# CONTRIBUITION TO THE STUDY OF CALCIUM AND PHOSPHORUS ON BUFFALOES IN MARAJO ISLAND, BRAZIL

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## INTRODUCTION

Marajó Island is socioeconomicaly important for the state of Pará, due to the presence of varzeas ecosystem and floodlands areas which are appropriate to buffaloes raising. The soils of the region are know by their acidity and by low fertility index (1) where a livestock system is carried out based on low quality native grasses and without adequate mineral supplementation (2).

A study on mineral deficiency in buffaloes is beeing developing in the region and this paper evaluate the status of calcium (Ca) and phosphorus (P) in growing buffaloes from municipalities of Muaná and Ponta de Pedras.

## MATERIALS AND METHODS

Forty two male and female crossbreeding Murrah X Mediterranean were divided in two categorias: Category 1, suckling calves aging about 6 months and category 2, weaned calves aging about 14 months. In the blood, serum Ca analysis was done by atomic absorption and P analysis by colorimetric method.

The bone tissue was sampled by biopsy of eleventh rib for analysis of Ca, P and ash (3) (4).

The forage of six more consumed grasses were sampled by cutting their parts simulating grazing for mineral analysis. At the same time, ten samples of soil were collected and lately transformed in a composite sample for analysis of pH (water) and mineral. Soil Ca analysis was done by spectrophotometry of atomic absoption and soil P by colorimetric method. A soil aluminium (Al) determination was done by titulation.

The experimental design was completely randomized with factorial arrangement of treatments. The season factor, rainy and dry, was considered as split plot of animal. The Tukey test was used to compare statistically means with 5% probability.

## RESULTS AND DISCUSSION

<u>Soil characteristics</u> - Along the season the ionic acidity was practically stable (pH 4,60 and 4,56). The levels of Ca (0,74 and 0,78 meq%) and absorbed P (1,67 and 1,78 ppm) were below the fertility standars (5) and the levels of Al (2,25 and 3,28 meq%) were very high and incressing in the dry season.

Mineral composition of forage grasses - Almost all studied grasses showed Ca levels near the minimum requirement of 100 kg

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65

suckling calves and 200 kg weaned buffaloes calves - 0,20 and 1,15% respectively, considering the intake of dry matter of 2% of live weight. The grasses *Panicum conjugatum* and *Eragrostes reptans* showed Ca levels below this limit. Also almost all grasses showed P levels bellow the minimum requirement of the minimal as specified above. Only in *Echinochloa pyramidalis* and *Paspalum zizanoides* the P levels were above the minimum requirement.

Effect of animal category - The absolute value of Ca and P (Tab 1) were variable in comparision to normal standard values (7), however, this response was similar to that of buffaloes with mineral deficiency already detected in the state (8).

Table 1. Mean and standard deviation of calcium and phosphorus content.

Category	Ca (mg/dL)	P (mg/dL)
ucklers	11,26a <u>+</u> 1,31	6,30a <u>+</u> 1,81
Weaners	$10,46b \pm 1,24$	5,25b <u>+</u> 1,88

Bone Ca and P values (Tab 2) showed deficiency, beeing bellow the critical values for bovine (9) and also they were lower of those showed by mineral deficient bovine (10).

Table 2. Mean and standard deviation of bone calcium, phosphorus and ash content.

Category	Ca (%)	P (%)	Ash (%)
Sucklers	22,80a <u>+</u> 2,89	9,33b <u>+</u> 1,41	55,74b <u>+</u> 4,71
Weaners	23,31a <u>+</u> 1,62	10,40a <u>+</u> 1,23	57,75a <u>+</u> 2,49

Effect of season - The bone P and ash content was significantly higher in dry season than in rainy season (Tab 3). Similar response was observed in bovine in the state of Roraima (11) and pointed out a week bone mineralization, indicating a need of Ca and P supplementation mainly in the rainy season. It is well known that in the rainy season the cattle tend to show higher gains due to better nutritive value of forage mainly in terms of protein and energy. The P mobilization in animal body is necessary to form and transfer of energy as well as to compose osteoid tissue (12), essential to the animal growing.

Table 3. Mean and standard deviation of bone calcium, phosphorus and ash content by season.

Season	Ca (%)	P (%)	Ash (%)
Rainy	22,78a <u>+</u> 2,68	9,47 <u>+</u> 1,21	55,30b <u>+</u> 3,75
Dry	23,34a <u>+</u> 1,93	10,26 <u>+</u> 1,56	58,20a <u>+</u> 3,60

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217