

NATURAL WORM BURDENS IN DORSET HORN, MERINO AND CORRIEDALE WEANERS AND THEIR CROSSES

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Interest in the genetics of parasite resistance has heightened recently due to the advent of drug resistant strains and the sharply rising costs associated with traditional drug control methods.

In this study in November 1973 at Armidale natural worm burdens were measured by faecal egg counts and larval cultures in 575 mixed sex lambs from -the Dorset Horn (D.H.), Fine Wool Merino (F. Mer.), **Collinsville Merino (S. Mer.)** and Corriedale (Corr.) genotypes and their reciprocal crosses. Sampling occurred on the day after weaning prior to which all lambs and their dams had grazed as a single flock.

The data were examined by least squares methods using a model which included effects due to sex of lamb, age of dam, type of birth, sire, breed of sire, breed of dam and the interaction between breed of sire and breed of dam. Data were transformed as log (count +1) before variance analysis but the mean egg counts given in Table 1 are in the original scale. Sub-class numbers ranged from 17 to 59 and standard errors (original scale) from 61 to 188.

TABLE I: Mean worm egg counts (eggs/gram) averaged over both sexes.

Breed	Nematodirus spp.				Other species †			
♀	D.H.	S. Mer.	F. Mer.	Corr.	D.H.	S. Mer.	F. Mer.	Corr.
♂	D.H.	S. Mer.	F. Mer.	Corr.	D.H.	S. Mer.	F. Mer.	Corr.
D.H.	585	468	334	492	472	542	432	401
S. Mer.	402	382	241	336	492	561	382	297
F. Mer.	268	156	157	186	244	570	670	329
Corr.	407	189	309	280	274	233	429	268

† Principally (\approx 70%) Ostertagia spp.

For Nematodirus spp. the counts are moderate to high and there were significant differences between breed of sire ($P < 0.001$), breed of dam ($P < 0.05$), sex ($\sigma > \phi$, $P < 0.05$) and type of birth (singles < multiples, $P < 0.05$). By contrast counts for other species are low but significant differences were observed between sires ($P < 0.001$) and breed of dam ($P < 0.05$). Heritability estimates based on 28 d.f. for sires with an average of 17 offspring/sire, were 0.11 ± 0.09 and 0.29 ± 0.12 for Nematodirus and other species respectively. For most breed pair and worm type combinations crossbred mean egg count was lower than the mean of the corresponding purebreds but in only one case (S.Mer., Corr.; other species) was the difference significant ($P < 0.05$).

These data confirm previous reports on between strain (Southcott, pers. comm.) and within breed (Whitlock, 1958) genetic variation in helminth parasite resistance. They document for the first time evidence of heterotic effects and indicate the possibility of improving resistance through breeding.

WHITLOCK, J.H. (1958). The Cornell Veterinarian 48: 127.

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