To estimate herbage intake by lambs at pasture, we have tested the method described by Mayes et al. (1986) which employs the natural odd-chain n-alkanes (C₃₁ and C₃₃), contained in plant cuticular waxes, as internal markers associated with a dosed adjacent even-chain n-alkane (C₃₂) as an external marker.

In July, 9 lambs (5 months old) were housed in digestibility cages for 2 weeks. They received, ad libitum, freshly cut grass from a pasture they had previously grazed, and were dosed at 9.00 with a pellet containing 120 mg C₃₂. In the second week, for 7 d, a rectal faeces sample was collected from each animal, daily after dosing and intake was measured. The n-alkanes in herbage, faeces and pellet were extracted and measured by gas-chromatography, and intake estimated. The dry matter intake (DMI) measured on day J was compared to the DMI estimated from faces collected on days J + 1 and J + 2.

The mean recovery of n-alkanes in faeces is: 66.6% (CV:11.8%) for C₃₁; 83.4% (CV:6.2%) for C₃₂; and 77.5% (CV:12.0%) for C₃₃. These results are similar to those reported by Dove et al. (1989) for C₃₂, but less for the others. The proportion of C₃₂:C₃₃ recovery (1.08, sd:0.07) is better than C₃₂:C₃₁ (1.26, sd:0.07), and we have used it to estimate intake. The best prediction of dry matter intake measured on day J (Y) is by measuring n-alkanes in faeces collected on the morning of day J + 1 (X). The regression equation is: Y = 1.02 X + 13.39 (r² = 0.95; rsd : 24.6 g) (fig 1).

This method leads to an accurate estimation of grass intake for lambs at pasture. Nevertheless, the recovery of C₃₃ can be improved by careful selection of the diet sample, in which the concentration of C₃₃ is to be measured. This may require oesophageal sampling as recommended by Dove et al. (1989).


Fig 1. Estimation of daily dry matter intake.