

# Prevention the spread of mycoplasma bovis in new zealand

[Science](#), [Biology](#)



**ASSIGN  
BUSTER**

“ A tough decision was made to eradicate Mycoplasma Bovis (M. Bovis) in what would be a world first attempt. I emphasize fully with those farmers going through the pain of losing their herds,”

says New Zealand’s current Prime Minister Jacinda Ardern. M. Bovis could become a major problem for animal welfare and overall milk and dairy product production, which could in turn affect the stability of our national and international dairy industry. Because of the difficulty of treating this disease it is feared by all countries that rely on the national dairy industry. With New Zealand having such a large segment of dairy industry, this fear is justified. The New Zealand government has made plans to eradicate the spread of M. Bovis by the culling of up to 126, 000 cows. This process will cost over \$886 million. The purpose of this research report is to pose the question: “ Do you agree with the eradication process the New Zealand government is willing to make to help prevent the spread of Mycoplasma Bovis?”

## **Biological Explanation of M. Bovis**

M. Bovis is a tiny bacteria known to cause mastitis in cattle. It is suspected that the nasty disease was first introduced into New Zealand late 2015, early 2016; but wasn’t initially diagnosed in July 2017. The bacteria is resistant to antibiotics that are normally used to treat sick cows. Mastitis is an infection of usually one quarter of the udder causing inflammation, pus, pain and discharge. This bacteria is less common than other mastitis causing bacteria like Staphylococcus and Streptococcus and can be differentiated because it has different signs and symptoms. It is known to be highly contagious, and is

predominantly seen in cows under stress and causes significant loss of milk production, affected cows can remain externally normal but have severe disease and this disease is usually seen in multiple quarters of the udder. *M. Bovis* is very hard to treat as normal antibiotics are unable to detect it as the disease does not have a cell wall and is able to avoid the antibiotics by 'hiding' within abscesses.

Many antibiotics do their work by attacking the cell wall of bacteria, and the drugs prevent the bacteria from synthesizing a molecule in the cell wall called peptidoglycan, which provides the wall with the strength it needs to survive. There are many factors which play an important role in the virulence and *M. Bovis* disease development. The *M. Bovis* bacteria does not an organelle but has proteins which help it attach. These surface proteins however are forever changing and switching which increases its ability to evade the cow's immune system. It is also capable of surviving for long periods of time due to the production of biofilm, which is a protective film which protects it from being destroyed.

There have been many *Mycoplasma* bacteria isolated internationally however *M. Bovis* appears to be one of the only isolates that causes the mastitis issues. It can cause other symptoms including lameness or swelling of the joints (throughout animals of any age), pneumonia and an associated head tilt in calves. When milking and herds, it is important to keep an eye on the somatic cell count (SCC) as an increase in this can indicate mastitis in a cow. It is quantified by the amount of cells per ml of milk. The average SCC count for a cow is 100, 000, this means that they are uninfected whereas

any cow with a SCC over 200, 000 can indicate infection in at least one quarter of the udder. The cell counts reflect the quality of milk. If SCC is over 400, 000 it is deemed unfit for human consumption.

In some farms the disease can cause chronic signs with a very large amount of animals involved, whereas in other farms there are basically no signs at all. This is called the silent carrier state. The silent carrier state is where there is a presence of a genotypic defect which is not detected in the phenotype.

M. Bovis is very easily transmitted from one cow to another due to the fact that it is a highly contagious disease. Any cow/calf that is infected with the disease can easily pass it onto another cow by nose to nose contact. In this case it can be when a cow sneezes onto another cow, this now means that both cows are infected. Not only is it nose to nose but the disease can be spread from the vagina, sperm, rectum, eyes and teats from the bacterium being shed, this leads to an increased amount of affect cows. As dairy farmers use some of the milk to feed calves, it is possible the infection can be spread from the milk to the calf. Although M. Bovis does affect cattle immensely, it luckily doesn't not have any effect or harm on humans whether we consume infected cattle meat or milk.

### **Risk factors and spread of the disease**

It became known when the United States of America started seeing M. Bovis in their herds that a positive correlation was made between the size of the herds and the vulnerability of culling the cows. Larger herds were more vulnerable to disease than smaller herds. This may be due to the herds

closer proximity. However what we know is that with the culling of cows, dairy farmers then have the job of replacing their herds and consequently does this increase the risk of introducing more cattle with the disease? Nicholas, Fox and Lysnyansky (2016) confirmed that importing or the moving around of cattle clearly increases the risk of introducing M. Bovis to farms and those farms with larger herds provide a greater opportunity for the spread of disease from one animal to another. The contagious nature of this disease and the nature of stock movement in New Zealand can have disastrous effects on our dairy population.

Share Milking has become a cornerstone of the dairy industry in New Zealand for more than a century and is commonly when two parties are involved in the dairy process. One person owns the land and milks the cattle which are typically owned by the sharemilker. Historically this has been a way in which young dairy farmers have been able to build wealth and experience, and then eventually own their own land. However each year on the first day of winter (June 1st) sharemilkers move their herds to winter grazing. This is known as “ gypsy day” where thousands of cows are moved around the country. Federated Farmers Mid Canterbury dairy section chairman Chris Ford said: “ There’s no legislation of how farmers are supposed to move their cows or move their property from one farm to another, so there’s a lot of trust that the farmers are doing it right.” This is backed up by Agriculture Minister Damien O’Connor who stated that it might not be all plain sailing.