

GENETIC PARAMETERS FOR CARCASS TRAITS OF THE
SOUTH AUSTRALIAN MERINO AT 16-18 MONTHS OF AGE

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INTRODUCTION

The Australian Merino, which has been selected primarily for producing wool, forms an integral part of the lamb-meat industry, and contributes either 0.5 or 0.25 of the genes in cross breeding systems. This paper reports phenotypic and genetic parameters for carcass traits in South Australian Merino sheep at hogget age.

MATERIALS AND METHODS

The sheep were raised at Cape Borda on Kangaroo Island, South Australia. Observations were made on 4 drops born in 1981-1984 giving 290 castrated male progeny of 30 sires from a daughter stud of the Collinsville family group. Liveweight (LW) and body condition score (BCS) were recorded following an overnight fast. Sheep were slaughtered at a commercial abattoir and carcass weight (CW; hot weight less 2%), carcass length (CLTH; Moxham and Brownlie 1976) and fat depth over the ribs (GR) were recorded. Heritabilities (h^2) and phenotypic (r_p) and genetic (r_g) correlations were estimated by analysis of variance and covariance, described by James et al. (1987).

RESULTS AND DISCUSSION

Heritability values for LW were in agreement with those of Pattie (1965) and Gregory (1982) for Merino strains. The value for CW agrees with those summarized by Wolf and Smith (1983) for other breeds. The low h^2 for fat depth (GR) is in contrast to other results or assumed values for similar measures of fat depth (Wolf and Smith 1983; Bennett and Clarke 1984; Simm et al. 1987); they report moderate to high values of about 0.30. Our high h^2 for CLTH agrees with that reported by Cotterill and Roberts (1976). Standard errors for r_g 's for all except LW and CW, LW and CLTH, and CW and CLTH, were very large due to the limited number of sires and progeny.

Table 1 Means (SD), heritability estimates (SE), phenotypic (above diagonal) and genetic (below diagonal) correlations (SE) for liveweight, body condition score and carcass traits of the South Australian Merino at hogget age

	LW ^A (kg)	BCS	CW (kg)	CLTH (mm)	GR (mm)
Mean	45.1	2.00	21.4	1109	7.76
(SD)	(6.4)	(0.83)	(3.9)	(47)	(4.57)
Heritability	0.48	0.08	0.43	0.52	0.03
(SE)	(0.24)	(0.17)	(0.24)	(0.25)	(0.12)
LW ^B	-	0.43	0.93	0.80	0.54
BCS	0.20 (0.70)	-	0.52	0.22	0.56
CW	0.97 (0.02)	0.69 (0.40)	-	0.79	0.65
CLTH	0.85 (0.10)	0.51 (0.53)	0.82 (0.12)	-	0.38
GR	0.14 (1.07)	0.68 (1.20)	0.15 (1.12)	0.14 (1.04)	-

The high h^2 for LW and CW and the high r_g between these traits indicates that selection of hoggets for LW should be effective in improving carcass weight. The low h^2 for GR and BCS and their low and positive r_g 's with either LW or CW indicate that selection for LW in the South Australian Merino should result in negligible increases in carcass fatness.

REFERENCES

- BENNETT, G.L. and CLARKE, J.N. (1984). Proc. N.Z. Soc. Anim. Prod. 44:243.
 COTTERILL, P.P. and ROBERTS, E.M. (1976). Proc. Aust. Soc. Anim. Prod. 11:53.
 GREGORY, I.P. (1982). Aust. J. Agric. Res. 33:355.
 JAMES, P.J., PONZONI, R.W., WALKLEY, J.R.W., WHITELEY, K.J. and STAFFORD, J.E. (1987). In "Merino Improvement Programs in Australia", p 341, editor B.J. McGuirk, Aust. Wool Corp., Melbourne.
 MOXHAM, R.W. and BROWNLIE, L.E. (1976). Wool Technol. Sheep Breed. 23:17.
 PATTIE, W.A. (1965). Aust. J. Exp. Agric. Anim. Husb. 5:361.
 SIMM, G., YOUNG, M.J. and BEATSON, P.R. (1987). Anim. Prod. 45:465.
 WOLF, B.T. and SMITH, C. (1983). In "Sheep Production", Vol.26, p 493, editor W. Haresign, Butterworths, London.