***Mycoplasma bovis* – Key Points**

***Mycoplasma bovis* – The Disease**

Mycoplasma bovis is present in the majority of countries including Europe, the USA and Australia.

Mycoplasma bovis can be present in an animal and never cause disease. It is a tiny bacteria without a cell wall and is resistant to antibiotics that are normally used to treat sick cows. Infected animals will shed the bacteria from time to time – particularly when under stress. Shedding of the disease occurs mainly in milk and semen and from the eyes, nose, vagina and rectum.

There is no effective treatment for sick animals and no effective vaccine is currently available. *Mycoplasma bovis* causes mastitis, abortion, pneumonia and arthritis.

It is solely a disease of cattle, does not affect and is not carried by any other animals and has no human health risks. That includes no human health risk from drinking milk and eating meat from animals carrying the disease.

While it is not considered a serious disease by most countries, worldwide experience, including New Zealand, shows that a few farmers will be hit very hard by this disease (see below).

Moving to a long term management regime would mean that farmers hit by the disease would be extremely unlikely to receive compensation and those identified as being at risk properties [non-infected RPs (Restricted Places) and NODs (Notice of Direction)] would receive no compensation.

Note that farmers under movement control may find it difficult to sell their animals to other farmers, graze their animals off their properties and graze other farmers' cattle. Again there will be no compensation for this loss.

How is *Mycoplasma bovis* Spread

The main ways *Mycoplasma bovis* is spread is:

- Through movement of infected animals (high risk)
- Through feeding infected milk to calves (high risk)
- Through close and repeated contact of infected animals with others in the same mob and transferring the organism on milking cups (high risk)
- Through semen (thought to be low risk)
- Through movement of infected in-contact equipment such as milking equipment, AI equipment and calving equipment (risk can be eliminated by thorough washing, disinfecting and drying)

Testing for *Mycoplasma bovis*
It is not possible to detect **all** animals with *Mycoplasma bovis* as the bacteria hides in the animal and does not necessarily cause illness or an antibody reaction.

Testing provides a high degree of certainty that an individual animal has the disease but will not find all the infected animals – hence the need to cull the whole herd.

The **PCR** test detects for the actual bacteria. The **ELISA** test looks for antibodies that are evidence of an active infection - but is not a *Mycoplasma bovis* specific test

The most accurate test is a **PCR** test of tonsil swabs done on dead animals so this is of no use as a preventative measure.

The Eradication Options
Four options have been carefully considered by Industry and MPI over the past few months:

- ~~Rapid Eradication~~
- Phased Eradication
- Ongoing Management
- ~~Response wind down~~

These options were narrowed down to two options, Phased Eradication and Ongoing Management,

Industry leaders met with MPI for 3.5 hours on Tuesday 22 May 2018 to discuss the two options and made the unanimous recommendation to proceed with Phased Eradication (with caveats to review this decision in late 2018)

The Government stated that this will be a joint Industry/Government decision and on Monday 28 May 2018 Cabinet supported this decision.

The Options:

- **Phased Eradication**
  - This is essentially a continuation of the status quo as we seek to contain the disease with the aim of eradicating it.
  - This will be a reversible decision and would be reviewed if new evidence comes to light i.e. it has spread to more properties than anticipated.
  - Industry has formally requested that infected farmers be provided with the option to delay depopulation and farmers under Notices of Direction be able to move stock to winter grazing, where this can be achieved with low risk of disease spread

- **Long Term Management:**
  - This would have meant that eradication is off the table for the foreseeable future.
  - Deciding to live with the disease would be on the expectation that for many farmers it will have a relatively low impact if they take the necessary precautions but for some it could destroy their livelihood.
  - All movement controls on NODs would have been lifted and testing to find more infected properties halted.
  - A Tb type programme would be unlikely until such time (if ever) we develop a suitably live animal test that can accurately identify individual animals harbouring the bacteria.
  - Government Compensation would stop for previously under movement controls (NODs) and it is highly unlikely under this scenario that farmers with sick animals would receive any compensation.

Phased Eradication has two major advantages:

- It retains the ability to eradicate *Mycoplasma bovis* from New Zealand – a disease that while being managed overseas has devastating effects on a few farmers and it's **not** going away.
- It ensures that affected farmers (IPs, RPs and NODs) continue to receive compensation for the cost of controls (MPI is improving its compensation processes) and ensures farmers receive market value for their cattle that are killed **before** they get sick. NOTE: if animals get sick with the disease it is likely that those animals will have to be killed on farm and no compensation will be paid.

How will the *Mycoplasma bovis* response be paid for?

The response will be managed under a GIA (Government Industry Agreement) framework.

The affected sectors are dairy and beef farmers as this is solely a production disease (does not affect dairy or beef products)

The Crown has agreed to pay 68% of the costs with the industry picking up 32%.

The 10-year response cost could be in the of $870 million.

The industry proportion is expected to be largely met by a levy on milk and slaughtered beef animals.

Beef+LambNZ and DairyNZ will be responsible for collecting and managing the industry contribution and will joint decision makers along with MPI on managing and paying for the response.

Federated Farmers will continue in its support and advocacy roles.

While how the costs are still to be worked out (including how many years the industry contribution will be made and the beef/dairy split) the following is a guide to the costs:

Per $100 million of response costs

- 1.4 – 1.6 cents/KgMS
- $1.00 - $1.50 per head adult cattle

Technical Advisory Group (TAG)

We have had a number of internal and external questions regarding the technical credibility and independence of the Mycoplasma Bovis Technical Advisory Group (TAG) membership.

As you can see the TAG members have excellent credentials and experience and a good geographically spread – NZ (3), UK (1), Australia (5), Canada (1), USA (1)

Name	Organisation	Area of expertise	Available bios
TAG Chair Dr Scott McDougall	Managing Director, Cognosco (Research and Development in Animal Health), NZ	NZ farming and veterinary expertise	Involved in the New Zealand dairy industry as a veterinarian and researcher for over 25 years. Leading expert on mastitis in NZ. Former scientist for the Dairy Research organisation (now Dairy NZ).
Professor Robin Nicholas	Consultant, UK Previous Head of the Mycoplasma Reference Lab, Animal and Plant Health Agency, Defra, UK	Microbiology, *Mycoplasma* bacteria	Leading European expert on mycoplasma diseases, author of two books and numerous scientific articles on mycoplasma bacteria
Professor Glenn Browning	Director of the Asia-Pacific Centre for Animal Health, University of Melbourne	Microbiology	Veterinary microbiologist with an interest in the development of diagnostic tests and their use in understanding the epidemiology of infectious diseases in livestock.
Professor Jeff Caswell	Professor of Pathology, Ontario Vet College	Pathology	Canadian veterinary researcher with a particular experience of bacterial infections and immune responses, including mycoplasma-related lung disease in beef cattle.
Dr Stephen Cobb	Independent consultant, SRC Associates, NZ	Risk assessment; *Mycoplasma* surveillance	Veterinarian with experience in surveillance, field investigation and diagnosis of *Mycoplasma bovis* in the UK. Expert in animal health risk analysis and former manager of MPI's animal and aquatic risk analysis team.
Dr Mark Humphris	Dairy Veterinary Consultant, The Milk Road, Australia	Applied diagnostics and disease control	Specialist dairy veterinarian, who is a Project Leader for Dairy Australia and was on the Steering Group for Mycoplasma Research in Australia. Consults to dairy industry, and has a strong focus on disease prevention and for education in driving change.
Professor Larry Fox	Professor of Dairy, Washington State University	*Mycoplasma* epidemiology and disease control	Leading US researcher on dairy management with particular expertise in mastitis, including the role of *Mycoplasma* in mastitis.

Name	Organisation	Area of expertise	Available bios
Dr John Morton	Jemora, Geelong, Australia	Veterinary epidemiology	Veterinary epidemiological consultant; former Head Membership Examiner in Veterinary Epidemiology for Aust. and NZ College of Veterinary Scientists; former Senior Lecturer in Epidemiology and Biostatistics at Uni. Queensland; expertise in study design, data analysis and interpretation.
Professor Nigel French	Massey University	Epidemiology, disease control, use of genetics in epidemiology	Professor of Food Safety & Public Health, Director of the NZ Food safety Science a& Research Centre, Director of Infectious Disease Research Centre, Exec Director of the Infectious Disease Research Centre and the Molecular Epidemiology & Public Health laboratory
Dr Simon Firestone	Faculty of Veterinary and Agricultural Sciences, The University of Melbourne	Animal health, veterinary epidemiology	Senior Lecturer in Veterinary Epidemiology and Public Health, expertise in studying and modelling disease outbreaks and risk factor studies, and assessing diagnostic test performance.
Dr Ben Madin	AusVet	Animal health, veterinary epidemiology, data systems	Epidemiologist and Director of Ausvet. Experience in clinical and government practice in Aust and UK. Masters and PhD studies looked at modelling animal disease spread and traceability. Interested in data systems for disease management.

Overseas Experience

A Cumbria dairy farmers experience

A Cumbria dairy farmer is within days of slaughtering the remainder of his cows after battling for two years against a disease that has cost him almost £1m.
Duncan Maughan went back into milk production in 2011 with the intention of building up to a 220-cow herd. He's now left with just 98 ailing cows after struggling to combat an infection of Mycoplasma bovis.
"For two years we've been dealing with sick and crippled cows, unexplained deaths, low yields and poor fertility," said Mr Maughan.
http://www.fwi.co.uk/livestock/wake-up-call-as-disease-costs-dairy-farmer-1m.htm

Detailed Information

The Cull:

To Date	26,000 **Cattle** (Beef and Dairy cattle and includes calves)
Total IPs:	54,000 cattle
Potential Cull (2-3 years)	126,000 cattle (an estimated projection)

The Cull in Context:

Cows in milk:	5.2 million
Total Dairy Cattle:	6.7 million
Max recent Increase in Cows numbers:	150,000 in 2012/13 season
Recent Decrease in cow numbers:	136,500 in 2016/17
Total Beef Cattle:	3.7 million
Total Adult Cattle slaughtered per year:	2.4 million
Calves slaughtered per year:	1.65 million

Can we live with *Mycoplasma bovis*?
The simple answer is YES.

The more difficult question is what is the consequences of living with the disease.

We know that a large proportion of a herd will contract the bacteria but that, on most farms, only a small number of animals will show clinical signs.

We know that animals are more likely to get sick (and die) from M. bovis if they are under stress (particularly cows in late pregnancy and early lactation and young calves) and/or suffering from other diseases. So M.bovis is less likely to affect healthy well fed animals.

We know from overseas experience that farmers that know the signs of M.bovis and act quickly (isolate and cull sick cattle and don't mix M.bovis cattle with other sick cattle) generally avoid high rates of illness (remember M.bovis is untreatable).

We also know that many farmers around the world pasteurise milk fed to calves – capital cost of $12,000 -$16,000.

Work carried out by MPI in conjunction with the industry has estimated (and we will never really know) that the costs of living with M.Bovis significantly outweigh the costs of eradication – remembering that the industry will largely wear the costs of living with the disease and some farmers will be hit very hard and unlikely to receive any compensation.

New Zealand Experience
Two of the South Canterbury Properties were hit very hard by the disease.

One property lost 330 cows and over 100 calves from a 1,000 cow herd.

It is not known how hard the Winton properties were hit as the disease was not recognised at the time.

On the other hand none of the cattle on most of the other IPs have not been sick with *Mycoplasma bovis*. While these animals were healthy when they went to the processing plant a number of them would have been carrying the disease and some would have become sick later on.

USE LINKS

http://www.fedfarm.org.nz/FFPublic/Policy2/Industry/Factsheets/Mycoplasma_Bovis_Resources.aspx

www.mpi.govt.nz/bovis

www.dairynz.org.nz/bovis

www.beeflambnz.com