Updated advice following the second meeting of the *Mycoplasma bovis* Technical Advisory Group

Teleconference held at 11:00-13:00 15 February
(New Zealand time)

Summary

UPDATE FROM MPI

The TAG were given an update on changes since December including the increase in IPs, increased geographical spread, and the hypothesis that *M. bovis* introduction was now likely to have been mid-2016 or earlier. Poor movement records continued to hamper investigations. The national *M. bovis* bulk milk surveillance programme testing had been initiated using PCR. Although TAG recommended in December the optimisation of the bulk milk ELISA test as a more sensitive technique, there had been no resources available to prioritise this work. At the time of this meeting, bulk milk testing had identified one further confirmed positive herd that had also been identified via tracing.

At the time of the meeting, there was a backlog of 200 tracing herds to be tested, with each new IP generating 20-30 new trace farms. It was unknown how many calf movements from the s 9(2)(b)(ii) cluster had not been traced. MPI anticipated that additional resources would enable them to complete the outstanding tracing visits before Gypsy Day.

Entry mechanisms were further discussed. s 9(2)(b)(ii) has no history of using imported semen, making this route of introduction less likely (if this cluster represents the primary herd). Investigations are ongoing regarding the use of biological products.

Neither the most recent NZIER report nor the results of recent genome sequencing of *M. bovis* isolates were provided prior to this teleconference so these have not been reviewed by the TAG.

IS ERADICATION STILL FEASIBLE?

The majority of the TAG agreed that eradication was still feasible (and desirable) although the scale of this task was now bigger and would require a sustained effort over a prolonged period. Plausible links have been described between most IPs and, provided there are sufficient resources to identify all IPs and apply movement controls before 1 June, eradication remains an option.

Although bulk milk survey results have been helpful, testing will need to continue for at least two years to allow time for potentially infected calves to enter the milking herd and be tested. The timeline for eradication will need to extend for at least two years (more likely four years) and the risk of further spread will need to be managed during this time. Individual compliance with recording stock movements and controls on animal movements will be needed for successful eradication. Results to date remain consistent with one primary source of *M. bovis* and an epidemic driven by cattle movements between herds. The geographical and numerical extent of unrecorded calf movements needs further estimation. Some surveillance of this age group needs to be part of an eradication plan, rather than waiting for their entry into milking platforms.

There was a minority view that success of eradication remains possible but less certain because of significant uncertainty around the costs and benefits of this approach and the low likelihood of success. The likelihood of undetected spread of *M. bovis* since (possibly) 2015, the scale of tracing required, and the failure of NAIT to fully capture animal movements suggest successful eradication was now less likely than previously discussed in December. The national bulk milk survey will not detect herds where *M. bovis* is not being shed into

milk, infected cows are not in supply, or infection is in non-milking animals. There was also uncertainty as to MPI's capacity to ensure all tracing visits are completed and all infected or suspect herds placed under strict movement controls before mid-May 2018 as the TAG previously recommended.

A decision regarding eradication needs to be made no later than 1 May.

WHAT LONGER-TERM DISEASE MANAGEMENT OPTIONS WOULD FEASIBLY PROVIDE ADEQUATE DISEASE CONTROL?

The TAG were cautious about the suggestion of declaring North Island to be *M. bovis* free, because of the potential for untraced calves to be present there and the risk associated with the current North Island IP. Given the evidence for greater disease prevalence in South Island, it would be defensible to put in place inter-island movement controls, although this could be a significant drain on resources (running a permitting/testing system etc.), with a risk that this could displace other activities aimed at disease elimination. Establishing the North Island to be free from *M. bovis* may be desirable to provide a ready source of uninfected animals. This would also require time-dependent surveillance of the milking herd, and a history of not receiving animals directly or indirectly from the South Island. Alongside this there would need to be suppression of spread in the South Island from untraced movements or an unidentified source – primarily by surveillance of young stock with a history of movement.

There was some support within TAG for establishing disease free zones which would be largely based on current processes in place to detect and manage disease (bulk milk testing, blood testing, and movement restrictions on IPs and suspect properties). The ability to clearly identify an infected zone is currently impaired by the unknown means of entry, the possibility of the primary farm not being identified, and the as yet untested known traces.

A decision to adopt a Pest Management Strategy or other industry-based programme will require a transition strategy. The livelihood of farms identified as part of an at risk movement network would be jeopardised if MPI simply exited and the gains made through depopulation to date would be lost (sunk costs). The current deficits in farm, herd, and movement data should also be addressed.

A non-government control programme would benefit from the optimisation and adoption of the bulk milk ELISA test. Farmers would need education on risk reduction at the property level with a likely focus on buyers ensuring purchased stock was free of infection. DairyNZ has very good extension arm for informing farmers how to decrease risk of buying infected stock. A voluntary control scheme would be unlikely to be adopted by all farmers and individual behaviours could then pose a risk of spreading disease. Uncertainty remained about the presentation of disease on the current IPs and there was a need for a proper epidemiological and productivity study on the effects of the disease in the New Zealand setting. There are no historical examples where a national government has funded a disease eradication campaign for a disease not listed by the OIE and there are no human health, food safety or trade implications.

ADVICE ON MINIMISING THE IMPACT OF DISEASE

The impacts of this disease are routinely managed in other countries by good farming practice and well managed farms do not see problems, albeit with ongoing increased surveillance and management costs.

Early diagnosis and detection (using syndromic surveillance) is essential, and if farmers are aware of the clinical signs associated with infection then disease can be effectively managed in a herd. Australian experience has been that affected farmers quickly learn to identify clinical cases, then test and cull them. After a couple of months their concerns drop and with rapid culling of infected animals clinical disease is soon eliminated from their farm. Feeding of discard milk to calves should be avoided to limit infection to the milking parlour. Alternatively, farmers may consider pasteurisation (or acidification) of discard milk before use.

In the United States, some farmers are very aggressive in *M. bovis* mastitis testing and slaughtering. West of the Mississippi, bulk milk testing is often done to monitor contagious mastitis and if milk tested positive, a zero tolerance approach is taken whereby farmers test the herd and cull infected animals. Farmers also feed calves on milk replacement, or pasteurise or acidify waste milk. Strict milking hygiene is required although biosecurity measures concerning replacement animals are not so well implemented.
In the United Kingdom, *M. bovis* infection is often mis-diagnosed. When infection is diagnosed then metaphylactic use of antibiotics has been practised although the effectiveness of this strategy is being limited due to increasing antibiotic resistance. Autogenous vaccines have worked in some circumstances although are unlikely to be useful in the New Zealand context.

FINAL COMMENTS

Although the TAG has been asked to focus on the technical aspects of *M. bovis* control, it is difficult to view these in isolation from economic or management issues. Additional economic analyses have apparently been undertaken by MPI, and should be used in any cost/benefit analysis of eradication. Although the consensus from TAG is that eradication is still possible, the identification of new IPs in the South Island is of concern and clearly makes the task of eradication more difficult and more expensive. Maintaining the North Island dairies free of *M. bovis* must receive significant attention.

TAG recognise that MPI staff involved in this response have been working tirelessly. Nevertheless, this response has highlighted the challenges that New Zealand would face if a significant animal health disease incursion were to occur (animal movement tracing, properties not captured by passive surveillance, diagnostic capacity, operational manpower etc) and government resources should be prioritised to address these shortcomings.