LIFETIME WOOL 9. PROGENY BACK FAT AND EYE MUSCLE DEPTH

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Differences in body composition generated by plane of nutrition and diet composition are minimised when animals are compared at the same bodyweight. In a review by Black (1974) it is evident that poor nutrition early in life can increase the proportion of carcass fat when animals are compared at the same bodyweight. Greenwood *et al.* (1998) found that low birth weight lambs (2.2kg) contained more fat (14.1 vs 11.9%) at 20kg liveweight than high birth weight lambs (4.9kg). Nolan (1999) lends credence to this evidence suggesting that metabolism can be ‘programmed’ by poor nutrition during foetal and infant life so that when nutrition is later improved the animal is less productive. Therefore progeny from ewes exposed to poor nutrition during pregnancy and lactation should have a higher proportion of fat when compared at the same bodyweight as progeny from well-fed ewes.

Using extra funding from Meat and Livestock Australia, progeny (2002 born) from the ‘Lifetime Wool’ project (Thompson and Oldham 2004, *these proceedings*) had back fat and eye muscle depth at the C-site was measured using an ultra-sound scanner every 8 weeks from weaning until 12 months-of-age. The results presented include only single born and reared lambs that have a back fat and eye muscle depth measurement at 31 ± 1 kg liveweight.

Table 1. The effect of ewe condition score (CS; 2 or 3) at Day 90 of pregnancy and target feed on offer (FOO; kg DM/ha) during late pregnancy and lactation on the back fat and eye muscle depth of single born and reared Merino lambs at 31 ± 1 kg liveweight (mean ± sem).

Ewe Nutrition		No.		Age (days)		Back Fat (mm)		Eye Muscle (mm)	
		VIC	WA	VIC	WA	VIC	WA	VIC	WA
CS:	2	47	68	347±8	165±3	1.84±0.07	1.30±0.05	17.2±0.28	16.1±0.19
	3	63	74	342±8	168±3	1.82±0.06	1.31±0.04	17.3±0.21	16.4±0.22
FOO:	800	19	15	371^{a}±0	170±7	1.92^{a}±0.10	1.33±0.09	16.7±0.39	15.9±0.48
	1100	22	32	352^{ab}±10	165±4	1.93^{ab}±0.08	1.36±0.09	17.0±0.39	16.5±0.30
	1400	26	29	327^{ab}±13	168±5	1.90^{ab}±0.08	1.23±0.06	17.5±0.40	15.9±0.41
	2000	22	37	345^{ab}±12	164±4	1.82^{ab}±0.11	1.36±0.06	17.1±0.37	16.5±0.27
	3000	21	29	303^{b}±16	169±5	1.55^{b}±0.10	1.22±0.06	17.7±0.30	16.4±0.28

Values with different superscripts are significantly different at $P<0.05$.

Progeny at the VIC site had a higher back fat and eye muscle depth at the same liveweight than those at the WA site, probably reflecting differences in dam genotype. There was no significant effect of ewe condition score at mid-pregnancy on the age, back fat or eye muscle depth of the progeny at either site. At the VIC site, progeny from the lowest nutritional treatment during late pregnancy and lactation had significantly more back fat ($P<0.05$) and tended to have less eye muscle at the same liveweight as the progeny from the highest nutritional treatment. These results support the findings of Black (1974) and Greenwood *et al.* (1998) that previous nutrition can affect the proportion of fat in the body, however the effects of ewe nutrition during late pregnancy on the body composition of the progeny were less evident at the WA site. In practical terms, we conclude that the impacts of ewe nutrition on the body composition of Merino progeny, at least up to about 30 kg liveweight, are relatively small and will have little economic significance.

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