

RESISTANCE TO TB – CAN WE BREED FOR IT?

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Because animals have evolved together with parasites, bacteria, viruses and other disease-causing organisms, they have developed protective or immune mechanisms to cope with them.

However, within a population of one species, there will always be a range of resistance to a given disease, especially with different strains, breeds or subspecies of animals. For example we know that red deer are more resistant to gastro-intestinal parasites than Wapiti, and both these strains are more resistant to malignant catarrhal fever than Père Davids.

AgResearch Invermay has a programme to investigate resistance to Tb in deer. We believe that this could have two major outcomes.

Firstly, by selecting for the two extremes of resistance and susceptibility for Tb, it will help us study the immunological and

genetic differences. This should allow us to improve vaccines and improve immune responses if it is appropriate to start vaccinating animals in some areas in the future.

Secondly, we may be able to find genetic markers for resistance which allow us to select for more resistant animals and eliminate highly susceptible animals.

We have just completed the first two stages of this programme. A total of 39 red deer stags from a wide range of sources were gathered together on Invermay in summer 1994. Semen was collected from them in autumn, and frozen, and the stags were then transported to the Experimental Tb Farm at Milton near Dunedin.

The stags then all received the same sized dose of Tb organisms. They were monitored for six months, slaughtered and their lymph nodes and organs carefully examined for Tb.

As expected, there was a range of Tb disease. Five stags were completely free of disease, 13 had very mild disease, 13 had moderate disease, and eight were starting to develop severe Tb.

The second phase of the trial involved the laparoscopic insemination of 220 red deer hinds at a commercial property in Canterbury, using stored semen from the three affected (or resistant) stags, and the three worst affected (susceptible) stags.

Ultrasound scanning at 40 days showed that half of the hinds were in-calf with a fairly even spread amongst the sires.

Phase three of the programme will involve moving the offspring down to Milton after weaning next autumn, and challenging them with Tb to see if the resistance/susceptibility is inherited, and to identify the immunological and genetic markers for resistance.