

AMINO ACID SUPPLEMENTATION OF AN OAT GRAIN DIET AND WOOL GROWTH

J.R. LINDSAY,* J.P. HOGAN* and R.H. WESTON*

The significance of the supply of sulphur amino acids in limiting wool growth in sheep fed a diet of oat grain (*Avena sativa*) + minerals has been examined in wool growth and digestion experiments.

In one wool growth study, sheep offered 500-600 g oat grain daily were infused per abomasum for 12 weeks with L-cystine (2 g/day), casein (60 g/day) or L-cystine (2 g/day) + casein (60 g/day). Wool growth rates estimated by a clipping procedure, relative to the control period (\pm SE) were $107 \pm 26\%$, $168 \pm 10\%$ and $223 \pm 25\%$ respectively; the corresponding values for fibre diameter³ (d^3), used as an index of wool growth (Downes 1971) were $112 \pm 16\%$, $155 \pm 10\%$ and $188 \pm 21\%$. In a second wool growth study, sheep offered 500 g oat grain daily were infused per abomasum with either L-cystine (2 g/day) or L-cystine (2 g/day) + casein (20, 40 or 60 g/day). Relative to control periods, the values for d^3 were $100 \pm 5\%$ with cystine and $179 \pm 12\%$ with cystine + all levels of casein.

For digestion studies sheep prepared with cannulae in the rumen, abomasum and terminal ileum were offered 500 g oat grain (1.57% N) daily either alone or supplemented per abomasum with cystine (2 g/day [³⁵S]cystine (25 μ Ci/g)) or casein (60 g/day, 7.7 g N). Rates of flow of digesta and non-ammonia nitrogen (NAN) were measured using the marker ⁵¹Cr-EDTA as described by Hogan (1973). The recovery of ³⁵S at the terminal ileum was $3.0 \pm 0.2\%$. As shown in Table 1, ileal digesta flow was not significantly altered by cystine infusion but was reduced by 24% with casein infusion. Both infusions reduced the flow of NAN by about 20%. Hence amino acid absorption was not impaired with cystine infusion.

TABLE 1. Flow from the ileum

	Basal	Basal + cystine	Basal + casein	(SED) [†]
Digesta (kg/day)	1.41	1.23	1.08*	0.10
NAN (g/day)	2.23	1.74*	1.86*	0.14

* Basal significantly different from basal + supplement ($P < 0.05$)

† SE of difference between means

The data suggest that contrary to the situation with roughages (Reis et al. 1973) the supply of sulphur amino acids is not the primary factor limiting wool growth with oat grain diets fed at about maintenance. Similar considerations may apply with wheat grain diets (Reis and Tunks 1974).

DOWNES, A.M. (1971). Appl. Polym. Symp. No. 18, p. 895.HOGAN, J.P. (1973). Aust. J. agric. Res. 24: 57.REIS, P.J. and TUNKS, D.A. (1974). Aust. J. agric. Res. 25: 919.REIS, P.J., TUNKS, D.A. and DOWNES, A.M. (1973). Aust. J. biol. Sci. 26: 249.