

Who in their right mind would deliberately infect their deer with Tb? Invermay scientists would. They are doing just that to find out more about the disease and how to combat it. **Hugh de Lacy** visited Invermay's deer unit to file this progress report.

Human Tb vaccine for deer?

NEW ZEALAND scientists say the world's most widely used human vaccine may hold the key to controlling tuberculosis in deer.

That's the word according to Dr Frank Griffin of Otago University's deer research unit and Colin Mackintosh of Invermay AgResearch.

They say the human Tb vaccine BCG, used throughout the world, is offering "significant protection" to deer on a deliberately infected farm at Table Hill, near Milton in Otago.

A similar vaccine, used in trials at Wallaceville AgResearch in Upper Hutt, has delivered 70 per cent protection in cattle.

Invermay researchers trialling the vaccine on the Table Hill infected deer farm (IDF), are hoping it will offer comparable protection to deer.

If it does, it may herald a breakthrough in the control of export-threatening Tb.

Results of the initial trials have yet to be analysed, but, "on a lesion basis the vaccine gives significant protection," says Mackintosh.

However, the general manager of the Animal Health Board, Robert Isbister warns that "it's very early days".

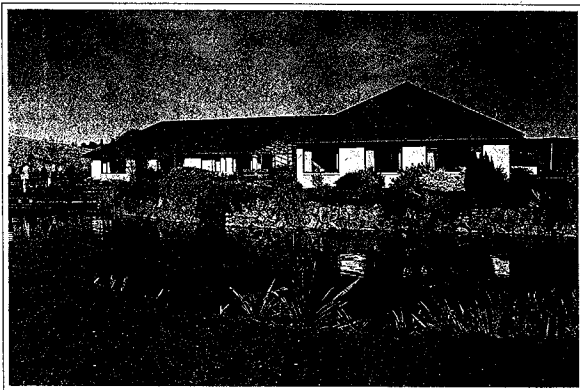
Nobody's yet making any strong claims about the vaccine's effectiveness.

"But it's encouraging enough to carry on further," Isbister told TDF. The board, which is responsible for Tb control, sanctioned the establishment of the infected deer farm and underwrites the vaccine research programme.

It might seem obvious that a vaccine used with apparent success on humans should be tried on other large mammals.

It begs the question why it hasn't been done before.

Isbister says a major reason is the continuing international scientific debate over BCG's effectiveness in



Invermay AgResearch

protecting humans.

"There's been a lot of debate about the validity of international trials, and whether the greatly reduced incidence of Tb doesn't really reflect better hygiene and higher living standards," he says.

The success of pasteurisation in preventing cross-infection between cattle and humans has also increased doubts about the effectiveness of the vaccine.

The most important factor in assessing BCG's potential is the infected farm.

This was the brainchild of Dr Mackintosh, who shepherded the concept through a maze of bureaucratic and environmental concerns until its approval by the AHB in 1991-92.

Given wide-ranging - some might say draconian - powers to reduce the threat of Tb to New Zealand's primary exports, the AHB was always going to be chary about approving

the deliberate infection of deer on a commercial farm.

But it was persuaded by the benefits to Tb research that are already accruing from the farm, and by stringent safeguards.

The farm is in a Tb-endemic area, part of an 800 ha grazing block owned by Colin Batchelar, who retains ownership of the land and is contracted to run it for the researchers.

They have doubled the original 10 ha of deer-fencing, with Batchelar meeting the capital cost over time.

The farm had suffered recurrent cases of Tb in its cattle, and there was evidence of it in the deer.

Mackintosh had to persuade at least two-thirds of the 20 landowners within a 5 km radius to accept the establishment of the unit.

Of those only two were initially diffident, but both eventually came round to the idea.

The AHB insisted the perimeter

fence be possum-proofed with chicken-netting and electric hot-wires, and that all wildlife within 3 km be controlled.

The latter job has fallen in part to Invermay researcher Dr Ken Waldrup. He found that up to a quarter of the ferrets and pigs he caught were infected with Tb, though only one possum in 250 was infected.

Trapping

The area around the infected farm is laid with traps and/or poison every three months. Night-shoots and bait stations give further protection.

Rabbits are a special target of the control programme. Without them, the land cannot support a population of Tb-carrying ferrets.

Previously the property was "crawling with rabbits", says Mackintosh, but last year's hard autumn and winter, plus 1080, contributed to a good kill.

The result is what AgResearch deer programme director Dr Ken Drew calls "a brilliant resource" for researching Tb in deer.

The \$400,000 invested to develop the farm came from the taxpayer via a grant from the Foundation for Research Science and Technology.

The vaccine research programme

is run by Dr Frank Griffin of Otago University, who already has a strong profile in Tb research

Dr Griffin's blood sampling technology enjoys an accuracy percentage in the high nineties.

The IDF was stocked with 80 animals screened by Dr Griffin to ensure they were Tb-free.

In the BCG programme, animals received two doses of commercial human BCG vaccine, and were later challenged with live virulent cattle Tb (*Mycobacterium bovis*) and kept in an otherwise normal farm environment.

To approximate natural infections as closely as possible, Dr Mackintosh has developed an artificial system of infecting animals through the tonsils, resulting in lymph node lesions identical to those found on farms and in the wild.

To prevent suffering, the deer are slaughtered before they develop a serious disease. Invermay's Animal Ethics Committee also keeps a watching brief over the programme.

The committee includes members from the Society for the Prevention of Cruelty to Animals and experts from outside the deer industry.

Identifying the optimum use for a successful Tb vaccination regime in



Dr Colin Mackintosh

New Zealand agriculture is a long way down the track, but Mackintosh sees it opening up an immense range of options.

"Apart from vaccinating livestock in endemic Tb areas, it may be possible to immunise wild animals such as pigs, possums, ferrets and cats if a suitable delivery system can be found.

"Once proven, the potential of a vaccine would be enormous." □