The diet of free-ranging beef cattle in a semi-arid savanna of eastern Namibia

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Introduction Beef ranching is the most important agricultural enterprise in arid and semi-arid SW African countries. It earns foreign exchange via beef exports to the EU and very many rural people depend on cattle pastoralism for their livelihood. However there is no published information on what cattle eat in such extensive systems. Therefore, it is difficult to optimize grazing strategies and to prevent degradation of rangeland.

Materials and methods The diet selected by free-ranging beef cattle in a semi-arid Namibian savanna was observed from 2001 to 2003. A 2 x 4 factorial design investigated treatment effects on cattle and rangeland: 2 cattle types (large-frame AfrikanerXSimmental versus small-frame purebred Sanga) X 4 systematically increasing stocking rates (low, targeting 30 ha/LSU, to high, targeting 10 ha/LSU). Diet selection by 6 randomly chosen cows/treatment was determined by bite-counting for 10 min/cow, repeated on 4 consecutive days early in the grazing cycle (Narjisse, 1991; Ortega *et al.,* 1995). Treatment plots (mean 142±28.9ha) were not replicated. Bites were converted into dietary abundance (% frequency) and transformed by arcsine before ANOVA-GLM analysis. Abundance data were pooled for the 3 main treatments cattle type, stocking rate and season of the year.

Results and discussion The perennial grasses, *Schmidtia pappophoroides, Anthephora pubescens, Eragrostis lehmanniana* and *Stipagrostis uniplumis*, were the principal forage species (those used most often), contributing 33.7±18.23, 14.5±19.65, 11.0±10.50 and 7.5±9.54%, respectively ($P<0.01$), to cattle diet. The 3 main treatments affected utilization ($P<0.01$, Figure 1). *S. pappophoroides* was the only grass that was both a principal forage species and maintained a sizeable presence in the sward, making it a valuable ecological indicator. Woody forage species (e.g. *Acacia mellifera*, a major invasive species in these parts) and non-graminiferous herbaceous forages (e.g. *Nidorella resedifolia*, an annual, indigenous weed characteristic of disturbed sites) became important to cattle only during the drier seasons and at the higher stocking rates (Figure 1).

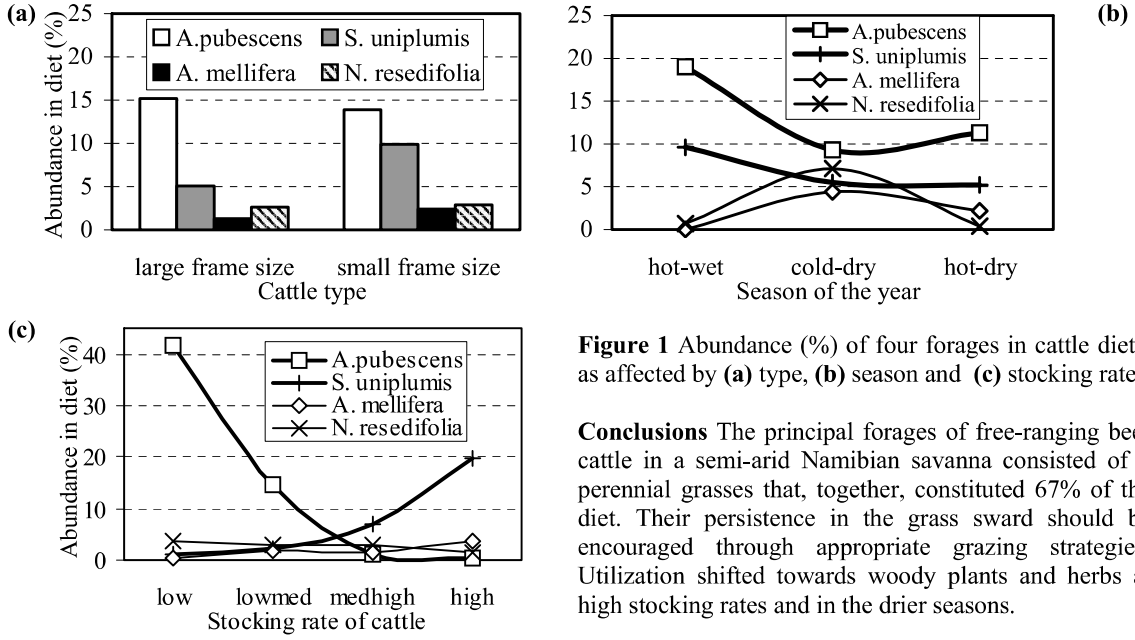

Figure 1 Abundance (%) of four forages in cattle diets, as affected by **(a)** type, **(b)** season and **(c)** stocking rate

Conclusions The principal forages of free-ranging beef cattle in a semi-arid Namibian savanna consisted of 4 perennial grasses that, together, constituted 67% of the diet. Their persistence in the grass sward should be encouraged through appropriate grazing strategies. Utilization shifted towards woody plants and herbs at high stocking rates and in the drier seasons.

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