



Mortality in Savanna Brown Does Fed Flamboyant Tree Seed Meal as Replacement for Groundnut Cake

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Abstract

Fifteen (15) Savanna Brown does aged between 6 and 8 months with mean initial body weight of 9.55 kg were used in this study lasted for 20 weeks. The study was designed to investigate the anti nutritional factors present in flamboyant tree seed and mortality rate among does fed varying levels of inclusion of flamboyant tree seed meal (FTSM) as replacement for groundnut cake (GNC). The does were allowed a pre-treatment period of two weeks to enable them acclimatize following which they were randomly assigned in to five groups comprising of three animals each. The groups were designated T1, T2, T3, T4, and T5. Does in T1 which served as control had 0 % FTSM in their diet while those in T2, T3, T4, and T5, had 25 %, 50 %, 75 % and 100 % FTSM inclusion. The does were allowed to graze between 9.00 am and 4.00 pm daily and had access to water and salt like *ad-libitum*. Prophylactic treatment was also administered against helminthes and other parasites. Data obtained were subjected to descriptive statistics using percentages. Does in T5 (100 % FTSM inclusion in their diet) recorded the highest mortality rate (100 %). T3 and T4 recorded 33.33 % mortality, respectively while T2 and T1 (control) did not record any mortality (0 %). The result showed that as the level of FTSM increase in the diet, mortality rate also increased. It is therefore recommended that in order to forestall mortality among semi intensively managed Savanna Brown does, not more than 25 % FTSM should be included in their diet.

Introduction

In many areas of Nigeria, goat production has been of major importance mainly to the rural population. It served many purpose in the direct production of meat, hair, wool and milk. However, goat production across these areas is constrained by the poor quality and cost of the consumed feed. The ever increasing price, scarcity and competition for the energy and protein feedstuff in Nigeria have necessitated the search for cheaper alternatives. One of such alternatives is the use of multipurpose tree and shrubs which are valuable sources of protein, vitamin and minerals to herbivores. According to Grant *et al* (1991), flamboyant tree (*Delonix regia*) which is grown widely as an ornamental tree, produce numerous long pods containing large number of seeds of moderately high nitrogen content and apparently is not utilized as foodstuff or feed stuff which makes it a suitable component for trial in the diet of ruminants.

This study is therefore designed to investigate the levels of anti nutritional factors present in flamboyant tree seed and to observe the rate of mortality among the animals fed FTSM supplement since most leguminous forages and tree seeds are known to contain anti nutritional factors (Pustain and Palmer, 1977)

Materials and Methods

The study was conducted at the Research farm of the School of Agriculture and Agricultural Technology, Federal University of Technology, Minna, Niger State. Minna is Located between longitude 6°33' East and latitude 9°31' North in the Southern Guinea Savanna agroclimatological zone of Nigeria. It has an annual rainfall of 1200mm and mean annual temperature of 29 °C.

Fifteen (15) Savanna Brown does, aged between 6-8 months with average initial body weight of 9.55 kg were purchased from Beji village market near Minna. The

animals were dewormed, treated against ectoparasites and were allowed a pre treatment period of two weeks to enable them acclimatize following which they were randomly assigned into five groups (T1, T2, T3, T4 and T5) consisting of three does each and were fed diets contained 0 %, 25 %, 50 %, 75 % and 100 % of FTSM, respectively. T1 served as the control (Table 1). The diets were formulated to be isonitrogenous and isocaloric. Ample amount of fresh clean water and salt lick were provided *ad libitum*. The animals were managed semi-intensively. They were allowed to graze between 9.00 am and 4.00 pm daily and fed 500 g of formulated diet per animal per day as supplement. The mortality rate among the groups and period of occurrence were recorded. Chemical analysis of the diet was also conducted using AOAC (1990) procedure. The anti nutritional factors were determined using AOAC (1984) method for saponin, Wheeler and Ferrel (1979) methods for phytate while tannin and trypsin inhibitor was determined as outlined by Onwuka (2005). Data obtained were subjected to descriptive Statistics using percentage.

Results and Discussion

Table 2 shows the proximate composition of experimental diets, raw and roasted flamboyant tree seed. Dry matter, crude protein, crude fibre and ether extract were higher in the roasted seeds while moisture, ash, nitrogen free extract and energy were higher in the raw seeds. The anti nutritional factors (tannin, saponin, and phytate and trypsin inhibitor) in the raw seeds were also seen to be reduced by roasting (table 3). This was in line with the observation of Grant *et al* (1991) that traditional processing methods remarkably reduce the anti nutritional factors in legume seeds. As the level of flamboyant tree seed meal increases in the diet of Savanna Brown does, mortality rate also increased from the control group (T1) with 0 % FTSM inclusion to T5 that had 100 % level of

Table 3: Anti nutritional Factors in Raw and Roasted FTSM

Anti- nutritional Factors	raw FTSM	roasted FTSM
Tannin (mg/100/g)	93.10	11.20
Phytate (mg/100/g)	2.13	0.58
Saponin (%)	12.23	2.22
Trypsin inhibitor (Tu / mg)	273.00	62.00

Table 4: Mortality among Semi-intensively managed Savanna Brown Does Fed Varying Levels of Inclusion of Flamboyant tree seed Meal

Parameter s	T1	T2	T3	T4	T5
Number of Does	3	3	3	3	3
Number of dead Does	0	0	1	1	3
Number of living Does	3	3	2	2	0
Mortality (%)	0	0	33.33	33.33	100

Table 5: Period of mortality among Savanna Brown does fed varying level of Inclusion of flamboyant tree seed Meal.

Month	Diet					Total number of dead Animal per month
	T1	T2	T3	T4	T5	
April	-	-	-	-	1	1
May	-	-	1	1	1	3
June	-	-	-	-	-	0
July	-	-	-	-	-	0
August	-	-	-	-	-	0
September	-	-	-	-	1	1

inclusion. This finding was in agreement with that of Liener (1996) and may be associated with the presence of saponin and other toxic substances in the flamboyant tree seed. Even though the level was greatly reduced, roasting was not effective enough to completely eradicate these toxic substances. In addition fibre content was observed to increase from T1 to T5. The higher the level of fibre in the diet, the greater the chances of irritation of the gastro intestinal tract which led to scouring and subsequent death of does as reported at the early stage of this experiment (Table 5). The animals later got use to the diet and acclimatized from June to August during which no mortality was recorded. However, the last animal in T5 (100 % FTSM) died in September not because of the diet effect but rather due to goat "kata" which was diagnosed then. The availability of lush pasture between June and August may also have contributed to stabilizing the animal during this period. The consumption of grasses *ad libitum* may exhibit a diluting effect on the anti nutrient and fibre present in the feed supplement hence reducing their potency (Arnold and Hill, 1982).

Conclusion and Recommendation

The result of this study showed that up to 25 % level of inclusion of roasted Flamboyant tree seed in the diet of Savanna Brown does did not lead to the death of goats and is therefore recommended to goat farmers for use as livestock feed supplement.

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Table 1: Composition of experimental diets

Constituent front	Diets				
	T1	T2	T3	T4	T5
Maize	65.35	55.10	43.50	31.90	20.57
Rice Milling Waste	29.91	37.18	48.78	60.38	71.71
Groundnut cake	6.22	4.66	3.11	1.56	0
Flamboyant tree seed meal	0	1.56	3.11	4.66	6.22
Bone meal	0.75	0.75	0.75	0.75	0.75
Salt	0.75	0.75	0.75	0.75	0.75
Total (kg)	100.00	100.00	100.00	100.00	100.00
Calculated analysis					
Crude Protein %	12.05	11.99	11.99	12.00	11.99
Energy (Kcal/kg)	3220.75	3197.13	3167.82	3138.52	3110.13

Table2: Proximate Composition of Experimental diets, Raw and Roasted FTSM

Constituent	Diets					Raw FTSM	Roasted FTSM
	T1	T2	T3	T4	T5		
Dry matter	91.00	92.01	91.00	93.00	90.00	81.80	89.40
Moisture	9.00	7.99	9.00	7.00	10.00	12.20	10.60
Crude protein	12.07	12.01	11.99	12.03	12.01	18.10	18.90
Crude fibre	12.25	18.32	22.86	24.86	29.35	7.50	11.00
Ether Extract	13.36	17.38	10.74	18.16	13.96	7.50	9.00
Ash	5.01	7.00	7.00	9.01	11.06	3.60	3.40
Nitrogen free Extract	57.31	45.29	45.29	36.11	33.68	63.30	57.70
Energy (Kcal/kg)	3977.60	3856.20	3342.60	3560.00	3084.00	3931.00	3874.80