GROWTH PERFORMANCE OF WEST AFRICAN DWARF GROWING RAMS FED *PANICUM MAXIMUM* SUPPLEMENTED WITH DIFFERENTLY PROCESSED *CAJANUS CAJAN* LEAVES

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ABSTRACT

An experiment was carried out to investigate the Performance of West African dwarf growing rams fed differently processed *Cajanus cajan* leaves and *Panicum maximum* basal diet for 56 days feeding trial which was carried out at Teaching and Research Farm of Oyo State College of Agriculture and Technology Igbo-ora, Nigeria. A total of sixteen (16) growing WAD rams were randomly allocated to four treatments with four animals per treatment while two animals served as replicate. The experimental diet was fed at 3% body weight of individual animals while fresh, wilted, and dried forms of *Cajanus cajan* leaves supplemented at varied inclusion levels. There were significant ($P<0.05$) difference in all parameters measured expect dry matter intake (DMI) and feed conversion ratio (FCR) which showed no significant ($P>0.05$) difference across the dietary treatments. The results revealed that animals on the control diet recorded the least weight gain (12.68g/day) while the highest weight gain (25.89g/day) was recorded in T_3 that contained 30% wilted form of *Cajanus Cajan* leaves and 70% *Panicum maximum*. The daily weight gain of animals was significantly different across all treatments ($P<0.05$).The highest DMI (5.22kg) was recorded on the control treatment (T_1) that contained 100% sole *Panicum maximum* and the least value of DMI (3.50kg) was recorded in T_2 that contained 30% fresh form of *Cajanus cajan* leaves and 70% *Panicum maximum*. The highest feed efficiency ratio (0.29) and the lowest value (0.11) were observed in animals fed T_2, T_3 and T_1 diets respectively. It can be concluded that the animals on T_3 had the highest feed utilization while animals on T_1 had the highest dry matter intake.

Keywords: Tropical grass, Processed Cajanus cajan forages, WAD rams, Performance characteristics.

INTRODUCTION

Ruminant animals constitute a very important part of the livestock sub-sector of the Nigerian agricultural economy. The potential of small ruminant production in alleviating the low animal protein intake by man in developing nations such as in Nigeria has been reported (Fajemisin *et al.*, 2010). Sheep grown in West Africa and Nigeria are adapted to humidity and graze road sides and villages. They are prolific and can subsist on a wide range of feed materials (Silankove, 2000). During the dry season, grass and crop residues are in short supply, so there is deficiency in energy, protein, essential minerals and vitamins (Akinlade *et al.*, 2002).Tropical browse plants such as Pigeon pea (*Cajanus cajan*) have been identified as potential protein supplements for ruminants since they contain high crude protein, minerals and vitamins that are needed for the growth of ruminal microbes (Norton and Poppi,1995). *Panicum maximum* also called guinea grass, colonial grass and tangayika grass (FAO, 2003) is a highly productive, palatable, persistent and acceptable grass by ruminants. It can be fed to livestock solely or with concentrates or legumes. It has been reported that drying or wilting may influence chemical composition and digestibility of some tropical browse species (Smith *et al.*, 1995). To preserve for future use and to reduce the effects of some inherent anti-nutritive factors present in the leaves of some browse species either drying or wilting is employed at the On-farm level of production.

MATERIALS AND METHODS

Experimental Site and animals

The experiment was carried out at the Sheep and Goat Unit, Teaching and Research Farm, Oyo State College of Agriculture and Technology, Igboora. Sixteen (16) growing West African Dwarf rams weighing between 7.00 - 12.00kg

and of 6 – 9 months of age were used. The animals were acclimatized for two weeks and treated against ectoparasites and endoparasites prior to the commencement of the experiment.

Harvesting and Processing of Experimental Diets

The forages were harvested from pasture demonstration plot of the college farm. *Cajanus cajan* leaves and *Panicum maximum* were cut at a height of 30cm above the ground level at 50% flowering stage to allow for good re-growth . *Cajanus cajan* leaves including twigs and petioles were harvested and sun dried for four to five days by spreading on concrete floor and turning thoroughly to facilitate uniform drying for save storage while the wilting were carried out for 14hours between 3.00pm - 8.00am under the shade a day preceding the feeding day. *Panicum maximum* were harvested daily (Zero grazing) and chopped manually into 3-5 cm length before feeding.

Experimental layout, Design and feeding method

The animals were allocated by weight into four treatments of four rams per treatment and two animals as a replicate in a completely randomized design (CRD). The experimental diets were: T_1 (100% *Panicum maximum* solely), T_2 (70% *Panicum maximum* and 30% fresh *Cajanus cajan* leaves), T_3 (70% *Panicum maximum* and 30% wilted *Cajanus cajan* leaves) and T_4 (70% *Panicum maximum* and 30% dried *Cajanus cajan* leaves). Each group of animals was assigned to an experimental diet, and were fed *ad libitum* while fresh water was made available.

Data Collection and Analysis

Adjustment period of one week was allowed before data collection commenced. Dry Matter Intake (DMI), the mean initial body weight, weekly body weight, feed intake, feed efficiency and conversion ratio were calculated. Data obtained were subjected to one-way analysis of variance (SAS, 1999). Mean value variance showing significant ($P<0.05$) difference were separated using Duncan's Multiple Range Test (Duncan, 1955).

Experimental Diet Composition:

T_1 = 100% *Panicum maximum* solely.

T_2 = 70% *Panicum maximum* + 30% Fresh *Cajanus cajan* leaves.

T_3 = 70% *Panicum maximum* + 30% Wilted *Cajanus cajan* leaves.

T_4 = 70% *Panicum maximum* + 30% Dried *Cajanus cajan* leaves .

RESULTS AND DISCUSSION

The performance summary of growing West African Dwarf rams fed *Panicum maximum* supplemented with differenlyt processed *Cajanus cajan* leaves were shown in Table 2. The daily DM intake (DMI) of rams fed the basal diet only T_1 was higher ($P>0.05$) than daily DM intakes of rams fed fresh, wilted and dried *Cajanus cajan* diets (T_2, T_3 and T_4) with *Panicum maximum*. Animals in the control diet consumed more DMI (5.22%) compared to the legume supplemented treatments, because animals are seeking to meet their requirement through the intake of relatively more grass than the other treatments, which had an alternative source of feed, legume supplements. The low DM intake in rams on T_2 could be attributed to the presence of anti-nutritional factors in the fresh form of *Cajanus cajan* supplemented diet. Supplementation of *Panicum maximum* with wilted form of *Cajanus cajan* leaves increased voluntary feed intake of the rams in T_3. The improved feed intake for wilted form of *Cajanus cajan* leaves supplemented diet could have resulted due to faster rumen outflow and the provision of more degradable organic matter (Yousuf *et al.*, 2007). It could be that T_3 andT_4 with wilted and dried forms of *Cajanus cajan* leaves inclusions contained a balanced of nutrients, which efficiency interacted to give a better daily weight gain in rams. The rams on the T_3 diet gave the highest ($P<0.05$) weight gain (25.89g/day) followed by T_4 (19.64 g/d) supplemented with dried form of *Cajanus cajan* forage while the lowest value (12.68g/d) was observed in T_1. In the wilted and dried forms of *Cajanus cajan* leaves, growth rate was observed to improved ($P<0.05$) with increase in the level of supplementation. The values of the feed conversion ratio ranged between 3.48(T_3) to 7.35(T_1) and were better than the values (8.01 – 65.13) reported by Alokan and Adeleye (1991) when corn bran diets supplemented with protein were fed to West African Dwarf sheep. There was an improvement in feed utilization of the treatments groups compared to that of control diet. The result showed that T_3 had best feed

utilization of 3.48 while the poorest value (7.35) of feed utilization was recorded in T_1. The feed efficiency ratio of all the experimental animals was influenced significantly ($P<0.05$) by the dietary treatments. Animals on T_2 and T_3 diets recorded the highest FER (0.29) and the lowest value (0.14) was observed in animals in T_1.

CONCLUSION

Findings in this study revealed that *Cajanus cajan* leaves has a good nutrient profile and*Panicum maximum* for feeding small ruminant animals. The results also showed that wilted *Cajanus cajan* leaves are palatable and acceptable to (WAD) rams and *Panicum maximum* led to increase in dry matter intake and higher growth rate. Hence, it could be incorporated into diets of growing rams to solve the problems of inadequate nutrients due to shortage of feed during the dry season faced by smallholder ruminant farmers and will give a good performance characteristics.

RECOMMENDATION

Based on the result of this research, it could be recommended that *Cajanus cajan* leaves and *Panicum maximum* could be incorporated into the diet of WAD sheep at 30% wilted form of *Cajanus cajan* leaves and 70% *Panicum maximum* in terms of feed utilization as supplement and basal diets for (WAD) sheep to alleviate the body weight loses that are usually experienced during the dry period.

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Table 1: Chemical composition (%DM) of fresh, wilted, and dried *Cajanus cajan* leaves and *Panicum maximum*.

Parameters	Fresh*Cajanus cajan* leaves	Wilted*Cajanus cajan* leaves	Dried*Cajanus cajan*leaves	*Panicum maximum*
DM	44.50	86.60	91.48	32.80
CP	22.31	21.20	19.00	5.30
CF	25.26	26.86	27.12	22.20
EE	4.79	4.64	4.50	2.90
ASH	9.12	9.32	9.45	3.30
NDF	33.20	33.52	33.83	51.00
ADF	29.50	29.47	29.40	31.00
Lignin	10.12	11.01	12.40	13.47
NFE	15.98	24.58	8.52	66.00
M.E (Kcal/Kg)	3427.07	3804.98	3206.84	4223.06

DM=Dry matter, CP=Crude protein, CF=Crude fiber, EE=Ether extract, NDF= Neutral detergent fiber, ADF=Acid detergent fiber, NFE=Nitrogen free extract and ME= Metabolizable energy

Table 2: Growth Performance of West African Dwarf Growing Rams fed *Panicum maximum* supplemented with differently processed *Cajanus Cajan* Leaves

Parameters	T_1	T_2	T_3	T_4	SEM±
Average initial weight (kg)	9.79^{bc}	9.80^{bc}	11.15^{a}	10.30^{ab}	0.27
Average final weight (kg)	10.50^{bc}	10.80^{bc}	12.60^{a}	11.40^{b}	0.40
Average weight gain (kg)	0.71^{cd}	1.00^{c}	1.45^{a}	1.10^{b}	0.13
Daily weight gain (g/day)	12.68^{d}	17.86^{c}	25.89^{a}	19.64^{b}	2.36
Weekly weight gain (g/wk)	101.42^{d}	142.86^{c}	207.14^{a}	157.14^{b}	18.8
Dry matter intake	5.22^{a}	3.50^{d}	5.05^{ab}	4.61^{bc}	0.34
Feed Conversion Ratio	7.35^{a}	3.50^{bc}	3.48^{bc}	4.19^{b}	0.79
Feed Efficiency Ratio	0.14^{c}	0.29^{a}	0.29^{a}	0.24^{b}	0.03

^{abcd} *Means on the same row with different superscript are significantly different ($P< 0.05$).*

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