Patterns of sward height reduction in a tropical pasture grazed by dairy cows

Mezzalira J.C.[1], Carvalho P.C.F[1], Amaral M.F.[1], Bremm C.[1], Da Trindade J.K.[1], Gonçalves, E.N.[1], Martins, R. S.[2] and Genro, T.C.M.[2]

[1] Grazing Ecology Research Group, Federal University of Rio Grande do Sul, Brazil.
[2] The Brazilian Agricultural Research Corporation (EMBRAPA), EMBRAPA South Animal Husbandry & Sheep, Brazil.
Corresponding author: mezzalirajc@gmail.com

Introduction

The dry matter intake is considered the main constraint of animal production in pastures .

It is important to understand how animals influence and are influenced by pasture structural characteristics, and how those variables influenced the herbage intake rate.

The aim of this experiment was to study the changes on sward height and herbage intake measured during grazing of dairy cows on a pearl millet (*Pennisetum glaucum* (L.) R. Br.) pasture under a rotational grazing system.

Methods

Local: The study was conducted at the EMBRAPA South Animal Husbandry & Sheep, Bagé, RS, Brazil.

Pasture: The pearl millet pastures (*Pennisetum glaucum* (L.) R. Br.) was established in January 2008.

Measurements: began in March 2008 and the paddocks were grazed by four Holstein cows with mean weight of 450 ± 20 kg.

Treatments: consisted of combinations between two pre-grazing (60 and 40 cm) and two post-grazing (20 and 10 cm) sward heights (60-20; 60-10; 40-20 and 40-10).

Sward height: estimated by 30 measurements using a sward stick before and after grazing and in intervals of ten minutes to characterize the sward height reduction during the grazing period.

Short-term intake rate: determined by measuring pre- and post-grazing weight of cows corrected for insensible weight losses.

Bite rate: represented the ratio between number of bites and eating time.

Bite mass: was calculated by the ratio between short-term intake rate and bite rate.

Experimental design: randomized block with four replicates (two in space and two in time).

Analysis: A repeated-measures ANOVA with measurement dates as repeated effect was used, as well as regression analysis using the SAS© Software.

Results

The treatments 40-10, 40-20 and 60-20 presented similar decreasing rate (cm min^{-1}) during the grazing period.

On the other hand, in the treatment 60-10 the animals reduced the sward height during the first 39.7 minutes of grazing in a high decreasing rate (1.2 cm min^{-1}). From this period to the end of all grazing time the sward height remained constant at 17 cm. This result indicates the important constrains to grazing created by this management strategy.

Bite rate did not differ among treatments and was observed to be 39 bites min^{-1}.

Bite mass exhibited higher values in treatments with 20 cm post-grazing sward height (12.9 mg $bite^{-1}$ $kg^{-0.75}$ MW min^{-1}) than at 10 cm post-grazing sward height treatments (11.4 mg $bite^{-1}$ $kg^{-0.75}$ MW min^{-1}).

The treatment 60-20 presented higher short-term DM intake rate (0.53 g $kg^{-0.75}$ min^{-1}) as compared to the other treatments (0.42 g $kg^{-0.75}$ min^{-1}).

These results clearly indicate how grassland management strategy can influence animal response in a rotational system and how these contrasting structures interfere with herbage intake (Carvalho *et al.*, 2009).

It is expected that animals will obtain high intake rates at highest initial sward height.

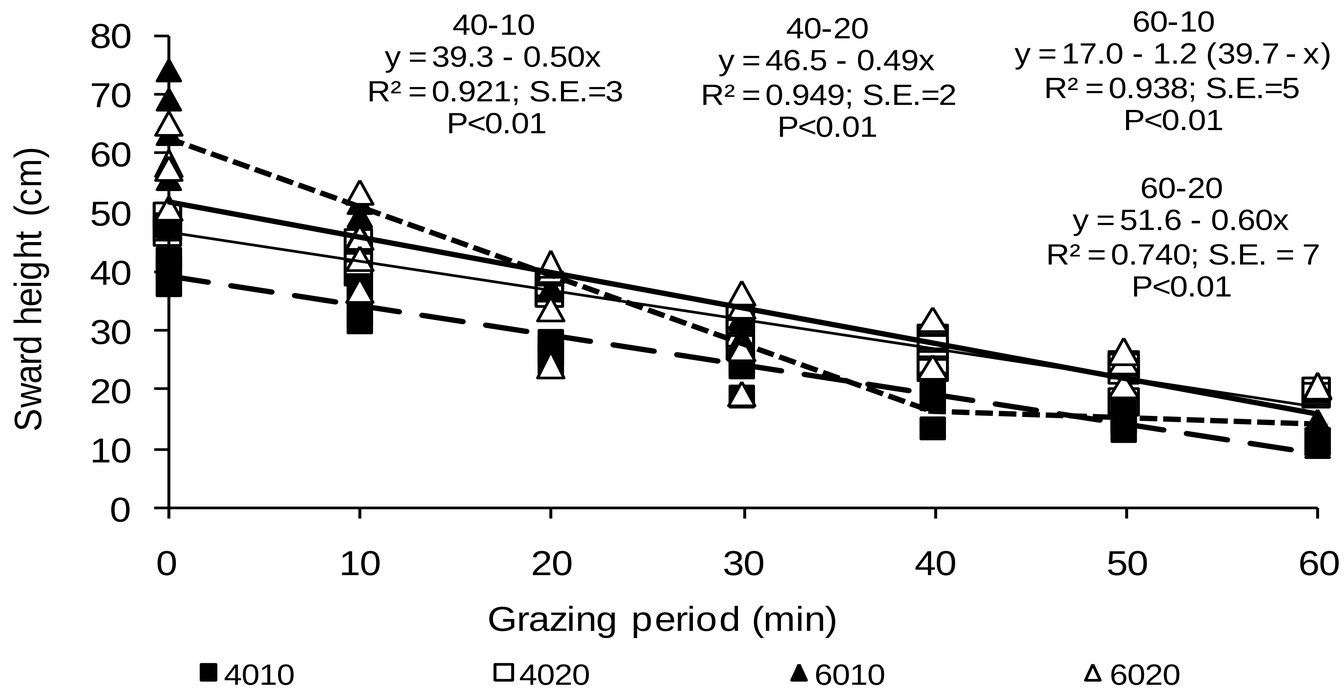

Figure 1: Sward height (cm) throughout the grazing period in pastures of *Pennisetum glaucum* (L.) R. Br. grazed by dairy cows under rotational stocking strategies (treatments: 60-20 (Δ), 60-10 (▲), 40-20 ( ) and 40-10 (■))

Conclusions

Lower post-grazing structures can constrain animal's intake. For dairy cows grazing pearl millet the best sward height seems to be 60-20 cm for pre and post-grazing strategy, respectively.

References

Carvalho P.C.F., Trindade J.K., Mezzalira J.C. Poli C.H.E.C., Nabinger C., Genro T.C.M., Gonda H.L. (2009). From the bite to precision grazing: understanding the plant-animal interface to exploit the multi-functionality of grasslands. *Brazilian Journal of Animal Science* vol.38, n. se, pp. 109-122.