

ASSESSMENT OF SKIN TYPES IN THE CSIRO FINE WOOL PROJECT FLOCK

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There is considerable debate within the Merino breeding industry on the merits of breeding programs based on subjectively assessed traits. Proponents of the 'soft rolling skin' (SRS™) scoring system claim to be able to identify superior sheep based on a number of visual and tactile attributes (Watts 1995). The classes of sheep are purported to differ in many respects with claims that selection for the SRS type of animal is an effective means of improving wool style whilst concurrently reducing fibre diameter (MFD) and diameter variability, and increasing clean fleece weight (CFW) (Watts 1995). The aim of this study was to assess the relationship between skin type and wool and skin attributes in the CSIRO Fine Wool Project flock at Armidale.

In March 1997, a classer, trained in principles of the SRS classing system, scored 564 ewes and 121 wethers from the CSIRO Fine Wool Project flock (Swan *et al.* 1993) on a scale of 1 to 5 where 1=SRS, 2=frame, 3=flat, 4=tight and 5=heavy-tight, as categorised by Watts (1995). The sheep were all born in 1994 and, when assessed, had approximately seven and a half months of wool. The scores for skin type were compared to fleece measurements from 1996. A sub-sample of the animals comprising approximately 30 sheep per bloodline, balanced across sire groups and the sexes, was also analysed for follicle characters and comparisons made to their 'types'. Total follicle density and S/P ratio were measured on eosin and picric acid-stained skin sections, prepared from biopsies collected in 1995, using image analysis. A linear model including the effects of birth type, rearing type, dam age, bloodline and management flock was fitted for each trait. Where the effects were not significant they were omitted from the model. The results presented are least squares means for skin type.

The distribution of the sheep with the five skin types were as follows: SRS, n=9 (1.3%); frame, n=243 (35.5%); flat, n=372 (54.3%); tight, n=61 (8.9%); and heavy-tight, n=0. All skin types were found in both sexes and were distributed across the bloodlines. However, some bloodlines had a larger proportion of some types.

Table 1. Effects of skin type on fleece and follicle characteristics (least squares means \pm s.e.)

	SRS	Frame	Flat	Tight	P-value
Body weight (kg)	34.5 \pm 1.29	33.7 \pm 0.25	33.0 \pm 0.20	31.9 \pm 0.48	P<0.01
Clean fleece weight (kg)	2.53 \pm 0.118	2.63 \pm 0.028	2.61 \pm 0.025	2.53 \pm 0.047	P>0.05
Mean fibre diameter (μ m)	19.0 \pm 0.390	18.8 \pm 0.10	18.9 \pm 0.09	19.4 \pm 0.16	P<0.05
c.v. (%) fibre diameter	17.2 \pm 0.67	18.1 \pm 0.14	18.1 \pm 0.11	18.1 \pm 0.26	P>0.05
Staple length (mm)	77.7 \pm 2.49	76.2 \pm 0.65	75.3 \pm 0.57	70.9 \pm 1.04	P<0.0001
Staple strength (N/ktex)	45.6 \pm 3.29	46.2 \pm 0.63	46.1 \pm 0.51	45.5 \pm 1.27	P>0.05
Total follicle density (#/mm ²)	76.9 \pm 8.70	82.3 \pm 1.57	83.2 \pm 1.32	84.4 \pm 3.12	P>0.05
S/P ratio	23.2 \pm 3.01	20.7 \pm 0.59	20.6 \pm 0.56	22.2 \pm 1.10	P>0.05

There were associations between skin type and bodyweight, MFD and staple length. The tights had higher MFD and shorter staples (P<0.05) than the other types which were not different from one another (P>0.05). The associations between skin type and CFW, MFD variability, staple strength density and S/P ratio were not significant. These findings contrast those of Daily *et al.* (1997) where sheep closer to the SRS type had lower MFD and MFD variability, and a higher S/P ratio. The results presented here are preliminary and the associations are limited as the measured wool traits are from the fleece collected the previous year, the skin data are from the year before and not all sheep were measured.

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