



Proposal: Management programme to provide the assurance of bovine TB freedom in a compartment of pig farms meeting appropriate biosecurity requirements

1.0. Background

The requirements for pig meat inspection in New Zealand are set out in the Animal Products notice (Ante-mortem and Post-mortem examination of Mammals, Ostrich and Emu Intended for Human Consumption, 31 May 2015).

Among other inspection elements is the requirement to identify TB-like lesions.

When TB-like lesions are found during routine post-mortem carcass and viscera examination, additional examination procedures are required to be carried out (Operational Code (Post-Mortem Examination, Red Meat Code of Practice Chapter 7, 4.8.2, 31 May 2015)). These additional more invasive examination procedures are set out in Appendix 1 to this document.

The purpose of identifying and scrutinising Tb-like lesions is to ensure that these lesions are not *Mycobacterium bovis* (bovine TB) which is a highly infectious zoonoses, transmitted directly by contact with infected domestic and wild animals and indirectly by ingestion of contaminated material, thus posing a food safety risk¹.

Currently if TB-like lesions are identified, the post-mortem disposition procedure (Operational Code (Post-Mortem Dispositions, Red Meat Code of Practice Chapter 8, 4.4 (3))), requires the post-mortem examiner to direct them to be sent for laboratory confirmation pending condemnation or release, or else to directly condemn the material. In practice because the laboratory testing is expensive and time consuming, the direction from the post-mortem examiner is likely to be direct condemnation. Somewhat misleadingly, unless bovine TB is positively ruled out, condemned material is recorded simply as TB.

All the laboratory confirmation that has been done in the commercial pig herd over the last 3 years has confirmed that there have been no bovine TB lesions; rather, lesions have been identified as *Mycobacterium avium* (avian TB), a similar bacterium to bovine Tb. A review of zoonotic aspects of *Mycobacterium avium intracellulare* complex (MAC) noted that in the event humans come into contact with mycobacteria, only a very small percentage would be

¹ Refer <https://www.oie.int/en/animal-health-in-the-world/animal-diseases/bovine-tuberculosis/>

likely to become infected (Biet et al., 2005)². Additionally, disease is most likely to occur in immunocompromised individuals with pre-existing conditions, such as patients with AIDS (Biet et al., 2005). Most importantly, from a food safety perspective, as distinct from milk which may be consumed with no heat treatment, pork meat is cooked before consumption, thus minimising risk³.

Further practical support for the hypothesis that bovine TB is not present on commercial pig farms in New Zealand is that commercial pig farms generally have very limited exposure to the risk pathways for bovine TB due to their relatively high level of biocontainment.

Managing risk pathways for avian TB compared to bovine TB is a different matter. As the name infers avian TB is a bacterium associated with birds and is regarded as an environmental contaminant. A considerable proportion of the commercial pig herd is raised at least partly in outdoor settings, or with some exposure to the outdoors. Despite intensive veterinary investigation, commercial pig farmers have not been able to exclude avian TB.

Since 2016, MPI has provided a dispensation to omit one lymph node incision (popliteal) in porcine carcasses from one pig farm where avian TB has been repeatedly confirmed. The dispensation enables collection of un-incised hind quarters from this farm, subject to 6 monthly testing of lesions to confirm that the causative agent remains avian TB. Since then, the 6 monthly sampling has continued to confirm the lesions as avian TB. As at July 2019 other farms are undergoing testing to seek a dispensation subject to confirmation of avian TB.

The consequence of increased inspection is loss of revenue, as invasive examination downgrades carcass value and increases condemnations. NZPork, with the guidance of its industry veterinarians has initiated discussions with MPI as to the possibility of managing the risk of bovine TB in another manner that is less destructive of pig carcasses while still providing the assurance of bovine TB freedom.

We have set out below a proposal for a management programme to provide the assurance of bovine TB freedom within a defined compartment of pig farms.

2.0. Proposed management programme to provide the assurance of bovine TB freedom in a compartment of pig farms meeting appropriate biosecurity requirements

2.1 The objective

The programme is designed to demonstrate freedom from bovine TB within a 'compartment' of pig farms meeting appropriate biosecurity requirements.

² Biet, F., Boschioli, M. L., Thorel, M. F. and Guilloteau, L. A. 2005. Zoonotic aspects of *Mycobacterium bovis* and *Mycobacterium avium intracellulare* complex (MAC). *Vet. Res.* 36, pp411 – 436.

³ Rademaker, Jan L.W., Vissers, Marc M.M., te Giffel, Meike C. Effective Heat Inactivation of *Mycobacterium avian* subsp. *paratuberculosis* in Raw Milk Contaminated with Naturally Infected Feces. *Appl Environ Microbiol.* 2007 July; 73 (13): 4185 – 4190.

A target population needs to be clearly defined to function as a ‘compartment’, a concept accepted by OIE as appropriate for making assurances of differential disease freedom. OIE recognises that the ‘risk boundary’ for a compartment can be specified in a range of ways, not only based on geographic boundaries. ‘Compartment’ definition requires justification for each particular disease. The key requirements are the ability to identify membership of the ‘compartment’ based on demonstration of appropriate risk management measures.

2.2 Identification of pig farms that qualify for a compartment of pig farms that meet appropriate biosecurity requirements

For bovine TB freedom, we propose a compartment of pig farms is defined as:

- PigCare™ certified farms: AND
- With additional biosecurity measures included in the PigCare™ audit checklist that focus specifically on managing risk pathways for bovine TB.

Utilising PigCare™ certification to define the compartment provides the assurance, based on an established programme, that certain standards are met. PigCare™ is annually audited, by auditors who are familiar with pig farming practices and procedures. The PigCare™ standards include New Zealand’s welfare standards, an assessment of the health of the pigs, the farm buildings and facilities including biosecurity containment measures, stockmanship, management, and husbandry practices. All these elements support the ability of the farm to provide for animal welfare, food safety, biosecurity and other relevant requirements.

PigCare™ certification applies across all farming styles. Refer PigCare™ requirements:

https://www.pigcare.co.nz/assets/files/PigCare_Requirements_Sept_2018.pdf

PigCare™ is independently managed by Quality Consultants of NZ (QCONZ). At the slaughterhouse, PigCare™ certified farms can be confirmed via an industry agreed question on the Animal Status Declaration for pigs: <https://www.nzpork.co.nz/assets/pdfs/nzpork-asd-2012.pdf>

NZPork will add further requirements to the PigCare™ audit checklist designed to specifically address the risk pathways for exposure to bovine TB⁴. All the following conditions must be met, with appropriate evidence of compliance provided:

1. *The farm has a documented biosecurity programme that was formulated by management in consultation with its veterinarian (i.e. that adequately manages potential crossover points e.g. people, vehicles and other equipment)*
2. *The farm follows its own biosecurity programme*
3. *The farm has a defined perimeter*
4. *The perimeter is sufficient to exclude non-farmed livestock (e.g. feral pigs, deer and cattle) from areas used to house pigs*

IF NO⁵:

⁴ New Zealand’s Bovine TB-free programme focusses on animal movement control, plus wildlife vector control. Refer <https://ospri.co.nz/our-programmes/tbfree/about-the-tbfree-programme/purpose-and-plan/>

⁵ This is an important alternative as e.g. deer can jump over standard fencing.

The area within the perimeter is inspected daily to confirm freedom from non-farmed livestock; AND

If non-farmed livestock are observed within the perimeter, steps are taken to remove them as soon as possible

5. *The farm has a possum control or exclusion programme (e.g. a trapping programme)*
6. *Where pigs are brought onto the farm e.g. as replacements or weaners, the pigs are all sourced from other PigCare™ accredited farms*
7. *(If yes to 6): the trucks that are used to move pigs onto the farm are cleaned before pigs are loaded*
8. *Measures are taken to limit the exposure of pig feed to faeces e.g. covered feeders, when necessary and achievable*

PigCare™ certification requires annual audit. If the audit finds that any PigCare™ requirement/s are not met, a corrective action request/s is issued. A timeline for addressing any issue/s identified is set by the auditor, with evidence being required to close out any CARs.

NZPork strongly recommends that PigCare™ certification is the certification process for defining the compartment, as it is a now well established on-going objective assessment method in the industry. PigCare™ spans the commercial industry⁶, and is a condition of supply by all major wholesalers, with audit undertaken by trained calibrated auditors with knowledge of the pig industry. There is ongoing investment and support for PigCare™, including in training and calibration of auditors, to ensure it remains fit for purpose as an assurance programme.

NZPork accepts that all pig farms (not just PigCare™ certified farms) should have the opportunity to qualify for inclusion in the bovine TB freedom assurance programme subject to demonstration that they can meet appropriate management of risk pathways for bovine TB.

This could be, for example:

- Via a farm dispensation from MPI where avian TB (not bovine TB) has been confirmed and which remains subject to 6 monthly testing of lesions to confirm that the causative agent remains avian TB; OR
- Provision of evidence, based on annual audit, to assure the meeting of the appropriate biosecurity requirements set out above, which specifically address the risk pathways for exposure to bovine TB. We cannot over-emphasise the importance of the selection of an auditor to undertake this assessment: it is our strong recommendation that the auditor is trained in PigCare™ auditing, and the requirements of the bovine TB freedom assurance programme, to ensure the integrity of the compartment.

We believe that farms who wish to pursue this route should be reviewed on a case by case basis. We suggest that referral to bovine TB areas of relative risk could serve as a further

⁶ Industry estimates are that over 95% of the commercial pork supply is covered by PigCare™ certification

input into confirming their suitability to be included within the bovine TB- free compartment: <https://ospri.co.nz/our-programmes/tbfree/about-the-tbfree-programme/disease-control-areas/why-movement-control-is-important/>

2.3 Surveillance

A surveillance programme based on testing a sample of TB -like lesions sourced from meat inspection within the defined compartment of pig farms will be undertaken each year to demonstrate ongoing freedom from bovine TB within this compartment. To ensure food safety in respect of bovine TB, we want to be able to detect the presence of bovine TB with a relatively high sensitivity.

➤ **Sample size**

MPI has recommended that a sample size of 90 per year will provide a 99% confidence of detection if the expected prevalence is greater than 5%⁷.

➤ **Sample selection**

Sample selection needs to provide reasonable coverage of TB-like lesions identified in the compartment, selected to also provide reasonable coverage of location and slaughterhouse (there are significant differences in both between farm and between slaughterhouse levels of TB-like lesions identified), as well as to ensure those farms with a higher incidence of identified TB-like lesions are included in the sample. To span all these we propose a combination of stratified sampling, covering all relatively high incidence farms, plus convenience sampling, spanning all 6 slaughterhouses.

Veterinary evaluation of meat inspection data via PigCheck has identified 13 farms with an incidence over 3% in any one month over the last year, or more than 1% throughout the last year. We propose that each of these farms contribute 5 samples per year, with not more than 3 on any one day.

In addition we propose that each of the 6 slaughterhouses contribute 5 samples per year, as well as the samples collected from the 13 high incidence farms.

This will provide a total of 95 samples per year.

➤ **Managing the sampling plan**

If MPI accepts this sample selection approach in principle, then we would propose that a 'Sampling Committee' is established to provide sampling instructions to the slaughterhouses. We propose that the Sampling Committee

⁷ Draft paper provided by MPI to NZPork as a basis to develop a proposal for a management programme to provide the assurance of freedom from bovine TB in the commercial pig herd (June 2019).

includes the pork industry veterinarians and a technical advisory representative from MPI Food Safety.

The Committee would agree the specific sampling instructions for each of the 6 slaughterhouses.

We propose that the Sampling Committee is provided with a quarterly report of the incidence of TB-like lesions in the compartment of pig farms. This is to ensure sample selection remains current. The Committee would monitor progress with sample collection against the selection criteria and amend as and if necessary. We propose that the 'Sampling Committee' convenes quarterly by teleconference following receipt of the quarterly reports.

The Committee would appoint a member (an industry veterinarian) as Chair, whose key objectives would be to ensure progress to meet the quantum of annual tests, that the coverage remains appropriate, and to propose the forthcoming sampling procedure to the Committee for confirmation. Involvement of MPI and industry veterinarians in sample selection will assist in maintaining confidentiality around individual farm data.

In this way we believe there will be appropriate oversight and adjustment of the sampling programme to ensure that both the annual sample size and appropriate sample selection are provided.

➤ ***Meeting the annual sample size***

For the first year, we propose that the tests initiated since July 2019 are included, and the 90 minimum sample size builds on from this base. We believe this is appropriate because we understand testing to date has provided MPI with confidence that the TB-like lesions tested are not bovine TB.

➤ ***Testing to confirm bovine TB freedom***

Industry veterinarians have consulted with AgResearch Palmerston North, on the advice of MPI.

Our proposal is to utilise AgResearch's established culture test validated for use in pig lymph nodes. This is the test currently used which provides MPI with confidence that the 3 farms with a dispensation are free from bovine TB.

Given the cost of this test, our proposal is to pool some samples per farm (up to but no more than 3) to reduce the overall testing cost.

We are aware that AgResearch has a PCR test available for bovine TB, but it has not been validated for use with pig lymph nodes. Validation could be undertaken by using virgin pig lymph nodes and spiking them with serial dilutions of bovine TB, then running them through the PCR to ensure that the infection is detected. Because this validation step would take some time, and has not been costed,

NZPork proposes that the testing is undertaken based on the already validated culture test, well accepted by MPI, to implement the management programme for bovine TB freedom as quickly as possible. Separately NZPork may investigate the steps required to validate the use of the PCR test and assess this cost versus the ongoing testing cost.

3.0. Dispensation

We understand that MPI will provide a dispensation to pig farms meeting appropriate biosecurity requirements to omit the additional inspection procedures as outlined in the Red Meat Code of Practice 4.8.2 Chapter 7 (shown in Appendix 1) and allow for collection of intestines and mesentery when tuberculous lesions are identified in the mesenteric lymph nodes, subject to the following conditions continuing to be met:

1. The farm provides evidence, based on annual audit, that it meets the requisite biosecurity measures to specifically address the risk pathways for bovine TB
2. A surveillance programme is in place that annually tests a minimum of 90 randomly selected suspected TB lesions to demonstrate that the TB lesions are not bovine TB. The testing will be by the culture method undertaken by AgResearch, or another testing method acceptable to MPI.

The product derived from carcasses and offal for human consumption from these farms is eligible for the New Zealand market.

We hope that the proposal outlined above is acceptable. We look forward to working further with MPI to confirm details, in order to initiate the programme and associated dispensation.

We understand that MPI may revoke the dispensation if there are any changes or new information is available whereby MPI believes it is no longer appropriate to provide this exemption.

NZPork

09 October 2019

Appendix 1: Procedures when tuberculosis-like lesions are found during routine examination

Set out in Operational Code (Post-Mortem Examination, Red Meat Code of Practice Chapter 7, 4.8.2, 31 May 2015)

The following additional examination procedures are carried out if tuberculosis-like lesions are identified during routine carcase or viscera examination:

- a) Palpate the liver.
- b) Incise the following carcase/head lymph nodes:
 - i. Anterior cervical.
 - ii. Iliac.
 - iii. Lumbar chain.
 - iv. Popliteal.
 - v. Precrural/subiliac.
 - vi. Prepectoral.
 - vii. Prescapular/superficial cervical.
 - viii. Superficial inguinal/supramammary.
- c) Incise the following visceral lymph nodes:
 - i. Bronchial.
 - ii. Hepatic.
 - iii. Mediastinal.
 - iv. Mesenteric.
 - v. Renal.