LIFETIME WOOL. 9. PROGENY BACK FAT AND EYE MUSCLE DEPTH

B.L. PAGANONI[A], R. BANKS[B], C.M. OLDHAM[A] and A.N. THOMPSON[C]

[A] Department of Agriculture Western Australia, South Perth, WA 6011
[B] Meat and Livestock Australia, North Sydney, NSW 2059
[C] Primary Industries Research Victoria, Department of Primary Industries, Hamilton, Vic 3300

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 (2.2 kg) contained more fat (14.1 *v.* 11.9%) at 20 kg liveweight than high birth weight lambs (4.9 kg). 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 compared with those at the same body weight from well-fed ewes.

Progeny (2002 born) from the Lifetime Wool project (Thompson and Oldham 2004) had back fat and eye muscle depth at the C-site 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 had 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 Merino lambs at 31 ± 1 kg liveweight (mean ± s.e.m.) (VIC - Victoria; WA - Western Australia).

Ewe	No.		Age (days)		Back Fat (mm)		Eye Muscle (mm)	
Nutrition	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 in columns for specific variables with different superscripts are significantly different ($P<0.05$)

Progeny at the Victorian site had a higher back fat and eye muscle depth at the same liveweight than those at the Western Australian 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 Victorian 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 was less evident at the Western Australian site. In practical terms, however, 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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Email: bpaganoni@agric.wa.gov.au