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The 21st International Grassland Congress / 8th International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

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Recording the prehensive bite diversity in cows for a dynamic analysis of foraging behavior on diversified vegetation

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Key words : on-farm recordings , ruminants , intake kinetics , feeding behavior , bite-count technique

Introduction Direct observation techniques have been widely used these last 30 years for recording intake of domestic and wild but tamed ruminants (Neff 1974 , Holeček *et al.* 1982 , Meuret *et al.* 1985 , Dumont *et al.* 1995) . Recent improvements allowed for a continuous recording and hence an accurate estimation of intake (Parker *et al.* 1993 , Agreil and Meuret 2004) , but mainly for small-sized ruminants (*i.e.* deer , sheep and goats) . The aim of this paper is to present a coding grid designed for the recording of bites of cows foraging on diversified vegetation .

Material and method The coding grid for cows bites was developed by observing on-farm a flock of heifers , in 2004 (Alpine range , France) . After the familiarization procedure (Agreil and Meuret 2004) , we grouped the diversity of observed bites into bite categories (BC) . At this stage , we looked for physiognomic similarities (nature , shape and size of the selected plant parts) , in order to limit the number of BC . This initial categorization was then sharpened by creating BC , when the observer anticipated major differences in mass or nutritional content . Each BC observed , containing either a single or several species , was manually simulated by the observer during the non-observation days , for determining the dry matter and nutrient contents .

Results and discussion The resulting bite coding grid (Figure 1) form a "language" , easily learnt by heart . Codes are monosyllabic and are easy to dictate immediately after the name of the selected botanical species , even during the highest bite frequency periods (over 100 bites/min) . The diversity of bites was satisfactorily described by 36 BC , which nearly as much as the number of BC needed for sheep and goats (Agreil and Meuret 2004) . However , certain special cases required additional information in order to complete the coding process , *e.g.* for variable proportion of dead materials in swards we needed a series of 3 "modifiers" superimposed on the basic grid .

Conclusions The bite-coding grid allows for an exhaustive recording of bites during whole meals and days , opening the way not only to an accurate estimation of intake on diversified vegetation , but also to a dynamic analysis of foraging behavior of cows .

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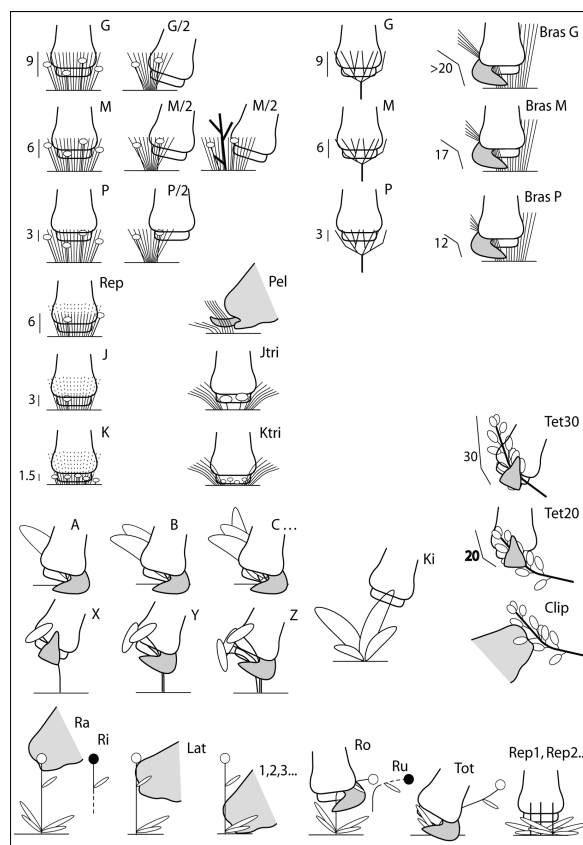


Figure 1 The coding grid for cows . The plant parts are indicated by small icons that symbolize their physiognomy : fine lines for stems or leaf blades , ovals for tree and shrub leaves , open circles for flowers and black circles for fruits . The length of leaves , laid out but not stretched , is indicated in cm . to the left of the icons . The mono- and bi-syllabic codes dictated during the observation are given to the right of the icons .