TB CONTROL IN THE NEW ZEALAND DEER INDUSTRY:

A REVIEW OF PROGRESS

CE CARTER
MAF Quality Management
PO Box 82, Wanganui

Since the adoption of the voluntary scheme to accredit deer herds free from tuberculosis (*Mycobacterium bovis*) and then the introduction of a compulsory herd testing programme in 1990, rapid progress has been made in reducing the incidence of this disease. But as the cattle and deer industries adopt strategic approaches to achieve internationally recognised levels of freedom from tuberculosis (TB), progress in control will require greater effort.

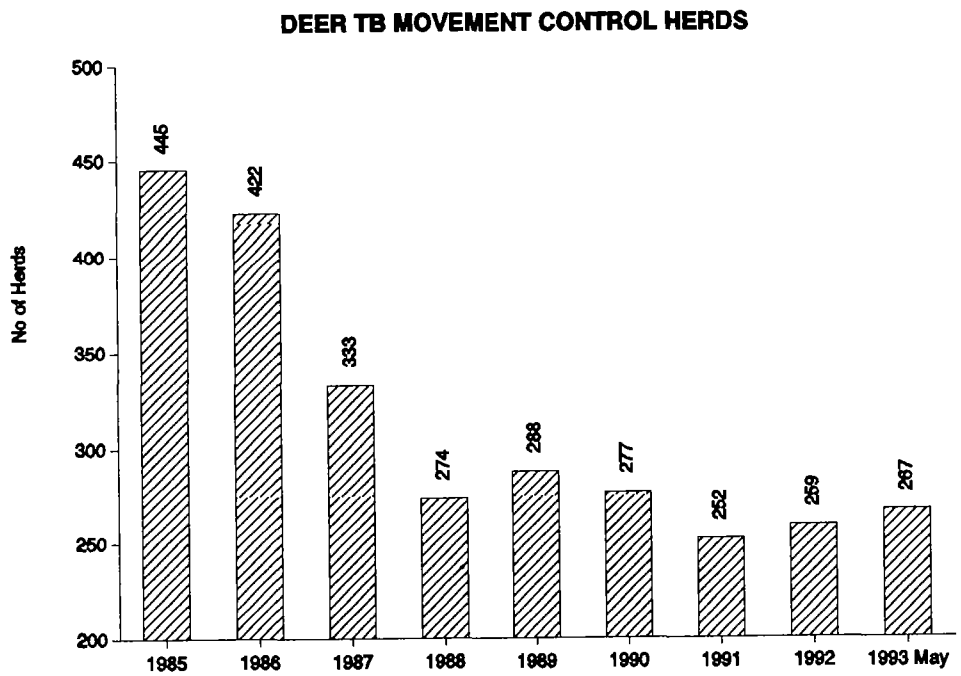
This paper outlines the Industry's progress to date and develops information presented to the New Zealand Veterinary Deer Branch conferences held in 1987[1] and 1990[2] as well as to a Symposium on Tuberculosis held in 1991[3].

MEASUREMENTS OF PROGRESS

Movement Control

Restricting or isolating the movement of animals from infected units is a standard disease control practise; for this reason the "quarantining" of TB infected deer herds became policy in the early 1980's. After an initial drop, the number of Movement Controlled herds has stabilised at the 260-270 level (Figure 1). These comprise over 4% of the national herd.

Figure 1



Eighty percent of the Movement Controlled herds ($^{217}/_{267}$) are associated with those areas of the country where TB is endemic in feral and wild species. This figure has lifted 20 percentage points since 1989. The comparable figure for the cattle industry is in excess of 90%.

The implication is that feral reservoirs are a potent source of infection for herds in these areas. Herds are either unable to be cleared of TB or are being infected from time-to-time. The ratio of Movement Controlled herds with an "Infected" herd status, to those with a "Clear" status, is 1.8:1 in areas where there is endemic TB and 0.96:1 in the non-endemic areas.

This difference in ability to clear infection is also reflected in the mean time herds are staying on Movement Control. Within the endemic areas herds are on an average staying 2.7 years on Movement Control while their counter-parts in non-endemic areas are on for 1.9 years.

In 1991 a considerable reduction in the number of herds coming onto Movement Control was noted; 112 new herds as against 146 for the 1990 year. However during the calendar year of 1992, 145 new herds came onto Movement Control.

Tuberculosis Incidence

In Table 1 the dynamics of TB in the national herd, at an animal level is given. Using the number of lesion reactors and tuberculous deer detected at the Deer Slaughter Premises as a guide to the true incidence of TB, the disease has been decreasing steadily since 1989. This result has been achieved at a time when the national herd has gone through a period of rapid growth and then stabilisation.

Table 1

INCIDENCE OF TUBERCULOSIS

	NZ Deer Population	No Reactors	Reactor Incidence	Lesion Reactors	Lesion Non-Tested Deer & Clinicals	TB % Incidence
1986	392,154	2390	0.61	Not Available	234	-
1987	500,397	1870	0.37	Not Available	Not Available	-
1988	606,042	2132	0.35	Not Available	Not Available	-
1989	780,066	2144	0.27	838	263	0.14
1990	976,290	2941	0.30	773	236	0.10
1991	1,130,000	1649	0.15	449	327	0.07
1992	1,200,000	1422	0.12	228	419	0.05

Over the last three years the ratio of TB infected deer detected at the Deer Slaughter Premises to those detected on farm has changed from 1:3 (1989) to 1.8:1 (1992). This trend is of concern given the intensity of the on-farm surveillance; more than 410,000 deer are tested during 1992.

When examined in more detail, just 11 herds accounted for 214 of the non-tested but infected deer diagnosed at slaughter as well as for 113 of the lesion reactors. The reason for the high levels of TB in these herds is mixed. Seven have established histories of TB and were either de-populating the herd or de-populating infected groups. Two were herds which had experienced sudden and severe breakdowns and were also de-populating as a means of control.

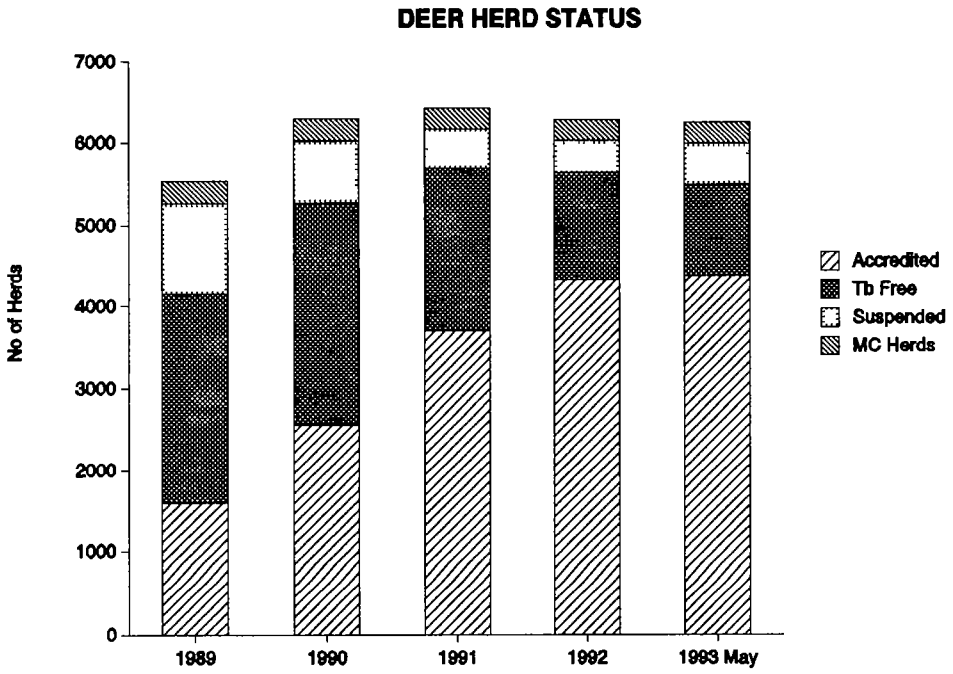
The other fact to emerge in 1992, was that 64% of the TB infected deer diagnosed at the Deer Slaughter Premises had never been herd tested or had been tested within the last 12 months. The latter included 30 herds with an accredited TB-free status; the reasons for this are now under examination.

In the 1993 calendar year to-date, the numbers of lesion reactors and non-tested infected deer are down on the levels recorded at the same time in 1992.

Accreditation

Seventy percent ($^{4340}/_{6230}$) of all deer herds now have an accredited TB-free status (Figure 2).

Figure 2

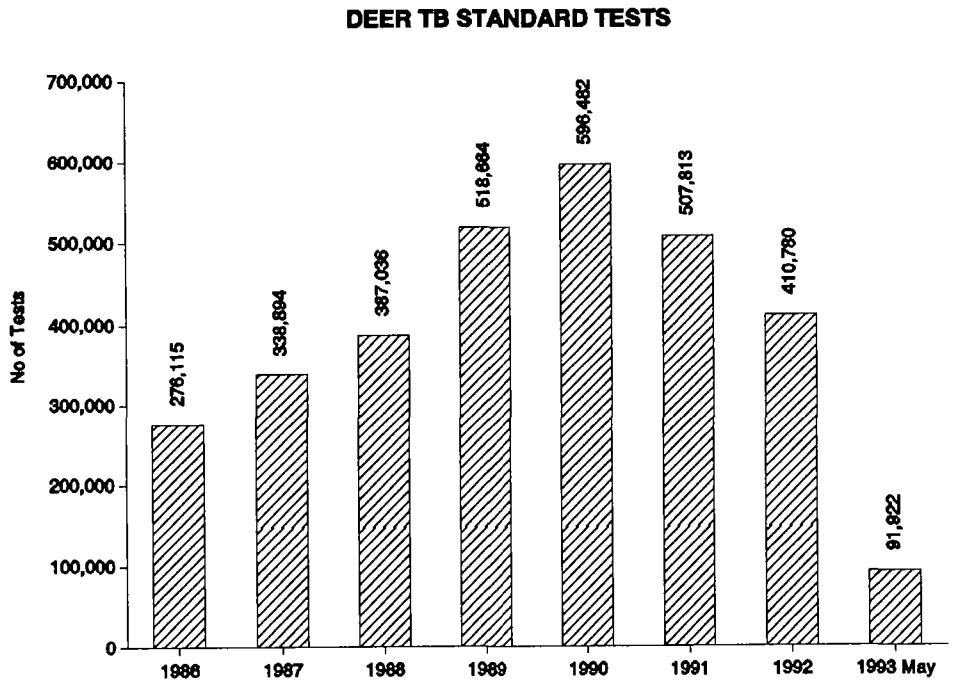


The percentage of accredited herds will continue to rise through the 1994 year and having a target of having 80% accredited TB-free at the end of this year should not be unrealistic.

SURVEILLANCE

With an increasing proportion of the national herd now accredited, the number of standard mid-cervical skin tests is decreasing (Figure 3).

Figure 3



Following a similar trend are the numbers of comparative cervical tests and lymphocyte transformation tests (Figures 4 & 5). However with increasing numbers of deer being slaughtered and subject to official meat inspection, approximately $^{2}/_{3}$ of the national herd is under active TB surveillance (on-farm testing/slaughter inspection) in any one year.

Figure 4

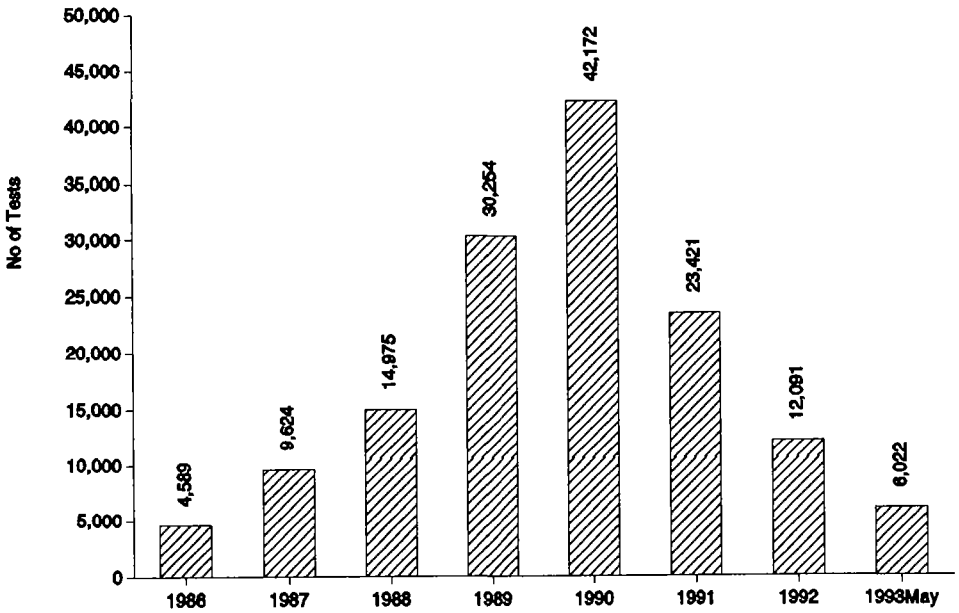
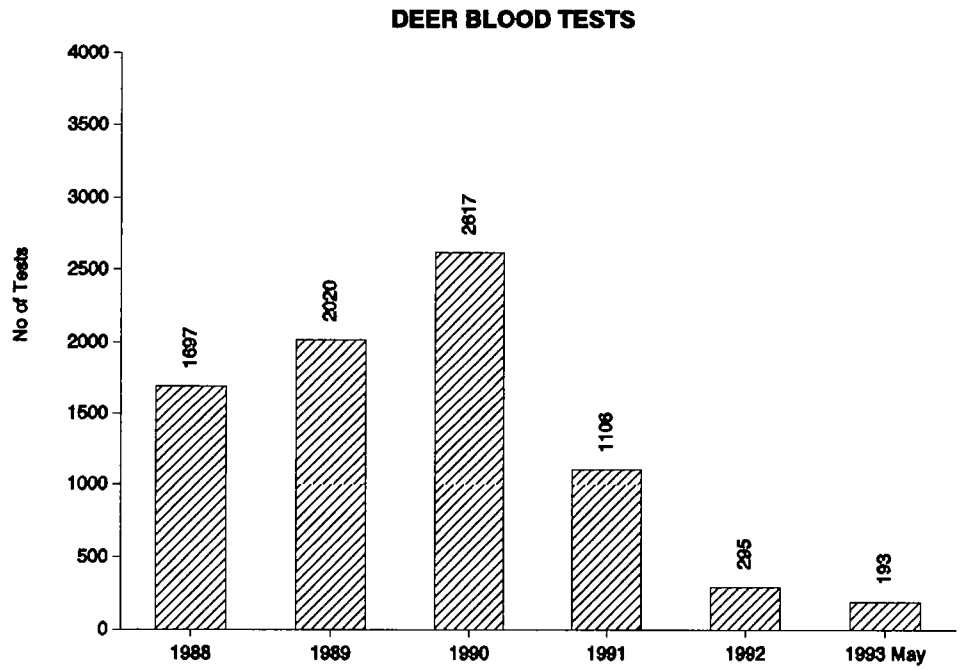


Figure 5



DISCUSSION

International standards for declaring freedom from TB, require that less than 0.2% of all herds be subject to Movement Control restrictions. For the deer industry if it were to stand in isolation, this would mean having no more than 13 Movement Controlled herds.

Although the industry has made steady progress in decreasing the incidence of TB at an animal level, aiming for quick and drastic reductions in the number of Movement Control herds will be un-realistic under current strategies.

The primary source of infection/re-infection remains in those areas of the country where there are feral/wild reservoirs of TB. Herds in these endemic areas are 4 times more likely to go onto Movement Control than those in other locations. Programmed on-farm control of these reservoirs will be essential to decrease the number of herds going onto Movement Control in these areas as well as decreasing the length of time they are subject to movement restrictions.

However not all breakdowns relate to feral/wild TB reservoirs. Movement of infected deer can still occur, although the risks have been lessened by the introduction of 2 policies. The first is that herds with an Infected Movement Control status may only sell directly to slaughter. The second requires all deer 3 months of age and over, moving from herds within Declared Movement Controlled Areas after 1 January, 1994 must have a negative TB test within 60 days prior to leaving. These areas correspond to the major TB endemic areas of New Zealand.

Early detection of disease when it does occur will often be the difference between an explosive epidemic within the herd, with transference of the disease into feral animals or a limited breakdown. Understanding the capabilities of the test(s) which have been selected and their appropriate use are important considerations for the veterinarian. This

along with herd management will reduce the length of time a herd will stay on Movement Control.

For some deer herd owners living with infection has become acceptable and no effort beyond a yearly test is being applied. Apart from the risk to their own investment, these herds place others at risk, either directly or by under-mining the effects of feral animal control programmes mounted by the Animal Health Board and Regional Councils. In light of the objectives of industry the stance of these herd owners cannot be supported.

Veterinary practitioners and MAF Quality Management have key roles in assisting owners of infected herds to come to grips with the wider picture and helping them through the design of control/eradication programmes for their herds.

The deer industry will also need to address the issues of how market signals will convince deer farmers to continue their individual investments into the control of TB. For some the cost is already considered to be too high but greater resource and effort will be required if the industry as a whole is going to reach its target of international freedom.

REFERENCES

1 KC Corrin (1987). Tuberculosis in Farmed Deer - Progress in Control. Proceedings of a Deer Course for Veterinarians, Deer Branch Course No.4, Dunedin New Zealand p.157.

2 CE Carter (1990). Tuberculosis Control for the New Zealand Deer Industry. Proceedings of a Deer Course for veterinarians, Deer Branch Course No.7, Auckland, New Zealand p18.

3 CE Carter (1991). Tuberculosis Control in the New Zealand Deer Industry. Proceedings of a Symposium on Tuberculosis. Foundation for Continuing Education of the New Zealand Veterinary Association, Palmerston North, New Zealand p.203.

NB: 1993 testing statistics used in this paper are based on provisional data.