

## Animal health programme for farmed red deer *Cervus elaphus* in New Zealand

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**Abstract.** For optimal efficiency of production it is essential to plan an animal health programme around the seasonal management and nutritional requirements of each class of deer on the farm. Good feeding practices are fundamental to the continued well-being of livestock. These include restricting food intake of hinds prior to calving and optimising food quality and quantity for young stock, lactating hinds and stags before and after the rut.

Weaning calves in autumn prior to the rut has some management advantages and occurs at a time of the year when the weather is warm and the pasture is plentiful. Regular drenching of calves with anthelmintic in the autumn controls lungworm *Dictyocaulus viviparus*. Minimising stress helps to prevent yersiniosis due to *Yersinia pseudotuberculosis* in calves in their first winter. Indoor wintering has benefits if precautions are taken to prevent potential disease problems. Calves should be vaccinated twice 4-6 weeks apart against clostridial diseases and also against leptospirosis in high risk areas. Hinds should receive booster vaccinations annually.

All deer on the farm should be tested for tuberculosis according to the rules of the TB accreditation scheme. Analyses of soil, pasture, liver and blood samples should indicate the trace element status on a property. Appropriate supplementation should prevent disease and optimise production. Necropsies should be carried out as soon as possible on all deer that die inexplicably and appropriate measures taken to prevent further losses if possible.

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### Introduction

Since the legalisation of deer farming in New Zealand in 1969 the number of farmed red deer has grown to around 500,000 (March 1987 estimate). There are over 2,000 deer farmers and the majority are

numbers of the Deer Farmers Association. Veterinarians have responded to the animal health needs of deer farmers and there has been a rapid period of research and education. A specialist branch of the New Zealand Veterinary Association was formed in 1984 and it now has over 400 members. It holds annual Deer Courses for Veterinarians and publishes proceedings from these courses, as well as a quarterly newsletter, "Veterinary Cervus".

The management of farmed deer has progressed a long way in the last 18 years (Moore et al., 1985) and much has been learned about their nutritional requirements (Fennessy, 1981, 1982; Kay and Staines, 1981; Loudon and Milne, 1985) efficient pastoral farm management of deer requires the fitting of seasonal pasture production, feed conservation and supplementation to the seasonal feed requirements of the different age and sex classes (Fennessy and Milligan, 1987). The integration of these factors with a planned animal health programme will assist in achieving optimal health and productivity. This paper describes such a programme for farmed red deer *Cervus elaphus* in New Zealand.

### Feeding and management

**Hinds** - It is essential that hinds are fed well during lactation and before mating. During the winter they should be fed maintenance rations and in the spring and early summer their intake should be restricted until just prior to calving, to avoid overfatness which can lead to calving difficulties. To prevent the overfeeding of late calvers, all the hinds should be brought in for udder-checking 3-4 weeks prior to the start of calving and divided into early and late calving groups based on udder development.

**Stags** - should be fed well in late winter and spring to promote antler development. In summer, after velvet antler, the stags can be used to assist pasture management by

|   | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <b>A. Main Activities</b>                 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>B. Anthelmintics *</b>                 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>C. Vaccinations **</b>                 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>D. Tuberculosis (whole herd)</b>       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>E. Yersiniosis (calves especially)</b> |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>F. Trace Elements***</b>               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

Fig. 1. Deer health programme. \* New generation benzimidazoles or ivermectin; \*\* Multivalent Clostridal and Leptospiral vaccines; \*\*\* Supplement only where necessary.

cleaning up rough paddocks. Sire stags should be chosen well before the rut and fed prior to and especially after the rut when they lose up to 30% of their body weight and go from over 20% body fat to about 2% (Drew, 1985).

**Calves** - Under intensive deer farming conditions it is advantageous to wean red deer calves prior to the mating season. This allows preferential feeding of calves, regular drenching and weighing. Weaning is less stressful if done in warm autumn conditions when there is an abundance of good quality feed, rather than after the rut when bad weather is likely to occur and feed is less plentiful. With good feeding, hind calves should achieve over 70% of their adult body weight by the time they are 15 months old and this should ensure a high calving percentage at their first mating season (Fennessy et al., 1986). Well fed young deer are more resistant to diseases such as yersiniosis and lungworm. For a summary of management activities see Fig. 1.

## Specific disease prevention

**Anthelmintics.** The most important parasite is a lungworm *Dictyocaulus viviparus* and this can seriously affect young deer in their first autumn. Red deer develop resistance with age and exposure and although most adults carry small burdens they are not usually clinically significant although they contaminate pastures for young deer.

Efficient control of lungworm is achieved by giving anthelmintics to calves regularly from late summer to early winter. New generation benzimidazoles ("white drenches") such as fenbendazole, oxfendazole, febantel and albendazole should be given every 3 weeks because the pre-patent period is about 21 days (Mackintosh et al., 1984). Ivermectin can be given every 5 weeks because it persists at therapeutic levels in deer for up to a fortnight preventing reinfection (Mackintosh et al., 1985). One or two drenches are usually given in the following late spring and early summer.

Wapiti and elk appear to develop resistance more slowly and should be drenched regularly until the end of their second autumn (Mackintosh unpub.). Adult hinds are usually drenched once or twice a year; precalving to reduce contamination of pastures for calves, and pre-rut to ensure hinds are in their best condition at mating. Newly captured adult deer are often susceptible to lungworm due to stress and possible lack of previous exposure and should be drenched regularly for 3 to 6 months.

Gastroenteric nematodes are controlled by the above drenching regime and rarely cause problems. Lice are rarely a problem but if they occur they are controlled by normal livestock ectoparasiticides such as "pour-ons".

A tick *Haemaphysalis longicornis* has become increasingly troublesome in the north of the North Island. Heavy infestations have caused fatalities in newborn calves due to acute blood loss. Control measures involving pasture management and insecticide treatments are being developed (Wilson, pers. comm.).

**Vaccinations.** Clostridial diseases in deer are not common but cases of pulpy kidney, blackleg and malignant oedema have been reported (McAllum, 1980; van Reenan, 1982; Wilson, 1984). Vaccination with multi-valent clostridial vaccines is cheap insurance. It is recommended that primary vaccination is given at weaning, followed by a secondary vaccination 3 to 5 weeks later. Yearlings and adults should receive an annual booster in spring (precalving for hinds and at velvet antler removal for stags).

Leptospirosis occurs in some areas and has caused deaths in young deer and abortions (Fairley, 1984; Fairley et al., 1984a; Mackintosh, 1984; Wilson, 1984; Flint et al., 1986). Vaccination of stock with trivalent (*Leptospira hardio*, *pomona*, *copenhageni*) vaccines is recommended at the same time as clostridial vaccines.

**Tuberculosis.** Recently a Tb accreditation scheme was set up by the Deer Far-

mers Association, Ministry of Agriculture and Fisheries and the Deer Branch of the New Zealand Veterinary Association. Farmers are encouraged to test their whole deer herd. Three clear tests over a 2 year period results in accreditation. If Tb is found then reactors are slaughtered and the herd retested until 3 clear tests are achieved.

The test consist of a single intradermal injection of 0.1 ml bovine PPD (1 mg/ml) in the centre of a 10x10 cm closely clipped area on the side of the neck. This is read 72 hours later and any detectible swelling or thickening is considered a reaction. On farms where there is good reason (previous history, negative necropsies etc) to believe that Tb is not present then reactors can be isolated for 3 months and retested with a comparative Tb test using avian and bovine PPD. If the bovine reaction is larger than the avian reaction the test is considered positive and the animal slaughtered. Avian sensitisation is not an uncommon problem in some herds and the comparative test is useful in these cases.

Development of a blood test is currently being undertaken (Griffin and Cross, 1986) and it is hoped that this will be available soon, as a supplementary test but it will be much more expensive than skin testing.

**Yersiniosis.** This bacterial enteritis, which is caused by *Yersinia pseudotuberculosis*, is characterised by an acute, smelly, watery diarrhoea which often becomes blood stained. It occurs mostly in deer calves during their first autumn/winter affecting up to 20% a group. The bacteria are carried by birds, rodents, rabbits, hares, cats and domestic livestock. The organisms persist in the environment for long periods especially under cold wet winter conditions. The disease is predisposed to by stressors, including bad weather, lack of shelter, underfeeding, transport and weaning (Mackintosh and Henderson, 1984).

Prevention is by providing adequate nutrition and shelter, especially during periods of bad weather. Wintering deer calves indoors may be beneficial as long as the feeding is adequate, there is no overcrowding and the bedding is renewed frequently.

Parenteral treatment with tetracyclines and fluid therapy is usually successful if given early enough. However, often the first cases are simply found dead. It is therefore important to observe young calves daily through the autumn, winter period for signs of inappetence, dullness or diarrhoea. Outbreaks can usually be stopped by treating the whole group with tetracyclines. An experimental vaccine is currently being evaluated (Mackintosh et al., 1986).

**Trace element deficiencies.** Deer probably have similar trace element requirements to sheep and cattle. Pasture, soil and animal tissue analyses should be carried out. The most important trace elements in NZ are copper, selenium and cobalt.

Copper deficiency, due to low pasture levels or induced by excess molybdenum, sulphate and iron, has been associated with enzootic ataxia in red deer and wapiti (Mackintosh et al., 1985a; Wilson et al., 1979). This usually occurs in young adult deer and is characterised by progressive posterior paralysis due to spinal cord demyelination. Copper deficiency has also been associated with spontaneous limb fractures, swollen joints and poor growth rates (Anon, 1984; Familton et al., 1985). Copper supplementation where necessary should be given in late winter and spring when pasture levels are lowest. It can take the form of injection, oral dosing with soluble copper compounds, the oral administration of capsules of copper oxide needles or the topdressing of pastures with copper sulphate.

Selenium deficiency may result in poor growth rates or white disease (English, 1979; Knox et al. 1987). Selenium is usually administered orally with anthelmintics at

regular intervals to young deer and once or twice a year to adults. Deport injections of barium selenate may be useful in deficient areas where deer are handled infrequently. Selenium can also be topdressed in pastures (Watkinson, 1983).

**Necropsies.** All deer that die inexplicably should be necropsied to determine the cause of death. This may also give an opportunity to check the trace element status by taking liver samples and the parasite status by examining the lungs and gastrointestis tract. Appropriate measures should be taken to prevent further losses.

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