HIGH FLEECE WEIGHT SHEEP SOMETIMES REQUIRE MORE FEED THAN LOW FLEECE WEIGHT SHEEP

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This study examined the impact of estimated breeding value (EBV) for clean fleece weight (CFW) on feed intake by sheep offered feeds that differed in nutritive value. Groups of 24 high and 21 low CFW ewes aged 20 months were selected from the Katanning Base Flock. The mean EBVs for the high and low CFW groups were 0.5 and –0.25 kg, respectively. Sheep with high and low EBVs for fibre diameter (FD) were selected within each group, but it was not possible to balance the fleece weight groups exactly, so the mean FD was 21.2 *v.* 20.1 μm for the high and low CFW groups, respectively. There was also a constraint on liveweight such that, when the study began, the mean weights were 45.2 kg for the high CFW group and 44.1 kg for the low CFW group. The sheep were maintained in single pens in an animal house for a month before the experiment started, to familiarise them with the feed and the accommodation.

In experiment 1, feed intakes were measured for a period of 2 weeks using a diet of moderate quality, being 88% oaten hay (*in vitro* digestibility 55.7%, crude protein 7.0%; measured by NIR) with 10% lupin grain and 2% mineral mixture. High CFW sheep ate more of this feed (1.37 *v.* 1.28 ± 0.03 kg/day, $P<0.05$, using liveweight as a covariate), but the mean liveweight gain was similar for both groups (0.95 kg per week). The EBV for FD was not related to feed intake or liveweight gain.

In a second experiment, animals were fed a low quality diet of milled barley straw (*in vitro* digestibility 49.9%, crude protein 4.8%) with 2% mineral mix for 4 weeks. There was no difference between the high and low CFW groups in feed intake during the measurement period, but the high CFW animals lost more liveweight ($P<0.01$; mean weekly losses were 1.33 *v.* 1.10 ± 0.05 kg). There was no significant effect of FD, but there was an interaction between CFW and FD ($P<0.05$), with the greatest liveweight loss occurring in high CFW sheep with a high EBV for FD.

Animals were then returned to pasture and shorn. Four months later, a third experiment was carried out on 12 high CFW and 12 low CFW ewes (average FD 21.0 *v.* 20.0 μm, respectively). Mean liveweights at this time were 54.1 and 54.0 kg, respectively. The sheep were re-introduced into the animal house and fed a diet with higher nutritive value (estimated *in vitro* digestibility 64.0%, crude protein 14%) for 2 weeks. The average daily intakes were 2.09 *v.* 2.13 ± 0.11 kg ($P>0.05$) for the high and low LCFW groups, respectively, and the average weekly increase in liveweight was 3.0 and 3.2 kg ($P>0.05$).

Sheep with a high CFW had a 7% greater intake on moderate quality feed than sheep with a low CFW, but when offered feed that was of such poor quality that they could not eat more of it, they lost more liveweight. No differences were observed when the sheep were offered high quality feed. In contrast, Thomson *et al.* (1989) observed that high fleece weight Romneys ate more good quality lucerne hay, but not medium quality meadow hay, compared to controls. This difference may be a breed effect, but it may also be caused by differences in fatness because the proportion of fat in the body affects feed intake and relative metabolic rate. In the present study, sheep were heavier and fatter in the third experiment in which they were offered high quality feed. If fleece weight affects the capacity of sheep to lay down fat under some conditions, it may result in the differences observed above and by Thompson *et al.* (1989). We conclude that further studies are needed to define the circumstances under which fleece weight affects feed intake.

THOMSON, B.C., DELLOW, D.W. and BARRY, T.N. (1989). *Aust. J. Agric. Res*. **40,** 1065-1074.

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