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The use of 1080 for pest control - 3.1 Possums as reservoirs of bovine tuberculosis

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3.1 Possums as reservoirs of bovine tuberculosis

Bovine tuberculosis (Tb) arrived in New Zealand with the cattle of the first European settlers. It was a serious problem by the 1940s, reducing productivity and putting many people's lives at risk, and today it remains the most important disease for both cattle and deer farming in New Zealand. It is a wasting disease in both cattle and deer, leading to weight loss and death. In cattle, milk production may decline. Bovine Tb is similar to human Tb and can move from livestock to humans with potentially fatal consequences. Owing largely to the pasteurisation of milk and the compulsory Tb control programme for cattle, bovine Tb is now a minor cause (1% to 5%) of Tb in humans in New Zealand. The current issue is how it affects our livestock industries and exports.

The trading threat

International animal health standards have risen since the 1960s and are now a major factor governing and threatening access to our overseas markets. The dairy industry is one of New Zealand's most valuable livestock industries, with an export value of \$5.9 billion in the year to 30 June 2002, about 20% of all foreign trade. In 1990, the European Union proposed to introduce regulations (but didn't do so at the time) requiring milk and milk products to be free of all pathogens, including Tb. This indicates the direction some importing countries are heading and the obvious risks to our trade. It is imperative that New Zealand clears Tb infection from its remaining infected dairy herds.

The perceived safety of meat products (with an export value of \$4.5 billion in the year to 30 June 2002) is also a matter of international concern, especially since the emergence of "mad cow" disease (BSE). Effective control of Tb is critical to protect our trade in dairy, beef and venison products.

If the Tb eradication programme was to stop, then the potential cost to New Zealand, if major markets were lost, has been estimated at \$5 billion over ten years. The levels of Tb in our cattle and deer currently prevent any exports of live animals to Australia and North America, and limit live export trade to other countries.

Eradication of bovine Tb

In most countries eradication of Tb from cattle herds is straightforward. All cattle are tested and those that are "test-positive" are either re-tested or slaughtered. Normally this rapidly reduces the level of Tb and can eliminate it entirely. The vast majority of our trading partners and competitors (Australia, North America, most Western European and South-East Asian countries) are classified as free from Tb. New Zealand has had a compulsory,

national Tb eradication campaign operating in cattle herds since 1970, and in deer herds since 1990. However, 0.5% of the national cattle herds and 1.4% of deer herds are still infected with Tb. In the 12 months to July 2002, 922 cattle and 274 farmed deer were confirmed with Tb.

So why does New Zealand still have a significant Tb problem, despite a long-running national eradication campaign?

Pests as Tb reservoirs and vectors

In the late 1960s, veterinarians in the Westport area were puzzled by chronic infection in cattle herds that could not be cleared by standard test and slaughter methods. Researchers linked the problem to high levels of Tb infection in the possum populations adjacent to these herds. Bovine Tb had "jumped" to a new host. Since then, possums with Tb have been identified in widely separated areas of New Zealand, co-existing with tuberculous cattle. While several wild animal species can be infected with Tb, research suggests that possums, and perhaps ferrets, are likely to be the only self-sustaining reservoirs of Tb. Feral red and fallow deer have also been identified as important vectors of Tb.

In the 1960s and 1970s, infected possum populations were mostly confined to high rainfall areas of the West Coast, and the lower and central North Island. Since then, infected possum populations have continued to spread and now occur in the areas shown on Figure 1. Scientists now regard possums as the most important vector of Tb, for most infected herds in New Zealand, over the last 25 years.

In total, Tb-infected possum populations now occupy about 38% or 10 million hectares of New Zealand. By 2002, approximately half of this area (4.6 million hectares) was under sustained Tb vector control.

How much control for Tb?

"No control" for bovine Tb purposes is not an option, given the trade, social and political risks. "How much" control is the issue.

The initial control operations that focused on Tb possums between 1974 and 1978 were very successful at first, and the number of infected cattle herds dropped rapidly. Unfortunately, as a consequence of this early success, funding, and therefore the number of control operations, was reduced over the next 11 years. Over those 11 years, the number of areas where wild animals had bovine Tb increased from eight to fifteen, and the number of infected herds rose to pre-control levels. Clearly, this "do little" option was not enough to contain, let alone reverse the Tb problem. Funding for Tb vector control rose in 1989 as other species, particularly ferrets, were identified as Tb vectors. Funding now exceeds \$50 million a year. Currently, the National Bovine Tb Strategy has set higher objectives to reduce the number of infected herds, and prevent new Tb areas from establishing. Obviously this means a greater effort, particularly in the control and eradication of Tb vector populations.

The downward trends are now very encouraging, thanks to the high investment in vector control since 1994. However, the areas with Tb infection are continuing to spread. Figure 2 shows the level of investment that has been required to control Tb vectors to achieve a decline in the number of infected herds.

Management of bovine Tb

Current management of possum populations for Tb involves two distinct phases: First, the population has to be heavily reduced over a large area, to cut down the likelihood of infected possums interacting with cattle or deer herds. Sometimes in this initial stage it is necessary to target other wild animal vectors, such as red deer and ferrets, as well. Large areas have to be

treated, otherwise new possums moving in from the edges of the controlled area quickly increase the population again. Making these initial reductions often involves spreading 1080 baits by air, over large (>1000 hectares) or difficult areas of forest and scrub. Aerial operations provide rapid control over a large area, something that ground control rarely provides. Aerial operations are complemented with ground control of possums, often using a variety of techniques, on adjoining pasture and forest/pasture margins.

The second phase, or "maintenance phase", requires that the initial control is followed by regular re-treatment to hold the possums within a pre-determined density range. Low density levels are required to reduce the likelihood that possums continue to act as reservoirs or vectors for Tb. Maintenance operations are usually more frequent in the areas that were initially ground treated, such as farm-forest margins, as these are the areas where possums and cattle most commonly interact. Large bush and scrub blocks are re-treated by aerial 1080 operations at about four to six yearly intervals.

These control operations, coupled with herd testing, culling of "test-positive" animals, and controls on stock movement, usually achieve an immediate reduction in the level of Tb in herds close to infected possum populations. However, if the possum population and other vectors are not kept down through maintenance control, then Tb levels in the herds usually rise to the pre-control levels within five to eight years. On the other hand, if control operations are able to keep possum populations low enough for long enough, Tb can be completely eradicated from the population. This is the long term aim of AHB's operations, and has been achieved so far in six small areas.

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