

THE USE OF PARATECT FLEX^R IN WAPITI

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**ABSTRACT**

Treatment with Paratect Flex in the autumn significantly reduced the incidence of illthrift and mortality in a group of 2 yr old wapiti x red deer hybrid stags which had been orally drenched with ivermectin (at 200 µg/kg). When used with animals which had been treated with topical ivermectin (at 1000 µg/kg), treatment with Paratect Flex had no significant effect on mature wapiti stags, mature wapiti hinds, 3 yr old wapiti x red deer hybrid stags or 2 yr old wapiti x red deer hybrid stags in autumn, or mature wapiti x red deer hybrid hinds in spring.

INTRODUCTION

The use of intra-ruminal anthelmintic devices was first developed for cattle (1) and later for sheep (2). Two types of devices have been used. One type delivers a prescribed dose of drug at various time intervals into the rumen fluid and is referred to as a pulse-release device (3). The second type delivers a constant amount of drug into the rumen fluid and is referred to as a sustained-release device (1). The fundamental difference between these types of devices is that the pulse-release device acts in a periodic manner whereas the sustained-release device exerts a continual effect. The objective of the sustained-release device is to prevent the accumulation of parasites either by killing larvae in the rumen or preventing establishment in the abomasum.

Paratect Flex^R (Pfizer Laboratories Ltd) is a sustained release device containing morantel tartrate and was originally developed and licensed for cattle as a control for parasitic bronchitis and gastroenteritis. It is not licensed for deer. Paratect Flex is designed to release morantel for at least 90 days and prevent the establishment of lungworm infections for at least 60 days (1). Morantel is in the same anthelmintic action family as levamisole (clear drenches). Levamisole is thought to be metabolized too rapidly by deer to be effective and is not recommended for use in these animals (4). Because the morantel in the Paratect Flex bolus does not need to be absorbed to be effective, it offers the potential for an additional type of anthelmintic for use in deer. As it was designed for cattle greater than 100 kg in weight, its large size (cylindrical, approximately 28 mm in diameter by 97 mm in length) may be a limiting factor in its use. The bolus is delivered by a special balling gun. Shortly after it has been swallowed into the rumen, the bolus uncoils preventing regurgitation

The objectives of this study were to study the influence of Paratect Flex on the incidence of illthrift during the autumn ("roar" for the stags and mating for the hinds) and spring (pregnancy and lactation for the hinds).

METHODS AND MATERIALS

This work was done at two sites: Seacliff Farm at Orokonui (a LandCorp property) and the Invermay Agricultural Centre at Mosgiel (AgResearch). Two groups of animals were used at Seacliff Farm: 1) rising 2 yr old wapiti x red deer hybrid stags during the autumn-winter and 2) mixed age wapiti x red deer hybrid hinds in spring/summer (late pregnancy and lactation). Four separate groups of animals were used at Invermay: 1) Canadian wapiti and New Zealand (Fiordland) wapiti-type stags, 2) Canadian wapiti hinds, 3) 3 yr old wapiti x red deer hybrid stags and 4) 2 yr

old wapiti x red deer hybrid stags. All studies at Invermay were done during the autumn-winter season.

For the autumn investigations, all animals were treated during March in conjunction with routine pre-mating health management procedures. The animals were weighed, and blood samples for serum were collected for general biochemical analysis in most instances.

Seacliff Farm

The stag group from Seacliff Farm was treated with Paratect Flex on 24 March and was not dosed with any other anthelmintic at the start of the trial. These animals had been orally drenched with Ivomec^R cattle oral solution (MSD AgVet, Auckland) at 200 µg/kg (standard cattle dose) in the previous spring. One stag which was treated with Paratect Flex regurgitated the bolus when released from restraint and so was then regarded as untreated.

The pregnant hind group at Seacliff Farm was sampled and treated on 17-18 November as part of routine pre-calving management. Pregnancy was determined by udder observation. These animals were treated with double-dose topical ivermectin (Ivomec^R Pour-on for cattle, MSD AgVet, Auckland) at the start of the trial. All of the hinds used in the final analysis were observed by the farm staff to have delivered a dead calf or to have a calf at heel. The second samples were taken on 16 March at weaning. Standard farm management prohibited disturbance of hind/calf pairs during the major part of lactation which explains the extended time interval between samples. These hinds had been orally drenched with Ivomec (200 µg/kg) in the previous autumn. As some hinds were later found to be nonpregnant, they were eliminated from the trial.

Invermay Farm

All of the Invermay animals were treated with topical ivermectin at the rate of 1000 µg/kg (double cattle dose) at the start of each investigation. This anthelmintic treatment had been standard at Invermay for the preceding 12 months (late winter for all wapiti stock and pre-calving for the hinds and at velveting for the stags). The wapiti hinds were treated on 11 March, the wapiti bulls were treated on 16 March, and the rising 2 yr old and 3 yr old wapiti x red deer hybrid stags were treated on 18 March. All animals in the experimental groups were ranked on their previous weight and then randomly selected in pairs as either treated or control.

Additional weights and blood samples were taken when practical at 60-70 days, 100-120 days and at 150-180 days post-treatment. The first sample would have been taken during the presumed functional life of the bolus, the second sample would have been taken just past the presumed functional life of the bolus and the third sample would have been presumably indicative of any carryover effect of the treatment. The serum was analyzed for total serum protein, serum albumin, A/G ratio, SGOT, GGT, GLDH, bilirubin, conjugated bilirubin, BUN, and creatinine by the Invermay Animal Health Laboratory, Mosgiel.

Statistical analysis was accomplished by ANOVA using Genstat 5 (2.2) for liveweight comparisons. Contingency table analysis was used to compare the prevalence of dead and illthrift stags and the calving percentage of hinds from Seacliff Farm.

RESULTS

Seacliff Farm

Stags - Table 1 shows the group mean liveweights and liveweight changes over the 188 day trial for the 2 yr old wapiti x red deer hybrid stags from Seacliff Farm. None of the 13 stags treated with Paratect Flex required additional treatment during the study period. By contrast, of the 15 nontreated stags, 2 died (aetiology unknown), and 3 required treatment for illthrift ($p < 0.05$). Two

stags were treated at day 70 and 1 stag was treated at day 113 of the trial. Treatment comprised Ivomec Pour-on (1000 µg/kg) and injectible B complex vitamins. All three treated stags gained weight in the period following treatment. All stags were clinically normal at day 188 of the trial. At 70 days post-treatment, the Paratect Flex group had gained an average of 3.5 kg whereas the 13 surviving untreated stags lost an average of 3.5 kg ($p < 0.05$). The two animals treated at day 70 and the stag treated at day 113 were eliminated from analyses after treatment. There were no significant differences in weight changes over the rest of the trial period nor was there any significant difference in mean velvet weights between the groups in the following spring/summer.

TABLE 1. Liveweight, liveweight changes, velvet weight and morbidity of 2 yr old wapiti x red deer hybrid stags at Seacliff Farm.

Group (n)	Starting weight Day 0 (Mar 24)	Weight change (kg)			Velvet weight	No of stags dead or ill
		Days 0-70 (Mar 24-Jun 2)	Days 70-113 (Jun 2-Jul 15)	Days 113-188 (Jul 15-Sep 28)		
Untreated (15)	187.9	-3.5*	-10.2	-0.7	2.12	5/15*
Paratect Flex® Treated (13)	191.3	3.5*	-10.5	-0.7	2.21	0/13*
SED	8.9	2.7	2.2	2.8	0.2	

* significant difference ($p < 0.05$)

SED = standard error of the difference

Hinds - There were no significant differences between Paratect Flex treated or untreated hinds in mean liveweight gains to day 118, nor was there a significant difference in the calving percentage although more of the untreated hinds lost their calves (97 vs 84% calving for treated vs untreated)

Invermay Farm

There were no significant differences in live weight gain due to treatment with Paratect Flex between any sampling dates or up to the end of the recording period in any of the four groups at Invermay (to day 193 for mature wapiti bulls, day 142 for mature wapiti hinds and day 183 for both two and three year old wapiti x red deer hybrid stags).

Biochemistry

Animals treated for illthrift (stags from Seacliff Farm) had decreased serum albumin levels. None of the other serum analyses gave any indication of biochemical changes that were of prognostic value.

DISCUSSION

The size of the Paratect Flex bolus was not a limiting factor in this study as all of the animals involved were wapiti or wapiti x red deer hybrids. The smallest animal treated with the bolus was a 139 kg wapiti x red deer hybrid hind. Manual palpation and manipulation of the bolus down the oesophagus was necessary in this animal. No difficulties were encountered in administering the bolus to animals weighing 150 kg or more. Because the size of the bolus precludes treatment of NZ red deer hinds which are the major breeding animal in New Zealand deer industry, the application of the Paratect Flex bolus in the deer industry is probably limited.

At the Seacliff farm, in the stags Paratect gave significant protection against death or illthrift and significantly higher growth rates in the first 70 days after treatment. The three animals that "faded" were all in the non-Paratect Flex® treated group and all three responded to treatment with double-dose ivermectin by gaining weight in the following period, strongly suggesting that the cause of the illthrift was parasitism. In the other five groups of animals used in this study, the use of the Paratect Flex bolus had no effect on weight gain or loss over winter (4 groups) or summer (1 group). Paratect Flex did not significantly influence the calving rate of the wapiti x red deer hybrid hinds at Seacliff Farm, though more of the hinds not treated with the bolus lost their calves. All 5 of these groups were also being treated with ivermectin pour-on at the rate of 1000 µg/kg (double the cattle dose). This doubling of the cattle dose rate of ivermectin for use in deer, especially wapiti (5,6), appears to be effective in treating parasitosis in these animals, and Paratect Flex does not seem to give any additional advantage. In the situation in which the Paratect Flex had an effect, this group was probably being treated with a sub-optimal dose of oral ivermectin and was therefore at risk of parasitosis.

As no postmortem worm counts were done on any animals and no specific indicators of parasitic disease were found in the biochemical analyses of the affected stag group, it was not possible to confirm the aetiology of illthrift in these stags. However, the results of this trial strongly support the theory that abomasal parasitism is the major factor in chronic illthrift (fading) in wapiti.

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