

THE EFFECT OF INTRAVENOUS ADMINISTRATION OF PHOSPHATE IN SHEEP

K.M. TOWNS*, F. VAN DEN BOOM* and H. STUBBE*

Salivary secretion of phosphorus (P) is a major factor influencing P homeostasis in sheep, but it is not certain whether this high endogenous secretion allows more efficient utilization of P. A single high dose of P (3.4g) given rapidly was quantitatively recovered from the faeces in the subsequent 4 days (Clark *et al.* 1973). In order to simulate natural conditions more closely, a smaller amount of P (1.5g/d) has been infused continuously over an 11-day period. The effect of the infused P on P turnover was examined using conventional balance techniques. Four sheep were given a ration of 700 g/d 1:1 lucerne and oaten chaff for 2 weeks prior to and during the experimental periods. The ration contained 1.08 g/d P and 4.01 g/d Ca.

Plasma P levels in 3 sheep rose from 4.2 to 13 mg/100 ml on the first day of infusion, but stabilized after one day at 5.8 mg/100 ml until the infusion was stopped, when the value immediately returned to 4.2 mg/100 ml. In the fourth animal, the plasma P was originally 4.9 mg/100 ml but rose to 63 mg/100 ml on the first day of infusion and then fell sharply, stabilizing at 7.7 mg/100 ml after 3 days. Values for faecal and urinary excretion of P are shown in table 1.

TABLE 1: Faecal and urinary excretion of P and balance data (mg/d) for four sheep prior to and during intravenous P infusion (mean $\pm$ SEM, n = 7).

	Sheep 1		Sheep 2		Sheep 3		Sheep 4	
Preinfusion								
Faecal P	992	± 47	969	± 71	983	± 69	819	± 86
Urine P	7	1	6	0.5	7	0.5	9	0.5
Balance	81	51	105	71	90	70	252	84
Infusion (days 5-11 inclusive)								
Faecal P	2487	± 140	2308	± 240	2219	± 210	1676	± 137
Urine P	9	2	7	0.1	12	4	367	45
Balance	84	143	265	242	349	212	537	147

Assuming that 10 l/d of saliva is secreted and that the concentration of P in saliva is directly related to and about 10 times greater than the concentration in plasma (Tomas, Moir and Somers 1967), the amount of P presented for absorption in sheep 1, 2 & 3 in the first period would be 5.28 g/d and the amount during the infusion period would be 6.88 g/d. In order to obtain the observed recoveries in the faeces we must assume that the true absorption of P in the first period is 81% and in the second 66%. Alternatively, if there was no change in the true absorption of P, daily excretion in the saliva would have to increase to 11.2 g/d to explain the amount of P recovered in the faeces.

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* School of Agriculture, La Trobe University, Bundoora, Victoria. 3083