

Recovery in faeces of alkanes from a controlled release device

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Knowledge of the n-alkanes found in pasture species combined with a known daily dose of synthetic alkanes and measurement of alkanes in faeces can be used to calculate intake of pasture. The extent of recovery in faeces of the different carbon chain-length alkanes needs to be known to make these calculations. Dosing of the synthetic alkanes C₃₂ and C₃₆ by intra-ruminal controlled-release device (CRD) is convenient and reduces disruption to grazing. This experiment was to determine the extent of recovery in faeces of C₃₂ and C₃₆ in ground alkane CRD matrix fed to cattle.

Eight Angus steers (ca. 300 kg; 10 months old) were individually penned and fed a ration of 60% rolled-barley, 32% chopped sorghum hay and 8% additives. After they were accustomed to the ration and to wearing a faecal collection bag they were fed a known weight (ca. 10 g) of ground CRD matrix mixed into feed, and then all faeces were collected over the next seven days. The ground matrix was prepared by grinding tablets from the core of two CRD (Captec Ltd, Auckland, NZ) to the consistency of table sugar. Total faeces for each animal each day was mixed and sub-sampled. Duplicate samples of dried (70°C) ground feed, feed spiked with known amount of CRD matrix, and faeces were analysed for their alkane contents using previously described methods (Herd *et al.* 2002).

The concentrations of C₃₂ and C₃₆ in the ground CRD matrix were equal, being 210 and 214 ppm dry matter (DM) when determined from the spiked feed samples, and 214 ppm for both when measured in ground matrix. Large amounts of C₃₂ and C₃₆ appeared in faeces over the first two days after dosing; their concentrations thereafter quickly approached background levels (Figure 1). Despite ingesting similar amounts of C₃₂ and C₃₆, considerably less C₃₆ than C₃₂ was excreted. Recoveries for different chain-length alkanes are shown in Figure 2. Recoveries for C₃₂ were 87 ± 19% (SD) and C₃₆ were 63 ± 14%.

Whether these recoveries for ground, pulsed-dosed alkane apply in the field where CRD alkane-matrix is slowly eroded over time remains to be determined. Recoveries of C₃₆ lower than for C₃₂ from similar CRD reported by Herd *et al.* (2002) would, without compensation, lead to erroneous calculation of feed intake. This report confirms the need to validate recoveries under the conditions of each experiment.

Herd, R.M., Hegarty, R.S., Dicker, R.W., Archer, J.A. and Arthur, P.F. (2002). Selection for residual feed intakes improves feed efficiency in steers on pasture. *Animal Production in Australia* 24, 85–88.

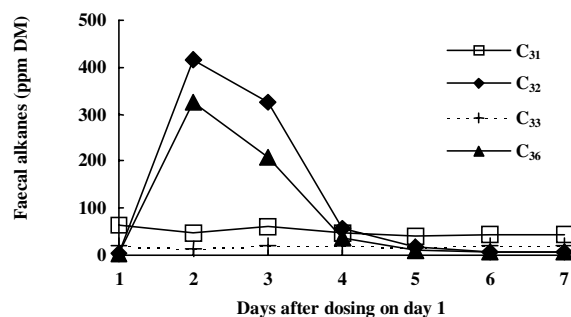


Figure 1 Faecal alkane concentrations.

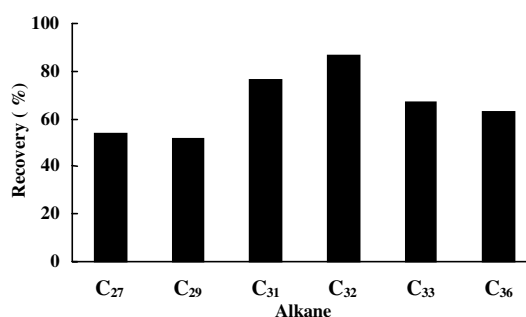


Figure 2 Mean recoveries of alkanes in faeces.