

## THE EFFECT OF FORMALDEHYDE-TREATED CASEIN ON THE MILK PRODUCTION OF DAIRY COWS

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The formaldehyde treatment (FT) of proteins protects them from microbial degradation in the rumen (Ferguson 1975) and increases the supply of amino acids to the small intestine (Faichney and White 1979). The concentration of aldehyde is critical if damage to the protein is to be minimised (Ashes et al. 1980) and the correct supply of essential amino acids to the small intestine maintained. In general the role of formaldehyde-treated proteins in increasing milk production has been variable, and this may be due to incorrect aldehyde treatment.

Casein was treated with formaldehyde at 0, 0.25, 0.5 and 0.75 g/100 g crude protein (CP). After 2 weeks the treated caseins were evaluated 'in vitro' and fed to lactating dairy cows. In a pretreatment period of 20 days the cows were allowed access to pasture supplemented with 2.5 kg barley per cow per day. Milk production was measured and the animals allocated to five groups of four cows. A control group was fed 2.5 kg barley supplement while the other four groups were supplemented for 12 d with 0.5 kg of treated casein and 2.0 kg of barley per cow per day in addition to their grazing of kikuyu pasture (12.3% CP). Milk production was measured on days 6, 8 and 9 of the treatment period and rumen ammonia levels on days 11 and 12. The results are summarised in the table.

% Formaldehyde treatment	% 'In vitro' protection	Rumen NH <sub>3</sub> -N (mg %)	Milk production (kg/d)	
			Pretreatment level	change
Control	-	9.0	10.3	+1.8
0.0	0	19.7	10.9	+1.7
0.25	17.9	16.7	10.5	+1.7
0.5	55.3	11.4	10.5	+2.6
0.75	65.7	12.0	10.9	+2.3
5% LSD		4.2	2.5	1.0

Milk production increased above pretreatment levels in all groups, due to an improvement in pasture availability. However, when compared with 0% FT, 0.5% FT resulted in the greatest increase ( $P = 0.059$ ) in milk production. Rumen ammonia was highest for untreated casein and was generally inversely related to 'in vitro' casein protection ( $r^2 = 0.86$ ). Thus the partial protection of casein by 0.5% FT increased amino acid absorption sufficiently to increase milk production in cows grazing pasture of moderate protein content; the higher FT level conferred no further advantage.

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