

FEEDING POULTRY MANURE AS A SOURCE OF AMINO ACID NITROGEN  
INCREASES INTAKE OF WHEAT STRAW DIET IN SHEEP

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Voluntary food intake (VFI) of sheep grazing poor quality cereal stubble may be improved by increasing rumen microbial growth and flow of digesta through the rumen. While nonprotein-nitrogen (NPN) may supply the nitrogen (N) requirements of rumen microorganisms for maintenance and growth, the addition of amino acid N can increase the cell yield (Maeng *et al.* 1976). Both NPN (ca. 40% of the total N) and amino acid N are available in poultry manure (PM) which is generally cheap and readily available in developing countries whereas protein sources such as legume seeds and oilseed byproducts are scarce or expensive. However, the use of PM in ruminant diets may be limited by its high ash content and presence of salmonella. These problems may be overcome by substituting some urea to reduce the high mineral content of a PM-based diet, ensiling PM to eliminate salmonella, and adding molasses in silage to improve its acceptability (Muller 1980). We tested the hypothesis that sheep fed wheat straw and urea with PM silage will eat more than sheep fed only straw and urea, and that including molasses in the silage will further increase the VFI.

Groups of four Merino wethers weighing  $62 \pm 1.2$  kg were individually fed one of three isonitrogenous diets (Table 1) for 31 days including 21 days of adaptation. Manure from caged laying hens was ensiled in airtight polyethylene bags and stored for six months and then mixed daily with wheat straw sprayed with urea.

Table 1 Composition of diets (g/kg dry matter) and experimental results

Diets	A	B	C	s.e.m.
Wheat straw, hammermilled	938	794	810	
Urea	40	20	20	
PM silage	-	178		
PM-molasses (33:1) silage	-	-	162	
Mineral mix	10	-		
Sodium chloride	4	4	4	-
Sodium sulphate	8	4	4	-
Total nitrogen	20.8	20.4	20.5	-
Total ash	62.2	95.1	113.5	-
Dry matter intake (g/day)	418 <sup>a</sup>	624 <sup>b</sup>	566 <sup>ab</sup>	70
Dry matter digestibility (%)	50 <sup>a</sup>	48 <sup>a</sup>	47 <sup>a</sup>	2
Organic matter (%)	54 <sup>b</sup>	51 <sup>ab</sup>	49 <sup>a</sup>	2
Nitrogen retention (g/day)	-1.0 <sup>a</sup>	0.5 <sup>b</sup>	0.7 <sup>b</sup>	0.4

Means in the same row with different superscripts differ significantly ( $P < 0.05$ )

Sheep fed diets B and C, which contained both amino acid and NPN, ate more DM and retained more N than those fed diet A with only NPN added without change in the digestibility of DM. This suggests that PM could be used to increase the VFI and N retention of sheep where cereal straw is the only source of feed. The inclusion of molasses in PM silage did not improve VFI. This may have been due to the reduced digestibility of organic matter as a result of the high ash content of this diet (Muller 1980). A further increase in VFI of wheat straw might be achieved if the digestibility could be increased by reducing lignocellulosic bonding through chemical treatment.

MAENG, W.J., VAN NEVEL, C.J., BALDWIN, R.L. and MORRIS, J.G. (1976). *J. Dairy Sci.* 59: 68.

MULLER, 2.0. (1980). "Feed from Animal Wastes: State of Knowledge" (FAO: Rome).

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