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Linear analysis method to calculate the specific forage ingestion by livestock

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Key words : pasture species , traceability , palatability indices

Introduction Native pastures include normally tens of species most of which are good forages . Measurements of massive biomass grazed are easy , whilst the calculation of specific ingestion is very difficult , nonetheless to know how much of each species is grazed by livestock can be useful to improve calculations of pasture carrying capacity and it is useful to research on traceability , in fact some pasture plants contain traceable components but they are not grazed and consequently the compounds are not found in the final produce , be it meat , milk or cheese . Several methods are used (Hodgson et al , 1981) but all are not precise : observations of livestock at grazing are done at distance from plants , animals fistulas change very much the grazing behaviour of livestock , twin sample areas and separate weighing take too long time and need many repetitions . We propose a simple method based on measurement of the massive biomass ingested and calculation of the percentual specific ingestion by the number of bites along lines of botanical analysis .

Materials and methods We chose 3 pastures of different complexity (39 species in flat land , 65 in mountain , 78 in hill) . The biomass was measured in each pasture in sample areas of 1 m² . After 5 days grazing we identified the species that had bitten leaves within 5 cm of distance from analysis points set at distance of 20 cm along lines of 20 m (Daget and Poissonet , 1971) . The quantity of bites received per species was pondered with the frequency of the species , this data was used to calculate the percentage of specific ingestion , finally the specific ingestion was multiplied by the total biomass to calculate the quantity of biomass ingested per species . This trails considered only the 15 most frequent species (5 per pasture) . The results we got by this method have been compared with specific indices of forage quality calculated con previous researches and known from literature (Pardini et al . , 2007) and indicative of the probable ingestion rate .

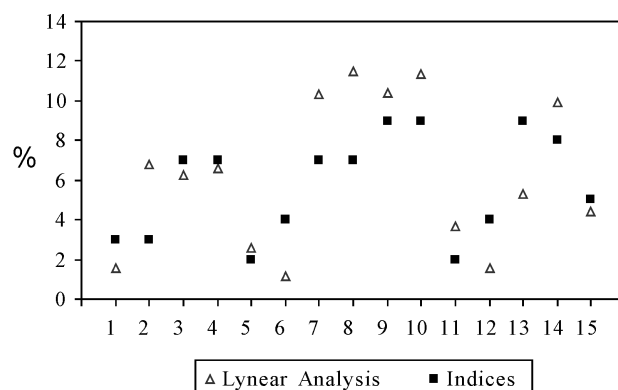


Figure 1 Grazing percentage and forage quality indices .

Results and discussion The specific ingestions calculated are very similar to the theoretical ingestion derived by palatability indices (Figure . 1) . The proposed method has distinguished species normally not much ingested like *Bromus erectus* (1) , *Holcus lanatus* (5) and *Plantago lanceolata* (11) because of little palatability , from those more palatable and normally more ingested like *Dactylis glomerata* (3) , *Festuca pratensis* (4) , *Lolium multiflorum* (7) , *L .perenne* (8) , *Medicago sativa* (9) , *Phleum pratense* (10) , *Trifolium repens* (13) , *Vicia sativa* (14) .

Conclusions There good similarity between the ingestion rates and the quality indices , consequently we consider the proposed method sufficiently reliable for quick analysis especially also because easy and rapid . However it should be further controlled in different seasons and environmental conditions , especially because the appreciation and ingestion of a species is related to the rest of the botanic composition of the pasture .

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