

Brief Communication

THE TRUE DIGESTIBILITY OF PHOSPHORUS IN THE EWE

The true and the apparent digestibility of nutrients is not always of the same magnitude. Differences in these figures might in particular be expected with mineral components which are returned by the digestive juices to the alimentary tract. The size of the endogenous return may be measured in periods when the particular nutrient is taken away from the ration (*Nicolaysen* 1937). A more recent approach is to label either the endogenous or the exogenous nutrient by a radio-isotope. Such a procedure was applied to ruminants by *Kleiber* (1956). The present work was undertaken by this method. It was used to assay the true digestibility of phosphorus by the pregnant Norwegian ewe late in the indoor period, and further to see if oral supplement with vitamin D₃ had an effect under these conditions.

Six animals one month before the lambing were injected intravenously with 12 mC P 32, labelled orthophosphate solution left in the pen for one week, and then kept another week in animal cages for the collection of urine and faeces. Venous blood samples were drawn each morning. The ewes were fed silage with small supplements of concentrate and mineral mixtures for dairy cows. Vitamin D was given with the concentrate. The distribution of phosphorus in the ration was 46 % in silage, 30 % in the minerals and 24 % in the concentrate. The endogenous and true digestible phosphorus was calculated from each day's sample, and then averaged for the week.

$$\text{Endogenous P} = \text{faeces P} \times \frac{\text{spec. act. of P in faeces}}{\text{spec. act. of P in serum (or urine)}}$$

$$\% \text{ true digestibility} = \frac{\text{P intake} - (\text{faeces P} - \text{endogenous P})}{\text{P intake}} \times 100$$

Urine and serum phosphorus specific activity did not deviate significantly and the average values were used for the calculations.

The results which are given in Table 1 show that true digestibility in the sheep ration was 59 %, which is much above

Table 1. Vitamin D and phosphorus digestibility.

Dose, i.u. a day	0	10 ²	10 ³	10 ⁴	10 ⁵	10 ⁶
Number of animal	1	1	1	1	1	1
Serum inorg. P, mg%	5.8	5.9	4.8	5.3	4.7	9.5
P intake, g	5.0	5.0	5.0	5.0	5.0	4.7
Apparent digest. P, %	19	14	15	20	15	47
Endogenous P, %	40	48	48	47	52	36
True digest. P, %	59	62	63	67	67	83

the 19 % apparent digestibility. It is higher than the 55 % utilization found by *Gueguen* (1962) for the lucerne hay, but lower than that of the high mineral supplemented rations given by *Conrad* (1965), both with male animals.

Only slight effects of vitamin D were noted, upon the true digestibility, and this does indicate a saturated situation in the animals. With the highest dose (10⁶ i.u. a day), however, there was pronounced difference to the serum phosphorus and phosphorus retention figures. The improvement in apparent digestibility was in part due to a reduction in the endogenous phosphorus, but equally due to a higher true digestibility of the phosphorus.

H. N. Astrup, E. Nordrum, K. Steenberg and J. J. Nedkvitne
The Institute of Animal Nutrition,
Agricultural University, Oslo, Norway.

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Reprints may be requested from: H. N. Astrup, Institute of Animal Nutrition, 1432 Ås-NLH, Norway.