

## THE RECOVERY OF NATURAL AND DOSED N-ALKANES FROM THE HORSE

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The cuticular wax of different plant species contain varying amounts and proportions of predominantly odd carbon chain length n-alkanes. If the n-alkane concentrations of plants on offer to and faeces produced by grazing herbivores are known then the botanical composition of the herbivores' diets can be determined, providing the extent of faecal recovery of the alkanes is known (see Dove and Mayes 1991). In addition, if the animals have been dosed with a synthetic even chain length n-alkane and its recovery is known, then dry matter intake and digestibility can also be calculated. This experiment was conducted to determine the faecal recovery of plant and dosed n-alkanes from the horse.

Seven diets each containing different proportions of oaten chaff, lucerne chaff, proprietary horse pellets and cottonseed meal were fed to three (period 1) and then four (period 2) adult horses. The horses were fed their diets in equal amounts at 0700, 1200 and 1600 hours and were given approximately 200 mg dotriacontane (C32, periods 1 and 2) and hexatriacontane (C36, period 2) that had been adsorbed onto powdered cellulose and mixed into 100 g cottonseed meal at 0600 and 1800 hours. The horses were adapted to their diets for two weeks before a six day faeces collection period. During one of these collection days, faeces produced by each horse was collected and sampled every two hours. N-alkane contents of feeds and faeces were determined and these data were used to calculate diet compositions (Dove and Moore 1995).

The faecal recoveries of the plant and dosed n-alkanes are shown in Table 1.

**Table 1. Percent recovery of plant and dosed n-alkanes in faeces of horses (n = 7 except for C36 where n = 4)**

|               | N-alkane C chain length |     |     |     |     |     |     |     |     |     |     |
|---------------|-------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|               | C25                     | C26 | C27 | C28 | C29 | C30 | C31 | C32 | C33 | C35 | C36 |
| Mean recovery | 86                      | 77  | 82  | 70  | 85  | 99  | 94  | 73  | 99  | 177 | 75  |
| s.e.          | 6.2                     | 7.1 | 2.3 | 5.1 | 4.0 | 11  | 2.8 | 1.7 | 3.0 | 23  | 3.0 |

The variation about the mean 24 hour faecal n-alkane concentrations as a standard error was  $\pm 5.6\%$  and the compositions of the diets were predicted with an accuracy of  $5.4 \pm 2.2\%$ .

These data indicate that recoveries from the horse of n-alkanes of plant origin are higher and those of dosed n-alkanes are lower than have been recorded for ruminants (see Dove and Mayes 1991). The anomalous results recorded for C30 and C35 were probably due to the very low concentrations of these n-alkanes in the diet and consequent measurement inaccuracies. The relatively constant concentration of synthetic alkane (C32) in the faeces indicates that these compounds can be used as digesta markers in horses and it is apparent that the n-alkane technique can be used to determine diet composition with reasonable accuracy.

DOVE, H. and MAYES, R.W. (1991). *Aust. J. Agric. Res.* **42**, 913-52.

DOVE, H. and MOORE, A.D. (1995). *Aust. J. Agric. Res.* **46**, 1535-44.