ENVIRONMENTAL EFFECTS ON CATTLE AND BUFFALOES IN CULTIVATED PASTURE OF MARAJO ISLAND, BRAZIL

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Abstract

Sixteen Mediterranean buffaloes and sixteen Nelore bovine males of about one year and half of age were fattened in a cultivated pasture of *Brachiaria humidicola*, stocking rate of 2 head/ha, continuous grazing, during dry and rainy period at the Marajó Experimental Station, of EMBRAPA/CPATU, Pará, Brazil. It was used a complete randomized block design, factorial 2 2 2 (Period of the year Species - Mineral supplementation), with two treatments, two replications and four animals per paddock. The treatments were: A - Buffaloes with mineral supplementation (MS); B - Buffaloes without MS; C - Cattle with MS and D - Cattle without MS. No significant differences were found for cattle liveweight gains per period, per head and per hectare/year. Supplemented buffaloes gave significantly higher responses for these variables and higher values than cattle. The intake of mineral supplement was higher by cattle and lower by buffaloes Environmental interferences on physiological variables were observed.

Key words: Amazon, *Brachiaria humidicola*, physiology.

Introduction

The main purpose of cattle and buffalo raising systems of the Amazon region is beef production from native and cultivated pastures. In Marajó Island, *Brachiaria humidicola* is the best grass forage to improve native pastures of low nutritive value, due to its rusticity, adaptation and productivity (1). In the last decade research in animal production has been directed towards the understanding of the relationship between the animals and the environment, to allow maximisation of genetic potential, with social and economical returns without harmful effects for the ecosystems. Thus, the objective of this study is to determine the relationship among productive, physiological and behaviour variables of cattle and buffaloes

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In 5th World Buffalo Congress

raised in cultivated pasture of *Brachiaria humidicola* and environmental variables (climate and nutrients), as well as the critical levels of animal comfort. From the results it is hoped that optimised production systems can be indicated to the farmers.

Materials and Methods

The trial was carried out at he Marajó Experimental Station, of EMBRAPA/CPATU (00° 40' S 48° 33' W), in the Salvaterra County, Pará, Brazil, during the dry period (July to December 1994) and the rainy period (December 1994 to July 1995). The main soil type is a Hydromorphic Laterite followed by Humic Gleys, of low fertility and high acidity. Sixteen Murran buffaloes and sixteen bovine Nelore males, of about one year and half of age were used in the trial. The experimental area of *Brachiaria humidicola* was divided into eight paddocks of 2 ha each, stocking rate of 2 head/ha. Available forage was collected at 28-day intervals, for dry matter (DM) and crude protein (CP). It was used a complete randomized block design, factorial 2 2 2 (Period of the year Species Mineral supplementation), with two treatments and two replications, with four animals per paddock. The treatments were: A - Buffaloes with Mineral supplementation (MS); B - Buffaloes without MS; C - Cattle with MS and D - Cattle without MS. At 28-day intervals its was collected data of liveweight; forage availability; mineral intake; and meteorological, physiological and behaviour variables. Forage and soil samples were taken for physical and chemical analysis.

Results and Discussion

No significant differences were found for cattle liveweight gains per day, per period, per head or per hectare/year. Supplemented buffaloes gave better results for all these variables, and in relation to cattle' There was a decrease in liveweight gain between September and December, due to the dry period ' Buffaloes supplemented with minerals showed less susceptibility to climatic effects on forage availability and at the beginning of the rainfall period presented a rapid recover having liveweight gains up to 0.950 kg, probably due to compensatory growth - (Table 1). For cattle, there were differences between the treatments with respect to weight at slaughtering, and weight of warm and cold carcass with superiority for the animals supplemented with minerals. For buffaloes supplemented with minerals the trend was similar (Table 2). Mineral intake was higher for cattle, while buffaloes had an intake smaller than the estimated values. Probably due to a better use of the supplements. With higher forage availability (December to March), the intake was reduced for both group of animals. The higher content of mineral and digestibility of the forage may have contributed for this fact. At the beginning of the trial P requirements were not totally met (Table

3). There were differences for heart beats between hours of sampling, animal species and treatments. These variations may have occurred by environmental interferences. The values found are higher than those reported in the literature - 50 to 55 beats/minute. Rectal temperatures were slightly higher for cattle, without any difference between treatments and hour of sampling. Breathing movements were more intense for cattle, mainly at noon. This variable presented lower averages during the rainy season. Values reported in the literature are lower for both species, (14,5 e 14 frequencies/minute, respectively for cattle and buffaloes, although from lower temperature conditions.

Table 1. - Liveweight gain (kg) of supplemented (M) and not supplemented cattle (NM).

	Cattle		Buffalo	
Variable	M	NM	M	NM
Daily gain (365d)	0.318	0. 241 a	0.451a	0.252b
Daily gain - dry period	0. 1 96a	0. 1 73a	0.303a	0. 1 97b
Daily gain - rainy season	0.421a	0.298a	0.575 a	0.298b
Gain per animal	116.15 a	87.96a	164.43a	91.88b
Gain per animail/year	232.30a	175.93a	328.85a	183.76b

Tabele 2. - Characteristics an carcass composition.

	Cattle		Buffalo	
Variable	m	NM	m	NM
Weight at slaughtering (A) (kg)	371.2	332.8b	376.9a	300.0b
Weight - carcass (B) (kg)	217.9a	191.9b	189.8a	148.6b
B in relation to A (%)	58.7 a	57.6a	50.3 a	49.6a
Gastrointestinal content (kg)	41.4a	39.2a	51.2 a	45.0a
Weight - empty body (C) (kg)	329.8 a	293.5b	325.7 a	255.0b
B in relation to C (%)	66. la	65.3a	58.3a	58.4a
Weight - cold carcass(kg)	215.5a	188.6b	187.4"	146.6b
Losses due to refrigeration (kg)	2.4a	3.2a	2.4a	2.0a
Losses due to refrigeration	1.la	1.7a	1.2a	1.4a
Fat depth (mm)	2.2 a	2.0a	4. 9a	3.0b
siren eye (cm)	83.0a	85.3a	81.0a	68.8b
Carcass length (cm)	126.0a	122.9a	123.1	117.0b
Commercial meat (D)	71.la	71.0a	69.9a	70.4a
Bone (E)	20. 1 a	19.7a	20.8a	21.9a
Fat (%)	8 .8a	9.3a	9.3 a	7.6 a
D in relation to E	3.5a	3.6a	3.4 a	3.2 a

Table 3. - Mineral intake (g/animal unit/day) per period.

Mineral intake	Cattle	Buffalo
July to December/94	151.20	119.11
January to July/95	67.55	41.09

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In: WORLD BUFFALO CONGRESS, 5., 1997,