Performance of Beef Heifers of Various Genetic Groups, Supplemented or Not, in Coastcross Pastures

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PERFORMANCE OF BEEF HEIFERS OF VARIOUS GENETIC GROUPS, SUPPLEMENTED OR NOT, IN COASTCROSS PASTURES.

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Abstract

The objective of this study was to determine whether the performance of beef heifers of different genetic groups was affected by breed x nutritional environment interactions. Sixty four weaned heifers, 16 per genetic group: ½ Angus + ½ Nellore (AN), ½ Canchim + ½ Nellore (CN), ½ Simmental + ½ Nellore (SN) and pure Nellore (NE), were used with or without 3.0 kg of concentrate.animal^{-1} .day^{-1} in a fertilized coastcross pasture under rotational grazing system. There were effects of genetic group and supplementation ($P<0.05$) on the weight and age at first estrus, but there was no interaction between them. In a rotational grazing system with 4000 kg of available dry matter per hectare with 13% of crude protein, the crossbred AN, supplemented or not, was more precocious (111 days) than Nellore heifers, showing the first estrus at 356 days of age and 324 kg of live weight.

Keywords: *Cynodon dactylon*, rotational grazing, supplementation, age at puberty

Introduction

The main factors related to animal production under grazing are availability of dry matter, sward canopy characteristics, nutritive value of grass species, pasture management, feed supplementation, genetic potential of the animal, reproductive aspects and interactions among them (Holloway et al., 1985 and 1993; Jenkins, and Ferrel, 1994; Hohenboken, 1996).

Concentrate supplementation, fertilization of tropical pastures and rotational grazing are important factors which affect availability of dry matter, forage nutritive value and as a consequence weight gain necessary for the animal to reach puberty as well reduce calving intervals, mainly in first calving cows (Holloway et al, 1993; Selk et al., 1988).

Little is known about the effects of dry matter availability of tropical pastures and its interaction with concentrate supplementation and animal genetic potencial, for grazing beef heifers, upon biological and economic efficiency, as mentioned for cows by Morris and Wilton (1976 and 1977).

The objective of this study was to determine, under tropical conditions, the effect of breed x nutritional environment (dry matter availability of coastcross and concentrate supplementation) interactions on weight and age of puberty of beef heifers on a fertilized coastcross rotational grazing system.

Material and Methods

Sixty four weaned female Nellore (NE) and crossbred calves (½ Angus + ½ Nellore (AN), ½ Canchim + ½ Nellore (CN), ½ Simental + ½ Nellore (SN) were used in a fertilized coastcross pasture under rotational grazing system at Embrapa-Southeast Cattle Research Center, in the State of São Paulo (Brazil).

Experimental design was completely randomized, in a 4x2 factorial arrangement with four genetic groups (16 animals of each genetic group) and two levels of concentrate (zero

and 3.0 kg . animal^{-1} . day^{-1}), two replications of area and a total of 80 paddocks (740m^2 each). Experiment began in 01/19/99 after a pre-experimental period of 35 days. Five paddocks were grazed by four animals in a 5-day grazing period and 20 days rest. Paddocks were fertilized wiht 20 kg of the formula 20:05:20 immediately after each grazing during the rainy season (300 kg of N . ha^{-1} . year^{-1}). Heifers had free access to water and mineral supplementation. The concentrate had 19% crude protein (CP) and 81% total digestible nutrients (TDN).

Available dry matter per hectare and forage quality were determined by sampling some paddocks of each treatment (5 samples of 0.5 m^2 per paddock per month). Paddocks were selected randomly and sampled during the months of february, march and april of the rainy season.

Results and Discussion

Variation in live weight of the different genetic groups is shown in Figure 1. Mean weight gain for all treatments in the experimental period was 0.75 kg per animal per day. The crossbred heifers gained more weight ($P<0.05$) than the Nellore heifers. Gains were 0.78, 0.76, 0.81 and 0.64 for the crossbred AN, CN, SN and pure Nellore, respectively. There was no interaction between genetic group and level of supplementation. Heifers supplemented with 3 kg of concentrate per animal per day gained more weight ($P<0.05$) than the unsupplemented ones (0.86 x 0.63 kg animal^{-1} . day^{-1}). This aspect contrast with the interaction observed by Holloway et al., (1993) between herbage allowance and yearling heifer growth of Brahman-Hereford F_1 grazing humid pasture and semiarid rangeland.

The means of available dry matter per hectare, crude protein and neutral detergent fiber are shown in Table 1. There was high availabilty of dry matter per hectare as well a high quality coastcross forage in all sampled paddocks, with stocking rates varying from 5.2 to 7.8 A.U. These conditions allowed high gains in all treatments.

The mean age at first estrus for all treatments was 404 days. There was effect of genetic group ($P<0.05$), but there was no effect of level of supplementation neither interaction between genetic group and level of supplementation.

First estrus of the Nellore heifers were observed later ($P<0.05$) than the crossbred heifers. The mean age at first estrus was 467 days (NE), 405 days (SN), 386 days (CN) and 356 days (AN).The difference in age at first estrus between the crossbred AN and pure Nellore was 111 days. Better results with crossbred AN as compared to Zebu (Brahman) heifers were also obtained by Reynolds et al. (1979) in the subtropical climate of Louisiana Agricultural Experiment Station.

Mean live weight at first estrus for all treatments was 312 kg. There was effect ($P<0.05$) of genetic group and level of supplementation, but there was no interaction between genetic group and level of supplementation. Mean weight at first estrus was 346.6 kg (SN), 324.4 (AN), 300.6 kg (CN), and 276.6 (NE). There was difference ($P<0.05$) between AN and NE heifers, between SN and NE heifers, but there was no difference ($P>0.05$) between AN and CN, AN and SN and neither between CN and NE.

Mean weight at first estrus of the supplemented heifers (332.7 kg) was greater ($P<0.05$) than the mean weight at first estrus of the unsupplemented heifers (291.4 kg).

Based on these partial results, we conclude that with 4000 kg of available dry matter of coastcross per hectare with 13% of crude protein, under tropical climate, the crossbred AN heifers, supplemented or not, were more precocious (111 days) than Nellore heifers, showing first estrus at 356 days of age with 324 kg of live weight.

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Table 1 - Means of available dry matter per hectare, coastcross quality in the paddocks of the different genetic groups with and without concentrate supplementation and mean stocking rate (SR).

Genetic group	AN*		SN*		CN*		NE*	
Concentrate (kg .anim^{-1} . day^{-1})	0	3	0	3	0	3	0	3
DM (kg .ha^{-1})	3953	3904	4138	4646	4401	4010	3798	3937
CP (%)	13,1	14,4	13,6	13,4	13,9	13,3	12,5	13,3
FDN (%)	80,3	78,8	78,8	80,5	79,4	79,0	79,5	80,8
SR (AU.ha^{-1})	6,8	7,3	7,0	7,8	6,1	6,7	5,2	5,8

*****AN-Angus x Nellore, SN–Simmental x Nellore, CN–Canchim x Nellore, NE-Nellore.

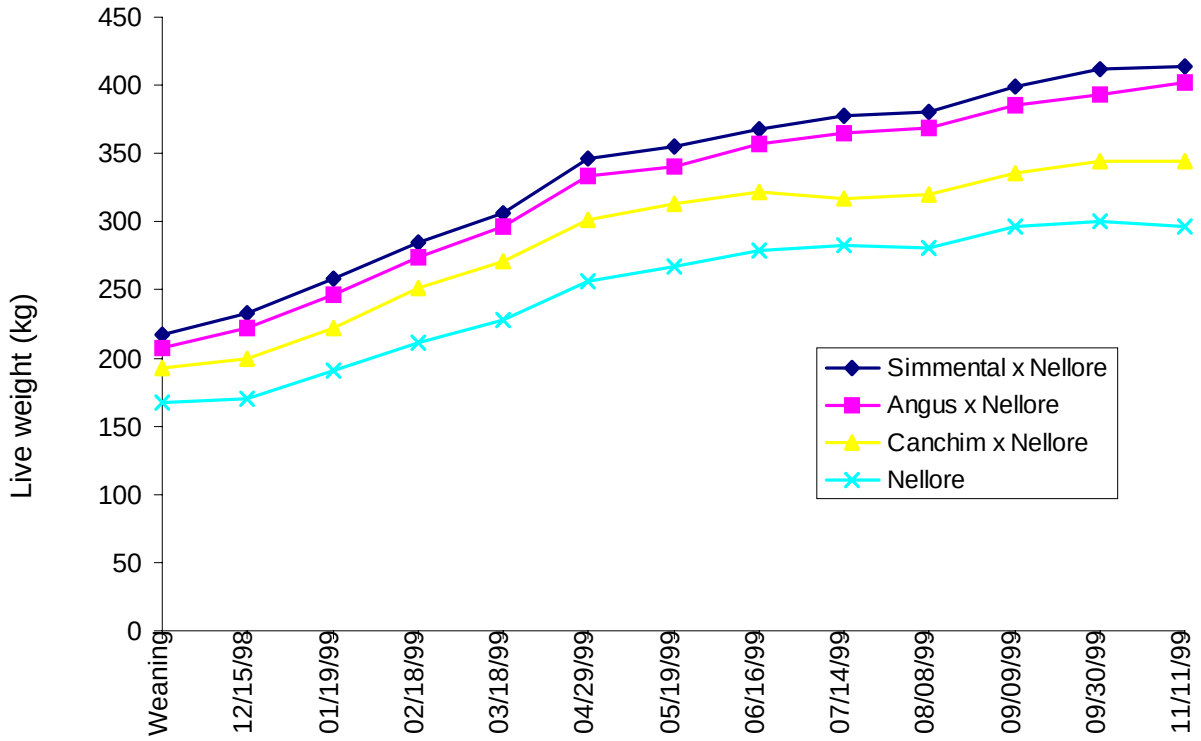

Figure 1- Mean weight change of heifers of different genetic groups on a coastcross fertilized rotational grazing system.