NUTRIENT INTAKE BY DAIRY COWS GRAZING PERENNIAL PASTURE

W.J. WALES, D.W. DELLOW and P.T. DOYLE

Kyabram Dairy Centre, Institute of Sustainable Irrigated Agriculture, Kyabram, Vic. 3620

Milk production in south-eastern Australia is predominantly pasture based because of the relatively low cost of converting pasture to milk. To balance nutrient intake with supplements, we must be able to measure or predict the intake of nutrients (energy yielding substrates, protein and minerals) from pastures, which vary in composition. Selection of components within a sward will also be affected by grazing management practices. Few data exist on the selection of nutrients by grazing dairy cows. Stockdale (1992) showed that cows selected metabolisable energy from a subterranean clover pasture that was from 6 to 17% higher than that on offer. For perennial pasture, Kellaway *et al.* (1993) found cows selected a diet that was 16% higher in metabolisable energy than that on offer.

An experiment was carried out to determine the dry matter, energy, protein, fibre and mineral intake by dairy cows in late lactation when grazing newly sown perennial pasture offered at allocations of 15, 20, 30 and 40 kg DM/cow.day. Each treatment was replicated 3 times.

Pre-grazing pasture height averaged 8 cm, (measured with a rising plate meter), and comprised of white clover (22%), ryegrass (54%), dead (18%) and weeds (6%) determined by hand sorting pasture samples collected daily. From reconstituted botanical composition samples, pasture on offer had an average *in vitro* dry matter digestibility of 74%, a crude protein content of 170 g/kg DM and contained 450 g/kg DM neutral detergent fibre.

Pasture intake varied from 8.0 to 14.6 kg DM/cow.day with pasture utilisation ranging from 54 to 37%. At the low allocation, cows produced 8.9 kg milk/day while at the high allocation they produced 15.5 kg/day (Table 1).

Table 1. Effect of pasture allocation (kg DM/cow.day) on residual pasture mass (kg DM/cow.day), intake of dry matter (kg DM/cow.day), metabolisable energy (MJ/kg DM), crude protein (g/kg DM) and phosphorus (g/kg DM), and the percentage of pasture consumed (%) and milk yield (kg/cow.day)

Pasture allocation	15	20	30	40	SED
Residue	6.8^{dA}	9.9^{c}	17.3^{b}	24.9^{a}	0.36
Intake					
Dry matter	8.0^{d}	9.9^{c}	12.4^{b}	14.6^{a}	0.14
Metabolisable energy	11.5	11.7	11.7	11.6	0.34
Crude protein	210^{b}	206^{b}	226^{ab}	249^{a}	10.7
Phosphorus	4.2	4.3	4.3	5.0	0.42
Pasture utilisation	54^{d}	50^{C}	42^{b}	37^{a}	1.2
Milk yield	8.9^{d}	9.5^{c}	12.7^{b}	15.5^{a}	0.62

^{A} Within rows values followed by different letters are significantly different at P = 0.05.

Cows consistently selected a diet 10% higher in metabolisable energy than that on offer. As pasture allocation increased, cows selected diets with crude protein levels of 22% to 40% and phosphorus contents that were 12 to 27% higher than that in pasture on offer.

The results from this experiment describe how selection differentials vary across different pasture allowances and adds to the base data on nutrient selection by grazing dairy cows. This information can then be used to determine the type and amount of supplements required to address nutrient deficiencies for increased production.

KELLAWAY, R.C., TASSEL, R.J., HAVILAH, E., SRISKANDARAJAH, N. and ANDREWS, A. (1993). *Aust. J. Agric. Res. 44: 23-30.*

STOCKDALE, C.R. (1992). *Aust. J. Agric. Res. 43: 28* 1-95.