While *in vitro* techniques for determining apparent digestibility of organic matter (DOM), particularly the cellulase method, are reliable and rapid this information might be adduced with sufficient accuracy for some purposes from pasture variables that are relatively easily measured in routine work.

Over 4 years (1974-76, 1978) 264 representative samples of pasture cut close to ground level (c. 2 mm) were collected at intervals of 1 or 2 months from each plot in a stocking rate experiment with grazing steers (Bird et al. 1978). A portion of each sample was hand-sorted fresh and the remainder freeze-dried. The DOM% (g OM digested/100 g OM) was determined *in vitro* using a modification of the cellulase method described by Allison and Borzucki (1978). *In vivo* standards were included in each batch and the raw *in vitro* DOM values were adjusted by regression to give predicted in vivo DOM values for cattle. The *in vivo* standards were obtained after harvesting pasture of varying maturity and feeding at ad lib. levels to steers in pens. DOM% was related to per cent green (%G) in the pasture dry matter (DM), per cent clover, and pasture availability (PA, t OM/ha), using the "Teddybear" regression programme (Wilson 1979).

The regression based on overall variation (within and between period) was

\[
\text{DOM\%} = 59.0 + 0.282 \times \%G - 2.513 \times \text{PA} \quad (R^2 = 88.8; \text{RSD} = 3.57).
\]

However, there were significant period differences among the adjusted means (A) of the 12 periods, hence the regression equation based on joint residual (within-period) variation should be used to allow for period differences:

\[
\text{DOM\%} = (A - 14.5) + 0.312 \times \%G - 1.883 \times \text{PA} \quad (R^2 = 80.2; \text{RSD} = 2.97).
\]

The variate per cent clover was not significant. The correlation between PA and %G was significant, -0.38. The adjusted means for Dec. (64.7) and Feb. (72.3) differed significantly from all other months for which the mean was 70.2 and range 68.2 (Nov.) to 71.9 (Jul.). The marked deviation in Dec. when pasture senescence begins is probably an artefact; mature plant material visually assessed as 'green' may be less digestible than green matter from active tissue.

The major determinant of digestibility was %G but the inclusion of the variate PA substantially improved the estimate. PA may be a simple index of the fibre content of the DM on offer. In Dec., the predicted DOM% of pastures varying in PA from 1.5 to 8 t DM/ha, but having a similar %G, differed by 12.3 units. In Oct. the difference was 11.9 units for an observed range of PA 0.7 - 7 t DM/ha.

It is accepted that DOM% predicted here may not correspond precisely with DOM% actually selected by cattle, although Langlands and Sanson (1976) found that the mean DOM% of green material selected did not differ from that on offer. At high levels of PA the DOM% will be underestimated due to greater opportunities for selection (Watson et al. 1980).


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