INFLUENCE OF WHEAT, SOYABEAN MEAL AND SODIUM BICARBONATE SUPPLEMENTS ON THE YIELD AND COMPOSITION OF MILK FROM GRAZING DAIRY COWS

A.G. KAISER*†, A.M. ASHWOOD* and E. BELINDA DETTMANN*

A depression of milk fat content often occurs when concentrates supply a high proportion of total dry matter (DM) intake during early lactation. There is some evidence that supplementation with buffers may improve yield and milk fat content (Hadjipanayioutou et *al.* 1978; Kilmer et al. 1980). In addition cows in early lactation may respond to protein supplementation. The present experiment examined the influence of these supplements on milk yield and composition.

Forty-nine Friesian, Guernsey and Friesian x Guernsey cows calving in April (mean live weight = 519 kg; mean condition score = 5.1) were allocated to seven treatments for the first 104 days of lactation. Cows were either unsupplemented, or given supplements of rolled wheat or rolled wheat + soyabean meal (79:21) at 15.6 g DM/kg live weight at calving. These supplements contained 162.5 and 232.6 g crude protein (CP)/kg DM respectively, and NaHC03 was added to supply either 0, 22.4 or 44.8 g/kg DM. Each cow received a mineral supplement and NaCl was used to equalize Na intake on each diet. Cows grazed kikuyu grass pastures (CP = 190.6 g/kg DM) which were managed to allow unrestricted forage intake, and for 41 days also had access to forage oats (CP = 246.3 g/kg DM) which provided an estimated 15% of total forage intake. The results are given in Table 1.

TABLE 1. Mean milk yield, milk composition and liveweight change

Supplement	Milk yield (kg/day)	Milk fat (g/kg)	Milk protein (g/kg)	Liveweight change (kg/day)
1. Control	12.1	41.0	35.3	-0.38
2. Wheat	17.9	30.9	35.7	0.08
3. Wheat + 22.4 g $NaHCO_3$/kg	17.8	32.7	37.2	0.14
4. Wheat + 44.8 g $NaHCO_3$/kg	19.1	33.1	35.8	0.00
5. Wheat/soya	20.8	32.2	36.7	0.05
6. Wheat/soya + 22.4 g $NaHCO_3$/kg	20.7	35.0	37.3	0.07
7. Wheat/soya + 44.8 g $NaHCO_3$/kg	20.7	35.7	36.0	0.15
SE of mean	1.54	1.36	0.74	0.074

Supplementation with wheat increased milk yield ($P < 0.001$) and reduced milk fat content ($P < 0.001$) and liveweight loss ($P < 0.01$). $NaHCO_3$ supplementation (treatments 3, 4, 6, 7 *v.* 2, 5) increased milk fat content ($P < 0.05$) but did not influence milk yield. As wheat supplementation caused a low milk fat problem the relatively small response to $NaHCO_3$ would have been of considerable economic benefit. The smaller response to $NaHCO_3$ in this compared to some overseas studies may be due to differences in the basal forage (pasture *v.* silage) and the fact that we equalized Na intake on each treatment. The improved milk yield ($P < 0.05$) when soyabean meal was included in the supplement indicates that responses to protein might be expected when grazing dairy cows in early lactation are given high levels of concentrate. The responses to supplementary feeding were 0.90 and 1.15 kg milk/kg supplement DM consumed on wheat and wheat + soyabean meal respectively.

HADJIPANAYIOUTOU, M., HARRISON, D. and ROWLINSON, P. (1978). Anim. Prod. 26: 365.
KILMER, L.H., MULLER, L.D. and WANGSNESS, P.J. (1980). J. Dairy Sci. 63: 2026.

* Agricultural Research Centre, Wollongbar, N.S.W. 2480
† Present address: Agricultural Research Institute, Private Mail Bag, Wagga Wagga, N.S.W. 2650.