

EARLY EVIDENCE OF A DIFFERENCE IN WOOL PRODUCING ABILITY

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Williams et al. (1972) reported that the concentration of free cyst(e)ine in plasma was lower in sheep selectively bred for high clean fleece weight (Fleece Plus) compared with sheep selectively bred for low clean fleece weight (Fleece Minus). This observation could be useful as an indirect means of selection for fleece weight, particularly if the concentration differed at an early age. The results of the present work indicate that the genetic difference in cyst(e)ine concentration is evident quite early in the sheep's life.

A flock of medium wool Merino ewes was divided into two groups, which were joined with either Fleece Plus or Fleece Minus rams (Pattie and Barlow 1974). After joining, the ewe flocks grazed together. At lambing, the lambs were identified with respect to dam, and thus, sire. Before marking, when the lambs were 7-10 days of age, blood samples were collected from 64 lambs, 32 of each sire group. The concentration of cyst(e)ine, both free and disulphide-bound, was assayed in plasma.

The lambs were again sampled on three occasions when they were 10, 12 and 13 months of age; wool production at the midside also being measured at these times by clipping from a measured area of skin.

The lambs sired by the Fleece Plus rams had consistently lower ($P < 0.05$) concentrations of cyst(e)ine in their plasma at each sampling; the concentration also being similar in the plasma from lambs and older sheep (Table 1).

TABLE 1 The concentration of cyst(e)ine ($\pm$ S.D.) in the plasma of sheep from two genotypes at various ages

Age	Fleece Plus Sire	Fleece Minus Sire
7-10 days	43.5 μ M (6.0)	52.2 μ M (4.6)
10 months	43.4 μ M (6.0)	52.1 μ M (4.6)
12 months	52.5 μ M (5.5)	60.1 μ M (6.5)
13 months	44.2 μ M (4.4)	53.1 μ M (4.5)

The daily rate of wool production at the midside during the three month sampling period was significantly greater in sheep sired by Fleece Plus rams (1.48 v 0.96 mg/cm²).

These results indicate that there is a genetic association between adult clean fleece weight and plasma cyst(e)ine concentration measured early in life. However, if the genetic correlation is only of the same order as the estimated phenotypic correlation ($r_p = 0.21$), plasma cyst(e)ine measured early in life is unlikely to be a useful indirect selection criterion for improving clean fleece weight.

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