

VOLUNTARY INTAKE AND THE ENERGY REQUIRED TO SHEAR OR COMMUNUTE DRY, MATURE SUBTERRANEAN CLOVERS

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The principal constraints to voluntary intake of forages are resistance of forage fibre to chewing and digestibility provided that intake is not constrained by low palatability, deleterious secondary compounds or the inadequacy of essential nutrients. Differences between forages in their resistance to chewing are reflected in differences in comminution energy (McLeod et al. 1990). A variety of techniques is used to determine the energy required to shear, grind or comminute forage material, and in this study four of these techniques were compared as predictors of voluntary intake of five genotypes of dry, mature subterranean clover by sheep.

The energies required to shear the five genotypes of dry, mature subterranean clovers using an Instron materials testing machine and the relationship with voluntary intake of the five genotypes is reported elsewhere (Baker et al. 1993). The energies required to comminute the same feed materials were determined using two wet-grinding methods, one developed by Minson (unpublished) and another by Troelsen and Bigsby (1964), and a dry-grinding method described by Minson and Cowper (1974). Mean values were compared as predictors of mean voluntary intake of the five genotypes by sheep.

With all four techniques there was a negative relationship between the energy required to shear or grind the dry mature subterranean clovers and voluntary intake. The energy required to shear the clovers accounted for the greatest proportion of the variation in voluntary intake ($r = -0.94$; RSD = 49.62, $p = 0.015$), followed by the energy required to grind the clovers using Minson's technique ($r = -0.93$, RSD = 55.42, $P = 0.022$), Troelsen and Bisby's technique ($r = -0.89$, RSD = 69.72, $P = 0.044$) and the dry-grinding technique ($r = -0.87$, RSD = 74.88, $P = 0.055$). Further studies are being undertaken to determine the relationship between the energy required to shear the feed material and voluntary intake for a wider range of genotypes of subterranean clover than is reported here.

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