



TB freedom in New Zealand's domestic cattle and deer herds by 2026.

Is this an achievable goal?

Amanda Jordan

Kellogg Rural Leadership Programme

Course 37 2018

Table of Contents

[Executive summary](#)

[Acknowledgments](#)

[Introduction](#) ____

[Aims and Objectives](#)

[Literature Review](#)

[Brief history bovine tuberculosis New Zealand](#)

[World management of tuberculosis and bovine tuberculosis.](#)

[Discussion](#)

[Conclusions](#)

[Recommendations](#)

[References](#)

Executive summary

The future of our primary industries relies on the wealth that we, as farmers, can create by having safe and integral products that we can export and market to the world. We also need to have a 'second to none' provenance story to command a premium price per unit from our increasingly conscious consumers. The aim to have a national cattle and deer herd that can boast freedom from Mycobacterium Bovis (Bovine Tuberculosis, TB) by 2026 will contribute to our beef, dairy and venison national product integrity story and eliminate risk to our international trade security in some markets.

Now is not the time to let complacency take us back to epidemic levels of TB. A well known farming cliché is 'don't let your foot off the throat' and this applies now, more than ever. Too much time, sweat and tears have been put in to the cause - not forgetting the huge monetary investment that farmers, the taxpayer and other contributors have poured into this effort to let our 'foot off the throat' now. Our fight against TB needs to remain a committed, national effort where money and resources are to be used as efficiently as possible to see the goals achieved that were set out in the latest National Disease Management Plan, 2016 (NDMP).

The latest NDMP (2016) has provided us all 3 clear goals to work towards over the next 37 years:

- 2026 TB freedom in domestic cattle and deer herds.
- 2040 TB freedom in possums.
- 2055 Biological eradication of TB from New Zealand.

We must be mindful that an intergenerational mission statement, 'to eradicate bovine tuberculosis from New Zealand', needs strong pathways of communication and knowledge sharing for it to be realised.

These ambitious goals, that are recognised to be achievable, require trusted and dedicated collaboration. Personnel must be attracted, and continue to provide expertise, in order to keep advising farmers on the most efficient ways to achieve this goal. New solutions need to be devised so we can achieve this. An engaged, levy-paying farmer base that understands why we are doing this is also fundamental to success. Enough highly-skilled, 'on the ground' experts, enough human capability and enough technology to gain efficiencies is also key to our achievement. Our Government and Ministry of Primary Industry needs to be approachable to recognise target successes, and offer a consistent funding model. Above all else, the governance and stewardship of this eradication plan must lead us seamlessly through the years, steering us towards an environment free of Mycobacterium bovis.

The health of our national herd has come into the spotlight as farmers face another significant national disease incursion. Although a different microorganism to the one that is the cause of bovine TB, it has sparked debate. General risks factors need to be taken in to consideration when farmers are making decisions around stock origin and history before purchasing. Activities that need special consideration include the grazing of animals off farm (separate or commingled), breeding bull accreditation processes and the purchasing of (and feeding of) pooled milk to calves that could contain disease. It has also raised discussion about the sacrifice of diseased animals for good of the national herd. These are all areas that need exploring continuously. We must investigate if there is a need for tighter restrictions to be enforced to stop the drift of the disease and to ensure the 2026 goal of TB freedom in domestic cattle and deer herds is achieved. This is not a time to 'let the foot off the throat.'

Acknowledgments

I would like to thank the following:

- My family, friends and other farming professionals for their dedicated support in my quest of personal farming development and learning throughout the years.
- The team, past and present, at OSPRI (formally TB free and NAIT) for helping my family through the devastating time of a TB infection on our farm, and for always indulging my inquisitive nature.
- The vets and staff at the New Plymouth Vet Group, an excellent source of local knowledge and support.
- The TB Free Committee members in Taranaki and nationally for engagement in robust, and at times difficult, discussions.
- My Kellogg Alumni for creating a fun and safe environment for us all to refine our knowledge on governance and leadership.
- The supportive Kellogg team: Scott, Lisa, Anne, and Patrick.
- The Kellogg Board for making the Kellogg Rural Leadership Programme part of leadership learning for future Primary Industries Leaders.

Introduction

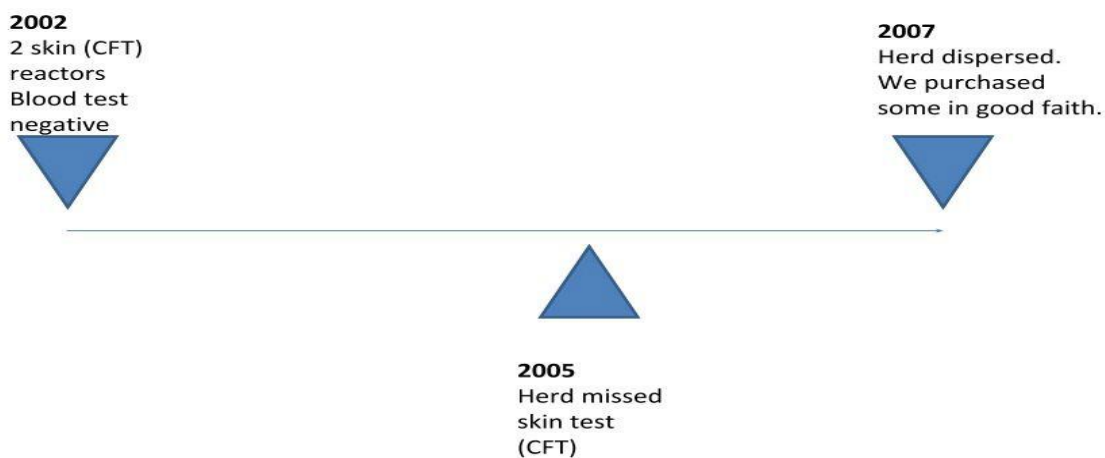
How did a fifth generation Taranaki farmer, with a now perpetual interest to see the national cattle and deer herds become free of bovine tuberculosis by 2026, hope to see the 'unwanted organism' *Mycobacterium bovis* completely eradicated from New Zealand?

From a young age I have always loved interacting with animals and have always been fascinated with the health and welfare of every herd, no matter how many there were. As we are in a high altitude, high rainfall area, attention was always focused on optimising condition and feeding levels. As land was acquired around our home farm, growth of stock numbers was lifted by natural increase through rearing extra calves. We had been a virtually closed dairy farm, with only breeding bulls purchased, with our own support block. On the 1st of June 2007 the family purchased two new blocks of land, meaning that there was not enough cows to milk these areas. We bought cows to fill this short fall from C10 status herds in Taranaki. Farming life went back to normal, but busier as there were now three cowsheds and the support block.

Now, skip back in time probably to the 1990s.

- ❑ An animal infected with TB leaves a farm on the West Coast of the South Island and is transported to a farm somewhere on the east side of the South Island.
- ❑ An animal infected with TB leaves the farm on the east side of the South Island and is transported to a farm somewhere in Taranaki (1).
- ❑ An animal infected with TB leaves the Taranaki (1) farm and is transported to another farm somewhere in Taranaki (2) before 2002. This farm is the vendor farm that we would unknowingly purchase an infected cow from.

Vendor herd (Taranaki C10 status)

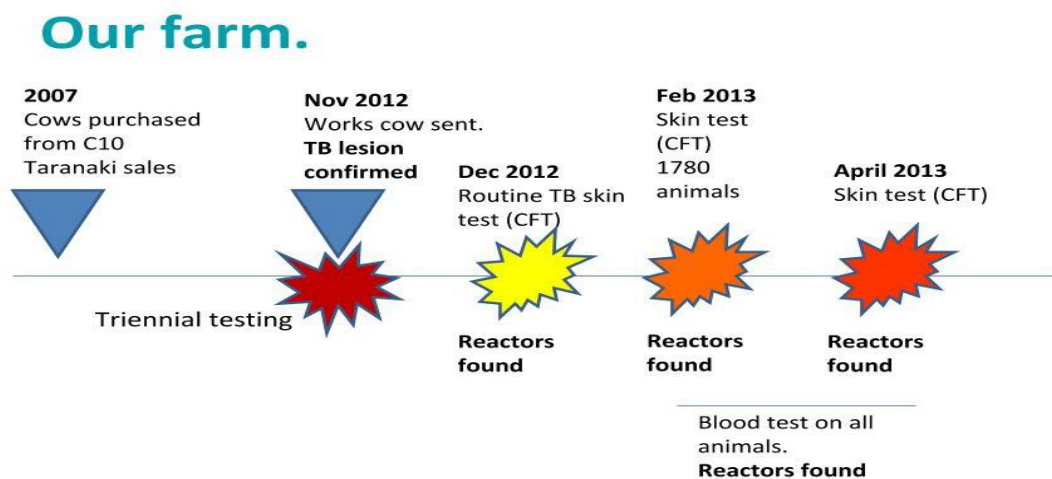


As you can see above, when tests were used in the serial, positive Caudal Fold Skin Test reaction, followed by a negative blood test, the two cows that were not slaughtered left the TB infection in the Vendor's herd. TB Free can not explain the missed Triennial Test in 2005.

I was promoted within the family farming enterprise in 2007, from calf rearer/drystock manager/farmhand to a lower order sharemilking contract. I was milking 180 jersey cows, and by natural increase built the herd to 240 cows by 2011. My TB knowledge to this point was limited to the ability to fill in an

Animal Status Declaration Form (ASD) and complete caudal fold skin test when I was notified it was due. I had grown up in a 'low to no prevalence' TB area, with Mt Taranaki as my doorstep, which had no known TB infected possum reservoir.

In 2012 this all changed at a kitchen table meeting with TB Free representatives who explained that there was a lesion found at the works that had cultured positive to TB. Its strain type was traced from the West Coast of the South Island. A Notice of Direction was served, meaning no animal was to leave the property unless destined for slaughter and milk could only be sold to our processing factory.

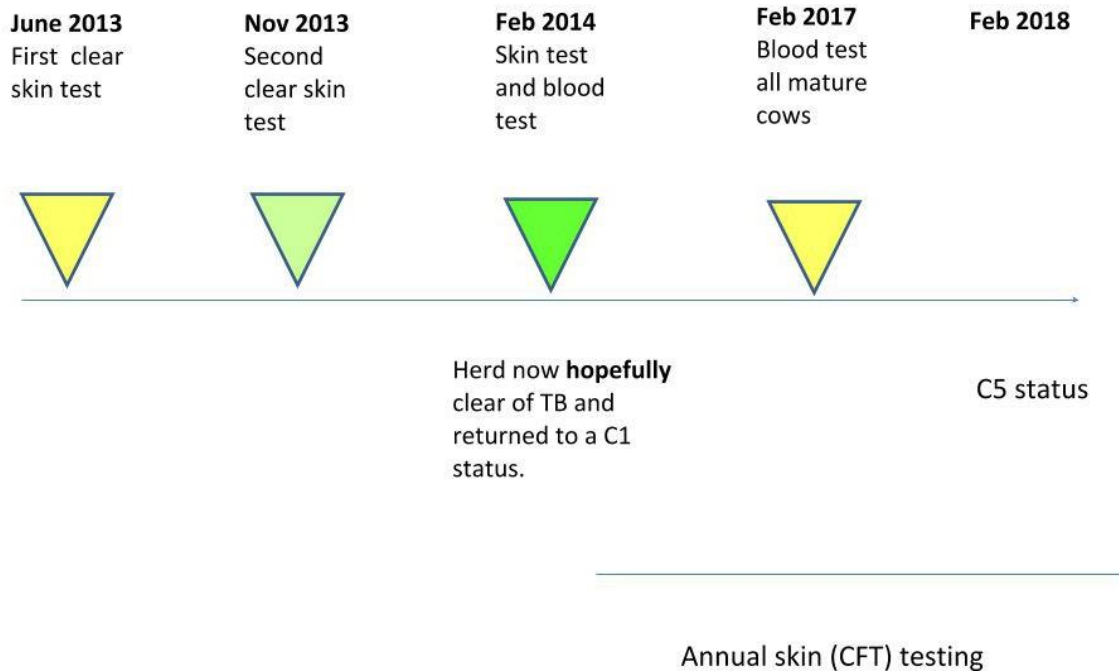


The intensive test and slaughter programme continued on our farm until we had met the requirements to gain a C1 status again. A possum and ferret survey was carried out to determine if TB had gone from my cattle to the wildlife and farms close by. Locally, we were put through more regular testing to assess if there were more infections other than just on our farm.

The financial and social impacts to Taranaki farmers would have been horrific if my infected cattle had passed infection to the wildlife of Mt Taranaki.

On receiving notice of our clearance, we were instructed that in 3 years time the mature cattle would undergo another blood test. Our cows had had a high infection prevalence to suspect that after intensive testing that infection could still be present. I had been taught to farm with full integrity, and with this issue playing on my mind, I made the decision that until we cleared that blood test in 2017 we would not sell any livestock. We sold bobby calves and adult cattle only for slaughter; our contribution for the greater good of our industry.

Having had first hand experience of a test and slaughter regime enforced upon our farm there were many difficult times and decisions. Some of which include not been able to recognise the 'sick' cattle, losing valuable breeding lines, our child not being able to take a school calf and the huge financial impact it had on lost milk production and lost cattle sales. This was motivation enough to have a 'Direct to Slaughter Policy' for this extra time period. I was not willing to risk selling an infected animal to another farmer. The infection had hidden, undetected, for six years already in our herd, TB could do that again.



Direct neighbours were notified by letter of our TB infection, but I felt it important that they heard it from me directly before receiving written confirmation of our infection. An information meeting at our local hall was also planned by TB Free representatives. This was not compulsory for me to attend and because of privacy they were not to name our farm but provide information on area testing requirements, the disease and answer any burning questions.

I went to the hall meeting and sat at the back, it was packed with neighbours I knew and neighbours I did not. What I was not prepared for was the atmosphere that could have been cut with a knife. These usually genuine, good people and farmers were hostile. The fear of the unknown had produced spirited anger with a harsh undercurrent of fear. I had never felt this mood before in our tight-knit and normally supportive community.

Standing at the back of the hall, I asked if I could speak. I boldly told them the infection was in my cows. At that moment all of the rumors were dispelled and I had brought the subject into 'the known'. I had fronted up and was part of the journey of healing for me. Now I was able to open up the much needed lines of communication and allow the process some transparency.

I was then asked to my first local TB Free Committee Meeting and from there my thirst for knowledge about this disease grew. The ability to talk about the emotional effects it has on farmers, teach others about a 'forgotten' disease and support others going through a similar situation was paramount to me; and so began a journey of knowledge.

Aims and Objectives

- Demonstrate that TB is a 'tricky disease' and how complex the story can be when you unknowingly become an infected farm.
- Draw on the knowledge that I have gained in the past 6 years to show why I think it is important to keep contributing to this scheme, in order to gain better knowledge on the disease and its legal obligations/complexities in order to help put a clearer farmer perspective to TB eradication.
- Highlight the stigma and behaviours exhibited due to the lack of knowledge and fear of the disease.
- Spark some robust discussion and debate about the risks/threats to the goal of 2026 of TB freedom in domestic cattle and deer herds.
- Highlight some positive changes that will steer us towards the goal of 2026 of TB freedom in domestic cattle and deer herds.
- Understanding of why it is so crucial for funding to continue after TB freedom in domestic cattle and deer herds has been reached.

Literature Review

Brief History Bovine Tuberculosis New Zealand

- Late 1800: Importation of cattle to New Zealand.
Mycobacterium Bovis unknowingly imported to New Zealand in cattle.
- 1950 to Start of active management of Bovine TB, along with the rest of developed world.
- 1970s Test and slaughter program introduced.
Post mortem inspections.
Suspicion of cross-species infection.
- 1971: Proof of transmission of the disease between cattle and brush-tailed possum.
Proof that brush-tail possums could host and spread bovine tuberculosis.
- Late 1970s: Government conservation funding for possum control dropped to minimal levels.
Fragmented government TB management partially levy funded.
- 1993: Biosecurity Act lists Mycobacterium bovis as an 'unwanted organism'.
- 1994: The Animal Health Board (Incorporated Society) was formed.
Mission statement "to eradicate bovine tuberculosis from New Zealand".
- 1995: 1684 peak infected herds.
- 1998: National Pest Management Strategy (NPMS) for bovine TB came into legal effect.
- 2000: Committed investment by farmers, local and central government.
- 2004: NPMS strategy amendment, reduce national herd infection rate to below 0.2% by 2013. "Official freedom by world standards".
- 2011: Review of NPMS. Continuation of vector control, prevention of new vector infection and maintenance of low herd infected prevalence.
- 2013: OSPRI formed. Management of TB free and NAIT programs.
- 2016: TB plan formally approved by Government.
- 2017: 46 herds infected (43 cattle and 3 deer).

- 2026: *TB freedom in cattle and deer herds.*
- 2040: *TB freedom in possums.*
- 2055: *Biological eradication of Mycobacterium bovis.*

World Management of Tuberculosis and Bovine Tuberculosis.

World organisation for Animal Health (OIE).

- Bovine tuberculosis is a notifiable chronic, infectious cattle disease caused by *Mycobacterium bovis*.
- *Mycobacterium bovis* can affect most mammals and must be reported under the OIE Terrestrial Animal Health code.
- This Health code sets worldwide framework for the standards for safe international trade in terrestrial animals and their products.

World Health Organisation (WHO)

- Lists Zoonotic TB as an area of work and priority.
- Zoonotic TB is a form of tuberculosis in humans caused by *Mycobacterium bovis*.
- Pathways of infection include: consumption of unpasteurized milk products, consumption and handling of untreated meat and also airborne transmission to people in contact with infected animals.
- The WHO has outlined their 'End TB strategy'.
- Their 'One Health Approach' has acknowledged the link between animal, human and the environment health sectors.
- Also commentary stating this disease results in economic loss and trade barriers.

Food and Agriculture Organisation of the United Nations (FAO).

In their section titled "Good health and wellbeing", they recognise that good health starts with nutrition. FAO sets global standards and works with governments and the private sector to ensure food quality and safety throughout the food chain.

The Union (International Union against Tuberculosis and Lung Disease).

Communicates a vision of 'Health Solutions for the poor'.

Human history and Tuberculosis

- Tuberculosis is one of the oldest human infectious diseases. Tuberculosis can be spread person to person carried by droplets. Some human tuberculosis strains are multi drug-resistant.
- In 1888 the first congress on tuberculosis was held in Paris.
- Supporting the demonstration of tubercle bacilli discovered by Koch in 1882.
- Valium reported transmissibility of tuberculosis between man and animal.
- Many developed countries around the world have eradication or control measures in place for bovine TB.
- Wildlife reservoirs of bovine tuberculosis known around the world include, but are not limited to: possum, stoat, ferret, deer, cat, dog, wild boar, monkey, buffalo, seal, sea lion, badgers and monkeys.

Discussion

Every farmer in this country is only one unknowing movement away from a TB incursion. TB remains a disease threat to our farmers' cattle and deer herds. This programme needs to have farmer commitment, for the benefit of the national herd. Engagement and funding are critical to the end and beyond from all farmers from all regions.

Stewardship of this programme needs clear and calm management and governance to ensure strong collaborations. The intergenerational importance means continual communication and education of young farmers and those buying in to farming practices.

Where to from here? The next steps in TB eradication

- The celebrations of targets reached and also any obstacles experienced must be **transparently communicated through open pathways connecting all parties of interest.**
- Farmers, as end users, funders and beneficiaries must feel included and heard in the process in order for the vital 'buy in' required for programme success.
- All personnel that commit the brain or the brawn to achieving this milestone must be supported.
- Our Government must be constantly reminded of the importance of this goal to the national economy.
- Leaders must be bold and not sway from the vision.

We must remember the past, but support good current decisions so that the programme can look to the future.

Examine and evaluate what has worked and what has not, and employ the "no. 8 wire" mentality going forward.

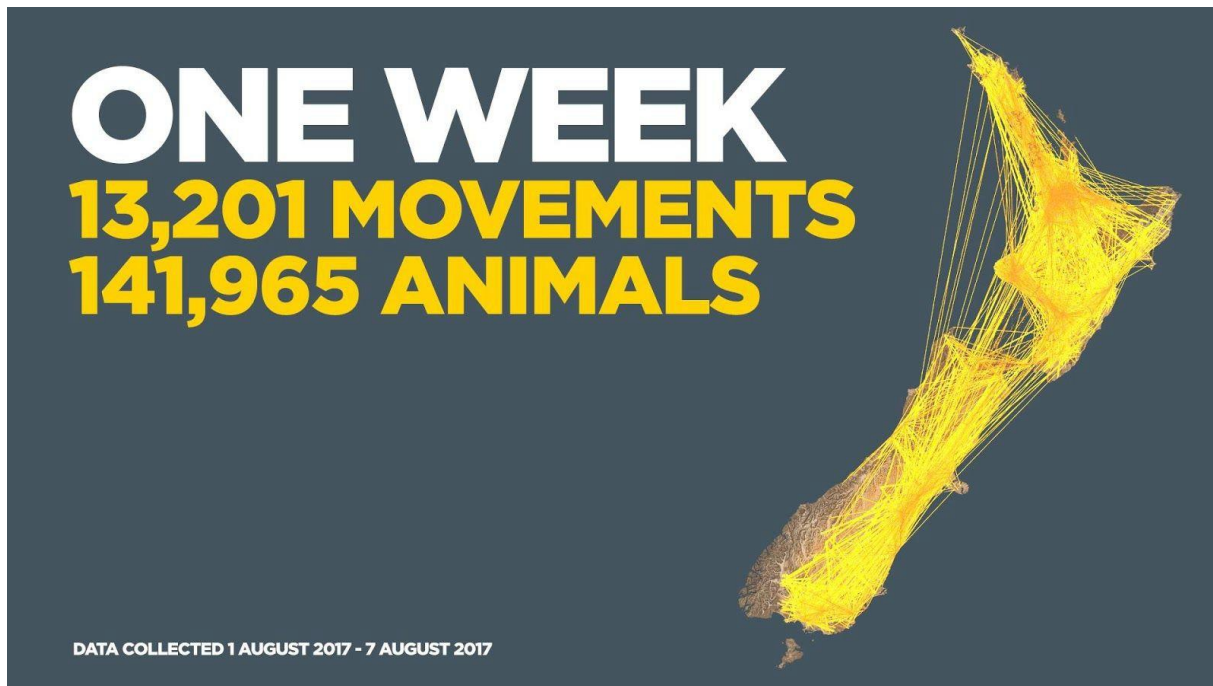
Perseverance and maintaining a traditional Kiwi attitude, we must stay strong and be united.



3 clear goals and a vision for the future. National Disease Management Plan 2016.

Farming practices have progressed, meaning greater cattle movement and commingling throughout the country. The majority of newly found TB infections can be traced back to stock movement.

The main risks are: purchasing a infected animal, grazing off where commingling is a farming practice, a subsequent breakdown from residual disease after clearance, newborn calves or fawns drinking from an infected source of milk, over the fence nose to nose contact with infected animals, or direct contact with an infected wildlife host and an animal.

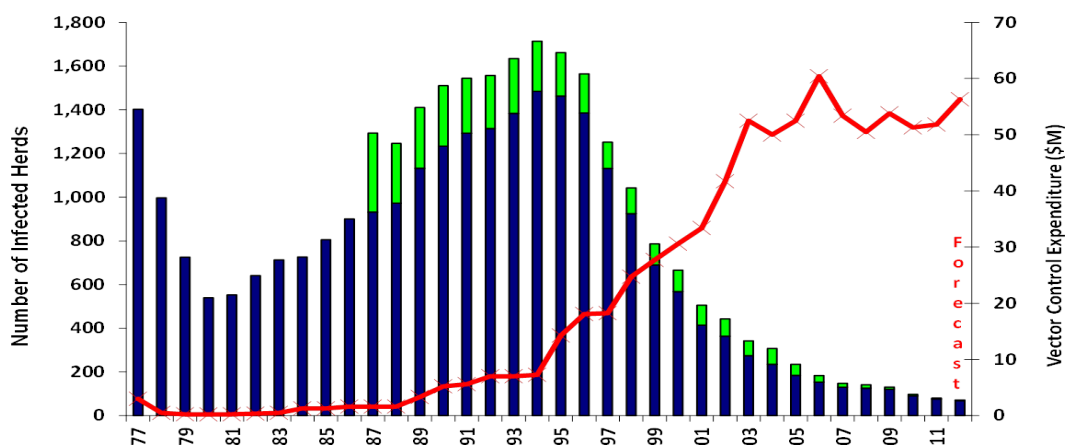


NAIT (National Animal Identification and Tracing) data inputted by farmers, saleyards and meat processors. Every yellow line represents an animal movement. (Note this is the week AFTER the Government's announcement of a new significant national disease incursion.)

Herd infection prevalence peaked to epidemic levels by 1995, through a combination of minimal pest control spend and fragmented herd surveillance. In 1994 the Animal Health Board (Incorporated Society) was formed. Mission statement “to eradicate bovine tuberculosis from New Zealand”. This was the beginning of a more organised approach to pest control and animal surveillance scheme. However, competition for work contracts saw cost efficiencies.

On 30 June, 2017 there were 46 infected herds. Herd infection has stabilise showing that a surveillance testing programme coupled with a committed, consistent effort to ground and aerial pest control is effective. The continual suppression of pest population away from farmland is key. Pest control collaborations, alongside organisations with a focus on a biodiversity outcome, is also helping to speed up the destruction of pests.

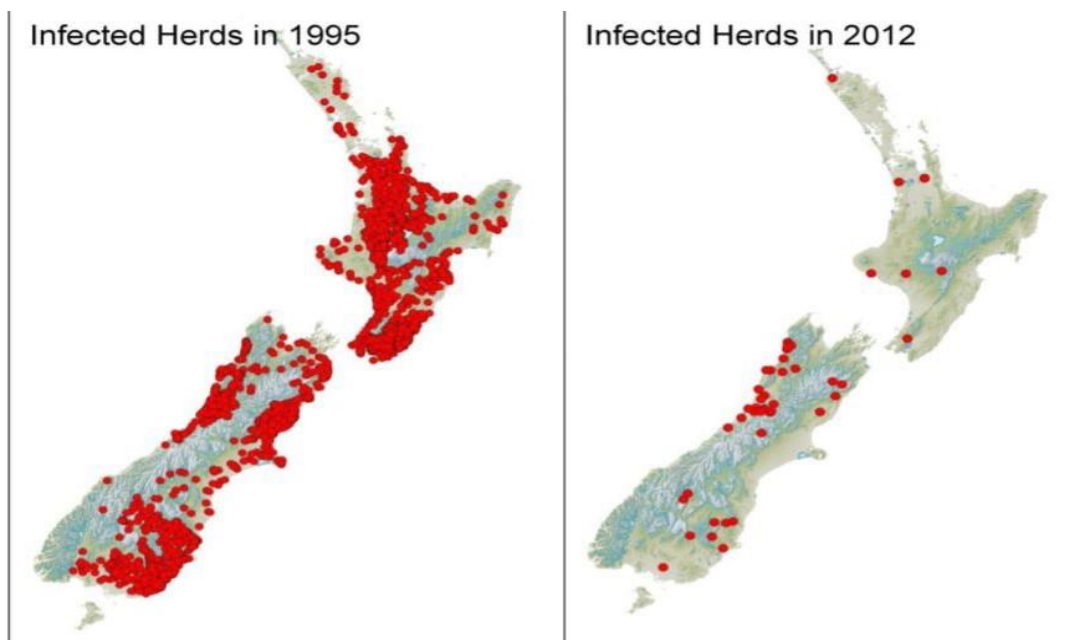
See below 2 tables.



Blue, number of cattle herds. Green, number of deer herds Red line is the expenditure.

Below
1995: 1684 peak infected herds.

Infected herds now fairly stable.



We discuss openly how to support of farmers through a disease incursion and the likely disruption to their business. Disruptions and issues include: The stigma, they may experience from others and geographic spread and timing of these incursions only exasperates the feeling of a farmer dealing with an isolated problem.

The serving of a Restricted Place Notice or ordering the destruction of livestock makes for an emotionally charged situation. Meeting safety is paramount and representatives should be mindful of this and take someone with them. Time and time again, affected farmers will not reach out to others and it is important that the policy has empathic people reaching out to affected parties. Persons under highly charged, stressful and emotional situations will not remember topics discussed as it will be an overload of information to start with. Leaving notes of what was discussed can be looked at later on, so documentation is essential. Having a trusted support person for the affected person can help as they are able to explain the topics discussed after the meeting.

Those bearing the bad news of a Restricted Place Notice or ordering the destruction of livestock are people too. We must respect the role they play in the completion of this eradication and that it will take a personal emotion toll on them too as they must also deal with the raw emotion created when communicating a disruption of livelihood.

Methods for finding and confirming TB infection in livestock and wildlife requires a broad array of tools and are used differently depending on the risk profile of a geographic area, or if investigation is needed. Some methods include:

- Caudal fold skin test.
- Blood testing.
- Finding visible lesions in the lymph nodes of livestock at carcass inspection.
- Culturing of lesion.
- Culturing of lymph nodes when no visible lesion from livestock or wildlife.
- DNA strain typing of infection to ascertain origin and movement.

The complete depopulation of a whole herd is a tool that is used sparingly and in only the most severe herd infection, when there is evidence of active infectious spread and a high risk of leaving latent disease behind at clearance. This could cause the same herd to break down again or pose a risk to other herds if livestock was moved off farm. A partial farm depopulation is used more frequently. Infected weaner calves infected by ingesting diseased milk or by direct contact with other infectious sources pose a real risk of alluding testing regimes. If it is thought that a certain age group in a farming system shows high prevalence of TB infection partial depopulation would be exercised.

Discussions for herd depopulation to only be used sparingly are:

When repopulating a farm there is a risk of buying stock infected with TB.

Loss of valuable breeding lines.

Finding suitable stock that would acclimatise to a specific farm location conditions.

Conclusions

Risks to 2026 goal:

- Farm business policy. Livestock movement; sales, purchases and grazing.
- Farming methods and intensification; Inshed feeding, feed bins and troughs, controlled tight grazing, feedlots and calf rearing practices.
- Farmer resistance to the efforts of our national disease management agency.
- Non compliance of testing requirements.
- Latent or residual infection.
- Using tests in serial to save an animal's life.
- Testing accuracy. Balancing specificity, sensitivity and interpretation.
- New infections to livestock from TB infected wildlife.
- New reservoir of disease becoming established in wildlife thought to be no risk.
- Resistance to use of 1080 and other pest control tools.
- Movement of infection around the country by hunters or the public.
- Microorganism brought back into country through border control.

Opportunities and initiatives towards achieving the 2026 goal:

- Clean national herd.
- Product integrity.
- International trade security
- Slaughter surveillance and carcass inspection overhaul.
- Risk based testing.
- Improved animal traceability system.
- Ability to re allocate funding to pest control.

Recommendations:

- Collect information from previously infected farms to understand the impacts and financial uncertainties on an infected farming operation, if an **extended slaughter only policy** was enforced.
- Collect information from Victor Risk Area (VRA) farm owners to determine whether a **restricted movement border** could be a possible policy. This would allow increased funding allocated back to these areas for pest control.
- **Accreditation scheme** for farms to communicate their biosecurity system type to interested parties (e.g. closed breeding bull farm).
- New Zealand farmers are the majority TB scheme funder. With this in mind we have given a **mandate** to the TB disease management agency. They are operating towards the vision of 'TB eradication' for the greater national good. We must respect their good decision even if they are unpopular and ask only for transparency in return. Some sacrifices will have to be endured for the good of the national herds.

References

www.ospri.co.nz (Wellington, New Zealand) History of TB control in New Zealand.

Anonymous, OSPRI (Wellington, New Zealand) Annual Report 2016/2017

www.mpi.govt.nz Ministry of Primary Industries, Government, (Wellington, New Zealand) Biosecurity on your farm.

World Organisation for Animal Health, website <http://www.oie.int/>

World Health Organisation, website <http://www.who.int/>

Food and Agriculture Organisation of the United Nations, website <http://www.fao.org/home/en/>

The Union, (The International Union against tuberculosis and lung disease) website <https://www.theunion.org/>

Case Study of the depopulation of a dairy herd in New Zealand infected with bovine tuberculosis (unpublished), J Sinclair.

A Century of Bovine Tuberculosis 1888-1988 Conquest and Controversy, D. G. Pritchard Journal of Comparative Pathology, volume 99, issue 4, November 1988 (357-399)

Wildlife reservoirs of bovine tuberculosis worldwide: hosts, pathology, surveillance, and control. S D Fitzgerald and J B Kaneene. Vet pathology. 2013 May;50(3):488-99.

Milk containing *Mycobacterium bovis* as a source of infection for white-tailed deer fawns (*Odocoileus virginianus*). M. V. Palmer, W. R. Waters, D.L. Whipple. Elsevier vol. 82, Issue 4-5, August 2002, Pages 161-165.

I wish to thank the Kellogg Programme Investing Partners for their continued support:

NZRLT PARTNERS

Strategic Partners



Programme Partners



Media Partners

