PROTEIN AND ENERGY SUPPLEMENTATION OF STEERS GRAZING IMPROVED TROPICAL PASTURES DURING THE WET SEASON

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Annual liveweight gains of cattle grazing native pastures in the tropics and sub-tropics are generally low (l00kg/hd) when compared to those from temperate regions. Strategies to improve liveweight gain are required if premium market specifications are to be met (Loxton *et al.* 1992). This experiment examined the response of steers grazing wet season pastures and supplemented with protein of high bypass value alone and with a rumen fermentable energy source.

Twenty four Brahman crossbred steers of average liveweight of 212 ± 16 kg (± SD) were assigned to 6 treatment groups. Daily allowances were: control, 250 g fishmeal (FM), FM + 500 g rolled barley (500B), FM + 1000 g barley (1000B), FM + 1500 g barley (1500B), and FM + 2000 g barley (2000B). Fishmeal contained 732 and barley 77 g crude protein/kg dry matter (DM). All steers were fed 300 g molasses/day. Steers grazed irrigated and fertilized pangola *(Digitaria eriantha* Steudel) and setaria (*Setaria sphacelata)* grass pasture for 80 days from January 1995. Steers were mustered and individually fed supplement daily in pens. The average green leaf DM on offer was 1568 kg/ha. Pasture quality was assessed from extrusa samples taken from 2 oesophageal-fistulated (OF) steers on 2 occasions and from leaf separated from quadrats cut for pasture yield estimation. *In vitro* DM digestibility of OF extrusa and leaf averaged 59.4% and 57.7% respectively. Crude protein averaged 14.1% and 16.9% respectively. Faecal output was estimated using chromic oxide capsules on 1 occasion and intake was calculated from this and the *in vitro* digestibility of the oesophageal extrusa. Liveweight was measured twice weekly.

The addition of 250 g fishmeal significantly increased liveweight gain by 200 g/day or 25%. Increasing the amount of barley fed in addition to fishmeal, up to 2 kg/day, did not significantly increase liveweight gain. Total DM intake was not affected by treatment. Based on these values, pasture intake declined 940 g for every 1000 g barley fed. Both rumen ammonia nitrogen and plasma urea nitrogen increased with fishmeal supplementation, but declined with each incremental increase in barley.

Table 1. Effect of supplementation on liveweight gain, pasture dry matter intake, rumen ammonia nitrogen and plasma urea nitrogen concentrations of steers grazing improved pasture during the wet season

Treatment	Liveweight gain (g/day)	Dry matter intake (% liveweight)	Rumen ammonia nitrogen (mg/L)	Plasma urea nitrogen (mg/dL)
Control	830[a]	2.8	58.3	12.1
FM	1044[b]	2.8	80.0	15.9
500B	1000[b]	2.7	73.7	14.1
1000B	960[b]	3.3	56.2	12.3
1500B	1100[b]	2.8	52.1	11.9
2000B	1070[b]	2.9	50.2	10.7

Different alphabetical notation within columns denotes a significant difference (P<0.01).

The increased liveweight gain with fishmeal supplementation probably resulted from increased supply of protein or limiting amino acids to the intestines. Provision of rumen fermentable energy as barley, to enhance the efficiency of use of supplemental protein, did not further increase liveweight gain, probably because of the large substitution effect. The need to find an energy source for growth which will not lead to marked substitution seems paramount if liveweight gain is to be increased.

LOXTON, I.D., HOLROYD, R.G., BLIGHT, R.G., JAMES, T.A., MULLINS, T.J. and JEFFERY, M.R. (1992). *Proc. Aust. Soc. Anim. Prod.* **19: 43-5.**