

CONSTRUINDO SABERES, FORMANDO PESSOAS E TRANSFORMANDO A PRODUÇÃO ANIMAL

DRY MATTER INTAKE AND APPARENT DIGESTIBILITY OF SHEEP FED DIETS CONTAINING AMAZONIAN CO-PRODUCT

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Abstract: As tortas de cupuaçú (*Theobroma grandiflorum*) e tucumã (*Astrocaryum aculeatum*) estão disponíveis na Amazônia em grande quantidade e têm uso potencial na alimentação de ruminantes. Objetivou-se avaliar o consumo de matéria seca e a digestibilidade aparente das tortas de cupuaçú e tucumã em ovinos confinados. Vinte e oito ovinos foram distribuídos em gaiolas metabólicas individuais, em delineamento em blocos ao acaso, onde os blocos foram definidos pelo peso dos animais; quatro tratamentos, sete repetições e dois períodos de coleta. Cada animal recebeu diariamente silagem de milho e um dos seguintes concentrados: com reduzido teor de óleo (ROC), contendo torta de cupuaçú (CUP), contendo torta de tucumã (TUC) ou elevado teor de óleo (HIOC). Animais que receberam a dieta TUC tiveram o menor consumo de matéria seca ($P>0,05$). As digestibilidades aparentes das dietas contendo co-produtos regionais foram inferiores, se comparadas aos tratamentos controles (ROC e HIOC). A inclusão de torta de tucumã reduz o consumo e a digestibilidade da matéria seca em ovinos confinados.

Keywords: cupuaçú pie, nutrition, ruminants, tucumã pie

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Introduction

Co-products use in ruminant feed is determined by factors such as availability, nutritional value, acceptability, and digestibility. Typical fruits from northern Brazil, such as cupuaçu and tucumã, have excessive production. Cupuaçu produce 9 million fruits per year (IDAM, 2013) and tucumã produce 50 kilos of fruits per tree per year (Figliulo and Silva, 2009). Besides the pulp extraction for human consumption, the oil is extracted from their almonds by mechanical pressing. The almond, with reduced oil content, is considered waste, but with potential use in ruminant feed (Rodrigues et al., 2013).

Although the ingredient availability is a very important factor for the diets' development, the animal acceptability and intake will be the factor that will determine its inclusion viability. After intake, it is necessary to know the ingredient digestibility, meaning the food portion that is digestible and ensures conversion to products of interest: meat, milk, skin, wool.

The objective was to evaluate dry matter intake and apparent digestibility of cupuaçu and tucumã pies in feedlot sheep.

Material and methods

The protocol used in this experiment was approved by the Ethics Committee on Animal Use, Federal University of Pará, Faculty of Veterinary Medicine/Campus Castanhal (protocol number 8694141217).

Twenty-eight castrated lambs of crossbreeding, Dorper x Santa Inês, with an average body weight of 35 ± 2 kg and 9 ± 2 months were used. They were housed in metabolic cages $0,75$ m², equipped with trough and waterer. Experimental diets were formulated to contain 7% ethereal extract in dry matter (DM) and to be isonitrogenous. The roughage feed was maize silage (400 g kg⁻¹ on a DM basis) plus concentrate (600 g kg⁻¹ on a DM basis). Experimental diets were formulated to meet the requirements of weaned lambs recommended by NRC (2007) for an average

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weight gain of 250 g day⁻¹. Diets were supplied daily at 08h00 and 17h00, to allow 20% as leftovers (fresh matter); the weights of feed supplied, and leftovers were recorded to estimate the dry matter intake (DMI). At the onset of the experiment, lambs were identified, dewormed, vaccinated against clostridiosis and distributed at random into the following treatments: reduced oil content (ROC), containing cupuaçu pie (CUP), containing tucumã pie (TUC) and high oil content (HIOC). The proportion of the ingredients in the experimental diets are presented in Table 1. The experimental period lasted 50 days; the first 14 days were for adaptation to the facilities and diet and the last 36 days were data collection defined as two experimental periods, with 18 d in each one. The experimental period consisted of 13 days of adaptation and 5 days to evaluate dry matter intake and apparent digestibility.

Chemical analyses of feeds and feces samples were pre-dried in a forced air ventilation oven (55°C; 72h) and milled with a knife mill equipped with 1-mm mesh sieves. The contents of DM (method INCT-CA no. G-003/1) were quantified according to the standard analytical procedures of the Brazilian National Institute of Science and Technology in Animal Science (INCT-CA; DETMANN et al., 2012). Dry matter intake and apparent digestibility data were submitted to analysis of variance considering effect of treatments and periods. The means were compared using a T test at 5% significance.

Table 1. Composition of the experimental diets (%)

Ingredient	Diets			
	ROC	CUP	TUC	HIOC
Corn silage	40.0	40.0	40.0	40.0
Ground corn	43.2	6.2	13.2	40.7
Soybean meal	14.8	6.8	13.9	1.3
Ground soybean	-	-	-	14.5
Soybean oil	-	-	-	1.5
Cupuaçu pie	-	45.0	-	-
Tucumã pie	-	-	30.9	-

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Mineral and vitamin supplement ¹	1.5	1.5	1.5	1.5
Limestone	0.5	0.5	0.5	0.5

¹calcium, 140 g; phosphorus, 65 g; magnesium, 10 g; sulfur, 12 g; sodium, 130 g; cobalt, 80 mg; iron, 1000 mg; iodine, 60 mg; manganese, 3.000 mg; selenium, 10 mg; zinc, 5.000 mg; fluorine (maximum), 650 mg; vitamin A, 50.000 U.I.; vitamin E, 312 U.I.

Results and Discussion

Dry matter intake in animals fed with tucumã pie was lower ($P < 0.05$) than the animals fed with cupuaçú pie and control treatments. Apparent digestibility was reduced when animals received diets containing the co-products (Table 2). There were no effects of DMI and digestibility between experimental periods ($P = 0.95$).

One of the factors that may have contributed to decreased DMI among the evaluated pies is the food acceptability by the animal and this is related to the chemical composition of the diet's ingredients (Berchielli, Pires and Oliveira, 2006). An animal with a weight of 35 kg, consuming 3% of its weight, is expected to consume $1.05 \text{ kg MS}^{-1} \text{ day}^{-1}$.

Table 2. Dry matter of diet, dry matter intake and apparent digestibility of experimental diets

Item	Diets				CV (%)
	ROC	CUP	TUC	HOIC	
Dry matter (%)	95.23	95.31	95.95	94.77	-
DM intake ($\text{g animal}^{-1} \text{ day}^{-1}$)	1.00 ^a	0.99 ^a	0.65 ^b	1.09 ^a	20.25
Dry matter digestibility (%)	68.34 ^a	56.94 ^b	54.90 ^b	69.32 ^a	12.10

Means followed by the same letters on the lines do not differ significantly by the Tukey test ($P < 0.05$). CV - coefficient of variation.

Lipid supplementation with ethereal extract higher than 5% compromises ingestion, through regulatory mechanisms that control ingestion, either by limitation or by the limited capacity of the ruminants to oxidize fatty acids. However, even with higher content of ethereal extract in the HIOC diet, there was no reduction in the consumption in this treatment, which indicates that another nutrient may have influenced the CMS reduction of Amazonian pies.

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Conclusion

Digestibility is reduced with the inclusion of cupuaçu pie. The inclusion of tucumã pie in the diet reduces dry matter intake and digestibility in confined sheep.

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