

Performance of calves receiving by-products of oil palm during the dry season in an integrated pasture-forestry system in pré-amazonic regions of Brazil

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Introduction

The integrated farming and livestock-forestry constitutes a viable alternative for the advancement of sustainable agriculture through its influence on social and ecological processes. Silvopastoral systems are integrated systems characterised by the management of animals in an agricultural-forestry association. These systems aim to provide shade for animals, stabilize forage production for meat production and/or milk products, forestry and various other environmental services (Maurício *et al.* 2010). Despite the benefits mentioned, the seasonality in the production of tropical forages needs to be considered. An efficient way to avoid losses in animal production in the dry season is with the use of supplementation. By-products from agri-business with high nutritional value, are often not recovered, and are discarded, sometimes incorrectly harming the environment. The use of these residues in animal feed can reduce environmental impacts and the cost of animal feed.

In this context, the aim of this study was to evaluate the performance of a cattle silvopastoral system in the dry season, supplemented with babassu meal.

Methods

The experiment was conducted at Tank Farm property in the municipality of Matinha, Brazil, whose geographical position is 45°06'25" W longitude, 02°59'35" S latitude and the climate is classified as Aw, according Koopen. The forage used was *Brachiaria brizantha* cv. Marandu in a silvopastoral system with babassu (*Orbygnia phalerata*) as an integrated forest. We used a 3 x 3 factorial (three densities of palms and three levels of babassu meal replacement), allocated in a completely randomized design. The densities of the babassu palm in the pasture were: 39, 72 and 92 palms per hectare, respectively. And the substitution levels of soybean meal by babassu meal were: 10, 20, 30% respectively and the diets were isoproteic.

Pastures were corrected with lime, superphosphate as

a source of phosphorus, potassium chloride as a source of potassium and urea as nitrogen source, according to the soil test recommendation. The experimental units were 18 nelore guzonal cattle, 10 and 9 months old that weighed approximately 200 kg. The animals were divided into 9 paddocks of 0.61 ha. The experimental period was 76 days, with 10 days of adaptation and 66 days of evaluation, where the animals received 2% of their live weight for each feed. The data were analyzed by statistical program InfoStat® (Infostat - Statistical Software, Cordoba - Argentina 2004).

Results and Discussion

Data on weight gain of animals receiving different levels of babassu meal to replace soybean meal, on pastures with different densities of the babassu palm are found in Table 1. It was observed that there was no statistical difference ($P>0.05$) between the isolated factors or the interaction. These results corroborate those obtained by Castro (2012) who evaluated the addition of increasing levels of babassu meal as a substitute for cane sugar for heifers and found that the final weight of the heifers was not altered by the diets. However, in their study the average daily gain of the animals had a quadratic relationship, with greater ADG by replacing the 19% bulky babassu meal. Xenophon *et al.* (2008) evaluated the performance of lambs fed diets containing different levels of babassu meal bran (0, 10, 20 and 30%, DM basis) and observed ADG decreased linearly with increasing babassu. However, Castro (2007) found the

Table 1. Table of averages, total weight gain of the experiment in kg, no significant differences detected.

Replacement levels	Density of palm trees		
	92 palm/ha	72 palm/ha	36 palm/ha
30% babassu meal	34.17	49.67	49.50
20% babassu meal	49.17	45.17	39.50
10% babassu meal	44.83	57.00	42.17

inclusion of 15% babassu meal in place of soybean meal in the diet of dairy cows received no differences in ADG.

Conclusion

We conclude that replacing 30% of soybean meal with babassu meal and up to 92 babassu palms/ha in pastures did not interfere with weight gain of cattle. However, the error around individual measurements needs to be considered, due to a lack of replication in the design, which may mask differences between treatments.

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