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Extreme ewes: Fleece weight selection – wool, lambs or meat?

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The negative genetic correlation between clean fleece weight (CFW) and fat depth (Fogarty et al. 2003) is under investigation. Adams et al. (2004) found that as CFW increased, the ability of Merinos to store fat declined under low and moderate feed conditions. The biological impact of reduced body fat during times of nutritional stress is likely to extend to various aspects of reproduction, including fertility, lamb survival, lamb weight (Cloete et al. 2004) and meat quality (Pethick et al. 2005). This paper reports the responses to a regime of restricted feed intake among ewes selected for high (H) and low (L) CFW and (H) and low (L) bodyweight (BWT), after 8 months of treatment.

Haddon Rig medium wool Merino ewes (*n=314*) and rams (*n=12*) from the Trangie QPLU$ project (Taylor and Atkins, 1997) were selected on the basis of their hogget CFW, fibre diameter (FD) and off-shears BWT using a standardised deviation approach. A revolving pattern of allocation to each of 4 phenotype groups was used to ensure that the best available ewe and ram was allocated to each phenotype (CFW and BWT respectively, creating HH, HL, LH and LL). The ewes were allocated by stratified randomisation into replicated average and high stocking rate treatments (10 DSE/h and 15–30 DSE/ha) to restrict total feed intake. Care was taken to randomise FD across the four groups and each grazing replicate. Stocking rate was adjusted according to fortnightly feed-on-offer estimates, with pasture quality measured at critical dates. The treatment reported here covers joining to day 140 of pregnancy and from marking to weaning. Ewes were joined and lambed in single sire groups and measurements include fortnightly liveweight, monthly fat scores (GR), periodic ultrasonic fat depth (FatC) and loin muscle depth measures and wool dyebands. Data were analysed using REML linear mixed models (GENSTAT 2005).

Phenotype, adjusted for liveweight, had an effect on muscle depth at weaning (<0.05) and on fat score (<0.001) and fat depth (<0.001) at mid-pregnancy and weaning. High CFW ewes (HH and HL) had reduced muscle depths in comparison to low CFW ewes. Stocking rate affected fat score and fat depth at mid-pregnancy but not at weaning. Total weaning weight of lamb was significant (<0.001) with HH and LH ewes weaning more weight in lamb than HL and LL. Preliminary conclusions are that HH ewes are leaner and less muscular than all phenotypes at weaning, having reared more weight of lamb. When high BWT is combined with high CFW, a negative impact on body composition occurs independent of stocking rate, and at important stages of reproduction. The impact of these effects on subsequent reproduction, wool growth and hogget meat quality will be monitored during 2007.

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