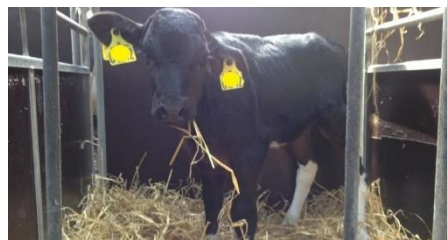


## *Mycoplasma bovis* Outbreaks on Dairy Farms

### Introduction

*Mycoplasma bovis* (*M. bovis*) is a bacterial agent leading to disease that is commonly found in cattle all over the world, including Europe, New Zealand, Australia and North America. In Eastern Canada the prevalence of *M. bovis* in bulk milk tank samples ranged from 1.5 to 2.4% [1]; however, the prevalence may increase with larger herd sizes and was reported as 6.8% in the US [2]. The prevalence of *M. bovis* is a larger issue in feedlots, contributing to Bovine Respiratory Disease and Chronic Pneumonia and Polyarthritis Syndrome [2]. While *M. bovis* does not infect humans and presents no food safety risk, it does result in serious conditions in cattle and leads to welfare and productivity issues. The clinical conditions caused by *M. bovis* are extremely difficult to treat with virtually no effective treatments labelled for use in lactating dairy cattle. Moreover, affected cattle may become permanent carriers of the disease. *M. bovis* primarily spreads from animal to animal through close contact and can spread between farms by movement of healthy carriers; however, outbreaks of *M. bovis* have also occurred in closed dairy herds in Alberta. Therefore, the spread of *M. bovis* between farms and within a farm represents a significant biosecurity risk.



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### How does *M. bovis* Affect Cattle?

*M. bovis* often resides in the nostrils of cows that are not presenting symptoms, making carriers difficult to detect, but once an animal is under stress it can lead to an active infection. *M. bovis* infections can present as untreatable and contagious mastitis in dairy and beef cows. It can also present as pneumonia and as swollen joints causing lameness. While this can have a negative impact on production, a large economic impact can also be due to infections spreading to calves. In two Florida dairy farms with *M. bovis*, 60% of calf illness and 10% of calf deaths were due to clinical *M. bovis* infection [3]. In calves, *M. bovis* typically presents as respiratory infections combined with varying degrees of ear infection severity. Since *M. bovis* is difficult to treat and may be chronically present in affected cows, aggressive control strategies, including segregation and culling, should be considered. Due to the contagious nature of the bacteria, especially if not diagnosed quickly, an outbreak can lead to a significant loss of animals and economic impact. In a past outbreak of *M. bovis* in Alberta, 40% of the cows on farm tested positive, leading to an estimated loss of approximately \$300,000, primarily due to culling.

## How Can *M. bovis* be Prevented?

*M. bovis* is primarily spread from cow to cow, and so the greatest risk is introducing new animals to the herd. Testing new additions to the farm (milk, semen, or nasal swab) can help to identify cattle positive for *M. bovis* and reduce the risk of transmission in the herd [4]. Additionally, as a contagious udder infection, it is important that recommended milking practices are followed to reduce the spread from contaminated equipment. These practices include:

- Pre dip
- Use of rubber gloves
- Back flush
- Single service towels
- Post dip

For farms using automated milking systems, proper maintenance and equipment testing is also necessary. Adequate teat dip coverage should be verified on a monthly basis and may require adjustments throughout the year as temperature and ventilation can affect dip viscosity and spray pattern.

Pasteurization of colostrum and whole milk fed to calves is an effective way to prevent the spread of bacterial infection from cows to calves. In addition, individual calving pens and strict biosecurity measures when entering calf areas will help to prevent transmission. Due to the spread of *M. bovis* into closed herds, it is also essential to implement other best management practices for biosecurity. *Mycoplasma* species are very sensitive to disinfectants and should be controllable with good management practices. *M. bovis* can survive for months in cool, moist environments [2] and there is evidence of transmission from people and contaminated equipment moving between farms [4]. Controlling visitor traffic on farm and ensuring the sanitation of footwear and equipment brought on farm, especially around cattle, is essential.

Routine testing of bulk milk tanks for *Mycoplasma* species and other pathogens can be used to monitor and reduce the spread of infection on farm. For detection of *M. bovis*, a specific polymerase chain reaction (PCR) test is used and monthly bulk milk sampling is recommended to ensure that a problem is detected in a timely manner. In the event of a positive test, a quick response to early detection may help to manage an outbreak.

## How can an *M. bovis* Outbreak be Managed?

If cows in your herd develop a persistent and untreatable mastitis or other symptoms of *M. bovis*, contact your veterinarian immediately. While certain conditions caused by some *M. bovis* infections do partially resolve, the infection itself is virtually untreatable. There are currently no treatments that have been proven to be effective against *M. bovis* infections; therefore, your veterinarian is the best resource to help manage an outbreak. The attempted use of off-label drugs only leads to other contamination issues involving milk quality and food safety. Treatments with antibiotics are often ineffective as *M. bovis* has shown resistance to all the main antibiotic classes and its ability to infect multiple areas of the body makes most treatments insufficient [5]. Cows with clinical symptoms should be immediately segregated and cows with elevated somatic cell count should be identified and tested. As an outbreak of *M. bovis* can result in 40% of the herd becoming infected [5], it may be necessary to test more animals to assess the spread. At this stage, test-positive cows can either be culled or isolated from the healthy group using strict biosecurity and best milking practices. These decisions should be made on a farm by farm basis with your herd veterinarian.

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