

SAMPLING PIGS FOR TB SURVEILLANCE

FACTSHEET RD06

THE NEED FOR TB SURVEILLANCE

About nine million hectares of New Zealand is suspected to contain possums and other wildlife infected with TB. Through its management of the TBfree programme, OSPRI aims to progressively declare more and more of that area free of TB.

It achieves this by first reducing possum numbers (to break the TB cycle in possums) and then surveying the possums to either detect any residual infection or, alternatively, to increase confidence that the disease has been eradicated from the specific area.

This TB surveillance can focus on possums (the main wildlife host) themselves, or it can focus on other hosts such as pigs that become infected from possums. Feral pigs are particularly useful in this context.

HOW PIG SAMPLING HELPS WITH TB SURVEILLANCE

- Where TB is detected in the surveyed pigs, enables possum control effort to be selectively targeted at high risk areas
- Where TB is not detected, that increases confidence that it has been eradicated from the area.

WHY PIGS ARE GOOD SENTINELS

If present, pigs are usually the best wildlife sentinel species – when TB is present in possums in an area, it is highly likely that it will also be present in local pigs. The main reason pigs are such good sentinels is because they very readily find and scavenge the carcasses of any animals that die of TB, and as a result become infected with the disease. That usually results in visually detectable signs of infection (pus-filled lesions) in the lymph nodes (glands) under the pig's jaws within months of an infectious scavenging event and even pigs as young as 3 months old have been detected with TB.

Knowing how old a sentinel pig was when it was killed and checked for TB, helps identify the earliest approximate date that the pig could have been infected and also the period of time it has been 'surveying' the area for TB-infected carcasses. The approximate age of feral pigs can be easily assessed by looking at their teeth – which teeth are present and how worn they are. Most pigs killed by hunters are only 10-18 months old.

A number of studies have measured pig home range size, so knowing where a sentinel pig was killed identifies where it could have become infected. Pigs have much larger home ranges than possums. For example, the average home range of a pig in the native forest of the Hauhungaroa Ranges is around 7.6 km² while in the open dryland grassland habitat of Molesworth Station it is around 3.7km²; possum ranges in these areas are less than 0.2 km². Thus when a pig is sampled, a 'detection circle' based on the usual home-range size for the particular habitat can be drawn around its location. If TB is not

found in the pig, we have some confidence that TB is absent; conversely if TB is found, we have some confidence that TB has occurred in wildlife within a particular time and area.

The other important attribute of pigs as sentinels is that once infected, pigs are rarely killed by the disease and rarely pass it on to other pigs so they seldom make the disease situation worse. This, combined with their much larger home ranges than possums, their moderate life-expectancy and their widespread distribution usually makes them much more cost-effective TB detectors than other species. In terms of surveillance sensitivity and efficiency, killing and sampling one pig can be at least 50 times more efficient than sampling either individual cattle or possums, and four times more efficient than sampling an individual ferret.

OBTAINING A SUPPLY OF PIG TB SURVEILLANCE DATA

OSPRI sometimes uses contract hunters to obtain pigs but mostly relies on obtaining the heads of pigs killed by recreational hunters; these heads are checked by OSPRI for signs of TB. Recreational hunting of feral pigs is a popular pastime in New Zealand – one estimate from the 1980s suggests that 100,000 feral pigs are killed in New Zealand every year. The reasons for pig hunting are varied but include harvesting meat, sport, dog handling and protecting farm productivity (by reducing pasture/crop damage and livestock depredation).

Surveying pigs already killed by recreational hunters has the potential to be a win-win situation: OSPRI can get useful surveillance data and recreational hunters get reimbursed towards hunting costs for pig heads that are normally discarded (sometimes far from where the pig was killed).

FREQUENTLY ASKED QUESTIONS

How can we trust hunters are getting pig heads from where they say they are?

Hunters who supply OSPRI with pig heads for TB surveillance are required to provide a range of information aimed at ensuring the pigs were obtained both legitimately and from the area of interest. Each pig head handed in must be tagged with an individual 12-digit bar-code tag and accompanied by a GPS track log of the hunt, a GPS waypoint of the kill location that is time and date stamped, and a photograph of the pig *in situ* with a labelled biodegradable piece of cruise tape tied above it. The cruise tape is to help OSPRI staff find the location of the gut bag at a later date for auditing purposes if required. Each pig hunter must comply with all these requirements for each head before any payment is made. Most hunters have a GPS and camera, although setting up the GPS and storing the required data may require help from OSPRI staff or one of their contracted agents.

What if recreational hunters don't supply heads?

In some cases where access is difficult, or there is no interest from recreational hunters, targeted pig hunting may be undertaken by professional hunters. In more open habitat this is likely to be aerial shooting from a helicopter; in sensitive areas pig trapping may be more likely. Aerial shooting has the same requirements for track logs and waypoints with individual bar-coded tags. Aerial shooting may be further enhanced by using Judas pigs, whereby a radio-tagged pig is released into the area and later relocated several times, hopefully helping the hunters find any other pigs that it has associated with.

Don't you want to get rid of pigs if they have TB?

OSPRI does want to get rid of TB in pigs but that doesn't require getting rid of pigs themselves. The evidence for that comes from New Zealand research that shows TB in feral pigs nearly always comes from some other species, predominantly possums but occasionally deer and possibly some other wildlife hosts. Importantly, several studies show that if possum control (but not pig control) is undertaken in areas where TB is present in possums and pigs, the TB prevalence in pigs drops rapidly to near zero within a couple of years. This is a strong indication that pigs cannot maintain the disease in the absence of other infected species. Pen studies of wild TB-infected pigs kept with non-TB pigs showed there was far too little transmission between pigs for the disease to persist by that mechanism alone. The clear implication is that in New Zealand, pigs cannot independently sustain the disease.

The main problem associated with TB infection in pigs is from hunters illegally translocating potentially infected pigs or dumping infected pig heads where they can be scavenged by possums or ferrets which could start the TB cycle in those species all over again.

KEY REFERENCE

Nugent, G.; Gortazar, C.; Knowles G. 2015. The epidemiology of *Mycobacterium bovis* in wild deer and feral pigs and their roles in the establishment and spread of bovine tuberculosis in New Zealand wildlife. *New Zealand Veterinary Journal* 63 (S1) 54-67. <http://www.tandfonline.com/doi/full/10.1080/00480169.2014.963792>

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