

## STUDIES ON *HAEMONCHUS CONTORTUS*. VIII. ATTEMPTS TO PROTECT SUCKLING LAMBS AGAINST INFESTATION WITH *H. CONTORTUS*

R. K. REINECKE, I. L. DE VILLIERS and GERDA JOUBERT\*, Faculty of Veterinary Science, University of Pretoria, P.O. Box 12580, 0110 Onderstepoort

### ABSTRACT

REINECKE, R. K., DE VILLIERS, I. L. & JOUBERT, GERDA, 1982. Studies on *Haemonchus contortus*. VIII. Attempts to protect suckling lambs against infestation with *H. contortus*. *Onderstepoort Journal of Veterinary Research*, 49, 149-150 (1982).

A group of 12 Merino lambs, 3.5 months of age, which were still suckling, were each dosed with 40 000 infective larvae of *Trichostrongylus axei* on Day 0. From Day +62-Day 64 each of these lambs and those of a 2nd group of 11 controls were dosed with 30 000 infective larvae of *Haemonchus contortus*, and all the lambs of both groups were killed on Day +90. Attempts to use *T. axei* to protect them against subsequent challenge with *H. contortus* were unsuccessful.

### INTRODUCTION

Reinecke, Brückner & De Villiers (1980) have shown that if weaned Merino lambs were dosed with infective larvae of *Trichostrongylus axei* and challenged 60 days later with infective larvae of *Haemonchus contortus*, the efficacy in suppressing the challenge with *H. contortus* was > 60% in > 60% of sheep (Class B). The present trial done on suckling lambs 3.5 months of age was an attempt to confirm the results of Reinecke *et al.* (1980).

### MATERIALS AND METHODS

The Merino lambs were all born within a week of each other and were housed in concrete-floored pens which were cleaned every day. At 3.5 months, while they were still suckling, 12 lambs in Group B were each dosed with 40 000 infective larvae of *T. axei* harvested from faecal cultures of infested calves. From Day +62 to Day +63 these lambs were challenged and an additional 11 control Merino lambs of the same age in Group A were dosed with *H. contortus*, each lamb receiving 50 000 infective larvae. On Day +72 Lamb M1 of Group B, predosed with *T. axei*, had a severe diarrhoea and was slaughtered. The 22 surviving Merinos were killed on Day +90 (Table 1).

### RESULTS

Worms recovered are summarized in Table 2.

#### Group A (Controls)

##### *H. contortus*

Fourth stage larvae (L<sub>4</sub>) ranged from 0-1 054 and the total worm burdens from 751-12 892.

##### *T. axei*

Numbers ranged from 0-86 in this group.

#### Group B

##### *H. contortus*

There were only 0-424 L<sub>4</sub> in this group, but the total worm burdens ranged from 30-6 835.

##### *T. axei*

40 000 *T. axei* on Day 0.

There was no statistical difference between the total worm burdens of *H. contortus* when Group A and B were compared (Table 3).

##### *T. axei*

Ninety days after being dosed, 3rd stage larvae were present in Group B. As there were also L<sub>3</sub> in the controls (Group A), however, it is clear that the kraal must have been infested.

TABLE 1 Merino lamb trial. Experimental design. The age of the lambs, the days on which they were dosed, the number of infective larvae used and the days of slaughter

Day	Date of birth	No. of infective larvae dosed to each lamb	
-111	First lambs born on 23 August 1977	Group A	Group B
-104	Last lambs born on 30 August 1977	—	<i>T. axei</i> (calf strain)
0		Total — 40 000	
+62	<i>H. contortus</i>	<i>H. contortus</i>	
+63	<i>H. contortus</i>	<i>H. contortus</i>	
+64	<i>H. contortus</i>	<i>H. contortus</i>	
	Total	30 000	30 000
+72	Lamb M1 (Group B) developed diarrhoea and was slaughtered		
+90	Slaughter	Slaughter	

TABLE 2 Experiment 13. Merino lamb trial. Worms recovered at necropsy

Lamb No.	<i>H. contortus</i> Stage of development		Total	<i>T. axei</i> Stage of development			Total
	L <sub>4</sub>	5 + A		L <sub>3</sub>	L <sub>4</sub>	5 + A	
Group A Controls <i>H. contortus</i> 30 000 from Day +62-Day +64							
M13	1 054	11 838	12 892	76	0	10	86
M14	83	3 041	3 124	15	0	2	17
M15	387	6 406	6 793	10	0	2	12
M16	0	751	751	0	0	60	60
M17	109	6 156	6 265	9	0	0	9
M18	703	11 611	12 314	0	0	0	0
M19	843	6 944	7 787	9	0	28	37
M20	172	5 451	5 623	0	0	40	40
M21	244	9 731	9 975	32	0	0	32
M22	39	4 306	4 345	12	0	3	15
M23	372	11 485	11 857	34	0	12	46
Group B <i>T. axei</i> 40 000 Day 0 <i>H. contortus</i> 30 000 Day +62-Day +64							
*M1	30	0	30	0	0	5 220	5 220
M2	52	6 313	6 365	1	1	5 545	5 547
M3	29	5 563	5 592	9	0	11 522	11 531
M4	26	3 660	3 686	0	0	9 456	9 456
M5	46	74	120	0	15	30 132	30 147
M6	100	8 833	8 933	23	0	33 173	33 196
M7	213	2 861	3 074	38	0	23 072	23 110
M8	132	6 150	6 282	0	14	18 357	18 371
M9	20	90	110	32	0	12 154	12 186
M10	0	301	301	0	0	9 987	9 987
M11	36	6 799	6 835	103	0	17 958	18 061
M12	424	5 050	5 474	16	0	19 127	19 143

\* M1 died on Day +72

\* 359 Cliff Ave., Waterkloof Ridge, 0181 Monument Park, Pretoria  
Received 13 April 1982—Editor

TABLE 3 Merino lamb trial. Ranked worm burdens of *H. contortus* and *T. axei*

Stage of development L <sub>4</sub>	<i>H. contortus</i>		<i>T. axei</i>
	5 + A	Total	Total
Group A Controls			
0	751	751	0
39	3 041	3 124	9
83	4 306	4 345	12
109	5 451	5 623	15
172	6 156	6 265	17
244	6 406	6 793	32
372	6 944	7 787	37
387	9 731	9 975	40
703	11 485	11 857	46
843	11 611	12 314	60
1 054	11 838	12 892	86
	Median 6 793		
	X 0,5 = 3 396		
Group B <i>T. axei</i> 40 000 Day 0			
0	0	30	5 220
20	74	110	5 547
26	90	120	9 456
29	301	301	9 987
30	2 861	3 074	11 531
36	3 660	3 686	12 186
46	5 050	5 474	18 061
52	5 563	5 592	18 371
100	6 150	6 282	19 143
132	6 313	6 365	23 110
213	6 799	6 835	30 147
424	8 833	8 933	33 196

## DISCUSSION

A comparative analysis of the data in Groups B (*T. axei*) and Group A (controls) showed that there was no significant difference between the number of *H. contortus* in these 2 groups. It is possible that *T. axei* of bovine origin does not protect sheep against *H. contortus*, while *T. axei* from sheep does. Moreover, the number of *T. axei* on Day 90 (Group B) ranged from 5 220 to 33 196. In other experiments *T. axei* ranged from 20 000–30 000 and gave better protection against challenge with *H. contortus* (Reinecke *et al.*, 1980).

Despite the postulate of Reinecke *et al.* (1980) that the protection against *H. contortus* in sheep previously infested with *T. axei* is due to intergeneric competition, immunological immaturity may play some role. This hardly seems likely in view of the poor "take" of *T. axei* in the present trials. We are therefore unable to explain these conflicting results.

## REFERENCE

- REINECKE, R. K., BRÜCKNER, CHRISTEL & DE VILLIERS, I. L., 1980. Studies on *Haemonchus contortus*. III. Titration of *Trichostrongylus axei* and expulsion of *H. contortus*. *Onderstepoort Journal of Veterinary Research*, 47, 35–44.