INCREASING GROWTH RATES OF CATTLE IN THE WET SEASON USING SUPPLEMENTS OF MOLASSES/UREA COMBINED WITH VARIOUS PROTEIN SOURCES

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The growth rate of cattle in the wet season can be increased by supplementing with sources of bypass protein (Mbongo *et al.* 1994; Bolam *et al.* 1996). An alternative strategy is to increase intake of fermentable organic matter (FOM) in order to increase microbial protein production in the rumen. Molasses is one of the cheapest sources of FOM available in northern Australia. In addition, two plant protein sources, whole cottonseed (WCS) and pelleted lucerne, have characteristics which might enhance the response to molasses feeding. Whole cottonseed contains 20% lipid and 20% crude protein (CP) and the lipid will provide an additional energy substrate. Pelleted lucerne represents a leguminous alternative protein source, with the grinding and pelleting process increasing its protein rumen-escape characteristics. Two experiments are reported here examining the liveweight gain (LWG) response by steers grazing pangola grass (*Digitaria eriantha*, Steudal) to combinations of supplements designed to vary the characteristics described above.

In Experiment 1, 25 Brahman crossbred steers (203 ± 4.2 kg), randomly allocated to treatments, grazed fertilised pangola grass for 84 days from January to April 1996 and received supplements of: nil, control (C), C + molasses/urea (97:3; w/w) at 0.5% liveweight (W; 5M) or 1.0% W (10M), and C + molasses/urea + WCS + fishmeal (55:20:25) at 0.5% W (5MWF) or 1.0% W (10MWF). In Experiment 2, 25 Brahman crossbred steers (273 ± 9.4 kg) grazed similar pasture for 84 days from February to May 1997 and received supplements of: nil, (C), molasses/urea + WCS (55:45) at 0.5% W (5MW) or 1.0% W (10MW), and C + molasses/urea + lucerne pellets (55:45) at 0.5% W (5ML) or 1.0% W (10ML). Steers were mustered daily (0600 hours) and individually fed their supplement allocation. For the green leaf fraction of the pasture, mean yields on offer were 1870 and 1922 kg DM/ha, *in vitro* DM digestibilities were 64 and 57%, and CP contents were 17 and 16% for Experiments 1 and 2 respectively.

Table 1. Supplement dry matter intake (DMI), liveweight gains (LWG) and concentrations of ammonia-nitrogen (NH_3-N) in rumen fluid, of steers grazing pangola grass during the wet season

	Experiment 1					Experiment 2				
	C	5M	10M	5MWF	10MWF	C	5MW	10MW	5ML	10ML
Supplement DMI (% W/day)	0	0.32	0.52	0.38	0.76	0	0.35	0.74	0.38	0.70
Rumen NH_3-N (mg/L)	199[a]	231[a]	240[ab]	237[ab]	279[b]	149[a]	188[ab]	208[b]	181[ab]	206[b]
LWG (kg/d)	0.96[a]	0.97[a]	0.91[a]	1.29[b]	1.34[b]	0.58[a]	0.81[b]	0.84[b]	0.74[b]	0.84[b]

Within experiments, means in the same row with different superscripts are significantly different ($P<0.05$)

In agreement with Winks *et al.* (1980), molasses/urea alone did not increase LWG of cattle grazing high quality tropical pastures, at either level of intake. Rumen NH_3-N concentrations were quite high, even for the control steers, and indicated no deficiency of rumen degradable protein for microbial protein synthesis. However, the inclusion of plant protein sources or fishmeal were associated with subtantial increases in growth rate, perhaps partly in response to additional supply of undegraded dietary protein to the intestines. The combination of molasses and WCS provides a means of utilising two inexpensive by-products, but grinding a legume and incorporating it into molasses may represent an alternative when other protein meals are expensive or limiting in supply.

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