

THE EFFECT OF PROTECTED AND UNPROTECTED CASEIN SUPPLEMENTS ON
THE PERFORMANCE OF LACTATING COWS FED PASTURE

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There is conflicting evidence in the literature as to whether the milk yield of cows fed pasture is limited by the supply of amino acids reaching the small intestine (Brookes 1982). In this study, four pairs of identical twin cows were housed indoors and offered ryegrass- white clover pasture ad libitum from 2 weeks after calving. The pasture contained 14.5MJ digestible energy (DE) and 36g nitrogen (N)/kg dry matter (DM). A daily supplement of 1kg casein (887gDM/kg and 149gN/kgDM) was mixed with the pasture. The casein offered to one twin in each pair was treated with a 10% solution of formaldehyde at a rate of 0.1l/kg casein. The extent to which this treatment afforded protection against rumen degradation was determined by suspending polyester bags containing casein in the rumen of a grazing cow. After 8 hours, 5% and 88% of the N was lost from the treated and untreated casein respectively.

Feed intake and milk production data are given in Table 1 and the results of a 10-day faecal and urine collection on individual cows are shown in Table 2.

TABLE 1 Mean daily DM intakes and milk production of 3 sets of twin cows for 29 days in early lactation

	DM Intake (kg/d)		Milk	Milkfat (kg/d)	Milk Protein
	Pasture	Casein			
Protected Casein	14.24	0.77	22.95	1.06	0.81
Unprotected casein	15.07	0.73	24.14	1.07	0.82
LSD (p=0.05)	2.95	0.04	3.55	0.14	0.08

TABLE 2 Mean daily intake and nitrogen balance data from 4 sets of twin cows for 10 days in early lactation

	Intake		Nitrogen Output (g/d)		
	DE (MJ/d)	N (g/d)	Faeces	Urine	Milk
Protected Casein	221	618	134	294	125
Unprotected Casein	222	622	131	320	115
LSD (p=0.05)	19	53	11	59	15

Plasma urea and insulin concentrations were determined on blood samples taken hourly throughout the day. These did not differ significantly between treatments (Urea - 0.48 and 0.52 mg/ml and insulin - 3.0 and 2.7 ng/ml for the protected and unprotected casein groups respectively).

The supplementation of high yielding dairy cows (over 1kg milkfat daily) with protected casein for approximately one month in early lactation did not significantly increase milk yield -or N output in milk, compared with those fed unprotected casein. This suggests that the supply of amino acids reaching the small intestine from a pasture diet was not limiting the production of these cows.

BROOKES, I.M. (1982) Dairy Production from Pasture: p 211. N.Z.S.A.P. Hamilton, N.Z.

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