

FINEWOL SHEEP ARE LESS SUSCEPTIBLE TO CORTISOL-INDUCED FOLLICLE SHUTDOWN THAN STRONGWOOL SHEEP

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Low staple strength of fleeces from sheep in Mediterranean environments is partly associated with an induction of follicle shutdown which coincides with the break of the season in autumn (Schlink, unpubl. data). Little is known of the causes of follicle shutdown or of the susceptibility of different sheep genotypes to environmental stressors. We have examined the follicular responses of sheep differing in fleece phenotype to cortisol injection.

Four groups of sheep were selected as follows: (1) low diameter, low coefficient of variation (CV) of diameter (LL); (2) low diameter, high CV of diameter (LH); (3) high diameter, low CV of diameter; (4) high diameter, high CV of diameter (HH), from Finewool (L) and Strongwool (H) flocks. The selected sheep (n=10/group) were individually penned, offered a maintenance diet of sheep pellets and oats chaff and injected (im.) with cortisol (1.27 mg/kg liveweight.day) daily for a period of 2 weeks. Skin samples (1 cm diameter) were taken from the left midside region of each sheep at weekly intervals after injection commenced. Shutdown (%) was determined as per Hughes *et al.* (1996).

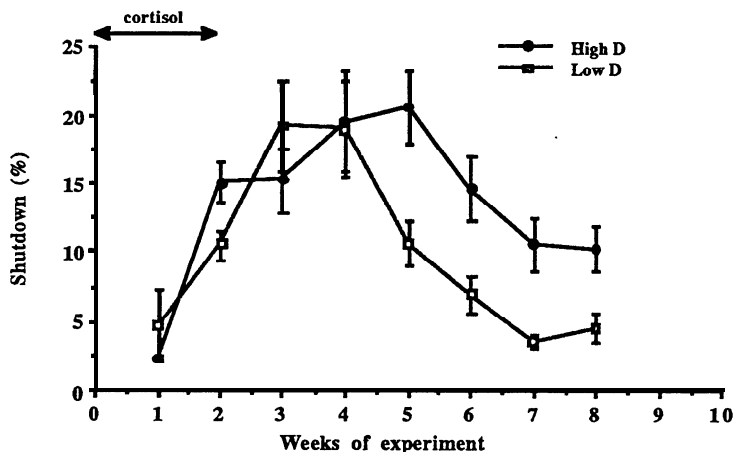


Figure 1. Changes in follicle shutdown (%) with time after cortisol (means \pm SEM)

There was no significant effect of fibre diameter variability on follicle shutdown (%) ($P = 0.178$) so only fibre diameter groups are considered. On average the Finewool sheep had fewer ($P < 0.001$) shutdown follicles than Strongwool sheep in the 8 week period after cortisol dose was started (Fig. 1) largely due to a significant diameter group \times time interaction ($P < 0.0119$). The follicles of Finewool animals recovered much more rapidly than those of Strongwool animals after the cortisol injections were stopped. Plasma cortisol levels throughout the experiment were similar in all groups.

These results suggest that there are genetic differences in follicle susceptibility to elevated cortisol levels, with the follicles of Finewool animals able to recover more rapidly than those of Strongwool animals. Variability of fibre diameter had no effect on follicle shutdown propensity. This has implications for the selection of sheep resistant to environmental stresses, particularly in relation to staple strength.

HUGHES, A., HYND, P.I. and EARL, C.R. (1996). *Proc. Aust. Soc. Anim. Prod.* **21**: 436.