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EFFECT OF CONCENTRATE SUPPLEMENTATION ON MILK YIELD OF CROSSBRED HOLSTEIN X ZEBU COWS GRAZING ELEPHANTGRASS

Fermino Deresz[1], Antonio Carlos Cóser[1], Rui da Silva Verneque[1]

[1]Embrapa - National Dairy Cattle Research Center - Rua Eugênio do Nascimento, 610 Juiz de Fora, MG, Brasil. CNPq fellowship.

Abstract

The study was carried out using 12 ha of Elephantgrass (*Pennisetum purpureum* Schum.) pasture, fertilized with 660 kg/ha/year of 20.05.20 formula, during the rainy season of 1999. It was used eight cows per treatment/site in a completely randomized block design. Blocks were based on milk yield and date of calving. Pasture was managed with 30 days of resting period using a stocking rate of five cows/ha. The objective of the study was to evaluate the effects of feeding concentrate for the first 60 (T60) or 120 days (T120) post-partum on milk yield, in relation to the control-group (T0), fed no concentrate. Concentrate was fed at a rate of 1 kg per each 2 kg of milk above the basal level of 10 kg (rainy season) or 12 kg/cow/day (dry-season). It was planned to have half of the cows calving on the beginning of the dry season and half on the beginning of the rainy season. The study started in February in site one and in site two in March. Corn silage supplementation started on April 15 (site one) and May 14 (site two) and was halted on November 23 in both sites. After the afternoon milking, the cows had access to paddocks. The data were analyzed separately for the two seasons. There was no treatment effect on milk

yield (P>0.05) for any season and the average dry season milk yield was 12.2, 12.8, 13.3, for the T0, T60 and T120 treatments, respectively.

Keywords: concentrate supplementation, Elephantgrass, dairy cows, milk yield, rotational grazing.

Introduction

There is information in the literature, indicating that it is possible to obtain average daily milk yield of 12 to 14 kg of crossbred Holstein x Zebu cows during the rainy season, on Elephantgrass (*Pennisetum purpureum* Schum.) pasture, rotationally grazed with 30 days of resting period and three days paddock occupation, without concentrate supplementation (Deresz et al., 1994). However, when the cows were supplemented with 2 kg of concentrate per cow per day, the milk response was on average 0,55 kg for each kg of concentrate offered during the rainy season on fertilized Elephantgrass pasture. Similar results have been observed by Alvim et al. (1997) working with purebred Holstein cows grazing coast-cross (*Cynodon dactylon* (L.) Pers.) fertilized pasture with a variable stocking rate and rotationally managed with one day paddock occupation and around 30 days resting period. However, the cost of 1 kg of concentrate under Brazilian conditions is usually higher than 1 kg of milk and so the concentrate supplement is not economically viable.

Considering the importance of these factors and their relationship with milk cost, different strategies of concentrate supplementation were proposed to evaluate the effects under grazing conditions using crossbred Holstein x Zebu cows.

Material and Methods

The study was carried out at Embrapa - National Dairy Cattle Research Center in Brazil, using 12 ha of Elephantgrass (*Pennisetum purpureum* Schum.) pasture in two different sites with six ha each. The pasture was fertilized with 660 kg/ha/year of

20.05.20 formula, applied half in January and half in March of 1999. It was used eight crossbred Holstein x Zebu cows per treatment/site in a completely randomized block design. The blocks were based on milk yield and date of calving. The potential milk yield per cow was around 3,500 kg/lactation. The pasture was rotationally managed with 30 days of resting period and three days of paddock occupation using a stocking rate of five cows/ha. The objective of the study was to evaluate the effects of feeding concentrate for the first 60 (T60) or 120 days (T120) post-partum on milk yield, in relation to the control-group (T0), fed no concentrate. Concentrate was fed at a rate of 1 kg per each 2 kg of milk above the basal level of 10 kg (rainy season) or 12 kg/cow/day (dry-season). It was planned to have half of the cows calving (pregnant cows) on the beginning of the dry season and half on the beginning of the rainy season. The study started in February in site one and in site two in March. During the pre-partum period (60 days) all the cows remained in the treatments with no concentrate supplementation, following the treatments, observing the seasons differences (dry season silage) to evaluate the residual treatment effects. Corn silage supplementation started on April 15 (site one) and May 14 (site two) and was halted on November 23 in both sites. After the afternoon milking, the cows had access to paddocks. Corn silage was offered ad libitum during the morning and the afternoon milking times. During the dry-season all the cows were fed 1 kg/cow/day of soybean meal to correct the crude protein of corn silage of 7-8% to 12-13% on a dry matter basis. The cows were milked twice a day in a milking machine and the data daily recorded. The data were analyzed separately for the two seasons.

Results and Discussion

Average milk yield in both seasons are presented on Table 1. There was no treatment differences ($P>0.05$) in milk yield. However, average milk yield was higher

during the dry than during the rainy season ($P<0.05$). The lower milk production during the rainy season were apparently due to the fact that half of the cows were pregnant and on the third stage of lactation and half of them were pregnant and expected to calve on November or December (rainy season) and above 120 days of lactation. Deresz et al. (1994) observed average milk yield of 12 to 14 kg/cow/day on fertilized Elephantgrass pasture rotationally managed during the rainy season, without concentrate supplementation with a stocking rate of five cows/ha.

The average corn silage chemical composition was 30.3% DM, 7.1% CP, 44% NDF and 62.3% IVDMD.

In the dry season the average milk yield were higher then during the rainy season apparently due to the fact that half of the cows were fresh in milk and receiving concentrate supplementation (T60 and T120) if the milk yield were above 12 kg/cow/day.. However, there was no significant difference ($P>0.05$) between treatments, mainly because of the high coefficient of variation (34%).

Overall average milk yield for both seasons are shown on Figure 1. Notice that the rainy season correspond to the first 15 weeks and also that the cows without concentrate supplementation (T0), during the dry season, produced on average 12.2 kg/cow/day (Figure 1).

In conclusion, there was no effect on milk yield due to the different strategies of concentrate supplementation in both seasons under the conditions of this study.

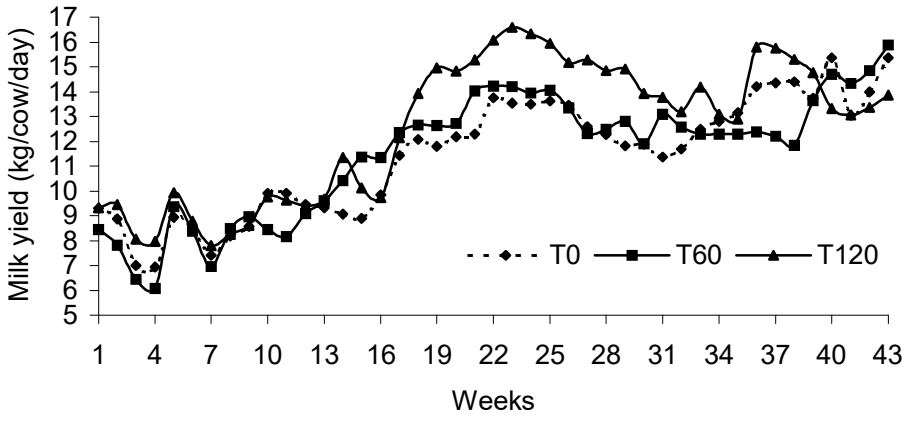
References

Alvim, M.J., Vilela D., Lopes R.S. (1997). Efeitos de dois níveis de concentrado sobre a produção de leite de vacas da raça Holandesa em pastagem de coast-cross (*Cynodon dactylon* (L.) Pers). Rev. Bras. Zootec**.**, **26**:967-975.

Deresz, F , Cóser A. C., Martins, C. E. et al. (1994). Utilização do capim-elefante (*Pennisetum purpureum* Schum.) para a produção de leite. In: Simpósio Brasileiro De Forrageiras e Pastagens, 1994, Campinas. Anais... Campinas:CBNA, p.183-199.

Table 1 - Average milk yield (kg/cow/day) of crossbred cows grazing Elephantgrass and fed concentrate for the first 60 (T60) or 120 days (T120) of lactation, during the rainy and dry seasons.

Treatments	Seasons	
	Rainy	Dry
T0	9.0 ± 0.9	12.2 ± 0.9
T60	8.6 ± 0.9	12.8 ± 0.9
T120	9.2 ± 1.1	13.3 ± 1.1



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