



## Animal Performance on *Brachiaria brizantha* Alone or Supplemented with Concentrate or Protein Bank of *Leucaena leucocephala*

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**ANIMAL PERFORMANCE ON *BRACHIARIA BRIZANTHA* ALONE  
OR SUPPLEMENTED WITH CONCENTRATE  
OR PROTEIN BANK OF *LEUCAENA LEUCOCEPHALA*<sup>1</sup>**

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**Abstract**

The experiment was carried out at the Instituto Zootecnia, Nova Odessa, SP, Brasil, from June/1998 to March/2000 (634 days), and the liveweight gains of Nelore steers was evaluated, per animal and per area, on *Brachiaria brizantha* alone (T<sub>1</sub>), *B. brizantha* + *Leucaena leucocephala* (T<sub>2</sub>), *B. brizantha* + supplemental feeding during the dry season (T<sub>3</sub>) and *B. brizantha* + supplemental feeding during the dry and rainy season (T<sub>4</sub>). The experimental design was a randomized block, with four replications each one composed by three paddocks rotationally grazed by Nelore steers. Mean weight gain per day and per hectare were 0.426 and 1.050, 0.459 and 1.150, 0.497 and 1.259, and 0.535 kg and 1.331 kg, respectively.

**Keywords:** beef cattle, *Brachiaria brizantha*, *Leucaena leucocephala*, protein bank, supplementary feeding

**Introduction**

Grasses of the *Brachiaria* genus are largely present in the Brazilian territory, representing 70 to 80% of the pasture area, where is located the majority of the beef cattle.

The animal performance on exclusive *B. brizantha* grass pastures was 0,323 kg/animal/day after 608 grazing days (LOURENÇO & CARRIEL, 1998). The introduction of legumes directly on the pastures (JONES, 1979) or as a protein bank (LOURENÇO et al., 1983; LOURENÇO et al., 1992; CASTILLO et al, 1989), can be an alternative to improve animal performance.

The objective of this experiment was to evaluate the performance of Nelore steers, from weaning to slaughter, on *Brachiaria* pastures supplemented with concentrates or protein bank of *Leucaena*.

### **Material and Methods**

The experiment was conducted at the Instituto de Zootecnia, located in Nova Odessa, SP, (lat. 22° S, long. 48° O'W, alt. 528 m), from June 1998 to March 2000, totalizing 634 grazing days.

The annual precipitation in 1998 was 1521 mm, while in 1999 was 1450 mm with a dry season between July and November.

The mean monthly temperature oscillated between 17 and 24.3° C in July and January, respectively. The lowest and highest minimum mean temperature occurred in June (9.8° C) and January (21.3° C). The lowest and highest mean maximum temperature were in July (24.4° C) and January (31.5° C), respectively.

The local soil is classified as Latossolo Vermelho-Escuro-Orto, with topography almost plain and well drained. Soil samples were taken in 1998, from 0 to 20 cm deep, each sample composed of ten subsamples per ha taken in different points.

The soil samples were analyzed at the Departamento de Nutrição de Plantas, of the Escola Superior de Agricultura “Luiz de Queiroz”, and for P, K, Ca and Mg a resin extraction

method was utilized, P was determined by colorimetry, K by Ca and Mg by atomic absorption, H<sup>+</sup> by SMO (RAIJ et al., 1987). The results were the following: OM = 26 g/dm<sup>3</sup>; P = 5 mg/dm<sup>3</sup>; K = 1.1 mmol/dm<sup>3</sup>; Ca = 5 mmol/dm<sup>3</sup>; Mg = 2 mmol/dm<sup>3</sup>; H+Al = 82 mmol/dm<sup>3</sup>; pH (CaCl<sub>2</sub>) = 4.1; S = 8; T = 89.5; and V% = 8.6.

The animals were submitted to the following treatments were utilized: T<sub>1</sub> – *Brachiaria brizantha* pastures only; T<sub>2</sub> – *Brachiaria* pastures plus a protein bank of *Leucaena Leucocephala*; T<sub>3</sub> – *Brachiaria* pastures supplemented with concentrate feed during the dry season (from June to November/1998, 140 days, and from June to december/1999, 198 days); and T<sub>4</sub> – *Brachiaria* pastures supplemented with concentrate feed all the time (from June/1998 to March/2000, 634 days). On T<sub>2</sub> treatment the legume was present in 20% of the pasture area, and the animals had free access to the protein bank.

The experimental area had 48 ha, divided in 48 pastures of 1 ha each and the animals were rotated inside the experimental unit of 3 ha (3 pastures of 1 ha each), with a occupation period of 21 and 28 days in the rainy and dry seasons, respectively. The period without animals was, in the same order, 42 and 58 days.

The *Brachiaria* were planted in 1992 and in March of 1998 were fertilized with 100 kg of P<sub>2</sub>O<sub>5</sub>/ha, 60 kg of K<sub>2</sub>O/ha and 100 kg of N/ha only in the grass. In March 1999, 100 kg of N/ha was applied.

To evaluate animal performance 192 Nelore steers were utilized and weight gain measured as the mean of the group on each experimental unit (from 9 to 12 animals each), and each treatment had four replications. The mean initial live weight was 187 kg. The live weight was taken without fasten at 28 days intervals.

The supplementary feeding was made in covered bunks, refilled twice a week, and supplement intake in the dry season of 1998 was 0,491 kg/day, in the rainy season of 1998/99, 0,738 kg/day, and in the dry season of 1999, 0,524 kg/day.

Periodic control of ticks and worms and vaccination against foot and mouth disease was accordingly to the recommendations for this kind of animals.

### **Results and Discussion**

Animal performance is shown in Table 1. The analysis of variance of the live weight gain during 634 days, from June 1998 to March 200, showed significant differences ( $P < 0.05$ ,  $F = 11.6$  and  $VC = 5.7\%$ ). Daily live weight gain of the animals in the *B. brizantha* pastures supplemented with concentrate all the time ( $T_4 = 0.535$  kg) was not different from the daily gain of the animals supplemented only during the dry season ( $T_3 = 0.497$  kg). However, daily gain in both treatments were greater than in the *B. brizantha* pastures without supplementary feeding ( $T_1 = 0.426$  kg). Similar results were obtained by EUCLIDES et al. (1997), with  $F_1$  Angus x Nelore steers on *Brachiaria decumbens* pastures. The supplemented animals had a daily weight gain of 0.510 kg and the non supplemented 0.375 kg.

In the treatment with protein bank of *Leucaena* the daily weigh gain was 0,459 kg, not different from the treatment without supplementary feeding. This last, however, was greater than the daily gain of 0.328 observed in *Brachiaria brizantha* cv. Marandu pastures by EUCLIDES et al., (1996), in Campo Grande, MS, and 0.334 kg observed with the same grass by LOURENÇO & CARRIEL (1998)

In Cuba, CASTILLO et al. (1993), showed advantage of the protein bank with free access to the *Leucaena* legume, with daily gains of 0.530 kg, greater than those obtained in this trial.

Live weight gains per hectare in 634 days of experimental period were 1050, 1150, 1259 and 1331 kg, for  $T_1$ ,  $T_2$ ,  $T_3$  and  $T_4$ , respectively, and the mean grazing pressure was 3.8 head/ha.

The supplementary feeding of Nelore steers from weaning to slaughter on *Brachiaria brizanta* cv. *Marandu* pastures, under the same grazing pressure, increased 25.6% the daily

gain and 26.8% the gain per hectare. Free access to a protein bank of *Leucaena leucocephala* increase 7.7% daily weight gain, all compared to a control o *B. brizantha* pasture fertilized with 100 kg of N/ha/year.

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**Table 1** – Animal performance on *Brachiaria brizantha* alone or supplemented with concentrate or protein bank of *Leucaena leucocephala* during 634 days grazing.

	Kg/animal/day	Kg/hectare
<b>T<sub>1</sub></b> – B. brizantha alone	0.426	1.050
<b>T<sub>2</sub></b> – B. brizantha + Leucaena	0.459	1.150
<b>T<sub>3</sub></b> – B. brizantha + Sup. dry season	0.497	1.259
<b>T<sub>4</sub></b> – B. brizantha + Sup. All time	0.535	1.331