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RESPONSE TO ANTHELMINTIC TREATMENT OF WEANED DAIRY CALVES AND UNWEANED BEEF CALVES

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Summary

A liveweight response of 14 kg was obtained following two anthelmintic treatments of weaned dairy calves. A smaller, but profitable liveweight response of 5 kg resulted from a single treatment of unweaned beef calves, but a second treatment 4 weeks later gave no additional advantage.

I. INTRODUCTION

Considerable loss of production as a result of nematode infestation occurs in cattle in many regions of Australia. However, deciding whether control procedures should be initiated is made difficult by seemingly conflicting experimental evidence and gaps in present knowledge. A complicating factor is that economic loss may occur through subclinical infestations.

Young dairy stock raised under intensive management systems readily acquire gastro-intestinal nematode burdens of sufficient magnitude to cause reduced liveweight gain. Several independent investigations have revealed a positive liveweight response to anthelmintic treatment of weaned dairy calves (Keith 1968; 'Brunsden 1968, 1969; Khouri *et al.* 1969).

The advantages of anthelmintic treatment of beef calves, particularly suckling calves, is less clearly defined. No liveweight advantage was obtained by Cairns and Gallagher (1964) after anthelmintic treatment of young, well conditioned bulls making good liveweight gains. Similarly, Winks (1968, 1970) obtained no liveweight advantage by regular treatment of young, suckling beef calves. However, positive responses to anthelmintic treatment of weaned beef calves have been obtained in other trials (Cairns and Gallagher 1964; Cooper 1970; McMullan 1973).

This paper reports a trial undertaken to establish the economic benefit of anthelmintic treatment of unweaned beef calves, and of weaned dairy calves on a property in the Central Hunter Valley.

II. MATERIALS AND METHODS

The trial was carried out in the late winter-early spring period (July to October) of 1968 at Westbrook, north-east of Singleton, N.S.W. The particular property was a typical, partially improved dryland grazing area. This region is regarded as semi-coastal, and has an average annual rainfall of 74 cm with no set seasonal pattern.

Calves in the trials were individually identified, and pairings on a matched weight basis were made between treated and control groups. Although treated and control groups of each trial grazed together, Trial A and Trial B were run separately.

Trial A consisted of twelve Guernsey calves, aged 5 to 9 months at the commencement, divided equally into a twice-treated group and a control group. Trial B was made up of 49 Hereford, Droughtmaster x Hereford, and A.I.S. x Hereford calves, running

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with their dams and aged approximately 8 months at the commencement of the trial. Twenty-five calves were allotted to the control group and twenty-four to the treated group. The treated group was further divided into a once-treated group of 11 calves and a twice-treated group of 13. Four weeks prior to the first treatment and sampling, all calves were weighed in order that the matching pairs could be allocated, and to determine current liveweight changes. Faecal samples for nematode egg counts, and blood samples for serum pepsinogen estimation, were taken from the same 8 calves in Trial A and the same 17 calves in Trial B at each of three weighings one month apart. Treatment of the appropriate groups was carried out at the first two weighings only. The anthelmintic used for treatment was injectable tetramisole (Nilverm I.C.I.) at a dose rate of 4 ml/45 kg liveweight, by subcutaneous injection. All laboratory work was carried out at the Veterinary Research Station, Glenfield, N.S.W.

III. RESULTS

Mean liveweight changes in the 28 days prior to the commencement of the trials are given in Table 1.

TABLE 1

Group mean liveweight changes over the 28 days preceding the trials

Trial	Liveweight change (kg) for groups	
	Treated	Control
A	-6.8	-5.9
B	+9.1	+9.5

Faecal samples submitted for laboratory examination revealed no trematode eggs. Cestode eggs were present on at least one occasion in samples from two calves in the treated groups and in one calf from the control group in Trial A. Similarly, cestode eggs were found in samples from four calves in the treated group, and five calves in the controls in Trial B. Coccidial oocysts were present in all samples. Two calves in Trial B, one from the control and one from the treated group, had paramphistome egg counts in their faeces of 15 and 60 eggs per gram (E.P.G.) respectively.

Faecal nematode egg counts are given in Table 2.

TABLE 2

Group mean nematode faecal egg counts immediately before the first (7/8/68) and second (11/9/68) tetramisole treatments and at the end of the trials (9/10/68)

Trial and treatment	No.in group	No. sampled	Eggs per gram of faeces on dates		
			7/8/68	11/9/68	9/10/68
Trial A					
Control	6	2	265	250	0
Tetramisole twice	6	2	1300*	175	0
Trial B					
Control	25	9	183	950	956
Tetramisole once	11	4	288	212	175
Tetramisole twice	13	4	212	388	50

* One calf recorded 2100 E.P.G.

Serum pepsinogen values of samples taken on 7/8/68 are listed in Table 3.

TABLE 3

Group mean serum pepsinogen estimates with their standard errors on 7/8/68, before application of treatments

Trial	No. of calves sampled	Serum pepsinogen (milli-units of tyrosine)
A	4	1625 ± 293
B	7	614 ± 55

All calves were weighed monthly and the group mean liveweights are listed in Table 4.

TABLE 4

Group mean liveweights on the dates of first (7/8/68) and second (11/9/68) tetramisole treatments and at the end of the trials (9/10/68), together with mean liveweight gains and their standard errors over the period of the trials

Trial and treatment	No. in group	Liveweight (kg) on dates 7/8/68	11/9/68	9/10/68	Liveweight gain (kg) 7/8/68 to 9/10/68
Trial A					
Control	6	156.0	162.9	174.6	18.6 ± 1.7
Tetramisole twice	6	153.8	164.4	186.4	32.6 ± 3.6
Trial B					
Control	25	162.0	173.2	188.0	26.0 ± 1.5
Tetramisole once	11	157.6	172.3	189.5	31.9 ± 2.9
Tetramisole twice	13	162.3	174.8	193.2	30.9 ± 2.2

IV. DISCUSSION

During the period of the trial, rainfall was insufficient to promote vigorous pasture growth, which is reflected in the moderate liveweight gains recorded and also in the relatively low level of nematode infestation. At the commencement of the tri on August 7, the feed available was low in both quality and quantity. Following 76 of rain at the end of August, pasture growth improved and feed was fair until completion of the trials on October 9, even though there was no further significant rainfall.

Although the serum pepsingen values recorded were not abnormally high, the higher readings for the Trial A calves, together with their greater liveweight response to treatment, suggests that worm burdens may have been greater in the Trial A calves compared to those in Trial B.

Response to anthelmintic treatment in the weaned dairy calves in Trial A was indicated firstly by the fall in faecal nematode egg counts in the tetramisole treate group. However, at the completion of Trial A both the treated and control groups recorded a 'faecal egg count of zero. This result was similar to that recorded by Cairns and Gallagher (1964) and could have been due to seasonal fluctuations. More noteable than the lowered egg counts was the 14 kg liveweight advantage of the treate calves compared to the control calves in Trial A ($P < 0.01$). This result is in accord with the positive response obtained by Keith (1968).

The unweaned beef calves in Trial B registered a reduction in faecal egg counts following anthelmintic treatment. This reduction was more marked in the twice-treated group, whereas the untreated controls showed a considerable rise over the same period. Clearly, the second tetramisole treatment had no effect on the liveweight gains of unweaned calves in Trial B. However, the mean liveweight advantage of 5.4 kg for the pooled treated groups compared with the controls was significant ($P < 0.05$). It would appear that under the conditions of this trial, a single anthelmintic treatment was adequate.

The liveweight response found in this trial with suckling beef calves is greater than that obtained by Winks (1970) for Central Queensland, where it was found that anthelmintic treatment with Trichlorphon was uneconomic. The economics of a single treatment was assessed for Trial B as follows:

Treatment Gross Margin

Assumptions

1.	Nilverm, 1000 cc	$19.00
2.	Mean liveweight of trial calves	159 kg
3.	Dose per calf	14 ml
4.	Labour cost per hour	$1.50
5.	Mustering and handling time for 30 cows and calves, 2 men for 2½ hours	5 h
6.	Mean liveweight advantage after treatment	5 kg
7.	Dressing percentage	50
8.	Mean carcass weight advantage after treatment	2.5 kg
9.	Carcass value	88 c/kg

Costs per Calf

1.	Nilverm	$0.27
2.	Labour	$0.25
		$0.52

Return per Calf

2.5 kg carcass at 88 c/kg	$2.20
Gross Margin per Calf	$1.68

Thus the benefit from anthelmintic treatment of weaned dairy calves was again demonstrated and, in addition, a net gain following anthelmintic treatment of suckling beef calves in early spring was established for this area.

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