# PERFORMANCE OF BUFFALOES ON CULTIVATED PASTURE SUPPLEMENTED WITH MINERALS CONTAINING BONE MEAL AND DICALCIUM PHOSPHATE

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## INTRODUCTION

Amazon buffaloes breeders have reported consumption of mineral supplements below the animal needs. In floodable lowland grasslands, which receive periodical fertilization during flooding seasons, the reduced mineral intake is probably due to the good soil fertility and the water mineral contents. Another reason for the low consumption seems to be the use of dicalcium phosphate as a source of phosphorus in the mixtures. Therefore, the only available alternative for the farmers is the use bone meal, which is produced in limited quantities in that region. To compare the effect of two mineral supplements of similar phosphorus content, one with bone meal and the other with dicalcium phosphate, on the mineral consumption and liveweight gain, an experiment was carried out using male buffaloes grazing non floodable cultivated pature.

## MATERIAL AND METHODS

The experiment was carried out in a Koronivia grass (*Brachiaria humidicola*) pasture, in the Agroforestry Research Center for the Eastern Amazon (CPATU), in Belém, Pará, Brazil. The soil is a low fertility Yellow Latosol (Oxisoil). The climate is an Afi (Köppen classification). Annual rainfall is about 2.870 mm, rainy season from December to May. The average temperature and humidity are 26 $^{o}$C and 85%, respectively (1). Three paddocks of two hectares per treatment were used in a rotational system, 28 days of grazing and 56 days of rest. Two groups of six Murrah males ageing about one year and of similar initial weight were used. Group A had bone meal (10% of P) and Group B dicalcium phosphate (19% of P) as sources of P. The animals received mineral supplements of similar phosphorus content (8%). The trial started in September 1990 and last eight months, involving a rainy and a dry season. The animals were weighed at 28 day intervals, after a 15-hour fasting period. Forage availability was measured and samples were taken for dry matter determination. The experimental design was completely randomized block with two treatments and six replications. The response variables studied were initial and daily gain, daily/head mineral intake and forage availability (2,3). Simple correlation coefficients between experimental and climatic variables and between experimental variables were

Index terms: Amazon, phosphorus, supplementation, liveweight gain.

estimated and tested for significancy (2). A chi-square test was used to find significancy between the observed and expected values for mineral consumption for each group. Economical benefits from both mineral mixtures (groups A and B) were estimated.

**RESULTS AND DISCUSSION**

Initial and final weights and overall and daily weight gains are presented in Table 1.

TABLE 1. Initial and final weight and overall and daily gains of male buffaloes supplemented with mineral mixtures containg two sources of phosphorus (1)

| Weight | Source of phosphorus | |
|---|---|---|
| | Bone meal (A) | Bicalcic phosphate (B) |
| Initial (kg) | 192 a | 195 a |
| Final (kg) | 370 a | 344 b |
| Overall gain (kg) | 178 a | 149 b |
| Daily gain (g) | 779 a | 650 b |

(1) Averages with same letter do not differ ($P<0.05$).

Group A had a daily liveweight gain 129 g higher than group B. Mineral consumption was 66 g and 30 g for A and B, respectively. Daily consumption of group A is similar to values reported in the literature (4) in same experimental conditions, and 16 g higher than the usual value estimated for animals weighing about 280 kg (5). The bone meal used in this trial had a crude protein content over 16%, which may have caused a higher intake of the mixture containing bone meal, mainly in the dry period when the protein content of the forage is lower. On the other hand the daily consumption of group B (30g) is similar to expected values. During the driest month group A consumed 100 g of the mixture/head/day, while group B consumed 8 g/head/day. This trend may have been associated to the low crude protein content of the available forage, inducing the buffaloes to ingest more bone meal to compensate the defficiencies found in the pasture. Forage availability varied from averages of 3.0 to, 11.5 t of dry matter/hectare higher than the minimum standards for grazing animals. There was no significant differences between the two treatments for this variable. The simple correlation coefficients showed a significant effect of climatic variables (except minimum temperature) over liveweight and pasture availability. There was no significant effect of climatic variables over mineral intake. These results are within the trends expected by the authors. The simple correlation between experimental variables showed that the higher were the

buffaloes weight the lower was the residual forage availability. Considering only the supplement costs, the relative income was 15% higher for group A. On the other hand, the supplement costs were 260% higher for this group. The lower costs for dicalcium phosphate is then an important factor to be considerad by the breeders in different seasons and management conditions. The use of bone meal as a source of phosphorus in mineral mixtures can give better weight gains of young male buffaloes, although its intake is also higher than dicalcium phosphate. The intake of dicalcium phosphate was within expected values for adequate daily consumption of the mineral mixture. In areas of long term drought the consumption of dicalcium phosphate can be reduced due to low nutritional value of the available forage. In these conditions bone meal intake is increased due to its crude protein content. The mineral mixture containing bone meal gave better economical returns in relation to bicalcic phosphate.

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