

METABOLIC FATE OF DOSES OF [<sup>35</sup>S]METHIONINE AND [<sup>35</sup>S]CYSTINE IN SHEEP

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Wool growth is stimulated by abomasal supplements of S-amino acids but dietary supplements are usually ineffective due to degradation in the rumen (Downes *et al.* 1976). Downes *et al.* (1970) found marked differences in the fate of doses of L-[<sup>35</sup>S]methionine given in the diet or via the abomasum. As L-cystine and both D- and L-methionine are effective for stimulating wool growth, the fate of doses of <sup>35</sup>S-labelled L-cystine, and L-, DL- and D-methionine has been compared. Each sheep was given 800 g/d of a roughage diet. Doses of amino acids (1.4 g of D-Met; 2.0 g of other doses) were given as abomasal infusions over a period of 6 h or were added to the diet (consumed within 4 h). Analytical procedures were as described by Downes *et al.* (1970).

TABLE 1. Fate of doses of [<sup>35</sup>S]methionine and [<sup>35</sup>S]cystine (5 µCi/g)

	Dose added to diet				Dose infused into abomasum			
	L-Met	DL-Met	D-Met	L-Cys	L-Met	DL-Met	D-Met	L-Cys
Observations	4	2	2	2	4	2	2	2
<sup>35</sup> S in plasma (% dose/l):								
Maximum	4.1	3.3	3.3	6.0	3.5	3.6	3.5	3.1
After 4 d	1.0	0.8	0.5	0.6	3.2	2.6	3.1	2.9
% of <sup>35</sup> S dose in:								
Urine (7 d)	52	47	40	78	11	11	14	13
Faeces (7 d)	20	18	20	20	9	4	5	14
Wool (14 d)	5	4	7	5	23	20	20	28

Dietary doses of methionine resulted in a peak of <sup>35</sup>S in plasma after c. 6 h (3 h for cystine) mainly in non-protein components; after 4 d virtually all <sup>35</sup>S in plasma was bound to proteins. Following abomasal doses, most of the <sup>35</sup>S in plasma was bound to proteins, reaching a peak after 1 d and remaining elevated after 4 d (Table 1). A much higher proportion of <sup>35</sup>S was excreted in the urine after a dietary dose than after an abomasal dose (Table 1), especially during the first day. All amino acids behaved similarly except for the greater urinary excretion of <sup>35</sup>S following a dietary dose of cystine. The incorporation of <sup>35</sup>S into wool was 4-5 times greater after an abomasal dose than after a dietary dose (Table 1), and appeared to be higher with sheep that grew wool at a faster rate. The higher incorporation of <sup>35</sup>S into wool following abomasal cystine may be related to the higher wool-growing capacity of these sheep.

These results indicate rapid ruminal degradation of dietary doses of S-amino acids and poor utilization for wool growth. The greater urinary excretion and higher levels of free <sup>35</sup>S in plasma 3 h after a dietary dose of cystine indicate that it may be degraded more extensively than methionine. All abomasal doses of amino acids were utilized with similar efficiency, and as most of the S incorporated into wool is in cyst(e)ine, it is apparent that L- and D-methionine are efficiently converted to L-cyst(e)ine.

DOWNES, A.M., REIS, P.J., and HEMSLEY, J.A. (1976). In "Reviews in Rural Science II" p. 143. (University of New England: Armidale.)

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