



Intake choices of cattle and sheep grazing alone or together on grass swards differing in plant species diversity

Cuchillo H.M. and Isselstein J.

Institute of Grassland Science, University of Goettingen, 37075 Goettingen, Germany

Objectives

To investigate the interaction of grazing system (mono or co-grazing of cattle and sheep) and sward botanical composition (diverse or grass dominated swards) on intake preference for six target forage species.

Introduction

Grazing of grasslands is considered an effective measure to maintain and enhance biodiversity. However, type of grazing and botanical composition of the swards modify the grazing behaviour of ruminants (Fraser et al., 2007). Up to now, no information is available whether vegetation composition and type of grazing interact in this respect.

Material and Methods

- Eighteen paddocks (0.5 ha) in a randomised block design of six treatments and three replications were arranged:

LC	Low diversity swards/cattle grazing*
LS	Low-diversity swards/sheep grazing*
LCS	Low-diversity swards /cattle and sheep co-grazing*
HC	High diversity swards /cattle grazing**
HS	High diversity swards /sheep grazing**
HCS	High diversity swards /cattle and sheep co-grazing**

* Grass-dominated swards (7 species / 9m²)
 ** Swards include grasses, forbs and legumes (14 species / 9m²)

- Intake preference for *Dactylis glomerata*, *Festuca pratensis*, *Lolium perenne*, *Phleum pratense*, *Taraxacum officinale* and *Trifolium repens* were measured. Percentage mass of each target species was visually assessed in five fixed 0.5 m² subplots per plot immediately before and after three days grazing.
- The stocking density was 3000 kg of animal live weight per plot.
- Jacobs' selection index[†] was used to measure forage intake preference (1974). Values ranged between -1.0 (entirely rejected) to +1.0 (exclusively preferred).

$$^{\dagger} \text{Jacobs' Selection Index} = \frac{ci - ai}{ci + ai - 2ciai}$$

ci = % of forage in the diet
 ai = % of forage in the pasture

Results

Fig. 1. Jacobs' selection index of six target species grazed by cattle and sheep alone or together on grass swards differing in plant species diversity

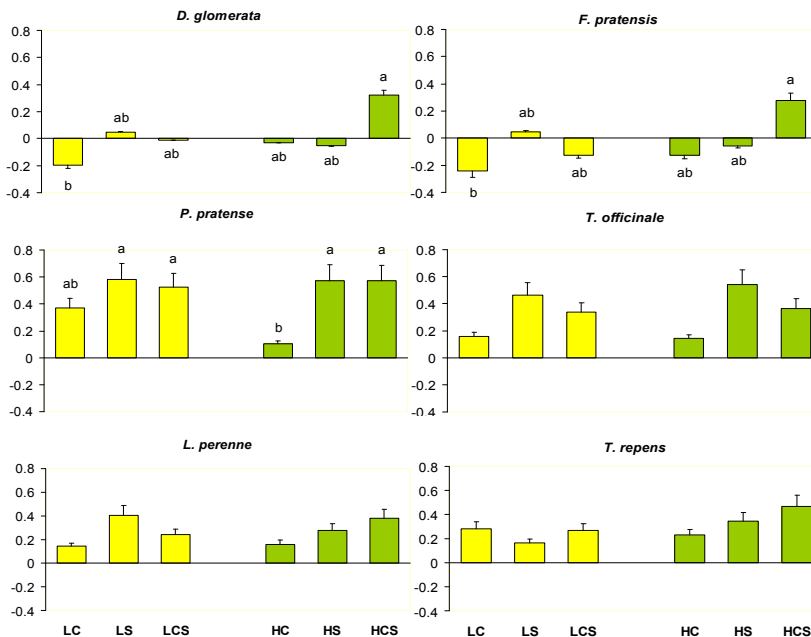


Fig. 2. Sheep grazing a high diversity sward



Fig. 3. Low (front) and high (back) diversity swards

- P. pratense* was the most preferred forage among target species.
- L. perenne*, *T. officinale* and *T. repens* were also preferred regardless of sward composition or type of grazing.
- In diverse co-grazed plots, cattle and sheep actively consumed *D. glomerata* and *F. pratensis*; avoiding high intake rates of readily digestible white clover (can't see in the figure and dandelion, whereas these species were refused in the grass dominated swards ($P < 0.05$)).

Conclusions

- Sward composition and type of grazing modified cattle and sheep intake preferences.
- Animal species differed in their intake choices. Sheep were more selective than cattle. To a lesser extent, the sward composition modified intake preferences.
- Co-grazing facilitated a more homogeneous intake and might have the potential to better maintain grassland biodiversity

Cuchillo H.M. was supported by a DAAD and DGRI-SEP grant.

References

Fraser M.D. et al. 2007. Effects on animal performance and sward composition of mixed and sequential grazing of permanent pasture by cattle and sheep. *Livestock Science*, 110, 251-266.
 Jacobs J. 1974. Quantitative measurement of food selection. *Oecologia*, 14, 413-417.