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*Summary only*

THE EFFECT OF FEEDING FORMALDEHYDE-TREATED CASEIN AND LUCERNE MEAL TO SHEEP ON NITROGEN METABOLISM AND WOOL PRODUCTION

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STUDIES of the nitrogen metabolism and wool production in Romney sheep fed formaldehyde-treated casein (two experiments) and formaldehyde-treated lucerne meal (one experiment) are described.

EXPERIMENT 1

Wethers in metabolism cages were fed once daily a maintenance ration of 750 g chopped hay. Supplements of 25 g, 50 g or 75 g of treated or untreated casein were given daily as drenches at feeding.

Treating the casein reduced the concentration of ammonia in rumen fluid, at all three levels of casein administration.

Nitrogen (N) retention was greater for treated than untreated casein, owing to a marked reduction in urinary N excretion.

EXPERIMENT 2

Thirty-six dry ewes aged 17 months were kept in pens and fed a basal ration of 650 g chopped hay and 125 g ground barley. The treatments comprised 25 g, 50 g and 75 g of treated or untreated casein per day, given by mixing with the barley.

The trial commenced in February 1969 and lasted for 15 weeks, divided into three equal periods. Midside wool samples measuring 100 cm<sup>2</sup> were clipped from each animal at the end of each period.

At the 25 g, 50 g and 75 g casein levels, treatment of the casein increased wool production by 31%, 27% and 39%, respectively. Formaldehyde treatment at the 25 g casein level produced no change in fibre diameter, but at the 50 g and 75 g levels diameter was increased by 2.5 (7.8%) and 3.6 microns (10.8%), respectively.

The increase in production at the 25 g level of casein feeding was caused entirely by an increased rate of fibre extension. At the 50 g and 75 g levels, 40% of the increase was attributable to increases in rate of fibre extension and 60% to increases in cross-sectional area.

Liveweight changes were small, but treated casein consistently promoted more gain than untreated casein.

### EXPERIMENT 3

A pelleted ration containing 55% hay, 15% barley and 30% lucerne meal was fed (1 kg/day) to wethers in a metabolism trial. The lucerne was soaked in four times its weight of formaldehyde solution for one hour at room temperature, followed by drying at 50 to 55° C. Formaldehyde concentrations of 0.033%, 0.066%, 0.10%, 0.25% and 0.50% were used; the lucerne in the control ration was neither soaked nor heat dried.

Nitrogen retention was 26% of N intake for the control ration; it decreased to 17% for 0.033% formaldehyde-treated ration and then increased with increasing formaldehyde concentration to reach 26% for the 0.25% treatment. At 0.50% formaldehyde N retention was 12% of N intake.

The true digestibility of lucerne N was calculated. This decreased sharply from 95% for the control ration to 80% for 0.033% formaldehyde-treated ration and then decreased more slowly to reach 50% where 0.50% formaldehyde was used.

Twenty-eight per cent. of truly digested N was retained on the control ration. This dropped to 20% for the 0.033% treatment, increased to a maximum of 33% for 0.25% formaldehyde-treated ration and then decreased to 16% at 0.50% formaldehyde.

The results obtained for the 0.033% formaldehyde-treated ration showed that protein damage had taken place in the soaking and heat-drying process and it is considered that this would have occurred to the same extent in all treatments. If this had not occurred, it is inevitable that N retention, as a percentage of N consumed, would have been higher than the control for the 0.25% formaldehyde treatment.

"Over-protection" of protein is evident on the 0.50% treatment.

Energy digestibility was depressed by 2 to 4 units on all treatments.