

Biosecurity response to *Mycoplasma bovis*

MPI *Mycoplasma bovis* intelligence team in alphabetical order

P BINGHAM, K BUCKLE, L EARL, AMJ MCFADDEN, J O'CONNELL, TR RAWDON, M VAN ANDEL, D VINK, K WALKER

“With a little help from our friends”

Introduction

Mycoplasma bovis, an unwanted organism under the Biosecurity Act 1993 was confirmed on a dairy farm on 22 August 2017. As a result of this finding a significant biosecurity response has unfolded, involving a large number of people from many organisations from both within and external to the government. Indeed this response has been a true collaborative effort between government and industry right down to farmers at the coal face. A brief introduction to the response has been outlined; however, at the time of writing activities still remain ongoing.

The response up to this point has been focused on a number of key objectives. These are:

1. Contain *Mycoplasma bovis* to its known distribution in New Zealand.
2. Assess feasibility of eradication.
3. Determine and track distribution of *Mycoplasma bovis* (delimit its spread).
4. Engage industry partners, stakeholders and iwi and work with them to effectively manage this outbreak.
5. Maintain confidence in New Zealand's biosecurity system and protection of conservation values.
6. Ensure that the welfare of affected farmer(s) and their livestock is effectively managed.

These objectives in simple terms can be summarised as communicating findings, maintaining confidence of stakeholders and trading partners, and robust decision making. Surveillance is the key activity that underpins all of these objectives and has been the focus of activities for the last few months.

Surveillance aims to determine the presence of *Mycoplasma bovis* in farms associated with the index case (affected enterprise) and whether it is present outside of the known location; if it were, perhaps indicating a long standing presence of the agent. Surveillance data will provide an indication on the feasibility of eradication.

Surveillance as part of the *Mycoplasma bovis* response has consisted of two main streams of activity; these are Response surveillance and National surveillance. Response surveillance has the purposes of focusing on farms associated with the affected enterprise (farms owned by the same group), trace farms - those connected by tracing of animals or risk goods, and contiguous property farms - those that share a boundary with a property of interest.

In contrast, national surveillance has the purpose of determining the presence of *Mycoplasma bovis* outside of our current understanding of local risk and thus has focused on status of farms not necessarily associated with the affected enterprise. This included report cases and national surveillance through active and passive methods. A brief summary of the individual components of the surveillance strategy are provided as follows.

Response surveillance

Enterprise surveillance, surveillance of contiguous properties, trace surveillance

As part of the process for determining the extent of potential spread of *Mycoplasma bovis*, the dairy farms within the affected enterprise and their neighbouring contiguous farms around the known high risk properties were interviewed to understand animals and risk good movements and tested to establish disease status.

An initial programme of testing (e.g. enterprise surveillance, contiguous property surveillance and trace surveillance) was focused on collecting up to 10 milk samples from cows with mastitis and milk from bulk milk tanks present on the farm, e.g. bulk milk, discard/penicillin/red milk, colostrum. These samples provided a quick look as to farm status; however, the negative predictive value of testing using this regime was low. This was particularly so when the herd was non-clinically affected or when the proportion of the herd calved at the time of testing was relatively low. Thus a confirmed positive laboratory test provided an indication of the presence of *Mycoplasma bovis*, but a negative test did not indicate that a farm was truly negative. Thus the necessity for several rounds of serological surveillance. The capability for carrying out serological testing (including understanding sensitivity and specificity of the test in the New Zealand context) had to be developed and was not available at the early stages of the response.

A process for sampling and testing stock was established, dealing with the highest risk (dairy properties) to lowest risk (beef dry stock) properties to give the greatest assurance that disease was not present. The testing was aimed at covering a sufficient time span for animals to produce positive tests if infected. For contiguous property surveillance of one to two rounds of testing or more (depending on risk) was carried out at 3-5 week intervals.

A summary of the activity carried out at each round of surveillance on each of the farms is as follows:

1. Blood samples collected from approximately 130 animals on farm, including animals from each group on the farm: calved, springers, dry cows and calves two weeks of age or older.
2. On dry stock farms the sampling activity was modified to include blood samples and swabs (vaginal and nasal) from 60 animals per epidemiological group.
3. Bulk tank milk sample testing, e.g. as part of District (National surveillance).

Trace surveillance included investigation of associated properties in the context of trying to understand risk pathways, for instance testing of bulk milk samples from herds that used the same semen batches as the affected enterprise.

National surveillance

Report case surveillance

The nature of disease caused by *Mycoplasma bovis* can be very vague; such that even though the risk of *Mycoplasma bovis* may be low in many cases it is important that it was excluded using laboratory testing. Thus where a veterinarian reported cases where there was concern (or required peace of mind that disease observed wasn't caused by *Mycoplasma bovis*) samples were collected, couriered to the Animal Health Laboratory, Wallaceville and molecular tests (PCR) carried out.

Reports were triaged based on assessment of risk. If the following features were associated with the notification then the call was classified as high risk and the notification escalated to the surveillance manager for a surveillance visit and field investigation.

- Multiple animals affected.
- A constellation of key clinical signs (mastitis, joint infection, pneumonia, abortion, otitis media).

Enhanced passive surveillance

Individual milk samples submitted to the Regional Veterinary Diagnostic laboratories (VDLs) from cows with mastitis. Laboratories submitted samples for testing, including where a known mastitis pathogen was detected. These samples have been screened for *Mycoplasma bovis* at the Animal Health Laboratory.

Active surveillance around affected enterprise

The aim of the survey was to provide confidence that

Mycoplasma bovis was not present outside (in the two districts around) the affected farm enterprise. A secondary aim was to determine the prevalence of positive herds and the distribution of positive herds in the two districts around the affected enterprise. For the two districts (Waimate and Waitaki Districts) surrounding the affected enterprise dairy farms were targeted. Dairy herds were targeted as the unit of interest because bulk milk samples from the herd were a convenient, readily available sample that provided a window on the likely *Mycoplasma bovis* status of the herd. Bulk milk samples and discard milk samples were collected every 3-4 days for three intervals, i.e. 3 * Bulk milk samples and 3 * Discard milk samples. Thus an approximate total of 2,000 bulk milk samples was collected and tested by PCR. For this survey a positive case herd was defined as being where there was a positive PCR with confirmatory sequencing on a bulk milk sample collected from the herd.

Risk-based surveillance

Practicing large animal vets were contacted and requested to identify farms which met a case definition that was suggestive of *Mycoplasma bovis* infection. Various samples and a brief questionnaire was carried out on these farms. The survey was designed to cover cattle herds across New Zealand. Massey University EpiCentre have provided expertise in the design of the survey, and assisted with implementation. Samples have been tested at MPI's AHL. The Society of Dairy Cattle Veterinarians of the NZVA were consulted to identify and liaise with the practicing veterinarians participating in the programme. Analysis of the results will be performed jointly by the EpiCentre and MPI's Surveillance and Incursion Investigation personnel.

Conclusion

At the time of writing surveillance results and response options analysis are in the process of being finalised. However, at this point in time results point to the detection being a result of a recent incursion with a small network of associated farm infection. Ongoing work will be presented as to the validity of this premise.

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