

PREDICTING CRUDE PROTEIN SUPPLY TO THE INTESTINES OF GRAZING SHEEP

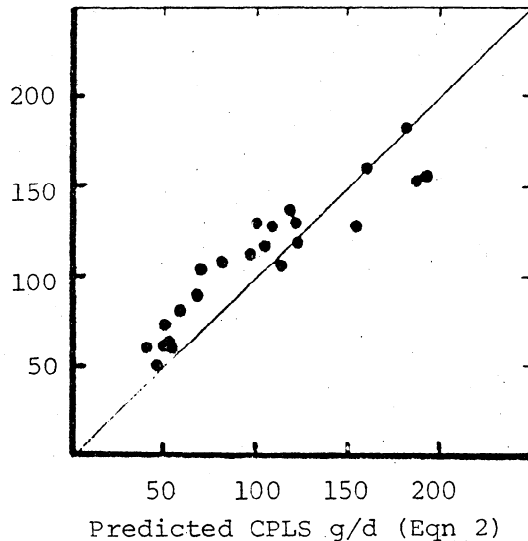
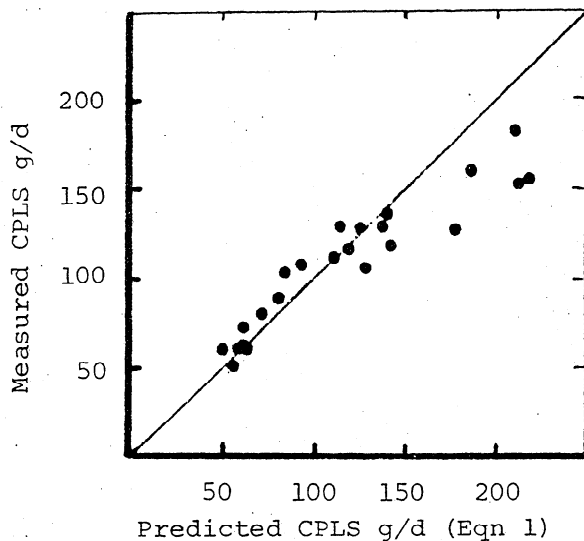
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Crude protein leaving the stomach of ruminants (CPLS=non-ammonia $\times 6.25$) comprises: (i) the fraction of crude protein intake (CPI) undegraded in the rumen; (ii) microbial protein in amounts related to dietary energy which can be expressed as digestible organic matter intake (DOMI); and (iii) CP of endogenous origin. These and related variables, except (iii), were measured in 23 experiments with sheep grazing phalaris, lucerne or native pastures, using techniques described by Corbett (1981). Measured CPLS (g/d) are compared below with those predicted with Eqns (1), derived from studies on dried forages, and (2) derived from a wide range of feeds.

$$(1) \text{ CPLS} = 0.36 \text{ CPI} + 0.16 \text{ DOMI} + 6 \quad (\text{Hogan and Weston 1981})$$

$$(2) \text{ CPLS} = 0.41 \text{ CPI} + 0.124 \text{ DOMI} \quad (\text{Verité et al 1979}).$$

These imply, respectively, that 0.64 and 0.59 of CPI is degraded, and that microbial CP production is 160 and 124 g/kg DOMI; the intercept in (1) indicates 6 g/d endogenous CP. Predictions with $[0.33\text{CPI}+0.18\text{DOMI}]$ (Hogan and Weston 1981) were similar to those with (1). Regression analyses showed that when measured CPLS was greatest, about 170 g/d, both equations overestimated by about 25%, and (2) underestimated to a similar extent at CPLS = 70 g/d. The overestimations may have stemmed from over-allowance for CP and the underestimation from too low predictions of microbial CP. Our mean values were 0.87 for the degradability of herbage CP, whence the appropriate expression would be 0.13 CPI, and 174 g microbial CP/kg DOMI (thus 0.174 DOMI). The model for predicting CPLS appears promising, but appropriate coefficients have to be determined for various types of pastures and for season of year. For example, microbial CP was 144 g/kg DOMI in autumn but greater (207 g/kg DOMI; $P < 0.05$) on the same pastures in summer.



CORBETT, J.L. (1981). In "Forage Evaluation: Concepts and Techniques", p. 383, editors J.L. Wheeler and R.D. Mochrie. (CSIRO: Melbourne.)
 HOGAN, J.P. and WESTON, R.H. (1981). *Ibid.*, p. 75.
 VERITÉ, R., JOURNET, M. and JARRIGE, R. (1979). *Livest. Prod. Sci.* 6: 349.

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