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BLOOD CONSTITUENTS IN GRAZING DAIRY CATTLE

C. HALPIN* and K. KING**

In a trial designed to determine the utilisation of perennial pasture by dairy cows, those at the-high stocking rate lost body condition and some died during the winter of 1974. Various blood constituents were monitored the following year to determine the extent of the stress on these cows and to determine the relationship of metabolic changes to clinical and sub-clinical disease and animal production.

Twenty-eight Jersey-Friesian cross cows were selected from the pasture utilisation experiment and divided into two groups (5.4 and 8.3 cows/ha) on the basis of previous treatment. Prior to calving, the groups were penned and fed a maintenance ration of hay (7.9 and 7.1 kg/cow/day for 5.4 and 8.3 cows/ha respectively). After calving, each group grazed pasture and were supplemented with hay ad. lib. until the spring flush. Blood samples were collected from all cows at intervals before and after parturition and the concentrations of glucose, ketones (acetoacetate and β-hydroxybutyrate) and serum protein were measured. Daily milk yield and liveweight change were correlated with blood constituents by stepwise regression, and significance of differences between stocking rates was determined by Student's "t" test.

No deaths or clinical disease occurred in the study period. Mean live weights at calving were 457 and 418 kg for 5.4 and 8.3 cows/ha respectively. In the first six weeks of lactation, the low stocking rate cows lost 28 kg ($P<0.05$) more live weight than the high stocking rate cows, but produced 2.0 kg/cow/day extra milk ($P<0.05$). 'Blood constituent levels are given in Table 1. There were no consistent relationships between milk yield, liveweight change and blood constituents.

TABLE 1 : The effect of stocking rate on the blood concentrations of glucose (mg/100ml), ketones (mM) and serum protein (g/100ml) in dairy cows 5 weeks before calving (BC) and 6 weeks after calving (AC).

		Glucose		Ketones		Serum Protein	
		BC	AC	BC	AC	BC	AC
5.4 cows/ha	Mean	37.4	29.7	0.280	1.197	6.8	7.7
	± SE	1.3	2.2	0.017	0.175	0.1	0.2
8.3 cows/ha	Mean	42.8	34.4	0.276	0.699	6.9	7.9
	± SE	1.5	1.3	0.019	0.057	0.1	0.1
Significance due to stocking rate		P<0.05	N.S.	N.S.	P<0.05	N.S.	N.S.

Cows at both stocking rates developed hypoglycaemia and hyperketonaemia, indicating that both groups were nutritionally stressed. It appeared that cows on the high stocking rate were able to compensate for the lack of food supply and poor body condition by reducing milk production drastically.

* Department of Agriculture, 'Attwood' Veterinary Research Laboratory, Westmeadows, Vic. 3047.
** Department of Agriculture, Irrigation Research Station, Kyabram, Vic. 3620.