




A Simple Vegetation Criterion (NDF Content) May Account for Diet Choices of Cattle Between Forages Varying in Maturity Stage and Physical Accessibility

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The XX International Grassland Congress took place in Ireland and the UK in June-July 2005.

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A simple vegetation criterion (NDF content) may account for diet choices of cattle between forages varying in maturity stage and physical accessibility

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Introduction The management of extensively grazed pastures requires an understanding and prediction of the diet choices of herbivores grazing on vegetation that is qualitatively (maturity stage) and quantitatively (biomass, sward height) heterogeneous. The Optimal Foraging Theory (OFT, Stephens & Krebs, 1986), bases its predictions on the relative energy intake rate (EIR) of forages. However, as EIRs are difficult to assess at pasture and are subject to wide intra- and inter-individual variations, another vegetation criterion was sought (accessibility, quality), by-passing the animal's influence, to predict cattle diet choices quantitatively.

Materials and methods The results of two grazing and two complementary indoor experiments (Ginane *et al.*, 2002; Ginane *et al.*, 2003) were pooled. Eighteen-month old heifers were able to choose, throughout the day for approximately 7 days, between two forages (standing swards or hays), varying in relative maturity stage (vegetative vs. reproductive) and physical accessibility (sward height). Forages were characterized by their protein and fibrous chemical composition, their digestibility (measured *in vitro*), and their intake rates (measured *in situ* on the animals used in the choice experiments). These measurements yielded EIR values.

Results Diet choices were significantly and positively linked to forage EIR ratio (EIR of the vegetative forage/EIR of the reproductive forage, Figure 1A), consistent with OFT. Among the different criteria tested the difference in NDF content between forages (reproductive-vegetative) was the one most closely related to diet choices (Figure 1B). The close relation between diet choices and the neutral detergent fibre (NDF) criterion may arise because the NDF content is linked to (i) forage prehensibility, as it takes into account sward resistance to defoliation and mastication (Sauvant *et al.*, 1996), (ii) forage ingestibility, as it partly expresses forage fill effect in the rumen (Mertens, 1994), and (iii) forage digestibility, which varies inversely with NDF content.

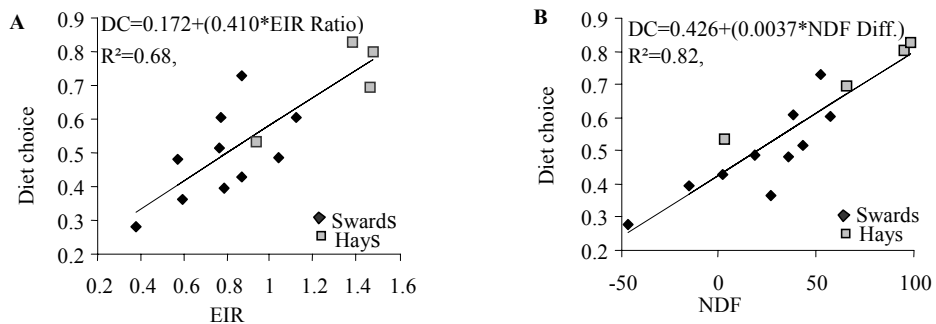


Figure 1 Linear regressions equations of observed diet choices (DC) with (A) EIR ratio of forages (vegetative/reproductive) and (B) difference in NDF content of forages (reproductive-vegetative)

Conclusions This study indicates that forage NDF content, a common and easy-to-measure criterion, may be useful for predicting cattle diet choices in heterogeneous pastures.

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