THE POTENTIAL OF DAP TO RESTRICT SUPPLEMENT INTAKE BY CATTLE

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One obstacle to the general adoption of supplementation of low quality paddock feed or hay-based rations for young dairy stock during summer-early autumn in Western Australia has been the lack of a low labour, cost effective method of supplying a limited amount of grain daily. Barker et al. (1987) reported that the intake of grain offered ad libitum to cattle can be successfully regulated by varying the amount of non-protein nitrogen compounds (e.g. urea, ammonium sulphate and diammonium phosphate, [DAP]) added to grain.

The potential of DAP compared with urea to restrict the intake of different grains (G) when offered ad libitum to steers was compared. Thirty-six Holstein-Friesian steers (liveweight = 110+2.6kg) were penned individually and offered supplements of either barley (12.6 MJ/kg DM) or lupin (12.4 MJ/kg DM) grain containing either 8% urea or 5.7% DAP in a 2 x 2 factorial experiment. Grain supplements and pasture hay (8.8 MJ/kg DM, 13.8% crude protein) were offered ad libitum for 91 days.

Consistent with previous studies (Hough et al., 1992), supplement and hay intakes were similar across grain types (see table). Both liveweight gain and feed conversion efficiency were 22-24% greater for cattle offered lupin compared with barley supplements. Although the levels of additive (A) were formulated to give similar supplement intakes, based on studies with beef cattle (Barker et al., 1987), intakes varied with average intakes of 1.3 and 0.6 kg/day/100 kg liveweight for supplements containing urea and DAP respectively. In the study by Barker et al. (1987), supplements were offered for only a week and intakes may not have stabilized during this short time. As steers offered supplements containing DAP ate less grain and more hay, FCE was 37% lower than for steers offered supplements containing urea.

	Barley		Lupin		s.e.	Significance		
	Urea	DAP	Urea	DAP		G	A	GxA
Supplement intake								
kg DM/day	2.1	0.9	1.9	0.9	0.11	n.s.	***	n.s.
kg DM/day/100 kg liveweight	1.5	0.6	1.2	0.6	0.07	n.s.	***	n.s.
Hay intake								
kg DM/day	1.8	2.9	2.4	2.9	0.17	n.s.	***	n.s.
kg DM/day/100 kg liveweight	1.2	2.0	1.5	2.0	0.07	n.s.	***	*
Total intake								
kg DM/day	3.8	3.8	4.2	3.8	0.18	n.s.	n.s.	n.s.
kg DM/day/100 kg liveweight	2.7	2.7	2.8	2.6	0.04	n.s.	*	n.s.
Liveweight gain (kg/day)	0.64	0.46	0.79	0.57	0.028	***	***	n.s.
Feed conversion ratio (kg DM+/kg gain)	5.8	8.4	5.4	6.5	0.39	**	***	n.s.

* P<0.05; ** P<0.01; *** P<0.001; n.s., not significant; + kg grain and hay

DAP restricts grain intake more effectively than urea as less was required to achieve a desired level of supplement intake. In addition DAP is less toxic than urea, on a percentage basis or at equivalent levels of nitrogen which may simplify the process of introduction of grain supplements with nitrogenous fertilisers additives, provided ad libitum.

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