FATE OF INTRAVENOUS DOSE OF ^{35}S-METHIONINE IN SHEEP WITH DIFFERENT POTENTIAL FOR WOOL GROWTH

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Two lines of Peppin Merino sheep with markedly different propensity for wool growth (Fleece Plus, F+ and Fleece Minus, F-) have been developed by the Department of Agriculture at Trangie, NSW. Much attention has been directed at identifying the reason for the superior performance of the F+ line. Many important physiological differences have been observed. The entry rate of cystine (Williams 1976) and plasma cystine concentration (Williams et al. 1972) are lower in the F+ animals, but the underlying cause of the differences in wool growth is not yet known. The purpose of the experiment described here was to examine the possibility that the turnover rate of plasma albumin contributed to the difference between the two lines of sheep.

Six Merino wethers (three F+ and three F-) were housed indoors in metabolism crates at ambient temperature and controlled lighting (12h light and 12h dark). The sheep were offered lucerne chaff (800g/24h) by a continuous feeding machine and water was available ad libitum. The sheep were adapted to the diet and feeding regimen by once daily pen feeding for nine days, and then continuous feeding in the metabolism crates for seven days prior to the experiment.

A single injection of 320-400 μCi L-[^{35}S]-methionine (746 mCi/mmol; in sterile physiological saline) was administered to each sheep at 0800h. Blood samples (10 ml) were withdrawn into heparinised syringes at frequent intervals for the first 12 hours of day one, and then at 0800h and 2000h on the remaining 13 days of the experiment. Urine was collected every 24 hours.

Plasma was fractionated into protein and non-protein components using sulphosalicylic acid. Globulin and albumin were isolated from plasma using gel filtration on Sephacryl S-200. In the table below, the recovery of ^{35}S in various plasma fractions on day seven is shown. The cumulative excretion of ^{35}S in the urine is also shown.

	F-	s.e.	(n)	F+	s.e.	(n)
(%dose/l/kg$^{0.73}$ x10^{-6})						
plasma	0.133	0.020	3	0.117	0.019	3
plasma protein	0.135	0.019	3	0.111	0.002	3
supernatant	0.005	0.0003	3	0.004	0.00008	3
(%dose/mg/kg$^{0.73}$)						
plasma albumin	1.478	0.115	3	1.203	0.209	3
(%dose)						
urine (7 day collection)	8.282	0.655	3	10.058	0.733	3

The relationship between %dose appearing in the albumin and time could be fitted to a fourth order equation. The rate of incorporation of ^{35}S into albumin tended to be higher in the F- sheep and the % dose incorporated was also greater. The excretion of ^{35}S in the urine of the F- sheep was lower than the F+.

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