

ASHLEIGH DOBSON

Veterinarian and developer Ashleigh Dobson discusses on-farm biosecurity in the face of the *Mycoplasma bovis* outbreak in New Zealand, highlighting what rural professionals and farmers can do to make a positive difference.

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MYCOPLASMA BOVIS AND ON-FARM BIOSECURITY – GETTING IT RIGHT

The current challenge

Since July 2017, when the bacteria *Mycoplasma bovis* (*M. bovis*) was first diagnosed in New Zealand, dairy and beef farm biosecurity practices have been under increased scrutiny. New Zealanders rightfully take great pride in punching above their weight on the world stage in many areas. Unfortunately, many think of biosecurity as something required only at the border and in our interactions with the rest of the world. It is time to change that mindset to include protecting the borders of our farms, our communities, and our food supply, as well as our other assets.


The entry of the disease into our country and the subsequent challenges encountered during the response have highlighted areas where we can improve biosecurity, both behind and beyond the farm gate. While the incursion of *M. bovis* has been absolutely devastating to many farms, creating considerable stress and upheaval in some areas, many have been fortunate to emerge relatively unscathed. Of great concern is the possibility

that if we don't learn what we can from this experience, and change our practices on-farm and in the wider community, the next time something breaches our defences it may cause far greater damage to our farming industry and global trading relationships than *M. bovis*.

Mycoplasma bovis – an overview

M. bovis causes disease in cattle only. The bacteria does not infect people and presents no food safety risk. The main signs seen in New Zealand cattle have been multi-quarter, non-responsive mastitis and arthritis. In one farm, several young calves showed neurological disease. Reports of ill-thrift (failure to gain weight) in calves are thought to be multifactorial and the role of *M. bovis* is still being examined, but at this point in time it is not considered the primary cause.

M. bovis is a fragile bacteria in the environment, because it does not have a cell wall like most other bacteria. It is easily killed by UV light and cannot withstand being dried out by heat and wind. However, the same characteristics that make it fragile in the environment are responsible for



Provide visitors with spare personal protective equipment (PPE) or have a dedicated cleaning and disinfection point

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making it difficult to kill once it is inside an animal. It is resistant to many antibiotics used on-farm and there is no effective *M. bovis* vaccine. For this disease, prevention of disease transmission is much more effective than trying to cure an infected animal.

It is very difficult to detect *M. bovis* in infected animals. Typically, in an infected herd, 80-90% of infected cattle show no clinical signs of disease. Infected animals shed the bacteria intermittently, which makes finding and eliminating them next to impossible. The testing strategies currently employed in New Zealand are based on multiple tests done over time to try and increase the chances of finding infected animals that are intermittently shedding bacteria.

Stress in cows at drying off and again at calving time may trigger shedding and/or clinical disease. At those times it will be important to remember that the bacterial infection with *M. bovis* may have been there for some time before the stressful event, and that this event has brought on the clinical signs.

The transmission of *M. bovis* occurs primarily through direct physical contact between groups of cattle and through feeding contaminated milk to calves. With that in mind, the strategies that will be most effective in protecting cattle from *M. bovis* will be those that eliminate direct physical contact and mixing between cattle from multiple sources, and that protect calves from contact with infected animals and the consumption of milk that contains *M. bovis* bacteria.

Gold standard biosecurity – not just a buzzword

Boiled down to basic principles, biosecurity is having a plan to minimise the risk of pests (e.g. weeds, plant and animal diseases, and some insects) establishing on a farm. Gold standard biosecurity refers to farm systems where people have taken all reasonable steps to protect their farm and stock from the incursion of pests and diseases. Examples of this can be seen in many pork and poultry operations where everything is contained in a barn, including:

- Positive pressure ventilation
- Vermin control
- All-in/all-out animal group movements
- Strict protocols for visitors to the facility – people have a shower on entry and get dressed in farm-specific personal protective equipment (PPE), and shower and change back into their own gear before they leave.

It is important to note that even under these conditions pest incursions and disease outbreaks can still occur.

For New Zealand pastoral farms, animal health gold standard biosecurity is practised on farm systems that prevent contact between stock from different sources. This includes farms that are operated as a 'closed herd', populated by animals that leave when sold or going to slaughter, but do not leave the property and then return (e.g. for grazing or lease). A truly closed herd does not buy in or lease any animals, but is re-populated by young stock raised on the farm. Breeding is done using

The fences and gates that surround a farm are the main defence against unwanted visitors, both human and animal.

artificial insemination, which can carry some risks, but those risks are lower than those posed by bulls or rams from other herds or flocks. Feed is grown on the main farm where possible, and bought in only from reputable sources if necessary. Owner-operated run-off or grazing arrangements that ensure 100% separation of stock from different sources are also practising animal health gold standard biosecurity.

For some New Zealand farms, the gold standard biosecurity described above is impractical. That does not mean that those farms cannot make changes to improve biosecurity practices. Some of those changes can happen immediately, and some can be planned for when funds and time are available. Longer-term changes may mean some adjustments to the farm system itself, such as the use of service bulls and off-farm grazing. Remember, any changes made are an improvement to the farm's biosecurity compared to the status quo.

Advice from rural professionals for farmers on biosecurity

The following recommendations are in the Biosecurity Warrant of Fitness (WOF) documents and in the grazer information that can be found on the DairyNZ and Beef+Lamb New Zealand websites. These are helpful tools that rural professionals can use to assist farmers improve biosecurity on-farm. Ideally, the WOF documents can be used by farmers, rural professionals and veterinarians working together to provide their individual expertise to

an overall farm biosecurity plan. Keep in mind that these recommendations are *not* all specific to *M. bovis*, but are general, good biosecurity recommendations.

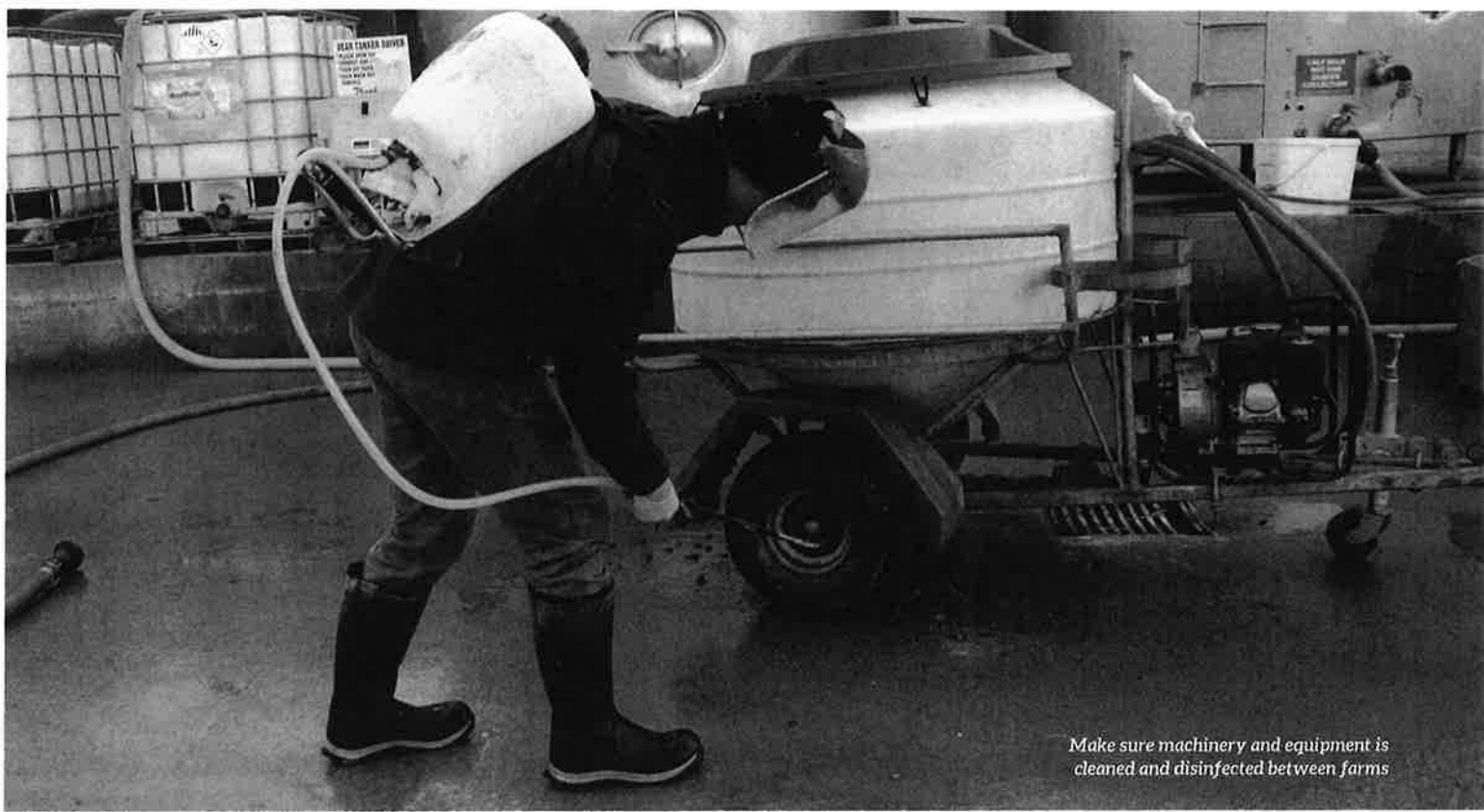
Boundaries and visitors

The fences and gates that surround a farm are the main defence against unwanted visitors, both human and animal. Fences and gates should be regularly maintained and, where possible, there should be a single entry point to the farm with any other entry points securely closed. In addition, where contact with neighbouring stock is possible, farmers are advised to create a two metre wide buffer zone to ensure that animal noses are kept at least one metre apart. Farmers are encouraged to have good relationships with their neighbours, and plan grazing to minimise the times when there are animals on both sides of boundary fences.

A sign at the farm entrance will remind visitors of farm biosecurity requirements. If visitors are unexpected, the sign should direct them to remain on the main farm track and give them the phone number of someone to contact about their arrival. Where possible, visitors should be transported through the farm on farm vehicles and leave their vehicles on the main farm track. If visitors are leaving the main farm track to enter a farm they should be provided with farm PPE, or asked to clean their boots and gear at a farm disinfection station (e.g. foot bath) on arrival and again on departure from the farm.



Prevent contact between animals across boundary fences using double fencing, outriggers, or other barriers such as hedgerows



Make sure machinery and equipment is cleaned and disinfected between farms

Rural professionals and contractors should realise they and their equipment are potential vectors of disease and other biosecurity risks.

Stock movements

There are many diseases that are carried by stock. Before farmers purchase, lease or allow stock on their property, they should aim to know as much as possible about where the animals have come from and what their health status has been. Farmers should ask questions about animal health, TB status, vaccinations, and disease and treatment history. They should consider using a pre-purchase checklist, such as the one found on the DairyNZ and MPI websites.

All cattle movements must be recorded in the National Animal Identification and Tracing (NAIT) system and all animals must have NAIT tags. Animal Status Declarations must also be completed and retained for the required amount of time. Any incoming stock should be kept separate from other stock for at least seven days. This is to allow newcomers to empty out any weed seeds they ate at the home farm, to give farmers time to watch for any signs of disease before they mix the new animals with their other stock, and to check that all the records are complete and accurate.

When sending animals off-farm, other than those going direct to slaughter, farmers should discuss biosecurity risks with their transport operator. Farmers should make sure that their animals are transported in a clean truck, and there is no mixing with animals from another herd. When having these discussions around truck cleaning, farmers must consider the transport operator's access to water, wash facilities, effluent disposal and time constraints. Farmers have the right to expect good biosecurity for their

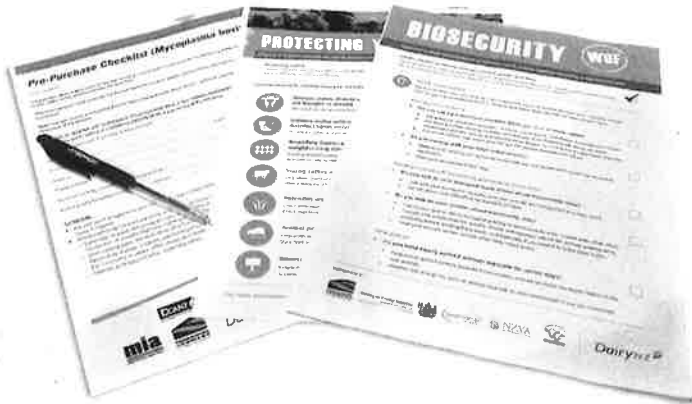
transported stock, but we all must respect the reality of constraints on transport operators. Truck effluent should not be dumped on-farm, so transport operators need access to effluent disposal that will not compromise farm biosecurity or contaminate the environment.

If farmers are sending animals to grazing, they should have a discussion around arrival, departure, and general expectations with the grazer well in advance of stock leaving their farm. Ideally, stock should not be exposed to stock from other farms at any point, and direct physical contact must absolutely be prevented from occurring. The use of grazer yards for arrival, vaccinating, drenching, tagging, drafting and departure must be planned in advance to reduce the chance of disease transmission. Where possible, farmers should consider doing tasks that require yarding at the home farm.

When stock return home from grazing, they should be kept separated from any other stock on the home farm for at least seven days. This gives the farmer time to observe them for any signs of illness before they are mixed with the rest of the stock on the farm.

Rural professionals and contractors – spread of disease

Rural professionals and contractors should realise they and their equipment are potential vectors of disease and other biosecurity risks. Farmers will have a growing expectation that any rural professionals visiting farms bring gear that has been cleaned and disinfected – that includes their boots, equipment, PPE, and anything they use that is going to touch an animal. It is simply good practice not to carry



Resources are available to help you protect your farm

mud and muck from farm to farm. While faecal spread is of low importance for disease caused by *M. bovis*, it is important for the spread of other diseases and some weed seeds.

Machinery can spread weed seeds and soil-based organisms and pathogens between farms. Farmers should discuss their expectations with all contractors so they know what is expected before arriving on-farm.

Waste water from cleaning gear, equipment and machinery must not go into waterways or into the farm effluent irrigation system, because this is another way to spread weed seeds. A 'clean on, clean off' policy is a good start to reduce the biosecurity risks of visiting contractors and others who come to the farm.

Conclusion

New Zealanders need to make improving biosecurity practices a priority. We have an opportunity to learn from this experience and improve our farming systems so that we are better prepared for an incursion of another pest or disease. A spin-off from this will be better management of pests and diseases that are endemic to New Zealand, such as bovine viral diarrhoea (BVD). Working together with a

biosecurity expert such as a veterinarian will enable both short-term and long-term goals for improving biosecurity on-farm to be developed and implemented.

Further reading

Biosecurity WOF:

www.dairynz.co.nz/media/5788853/biosecurity-wof-a4-brochure.pdf

<https://beeflambnz.com/knowledge-hub/PDF/biosecurity-wof-checklist>

Beef +Lamb New Zealand and DairyNZ Drystock Biosecurity Guidelines:

<https://beeflambnz.com/knowledge-hub/PDF/drystock-biosecurity-guidelines>

Grazier biosecurity:

www.dairynz.co.nz/environment/biosecurity/biosecurity-on-grazing-properties/

<https://beeflambnz.com/knowledge-hub/PDF/mp-bovis-%E2%80%93-information-graziers>

Pre-purchase checklist:

www.dairynz.co.nz/media/5787884/myco-bovis-pre-purchase-checklist-aug-2017.pdf

Grazing checklist:

www.dairynz.co.nz/media/4112103/heifer-grazing-questionnaire-stock-owner.pdf

Biosecurity Communication Plan for Graziers:

www.dairynz.co.nz/media/5789396/biosecurity-communication-plan-for-graziers-a4.pdf

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Have one main access to the farm and close off any alternative entry points