Proc. Aust. Soc. Anim. Prod. (1972) 9: 397

PARASITIC INFECTION IN MERINO LAMBS WEANED AT SEVERAL AGES

R. J. LEWIS, J. L. CORBETT and W. H. SOUTHCOTT*

Summary

Groups of Merino lambs were weaned at 3 or 6 or 12 weeks of age onto separate pastures and received no anthelmintic treatment. The lambs weaned at 12 weeks showed higher egg counts of *Haemonchus contortus* and *Ostertagia* spp than those weaned at earlier ages. *Nematodirus* spp. egg counts were also higher in the 12-week group, but differences in initial levels of herbage infection with this species influenced the result. Liveweight and wool production of untreated lambs were not reduced in comparison with their counterparts receiving thiabendazole regularly.

I. INTRODUCTION

Several reports have shown that early weaning tends to restrict the onset of parasitism in lambs. Southcott and Corbett (1966) found that infection with ***Ostertagia*** spp. and ***Haemonchus contortus*** was delayed, and the incidence reduced, in lambs weaned at 4 or 6 rather than at 11 weeks of age. The present study is an extension of that work.

II. MATERIALS AND METHODS

-General details of the experiment, designed primarily to study productive aspects of early weaning, have been given by Corbett (1968).

Merino lambs born between August 28 and September 27, 1965 (mean birth date September 14) were formed into four groups of 17 animals, and were grazed on separate areas of ***Phalaris tuberosa-Trifolium repens*** (white clover). The groups were balanced with respect to date of birth and sex of the lambs, and the stocking rate of their dams (10, 20 or 30/ha), but differed in the age at which the lambs had been weaned. In three groups, all lambs were weaned individually at exactly 3 or 6 or 12 weeks of age, and none received any anthelmintic treatment. The fourth group comprised approximately equal numbers weaned at the three ages which were treated with thiabendazole' at the times of weaning and thereafter every 3 weeks.

The four areas grazed by the lambs had the same management except that those grazed by the 3 and 6 week weaned (WW) groups had been occupied from spring 1964 to autumn 1965 (April) by weaners that received regular anthel-

*CSIRO, Division of Animal Psysiology, Pastoral Research Laboratory, Armidale, New South Wales, 2350.

mintic treatment while the other two pastures had carried untreated weaners. All sheep had been removed in mid-July 1965 and the areas were not stocked again until lambs in the 3 WW and 3-12 WW treated, 6 WW and 12 WW groups entered at the end of September, mid-October and the end of November respectively. The groups were combined into one flock in May 1966.

Larval populations on the pasture herbage were assessed before the weaned lambs entered, and at intervals thereafter, by collecting pasture samples and recovering and counting infective larvae. Faecal egg counts were made on all lambs every 3 weeks until May 1966 and faeces were cultured for subsequent recovery and identification of infective larvae. Larvae of ***Dictyocaulus filaria*** were recovered for counting by exposing 1 g faecal samples from individual sheep in a Baermann apparatus for 12 h.

All lambs were weighed at intervals and greasy wool production was measured at the first shearing in November 1966.

III. RESULTS

Rainfall from October 1965 to April 1966, was 73 per cent of the 21-year average of 587 mm. Falls of 25 mm or more occurred only in November, December (twice), February and March.

In September, before the first lambs were weaned, herbage larval counts showed ***low*** levels of ***Haemonchus*** *contortus,* ***Ostertagia*** spp. and ***Trichostrongylus*** spp. in the weaning paddocks. There were 10, 10, 16 and 67 larvae of these species per 100 g dry herbage in the 3 WW, 6 WW, 12 WW and 3-12 WW treated paddocks respectively. Larval counts had declined to 0, 0, 9 and 25 by November and in January and thereafter were zero except for one count of 1 larva/l00 g herbage. Corresponding figures for ***Nematodirus*** spp. were 0, 10, 185, 158 in September, 0, 0, 122, 126 in November, 0, 1, 106, 21 in January, and 0, 0, 15, 1 in May, indicating considerable differences in residual contamination between the two pairs of paddocks.

Haemonchus contortus made the greatest contribution to strongyloid egg counts in faeces (Table 1) and higher levels were reached in the 12 WW group than in the 3 WW and 6 WW groups. ***Ostertagia*** spp. egg counts were also at higher levels in the 12 WW group. ***Trichostrongylus*** spp. were present in all groups at low levels not exceeding 9 eggs per gram (e.p.g.) and have not been tabulated.

Egg counts for *Nematodirus* spp. were higher in the 12 WW lambs at about the time they were weaned (37 e.p.g., 6/12), and subsequently, than in the 3 WW and 6 WW lambs. Autopsies of non-experimental companion lambs established that the species present were ***N.*** *spathiger* and *N. filicollis*.

Strongyloid egg counts for the 3-12 WW treated group, not shown in Table 1, were generally zero except for ***Nematodirus*** spp. *Nematodirus* spp. egg counts were as high as 429 e.p.g. in November and 196 e.p.g. in December. They then declined to 8 e.p.g. in January, 3 e.p.g. in April, and were zero at the final sampling in May.

TABLE 1

Mean egg counts in faeces of ***lambs weaned at several ages*** of ***Haemonchus contortus*** (H), ***Ostertagia*** spp. ***(0) and Nematodirus*** spp. (N) (no. ***eggs per g)***

Date of Sample	3 weeks			6 weeks			12 weeks		
	H	O	N	H	O	N	H	O	N
15/11/65	0	< 1	0	0	< 1	22	—	—	—
6/12	0	< 1	0	0	1	5	5	7	37
29/12	0	5	0	0	1	23	9	43	477
17/1/66	2	5	2	< 1	5	23	65	109	1234
7/2	1	6	3	0	10	47	104	59	175
28/2	7	14	3	0	10	33	253	54	185
21/3	16	9	7	< 1	4	35	1375	24	39
13/4	59	2	6	0	5	60	2263	134	22
2/5	84	8	22	6	5	35	3730	79	0

— Not sampled

Dictyocaulus filaria larval counts in the 3 WW group were mostly zero; one sheep of the group was positive on one occasion in February. The 6 WW and 12 WW groups showed similar patterns and levels of infection; larval numbers increased from December to about 50/g of faeces in late February and then declined to 1 larva/g 3 weeks later. ***No D. filaria*** larvae were detected in herbage samples from any of the weaner paddocks, but it was observed that many of the ewes were heavily infected with this parasite at lambing. Rain (44 mm) suitable for development of the larvae had fallen from September 7 to 9 before the 6 WW and 12 WW lambs were weaned.

Lambs weaned at 12 weeks of age were significantly heavier ($P < 0.05$) at 17 and 37 weeks of age (January and May 1966) than the 3 WW and 6 WW lambs, and produced more wool at shearing in November 1966 ($P < 0.05$) (Table 2). The mean liveweight of the three untreated weaning groups combined was similar to that of the 3-l 2 WW treated group.

TABLE 2

Mean liveweights (kg) at intervals and fleece weight (kg) at first shearing of lambs weaned at several ages

Weaning Group	Weeks from birth: 3	6	12	17	37	
	Liveweights					*Fleece weight*
3 WW	8.0	9.4	14.1	17.3	19.0	2.8
6 WW	7.8	11.6	16.6	17.8	17.7	2.7
12 WW	8.0	12.4	16.9	20.5	23.2	3.2
3-12 WW (T)	7.1	10.1	14.8	17.9	20.0	2.9

IV. DISCUSSION

Rainfall was low during the experiment and, except for ***Nematodirus*** spp., this was reflected in low recoveries of infective strongyloid larvae from pasture and in low levels of host infection. The results confirm the importance of the ewe as a source of infection for the lamb and the favourable parasitological consequences of early weaning, provided residual. pasture contamination is at low levels.

Differences in grazing management of the weaning paddocks did not result in differences of any importance in residual populations of ***Haemonchus contortus, Ostertagia*** spp. or *Trichostrongylus* spp. on the herbage, and comparisons between weaning age groups for these species do not require qualification. About the time of weaning, 12 WW lambs had higher ***Nematodirus*** spp. egg counts than the other two groups. However, grazing of the 12 WW paddock in the previous year with untreated weaners was associated with high numbers of ***Nematodirus*** spp. larvae on herbage that are confounded with the post-weaning comparisons.

The pasture grazed by the 3-12 WW treated group also carried a high residual population of ***Nematodirus*** spp. larvae, and although the lambs were treated with thiabendazole as they entered the area and thereafter every 3 weeks, faecal egg counts indicated substantial acquisition of infection in the interim periods; this observation confirms the direct measurements of herbage contamination.

Weaning at 3 weeks almost precluded ***D. filaria*** infection but no differences were observed between the 6 WW and 12 WW groups. The similar patterns and levels of infection in these groups may indicate acquisition of infection at the same time, probably in the period following the September rains before they were weaned.

Lambs weaned at 6 weeks of age or younger showed a reduction in liveweight and wool production compared with those weaned at 12 weeks, which had the highest egg counts. It is evident from the results for the 3-12 WW treated group, duly weighted for the numbers weaned at the 3 ages, that reduction in worm infection was itself of no practical significance in the conditions of the experiment, but it is possible that advantages might accrue under higher rainfall conditions. The beneficial effects of early weaning on parasitism reported by Southcott and Corbett (1966) have been confirmed, but such benefits would generally follow rather than be sought as a reason for adopting the practice.

The study emphasizes how the annual grazing of the same areas by young sheep can lead to augmentation of herbage infection with ***Nematodirus*** spp., and suggests that control of ***Nematodirus*** spp. in lambs in Australia, as in Britain (Gibson 1963), would be assisted by avoiding the use of the same area for lambing or for weaned lambs in consecutive years.

V. ACKNOWLEDGMENTS

We wish to thank Mr. G. W. Major for undertaking the counts of infective larvae on herbage, and Messrs. G. H. Parkinson and K. A. Lisle for technical assistance.

VI. REFERENCES

Corbett, J. L. (1968). ***Wool Technology and Sheep Breeding.*** 15: 49.

Gibson, T. E. (1963). ***Research in Veterinary Science. 4: 258.***

Southcott, W. H., and Corbett, J. L. (1966). ***Proceedings of the Australian Society of Animal Production. 6:*** 194.