracycline — the active ingredient in LA-200<sup>®</sup> Biomylin 200<sup>®</sup> Tetradure 200<sup>®</sup> and other generics — has produced mixed results, Currin says. One study showed 50% of *M. bovis* isolates were resistant to oxytetracycline.

Tulathromycin — or Draxxin<sup>®</sup> — is the only drug approved for mycoplasma. Currin says this drug provides seven to 14 days of therapeutic blood concentrations against mycoplasma and *Mannheimia haemolytica*, *Pasteurella multocida* and *Histophilus somni*, all causes of BRDC.

“Calves treated early in the course of the disease respond fairly well,” Currin says. “The need for longer treatment than usual for BRDC is underscored by the fact that without therapy, 30% to 70% of the calves can relapse and require treatment again. Each time a calf relapses it will have more lung damage and be less likely to recover.”

Currin’s family has been in the stocker business for more than 40 years, and he says the recent attention and identification of mycoplasma across the beef industry is a concern.

“When I look back and talk to my dad, before the year 2000 here in Virginia we did not identify mycoplasma at all — period. We did not see these classic signs that we associate with it now. That certainly seems to be new,” Currin says. “With the increased movement of cattle, larger stocker operations and feedlot operations leading to more exposure and movement of animals have led to mycoplasma [being] expressed more.”

Estill says mycoplasma is a relatively new term that has cropped up recently in Oregon producers’ minds.

“Experts from some of the larger cattle feeding regions of the country feel that mycoplasma may be on the rise, particularly in lightweight stocker or backgrounder calves,” Estill says. “The apparent increase may be due to antibiotic resistance or to emergence of different strains, but this is unproven. It appears that more cow-calf operations now have *M. bovis* in their herds than in the past. Cattle can carry mycoplasma in their noses for months or even years.”

As producers become aware of mycoplasma, Currin says practicing good biosecurity protocols and early detection and identification of potential infection will help ensure they aren’t faced with the headache this bacterium can become. Currin says producers should work closely with their veterinarians if they believe they are experiencing a problem with mycoplasma.

He adds, “If it does get in individual animals or in your herd in a big way, it is a real expensive nightmare to deal with.”

