GRAZING INTAKE BY STEERS BACKGROUNDED ON THREE PASTURE SYSTEMS

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Estimates of pasture intake are required for assessing grazing value of pastures, for establishing relationships between intake, pasture characteristics and liveweight gain, and for studying genetic variation in feed conversion efficiency. The use of n-alkanes as markers for estimating intake has been reviewed by Dove and Mayes (1996). Dicker *et al.* (1996) showed that concentrations of natural alkanes, and of synthetic alkanes dosed from an intra-ruminal controlled release device (CRD), in feed and faeces, would allow accurate estimation of the intake of a high quality forage by penned cattle.

In the present study, the alkane method was used to estimate grazing intake by steers being backgrounded to export feeder specifications. In spring 1995, 90 steers from three Angus and three Hereford herds were grazed on three temperate perennial pasture systems at Glen Innes. These systems were: sown pasture (T1), pasture plus 26% protein pellet supplement (1.5 kg/head/day) (T2); and pasture plus forage crop (*Lolium multiflorum* cv. Concord) (T3). Alkane levels in faecal samples collected on days 5, 9 and 13 after steers received a C32 and C36 filled CRD, and in plucked herbage samples, were determined by gas chromatography. Intake of herbage was calculated from the formula of Dove and Mayes (1996).

Faecal concentrations of dosed alkanes on day 13 were low (<50ppm) in 22% of steers, suggesting that CRDs had released their load of alkanes faster than the specified 15 days. Dose rate of synthetic alkanes was therefore increased to 408 mg/day for 13 days from 354 mg/day for 15 days. Only 3% of steers had low concentrations on days 5 or 9, indicating malfunction of the CRDs. Data for these steers were discarded. Mean faecal alkane concentrations for days 5 and 9 (dosed C32 and mean of adjacent natural alkanes, C31 and C33, all adjusted for known recoveries) were then used in calculating estimates of pasture intake. An important source of error in estimating intakes on mixed species pastures (up to 10 species) was the reliability of plucked samples for determining levels of natural alkanes in the herbage actually eaten.

Table 1. Pasture intake (kgDM/head/day), intake per 100kg liveweight, liveweight (kg), liveweight gain (kg/hd.day), herbage biomass (kgDM/ha). *In vitro* digestibility (% DM) and nitrogen content (% DM) on pasture (T1), pasture plus protein supplement (T2) and pasture plus forage (T3)

Pasture system	Pasture intake*	Pasture intake per 100kg lwt*	Liveweight*	Liveweight gain*	Herbage biomass	*In vitro* digestibility	N content
T1	5.084^{b}	1.8^{b}	280^{c}	1.381^{b}	2860	63.3	1.6
T2	7.829^{a}	2.4^{a}	322^{b}	1.614^{a}	3044	67.5	1.9
T3	4.212^{b}	1.2^{c}	342^{a}	1.050^{c}	1892	78.4	3.4

*least squares means with unlike superscripts in same column are different, P<0.05

Results demonstrated the usefulness of the alkane method for estimating pasture intake and the grazing value of sown temperate perennial pastures in spring for backgrounding steers (Table 1). They also showed significant responses in pasture intake and liveweight, gain to the feeding of a protein supplement on these pastures. Pasture intake, intake/100 kg liveweight and liveweight gain were greater on T2 than on T1. Low intake and low liveweight gain on T3, despite high quality, was surprising but may have been due to low herbage biomass on the forage crop at this time. There was a significant effect of herd of origin on intake/100 kg liveweight, indicative of variation in feed conversion efficiency.

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