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Lambs sired by rams with low Australian Sheep Breeding Values for C-site fat depth have superior efficiency during finishing

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SUMMARY

Lambs may be subjected to periods of nutrient restriction. In cattle, such restriction limits their ability to meet market specifications (Greenwood and Cafe 2007). Ryan *et al.* (1993) demonstrated that feed-restricted wether lambs showed no change in feed conversion ratio (FCR) and Owens *et al.* (1995) demonstrated that lean tissue development is more efficient than growth of fat tissue. Therefore, we hypothesised that pre-weaning nutritional restriction would not affect feed efficiency during finishing and that a reduction in sire post-weaning C-site fat depth (PFAT) Australian Sheep Breeding Value (ASBV) would improve lamb efficiency during finishing. To achieve a nutrient restriction prior to weaning, we assessed twin *v.* single lambs. Two groups of lambs were finished: the average age at finishing of group 1 was 210 days (n = 40) and that of group 2 was 252 days (n = 35). Group 1 consisted of the heaviest lambs at weaning and group 2 the lightest lambs at weaning. Groups were balanced for sire, sex and numbers of twin- and single-born lambs. The lambs were the progeny of 13 sires that varied in PFAT ASBV(–1.59 to 0.3). Lambs were group-housed during finishing, fed a pelleted diet (13.5 MJ ME/kg dry matter, 16.7% crude protein) and individual feed intakes were recorded. Liveweight change and individual feed intake were used to calculate FCR. Single ewe lambs had a better FCR (about three FCR units) than twin ewe lambs ($P < 0.05$), a difference that was not evident in wethers (Fig. 1*a*). Lambs from group 1 were about nine FCR units more efficient ($P < 0.05$) than group 2 lambs, and within both groups, a decrease in sire PFAT of 1.5 mm improved ($P < 0.05$) lamb efficiency by about five FCR units (Fig. 1*b*).

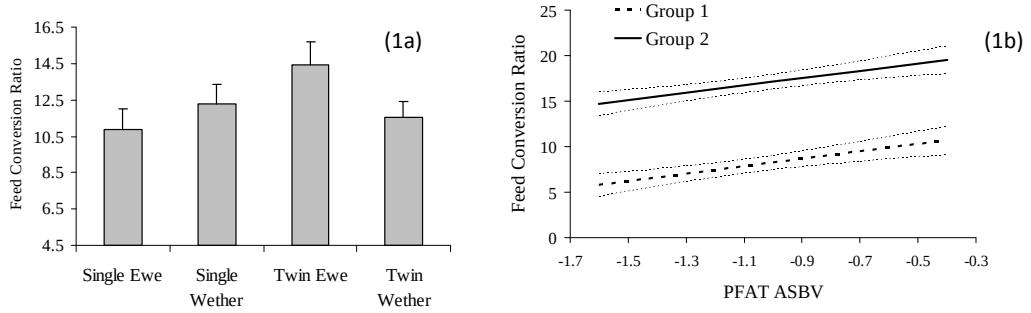

Figure 1. Effect of lamb sex and birth/rear type (*a*) and sire PFAT Australian Sheep Breeding Value (*b*) on feed conversion ratio (kg feed per kg liveweight gain) during finishing.

In contrast to our first hypothesis, twin ewe lambs were less efficient than single ewe lambs. However, the lack of a difference in FCR of wether lambs is consistent with Ryan *et al.* (1993). In support of our second hypothesis, lambs sired by leaner sires were more efficient during finishing in groups 1 and 2, which was probably associated with differences in the efficiency of lean tissue accretion (Owens *et al.* 1995). We are uncertain as to why there is divergence in the efficiency of groups 1 and 2, but it may be associated with stage of maturity. These results show that the current practice of selecting rams with low PFAT will improve FCR, and that an early restriction will affect the FCR of twin ewe lambs during finishing.

REFERENCES

Greenwood PL and Cafe LM (2007). Prenatal and pre-weaning growth and nutrition of cattle: Long-term consequences for beef production. *Animal*. **1**, 1283–1296.

Ryan WJ, Williams IH and Moir RJ (1993). Compensatory growth in sheep and cattle. 1.Growth patterns and feed intake. *Australian Journal of Agricultural Research* **44**, 1609–1621.

Owens FN, Gill DR, Secrist DS and Coleman SW (1995). Review of some aspects of growth and development of feedlot cattle**.** *Journal of Animal Science* **73**, 3152–3172.