

## EFFECT OF SINGLE MEAL SUPPLEMENTATION WITH FABA BEANS AND BARLEY FORTIFIED WITH UREA ON RUMEN ENVIRONMENT AND RATE OF DIGESTION OF DRY MATTER AND FIBRE OF OATEN CHAFF

A. NATSIR, L. BOONEK, A.R. EGAN and B.J. LEURY

School of Agriculture and Food System, I.L.F.R, University of Melbourne, Parkville, VIC. 3052

Oaten chaff, a roughage source for ruminants, is low in crude protein and energy. This can lead to an insufficient supply of these nutrients for rumen microorganisms, which in turn will limit microbial growth efficiency and potentially impair the extent and the rate of digestion of the roughage. Thus provision of nitrogenous and energy substrates to meet the requirement of rumen microbes is of primary importance to improve digestibility of oaten chaff. The present experiment was designed to investigate whether rumen degradation of oaten chaff can be improved by supplementing the animals with different sources of energy and nitrogen.

Three wethers with an average initial body weight (BW)  $\pm$  40 kg,  $\pm$  8 months of age, were used in this experiment. Each sheep was fitted with permanent fistula (40 mm) in the dorsal sac of the rumen and received either one of three treatments: Oaten chaff (8 MJ ME/kg DM, 16g N/kg DM) fed daily *ad libitum* as a control (C), C+FB (faba beans; 12.8 MJ ME/kg DM, 45.50g N/kg DM), or C+BUS (barley grain; 12 MJ ME/kg DM, 18.10g N/kg DM fortified with urea and sulfur). Either FB or BUS was given once daily in the morning at the rate of 250 g/animal/day. Urea-sulphate solution was prepared daily by diluting 525 g urea and 105 g ammonium sulphate in 1 L warm tap water. BUS was provided by mixing 25 ml of the solution with 250 g barley grain (air dry basis). Rumen fermentation parameters, pH and NH<sub>3</sub>, were evaluated while rumen degradation characteristics of oaten chaff were determined using the *in sacco* method described by Ørskov et al. (1980).

Average rumen pH of the sheep across treatments was similar ( $P>0.05$ ); 6.59, 6.47, and 6.40 for C, C+BUS and C+FB respectively while the rumen NH<sub>3</sub> of the sheep receiving C was significantly lower ( $P<0.05$ ) than those receiving C+BUS or C+FB (5.15 vs 14.7 or 15.6 mg N/100 ml rumen fluid, respectively). Data for rumen degradation characteristics of oaten chaff is presented in Table 1.

**Table 1. Rumen degradation characteristics of oaten chaff.**

Nutrient	Treatment	Degradation parameters				
		<i>a</i>	<i>b</i>	<i>a+b</i>	<i>c</i> (%/h)	<i>Lag</i> (h)
DM	C	27.62	33.44 <sup>a</sup>	61.06 <sup>a</sup>	0.041	4.37
	C+BUS	27.94	41.88 <sup>ab</sup>	69.82 <sup>b</sup>	0.050	3.40
	C+F	27.50	45.18 <sup>b</sup>	72.68 <sup>b</sup>	0.046	3.67
NDF	C	-6.20	51.85 <sup>a</sup>	45.65 <sup>a</sup>	0.036	5.57
	C+BUS	-10.03	64.32 <sup>b</sup>	54.29 <sup>b</sup>	0.034	4.90
	C+F	-8.58	64.93 <sup>b</sup>	56.35 <sup>b</sup>	0.031	4.77
ADF	C	-6.54	44.97 <sup>a</sup>	38.43 <sup>a</sup>	0.031	6.78
	C+BUS	-6.92	54.43 <sup>b</sup>	47.51 <sup>b</sup>	0.027	6.47
	C+F	-6.21	55.49 <sup>b</sup>	49.28 <sup>b</sup>	0.029	5.50

<sup>a,b</sup> means within the same column and the same nutrient with different superscript were significantly different ( $P<0.05$ ).

Degradation characteristics of DM, NDF, and ADF were similar for *a* (soluble fraction), *c* (degradation rate, %/h), and *Lag* time (h) but different for *b* (insoluble fraction) and *a+b* where the values were significantly higher for animals given either C+FB or C+BUS compared with animals given C. In conclusion, supplementation of oaten chaff with a single meal of either FB or BUS improved rumen NH<sub>3</sub> levels without altering rumen pH and improved the degradation of insoluble fraction of oaten chaff

ØRSKOV, E.R., F.D. Deb. HOVELL, and F. MOULD. (1980). *Trop. Anim. Prod.* **5**, 195-213.

Email: a.natsir@pgrad.unimelb.edu.au