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Jurema preta (*Mimosa tenuiflora* (Willd. Poiret) pods in the diet of lambs

Vagens de jurema preta (*Mimosa tenuiflora* (Willd. Poiret) na dieta de cordeiros

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ABSTRACT: The partial substitution of commonly used concentrate mixture by jurema preta (*Mimosa tenuiflora* (Willd.) Poiret)) pods (JPP) in the diet of Santa Inês lamb was evaluated according to a randomized complete block design with three treatments (0, 10 and 20% concentrate substitution, in a 40:60 concentrate: roughage fodder diet) and six replications, using18 non-castrated Santa Inês male lambs with initial body weight of 20.28±1.18 kg. The analyzed variables were daily consumption and apparent coefficients of digestibility of dry matter (CDM and CDDM), organic matter (COM and CDOM), neutral detergent fiber (CNDF and CDNDF), acid detergent fiber (CADF and CDADF), crude protein (CCP and CDCP), ether extract (CEE and CDEE), and non fibrous carbohydrates (CNFC and CDNFC), as well as consumption of metabolizable energy (CME) and water (CH_2O), mean daily body weight gain (BWG) and food conversion (FC). The consumption of CP, NDF, ADF and EE increased linearly, while consumption of NFC decreased linearly. Mean daily BWG and food conversion were not affected (P>0.05). There were no effects (P>0.05) of JPP on digestibility except for the quadratic effect (P<0.05) on CDNFC. Inclusion of jurema preta pods in the diet of lambs may contribute to the sustainability of the sheep activity in the semiarid region of northeast Brazil.

Keywords: alternative food, caatinga, digestibility, performance

RESUMO: Avaliou-se a substituição parcial do concentrado comercial pela vagem de jurema preta (VJP) (*Mimosa tenuiflora* (Willd.) Poiret) na dieta de cordeiros Santa Inês de acordo com um delineamento em blocos casualizados com três tratamentos (0, 10 e 20% de substituição do concentrado, numa dieta com 40% de concentrado) e seis repetições, totalizando 18 cordeiros machos inteiros Santa Inês, com peso vivo inicial de 20,28±1,18 kg. As variáveis analisadas foram os consumos e os coeficientes de digestibilidade aparente da matéria seca (CMS e CDMS), matéria orgânica (CMO e CDMO), fibra em detergente neutro (CFDN e CDFDN) e ácido (CFDA e CDFDA), proteína bruta (CPB e CDPB),extrato etéreo (CEE e CDEE), e carboidratos não fibrosos (CCNF e CDCNF), bem como o consumo de energia metabolizável (CEM),o consumo de água (CH_2O), o ganho de peso vivo médio diário (GPM) e a conversão alimentar (CA). Foram observados aumentos lineares nos consumos de PB, FDN, FDA e EE, e decréscimos no de CNF. O GPM e a CA não foram afetados (P>0,05). Não houve efeito (P>0,05) de VJP na digestibilidade, exceto o efeito quadrático (P<0,05) no CDCNF. A inclusão de vagens de jurema preta na dieta de cordeiros pode contribuir para a sustentabilidade da ovinocultura na região semiárida do nordeste do Brasil.

Palavras-chave: alimento alternativo, caatinga, desempenho, digestiblidade

Introduction

Sheep raising is practiced in the semiarid region of northeast Brazil due to its low costs of implantation and fast economic return. This activity is negatively affected during the approximately 8-month-long dry season because most of the plants stop growing, the quantity and quality of the forage produced by the spontaneous Caatinga vegetation are reduced, and supplementation is necessary (Araújo Filho, 2013).

However, leaves, sprouts and fruits of more than 70% of the Caatinga plant species, including trees, are consumed by domestic ruminants (Marques et al., 2007; Silva et al., 2008; Ramos et al., 2009; Bakke et al., 2010) and can be collected and stored to feed animals during the dry season.

The spontaneous forage produced by trees, shrubs and herbs is abundant and nutritive during the rainy season, but not in the dry season when senesced roughage fodder provide most of the food for ruminants. According to Araújo & Cavalcanti (2002), dry leaves and fine branches from shrubs and trees predominate in the diet of ruminants during the dry season, indicating the qualitative and quantitative importance that these species may have on animal feeding.

Jurema preta [*Mimosa tenuiflora* (Willd.) Poiret] is a legume tree of the Caatinga biome that produces forage (leaves, fine branches and pods) consumed by ruminants (Cordão et al. 2013). Considering specifically their pods, Araújo et al. (2005) reported production as high as3 kg/tree, although with a marked difference among years and plants. These pods contain 14% of protein, that shows high digestibility (54.24%), and may constitute an important food source for ruminants when they fall to the soil (Vale et al., 1985). These authors report a daily consumption of 83.1 g .kg$^{-0.75}$ of jurema preta pods (JPP) by 18.5 kg goats that resulted in a daily body weight gain of 141 g.

This study evaluated the effects of the partial substitution of commercial concentrate (ground corn, soya and wheat bran) by jurema preta pods on nutrient intake and digestibility, as well as on performance of Santa Inês lambs.

Material and Methods

The study was carried out at the Experimental Station of the Federal University of Campina Grande/CSTR, Patos, Paraiba, Brazil, from November 2009 to January 2010.

The initial average body weight of the 18 non-castrated Santa Inês male lambs was 20.28 kg ±1.18 kg (mean ± SE). Each lamb was dewormed (Ivomec: 1 ml/50 kg of live body weight) at the beginning of the 14-day adaptation period. Parasite load was estimated every 21 days, and parasite control was performed similarly in each lamb that showed more than 500 x 10^3 eggs of parasites/g of feces.

Experimental treatments were designated to plots according to a randomized complete-block design with three treatments ($T_{0\%}$=0%, $T_{10\%}$=10% and $T_{20\%}$=20% of substitution of commercial concentrate by JPP, fixed effect) and six replications of one lamb for the performance and digestibility trials. Each block consisted of lambs with similar weights (1.0 kg range), and the 18 lambs used for collection of the performance data were used to generate the data set regarding apparent digestibility of the diet nutrients. Tests of homogeneity of variance between treatments, and linear and quadratic polynomial regression analyses, correlating the levels (X, fixed effect) of concentrate substitution by JPP with the dependent Y variables [mean daily body weight gain, daily consumption and coefficients of apparent digestibility of dry matter, organic matter, neutral detergent fiber, acid detergent fiber, crude protein, ether extract, non-fibrous carbohydrates and metabolizable energy, intake of water and food conversion] were performed using the General Stepwise Regression and General Linear Model modules of STATISTICA 5.0 (Statsoft, 1999). The adopted significance level was P=0.05.

Dry JPP were collected in October 2009 from naturally growing plants at the Experimental Station, sundried for 2 days, comminuted through a forage processing machine and stored in nylon bags according to Araújo et al. (2005) recommendations. Elephant grass (*Pennisetum purpureum* Schumach.) was harvested at full vegetative stadium (90 days), comminuted, sundried and stored similarly to the JPP.

The ingredients of the diets were analyzed for dry matter (DM), ashes, organic matter (OM), crude protein (CP), neutral (NDF) and acid (ADF) detergent fiber, ether extract (EE), total carbohydrates (TC), non fibrous carbohydrates (NFC), calcium (Ca) and phosphorus (P) (Silva & Queiroz, 2002). Phenols and tannins contents of JPP were determined at University of São Paulo/Centro de Energia Nuclear na Agricultura laboratories while composition of the other diet components were those commonly adopted in literature (Table 1).

Table 1. Dry matter and chemical composition (% of DM) of the components of the experimental diets

	Components				
	Elephant grass hay	Jurema preta pods	Ground corn	Soya bran	Wheat bran
DM*	94.03	91.99	91.81	92.87	93.10
Ashes	10.11	04.96	10.19	07.58	05.85
OM	89.89	95.04	89.81	92.42	94.15
CP	04.28	19.61	08.86	47.26	14.77
NDF_{cap}**	79.31	33.65	15.30	18.04	42.50
ADF_{cap}**	47.56	30.91	06.54	11.05	24.46
EE	05.94	08.04	05.45	04.37	06.83
NFC	01.10	33.73	61.04	22.75	33.18
TF	-	03.08*	-	-	-
TT	-	02.33*	-	-	-
CT	-	1.00*	-	-	-
Ca	0.78	1.06	0.78	0.93	0.49
P	0.019	0.023	0.027	0.057	0.077

*DM=dry matter, OM=organic matter, CP=crude protein, NDF=neutral detergent fiber, ADF=acid detergent fiber, EE=ether extract, NFC=non fibrous carbohydrates, TF=total phenols, TT= total tannins, CT=condensed tannins, Ca=calcium, P=phosphorus.**cap=corrected for ashes and proteins.

The experimental diets were formulated to meet a 150 g daily body weight gain (NRC, 2007), and contained 60% (DM weight) of elephant grass and 40% of concentrate (Table 2).

Table 2. Composition of the diets according to the substitution level of the commercial concentrate by jurema preta pods

Ingredients	Levels of substitution of concentrate by JPP		
	0%	10%	20%
Elephant grass hay	60.0	60.0	60.0
Jurema preta pods	0.0	4.00	8.00
Ground corn	10.0	7.0	6.0
Soya bran	20.0	19.0	18.8
Wheat bran	9.0	9.0	6.0
Mineral mixture	1.0	1.0	1.20
TOTAL	100.0	100.0	100.0
Chemical composition (%DM)			
DM	93.53	93.53	93.51
Organic mater	90.02	90.20	90.13
NDFcap*	54.50	55.33	55.34
ADFcap*	36.72	37.19	37.50
Crude protein	14.24	14.28	14.44
Ether extract	5.60	5.71	5.77
Non fibrous carbohydrates	15.68	14.87	14.58
Total phenols	0,99	1.04	1.08
Total tannins	0.64	0.67	0.74
Condensed tannins	0.03	0.07	0.14

*NDFcap and ADFcap =neutral and acid detergent fiber corrected for ashes and proteins, respectively.

Animals were fed twice a day (07:00 h and 14:00 h), and the quantity of the food offered every day surpassed the expected daily food consumption by approximately 20%. The unconsumed food was collected every morning for analysis.

Performance trial lasted for 77 days (14 days for the adaptation of the animals to the diets and stalls, and 63 days for data collection). Each lamb remained in a 1.3 m x 0.75 m wood stall, with individual food and water supply. Animal weight was taken in digital balance after overnight fasting.

Digestibility trial lasted for 21 days, the first16 days for adaptation to the diets and metabolic cages (0.6 m x 1.0 m), and during the last 5 days data regarding the total amount of excreted feces and urine were collected, as well as daily sampling of the offered and non consumed food. Approximately 10% of the excreted feces of the last five days were stored in plastic bags at -10°C, originating five samples/lamb, that were mixed together, weighed, dried (65°C) in a forced ventilation stove, weighed again, grinded to pass a 1 mm sieve, and analyzed for DM, OM, NDF and ADF, CP, CE, and EE in the Laboratory of Animal Nutrition/UFCG/Patos-PB according to Silva & Queiroz (2002) recomendations.

Data collection considered the daily consumption [DM (CDM), OM (COM), NDF (CNDF), ADF (CADF), CP(CCP), EE (CEE), TC (CTC), NFC (CNFC), metabolizable energy (CME) and coefficients of apparent digestibility [DM (CDDM), OM (CDOM),NDF (CDNDF),ADF (CDADF), CP (CDCP), CE (CDCE), EE (CDEE), TC (CDTC), NFC (CDNFC)] of diet components. Water intake (IH_2O), mean daily body weight gain (BWG) and food conversion (FC) were also considered.

Consumption values were estimated by the difference between the daily amounts of food offered and non-consumed by the animals. Drinking water consumption was estimated in the same way, but corrected by subtracting the average water evaporation observed in three plastic pails similar to those present in each stall to which animals had no access. The coefficient of apparent digestibility (CD, in %) for each diet component was estimated by CD=(Quantity of nutrient ingested–Quantity of nutrient excreted in feces)*100/(Quantity of nutrient ingested).

Non-consumed food was collected every day from the feeder of each lamb, mixed and sampled at the end of the experimental period for analyses (DM, OM, NDF, ADF, CP, and EE) according to protocols exposed by Silva & Queiroz (2002). Content values of NDF and ADF were corrected for ashes and proteins, and the NFC were estimated according to the equations proposed by Hall (1999): at where: %TCH=100-(%CP + %EE + %MM), and therefore %NFC=(%TCH - %FDNcap).

Consumption of metabolizable energy was estimated based on the daily collection of 10% of the total amount of urine excreted by each lamb into plastic pails under each metabolic cage and with 10 mL of a 50% solution of chloride acid, resulting in five samples for each lamb. After collection, each urine sample was stored at -10°C in a hermetically closed glass container, and the next 4 urine samples collected each day from each lamb were mixed together and remained in the same glass container until CP and CE analyses were performed. Metabolizable energy was estimated by the equation proposed by Blaxter (1962); Food conversion (FC) was calculated by: FC=kg of DM intake/kg of body weight gain.

Results and Discussion

The CDM, COM, CCP, CME, BWG and CH_2O were not affected (P>0.05), while FC and consumption of NDF, ADF, NFC and EE expressed in units of metabolic weight ($k^{0.75}$) were affected by the inclusion of JPP in the diet (P<0.05) (Table 3).

Although CDM was higher than the NRC (2007) value (CDM=780 g/20-kg lambs), BWG remained below the expected 150 g for all treatments. This was surely not a result of JPP inclusion in the diet, because BWG of the control treatment averaged also below expectations (BWG<124 g), and Vale et al. (1985) reported BWG=141 g for 18.5-kg goats fed exclusively JPP. This poor lamb performance should be credited to other factors, such as low breed potential.

No significant effect (P>0.05) of JPP was observed on CCP, whose overall mean was 154.05 g, and exceeded the NRC (2007) recommendation (CCP=104 g) for a daily body weight gain of 150 g/20-kg lambs. There is a CCP positive trend (P=0.076) when expressed in a $g/kg^{0.75}$ basis. Average values for CCP were 13.83, 14.33 and 14.83 $g/kg^{0.75}$ respectively for 0, 10 and 20% of concentrate substitution by JPP (Table 3), and each 1% of substitution of concentrate increased CCP by 0.0500 $g/kg^{0.75}$ (regression equation not shown in Table 3)

Table 3. Mean consumption of diet constituents, body weight gain, food conversion and consumption of water, by Santa Inês lambs, with substitution of the commercial concentrate by jurema preta pods in their diet

Y	X					
	0%	10%	20%	L	Q	R^2
CDM* (g)	982.05	1024.00	1034.00	>0.05	>0.05	0.017
CDM ($g/kg^{0.75}$)	90.83	95.67	97.00	>0.05	>0.05	0.176
COM (g)	880.00	919.00	928.00	>0.05	>0.05	0.018
COM ($g/kg^{0.75}$)	81.17	85.67	86.83	>0.05	>0.05	0.192
CCP (g)	150.17	154.17	157.83	>0.05	>0.05	0.015
CCP ($g/kg^{0.75}$)	13.83	14.33	14.83	>0.05	>0.05	0.214
CME (Mcal)	2.67	2.66	2.31	>0.05	>0.05	0.081
CME($Mcal/kg^{0.75}$)	0.25	0.25	0.22	>0.05	>0.05	0.149
BWG (g)	119.77	123.52	111.20	>0.05	>0.05	0.205
FC	8.55	8.39	9.25	0.0069	0.0651	0.204
	$FC=8.5480-0.0676*X+0.0051*X^2$					
CNDF (g)	523.50	573.83	573.67	>0.05	>0.05	0.054
CNDF($g/kg^{0.75}$)	48.33	53.50	53.66	0.038	0.226	0.292
	$CNDF_{PMet.}=48.333+0.767*X-0.025*X^2$					
CADF (g)	303.00	343.30	345.10	>0.05	>0.05	0.091
CADF($g/kg^{0.75}$)	27.83	31.83	32.16	0.0158	0.1867	0.359
	$CADF_{PMet}=27.833+0.583*X-0.018*X^2$					
CNFC (g)	153.83	140.50	135.50	>0.05	>0.05	0.105
CNFC($g/kg^{0.75}$)	14.33	13.16	12.16	0.0087	0.4702	0.480
	$CNFC_{PMet.}=14.333-1.150*X+0.333*X^2$					
CEE(g)	52.50	56.33	57.50	>0.05	>0.05	0.004
CEE ($g/kg^{0.75}$)	4.850	5.258	5.360	0.0219	0.3687	0.258
	$CEE_{PMet}=4.850+0.0560*X-0.0015*X^2$					
CH_2O(g)	2718	2857	2816	>0.05	>0.05	0.004
CH_2O($g/kg^{0.75}$)	248.50	264.50	254.80	>0.05	>0.05	0.015

*CDM=consumption of dry matter, COM=consumption of organic matter, CCP=consumption of crude protein, CME=consumption of metabolizable energy, BWG=body weight gain, FC=food conversion, CNDF=consumption of neutral detergent fiber; CADF=consumption of acid detergent fiber, CEE=consumption of ether extract; CH_2O= consumption of water.

Similarly, Barreto et al. (2004) reported significant CCP increase (from 16.61 to 18.03 $g/kg^{0.75}$) by non-castrated Santa Inês lambs when pig manure was included in the diet as substitute of 0 to 12.6% of the concentrate (60% concentrate: 40% Tifton grass hay diet), or equivalently an estimated increment of 0.126 $g/kg^{0.75}$ in CCP for each 1% concentrate substitution by pig manure. Correcting these values for the observed differences in concentrate:roughage fodder ratios, the 0.0500 $g/kg^{0.75}$ and 0.1260 $g/kg^{0.75}$ rate values are equivalent to 0.125 and 0.1878 $g/kg^{0.75}$ respectively for each 1% increase of JPP or pig manure in the whole diet.

The BWG were lower than the values reported for Santa Inês lambs by Parente et al. (2009) (171.6g≤BWG≤218.8 g, when the animals were fed diets composed of different proportions of Tifton grass, concentrate and alternative foods, such as juiceless pseudo-fruit of cashew-nut, passion-fruit seeds and shell, and *Leucaena leucocephala* leaves), Cunha et al. (2008) (BWG=186.0 g/an for a diet composed of 20% whole cotton-seed, 20% ground corn and soya bran mixture, 34% Tifton grass hay and 26% prickly pear cactus (*Opuntia ficus-indica* Mill.), and Castro et al. (2007) (BWG=253,35 g for a diet composed

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of 40% concentrate and 60% hay of *Manihot sp.* fine branches).

Food conversion was affected by JPP ($P<0.05$), and showed averages similar to the reported by Parente et al. (2009) (FC=8.41) for ½ Santa Inês lambs fed 31% concentrate (ground corn and soya bran) and 69% Tifton grass hay, and by Ferreira et al. (2009) (FC=8.48) for lambs of undefined breed fed concentrate (1.8% of live body weight in a daily basis) and elephant grass silage.

The observed overall mean for CNDF and CADF were 557.0 and 330.5 g, respectively. These values were between the reported by Castro et al. (2007) (CNDF=416.49 g and CADF= 244.48 g, for Santa Inês lambs fed 60% *Manihot sp*. fine branches -Ø≤10mm- and leaves and 40% concentrate) and by Parente et al. (2009) (CFDN=737.97 g, for ½ Santa Inês lambs fed 38% ground whole corn-cobs, 32% *Leucaena leucocephala* hay and 30% Tifton grass hay).

Overall mean CEE=55.44 g is higher than the reported by Rebouças (2007) (32.3 g≤CEE≤47.8 g) for castrated 45-kg Santa Inês sheep. They found a quadratic effect of the substitution of the concentrate by *P. juliflora* pod bran in a 40:60 (concentrate:Tifton grass hay) maintenance diet.

However, when expressed in units of metabolic weight ($g/kg^{0.75}$), the effects of the substitution of commercial concentrate by JJP on consumption showed to be significant ($P<0.05$) to NDF, ADF, NFC and EE. Consumption of NDF, ADF and EE increased by 0.767, 0.583 and 0.056 $g/kg^{0.75}$, respectively, for each 1% substitution of concentrate by JPP (0 to 20% of substitution of commercial concentrate by JPP), certainly due to the increase also observed in CDM (Table 3). However, CNFC decreased 1.150 $g/kg^{0.75}$ for each 1% substitution of concentrate by JPP, what can be explained by the increase in the fiber content in the diet. However, this increase in fiber intake, especially the hardly digestible ADF, did not inhibit food ingestion and body weight gain, probably due to increase in the consumption of other diet components, such as EE.

The positive linear effect on CEE from 0 to 20% concentrate substitution by JPP totaled 0.510 $g/kg^{0.75}$, while Silva et al.(2010) reported CEE increase from 9 to 13 $g/kg^{0.75}$ for Saanen nursing goats when 13% of cotton-seed replaced corn and soya, but no significant CEE increase was observed when corn and soya were replaced by *Cnidoscolus quercifolius* seeds or seed cake (4.86 or 10.61% replacement, respectively).

Water consumption was not affected by concentrate replacement by JPP, and the overall means were 2797 g and 255.9 $g/kg^{0.75}$. Values in units of metabolic weight are similar or higher than the reported by Cordão et al. (2008) for the same region and facilities of the present study for Santa Inês sheep fed several hay mixtures of jurema preta, *C. quercifolius* and elephant grass: 79.8 $g/kg^{0.75} \leq CH_2O \leq 274.1$ $g/kg^{0.75}$.

Dry matter (DM), OM, NDF, ADF, CP, CE and TCH coefficients of apparent digestibility were not affected ($P>0.05$) by JPP, and showed an overall mean of 63.15,63.56, 51.60, 43.75, 74.13, 60.50, 52.77 and 63.29%, respectively (Table 4), values considered adequate to ruminants (Hoover, 1986; Milford & Minson, 1966).

Table 4. Means the coefficient of digestibility [CD(%)] of the diet components with the substitution of commercial concentrate by jurema preta pods, in diet of Santa Inês lambs

Y	X					
	0%	10%	20%	L	Q	R^2
DM*	64.59	65.21	59.64	>0.05	>0.05	0.269
OM	65.04	65.66	59.97	>0.05	>0.05	0.255
NDF	52.02	52.55	50.23	>0.05	>0.05	0.078
ADF	42.65	46.00	42.59	>0.05	>0.05	0.031
CP	76.72	76.65	69.04	>0.05	>0.05	0.157
EE	54.54	56.48	47.29	>0.05	>0.05	0.245
NFC	83.72	91.05	76.04	0.1449	0.0242	0.316
	$Y=83.727+1.850X-0.1117X^2$					

*DM=dry matter; OM=organic matter; NDF=neutral detergent fiber; ADF=acid detergent fiber; CP=crude protein; EE=ether extract; NFC=non fibrous carbohydrates.

Derivation of the significant quadratic regression model ($P<0.05$) relating the CDNFC (Y) and the substitution level of by JPP (X) ($Y=83.727+1.850X-0.1117X^2$) showed maximum CDNFC at X=8.28% of concentrate substitution by JPP. This point can be considered an optimum value because digestibility of the other diet components was not affected.

The estimated mean for CDDM was slightly lower than the reported by Cunha et al. (2008) (CDDM=66.62%) in a study with Santa Inês lambs fed 30% crushed whole cotton-seeds, plus prickly pear cactus (*Opuntiaficus-indica* Mill.), soya bran, ground corn, Tifton-85 grass, urea and minerals. Probably, this resulted from the higher content of secondary compounds such as ADF and tannins present in JPP than in cotton seeds. These compounds protect plants from microorganism and insect attack, and can similarly decrease the activity of the rumen biota and or be toxic to the animal itself (Santos et al., 2009). Also, fruits or part of fruits of perennial plants can be fibrous and hard to digest, and result in low coefficients of digestibility. Miotto et al. (2012) reported CDDM= 31.8% and 51.3% when sheep were fed, respectively, 78% and 0% of *Orbignya phalerata* Mart. fruit mesocarp as a substitute of elephant grass.

Crude protein digestibility was not affected ($P>0.05$) and averaged CDCP=74.13%. However, further studies are necessary to check the apparent negative trend on this variable, because CDCP average decreases from more than 76% to 69.04% for 20% concentrate substitution by JPP (Table4). Actually, this negative trend seems to occur recurrently for all diet components, and turned to be significant for NFC and will be considered later on this paper. It is possible that the type of tannins in JPP decreased digestibility, even when tannins concentration in the diet (Table2) remains in the acceptable range for ruminants (≤ 5%)(Barry&McNabb, 1999).On the other hand, the average CDCP observed for 20% concentrate substitution by JPP in the present study (69.04%) was similar to the one reported by Bakshi&Wadhwa (2007) for goats fed *Leucaena leucocephala* leaves (CDCP=69.8%), considered to be an excellent source of protein for ruminants. However, this plant is not easily grown in tropical dry regions, except where soil moisture is not a limiting factor. Digestibility at levels higher than 20% of the commercial concentrate by jurema preta pods should be considered, especially concerning CP, an important diet components that showed a relatively higher decrease in digestibility.

Digestibility of NFC showed to be in the expected range (CDNFC>90%) (Valadares Filho et al., 1995) for ruminants fed this type of food constituent only for 10% concentrate substitution by JPP, while it showed <90% for 0% and 20% of concentrate substitution by JPP(83.72 and 76.04%, respectively). Rebouças et al. (2007) reported CDNFC=55.21% by lambs fed a 40% concentrate: 60% Tifton grass hay maintenance diet, whileit increased and tended to stabilize around 79.61% when *P. juliflora* pods corresponded to 58% of the concentrate fraction of the maintenance diet.

Conclusions

The partial substitution of ground corn and soya and wheat bran by jurema preta pods does not affect significantly food consumption and digestibility. Substitution of approximately 10% of commonly used concentrate mixture by jurema preta pods tends to optimize food consumption and performance of confined Santa Inês lambs.

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