

PRELIMINARY GENETIC PARAMETERS OF FAECAL WORM EGG COUNT AND SCOURING TRAITS IN MERINO SHEEP SELECTED FOR LOW WORM EGG COUNT IN A MEDITERRANEAN ENVIRONMENT

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The Rylington Merino project was established in Western Australia in 1987 to demonstrate that selecting sheep for low faecal worm egg count (FWEC) will increase resistance to internal parasites. Karlsson *et al.* (1995) showed that the selected line had a lower FWEC; however, the selected line had a higher prevalence of scouring compared to the unselected control line. Previous results (Greeff *et al.* 1995) indicate that the best time to measure FWEC for selection purposes was at weaning in October and approximately 6-8 weeks after the start of the winter rainfall season. The aim of this investigation was to examine the genetic relationship between FWEC in October and June and the scouring traits.

This study was carried out on a dataset comprising 1383 progeny records from 44 sires in the selection line. All progeny born from 1988 until 1990 were subjected to a natural nematode challenge (approx 80% *Trichostrongylus* spp.) until 15 months of age, with 10 to 11 FWECs taken on a monthly basis from weaning in October until September the following year. Lambs born in 1991 to 1993 were subjected to a natural challenge from birth to December, were drenched and exposed to a second cycle of natural challenge following the next winter rainfall season. Faecal consistency score (FS) and dag score (DS) at crutching in autumn, were used as indicators of scouring.

The FWEC data were transformed to cubes and FS and DS to natural logarithms in an attempt to normalise the data. This data was analysed with a halfsib analysis using the computer program of Harvey (1987) and presented in Table 1.

Table 1. Heritabilities (diagonal), phenotypic (above diagonal) and genetic (below diagonal) correlation for FWEC and FS in October and June and for DS at crutching

	FWEC		FS		DS
	October	June	October	June	Crutching
FWEC (October)	0.26 ± 0.08	0.09	0.03	-0.04	0.04
FWEC (June)	0.39 ± 0.20	0.29 ± 0.08	-0.02	0.01	0.07
FS (October)	0.25 ± 0.22	-0.22 ± 0.22	0.23 ± 0.07	0.04	0.01
FS (June)	-0.67 ± 0.19	-0.12 ± 0.24	-0.06 ± 0.25	0.17 ± 0.06	0.23
DS (Crutching)	-0.42 ± 0.29	0.24 ± 0.29	-0.18 ± 0.31	0.93 ± 0.22	0.08 ± 0.04

FWEC at both times were moderately heritable. FS were moderately heritable at weaning but lower in June. A high negative genetic correlation of -0.67 was found between FWEC in October and FS in June. The genetic correlation between FS in June and DS at crutching in the autumn is close to unity indicating that they are genetically the same trait. These results suggest that selecting animals for a low FWEC at weaning could result in their progeny having a higher propensity to scour (high FS) in June after the break of the season; this is also reflected in the DS. This has important implications for selection for low FWEC especially for winter born lambs in a Mediterranean climate zone.

There is clearly a need for further research into the response mechanisms involved in the low FWEC selection line.

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