Proc. Nutr. Soc. Aust. (1991) 16

FEED REQUIREMENTS OF MERINO EWES FOLLOWING DIVERGENT SELECTION FOR WEANING WEIGHT

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Selection for increased liveweight (LW) in lambs results in a proportional increase in LW of the mature ewe accompanied by an increase in the feed requirement of the breeding flock. The size of any increase in flock feed requirements may be mitigated by correlated improvement in feed efficiency. We present here estimates of feed requirements for maintenance and growth by Merino ewes following long-term (>32 years) divergent selection for weaning weight.

The ewes were from 3 closed lines established in 1951 and selected either for high (W+) or low (W-) weaning weight, or from an unselected random (R) line. The ewes (4-8 years old; not pregnant or lactating) were fed a pelleted ration (70% lucerne:30% wheat) whilst in individual pens. They were fed for 6 weeks at 1 of 6 levels of feeding and were weighed weekly. The feeding levels were 0.5, 0.75, 1.0, 1.25, 1.5 and 1.75 times the expected maintenance requirement of 0.352MJ ME/kg $LW^{.75}$/day. Daily gain in LW, and LW midway through the experiment, were calculated for each sheep. The relationships between selection line, LW change and feed intake were examined using general linear model analyses.

The W+ ewes were 35% heavier than the W- ewes but required only 24% more feed energy per day to maintain constant LW (see table). There was a 3% reduction in feed required to maintain each kg of LW, which might be considered indicative of an improvement in feed efficiency in the W+ ewes. However, scaling feed intakes for differences in metabolic size ($LW^{.75}$) removed the differences between selection lines. This suggests that the reduction in feed required per kg LW reflected the slight reduction in metabolic rate known to accompany increase in size rather than any real improvement in feed efficiency. Efficiency of feed use for LW change was 0.41±.04, 0.45±.04 and 0.38±.04 kg gain/MJ ME/kg $LW^{.75}$ respectively for the W+, R and W- ewes.

Feed required for constant LW	Selection line W+	R	W-
No. of ewes	33	37	34
Liveweight (kg)	38.6±.9[a]	34.0±.8[b]	28.6±.7[c]
MJ ME/day	7.19±.26[a]	6.46±.21[b]	5.82±.20[c]
MJ ME/kg LW/d	.185±.006[a]	.186±.005[a,b]	.191±.004[b]
MJ ME/kg $LW^{.75}$/d	.458±.012	.446±.010	.446±.010

Means (±s.e.) within a line with different superscripts differ significantly ($P<0.05$)

After 10 years of selection W+ ewes were 15% heavier than W- ewes and required 15% more feed per day to maintain constant LW (Pattie and Williams 1967). Our results show that after more than 32 years of selection for weaning weight, efficiency of feed use for maintenance did not differ between selection lines. The ewes from each selection line were equally efficient in their use of feed for LW gain or loss.

PATTIE, W.A. and WILLIAMS, A.J. (1967). Aust. J. Exp. Agric. Anim. Husb. 7:117.

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