

Performance of Male West African Dwarf (WAD) Sheep Fed Graded Levels of *Moringa oleifera* Leaves During Wet Season

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Abstract

The study was carried out to investigate the performance of Male West African Dwarf Sheep fed graded levels of *Moringa* leaves. Twenty (15) male WAD sheep were used for the experiment and were randomly allocated to five groups with three replicates in a completely randomized design. Group 1 consumed 100% *Moringa* leaves, group 2 consumed 75% *Moringa* leaves + 25% cassava peels, group 3 ate 50% *Moringa* leaves + 50% cassava peels while group 4 consumed 25% *Moringa* leaves + 75% cassava peels and group 5 consumed 0% *Moringa* leaves + 100% cassava peels. The results obtained for the final weight gain. The body weight gain, average daily weight gain and feed intake followed the same pattern because they are significantly ($p < 0.05$) different from each other among the treatments but the feed conservation ratio deviated from the earlier pattern of the feed intake being significantly ($p < 0.05$) higher in treatment 4 (25% *Moringa* leaves + 75% cassava peels). With the inclusion of *Moringa* leaves there was a significant difference ($p < 0.05$) in the weight gain across the diets. As the level of inclusion of *Moringa* leaves resources, the weight gain of the animals was also affected. The best feed efficiency was recorded in group 1 which was an indication that the animals in the group had best utilization of most of the available nutrients.

Keywords: Cassava peels, feed conversion ratio, weight gain.

Introduction

Small ruminant suffers from scarcity of feed supply and pasture quality in the humid-region of West Africa especially during the dry season when the natural vegetation is of poor nutritive value (Akinfala and Tewe, 2002; Aye, 2007). Small ruminant such as sheep are important in feeding the rapidly expanding population of the developing world under typical harsh environmental condition, due to their low feed and urea supplement, short gestation interval, fast growth rate, and higher environmental adaptability compared to the large ruminant (Tibbo et al., 2006). In Nigeria, the main feed resource for livestock is natural pastures (Aye, 2002). One major positive effect of foreign legume is their positive effect on intake and digestibility (Ash, 1990).

Most tropical pastures are low in nutritive value to their rapid growth and early lignifications as well as feed availability which is more critical during the dry season (Patterson, 1994). *Moringa oleifera* is a well-known tree in West Africa especially in semi arid area where it is cultivated as a living fence around people's garden and consumed in various forms as food. Leaves of the tree are noted for high content of crude protein, essential vitamins, minerals and amino acids (Makker and Becker, 1997; Gidamis et al., 2003). According to Akinbamijo et al. (2004), the value of the tree and its benefits as a high quality supplement to low quality roughages in ruminant feeding system has not been widely exploited.

Materials and methods

The study location

The experiment was carried out in the Rabbitary Unit of the Teaching and Research farm, Tai Solarin University of Education, Ijagun, Ogun State. The study area located in the moderately hot, humid, tropical climatic zone of southwestern Nigeria, with distinct wet and dry seasons. The temperature of the study area varies from 23 oC to 33 oC while the humidity during the wet season varies between 78 - 87%.

Experimental dietary and animals

The study was carried at the Teaching and Research Farm of the Department of Agricultural Science, Tai Solarin University of Education, Ijagun, Ogun State. Fifteen (15) male WAD sheep were divided into five groups with average initial live weight in a completely randomized design. Each group contains three animals, and the animals were acclimatized for two weeks before the commencement of the experiment. During this period, the animals were dewormed with Levamisole and treated with Oxytetracycline. The animals were fed five percent of their body weight and clean water served ad libitum on daily basis. The groups were denoted as Group 1 (100% Moringa leaves), group 2 (75% Moringa leaves + 25% cassava peels), group 3 (50% Moringa leaves + 50% cassava peels), group 4 (25% Moringa leaves + 75% cassava peels) and group 5 (0% Moringa leaves + 100% cassava peels) as depicted in Table 1. Table 2 shows the chemical composition of Moringa leaves and cassava peels. The experiment lasted for a month.

Table 1: Composition of experimental diet fed to male WAD sheep

Ingredients	Groups				
	1	2	3	4	5
Moringa leaves	100	75	50	25	0
Cassava peel	0	25	50	75	100
Total	100	100	100	100	100

Table 2: Chemical composition of *Moringa* leaves and cassava peels

Parameter	Moringa leaves	Cassava peels
Dry matter	92.20	84.19
Crude protein	21.47	5.88
Crude fibre	10.11	20.14
Ash	11.98	3.99
Ether extract	10.55	1.62

Data Collection

The animals were weighed individually at the beginning of the experiment and continuously weighed every week before feeding in the morning. Weight gain was determined by the difference in the body weight of two consecutive weighing for individual animal. Known quantity of feed was given to each animal daily and left over was subtracted from the amount given.

Statistical Analysis

The parameters measured were computed and subjected to a one-way analysis of variance using statistical package for social scientist (1999). Differences between treatment means were separated using Duncan Multiple Range Test (Duncan, 1955).

Results and discussion

Table 3 depicted the result of the main effect of graded level of Moringa leaves indicated that values from final weight is significantly different ($p < 0.05$) from each other among the treatments except for treatment 2 (75% Moringa + 25% cassava peel) and 3 (50% Moringa + 50% cassava peel) which were only different numerically but not significantly different ($p < 0.05$) from each other except treatment 1 (100% Moringa leaves) and treatment 2 (75% Moringa leaves + 25% cassava peels) with only numerical differences. Average daily weight gain showed a significant ($p < 0.05$) differences among all the treatments.

The result of feed intake of animal also indicated significant ($p < 0.05$) difference in the feed consumed by all the animals on various treatments. The highest feed intake was recorded in treatment 1 (442.38 g/dm). The highest feed intake recorded in treatment 1 may have contributed to the highest body weight gain and also daily weight gain on the animal in treatment 1. The feed conversion ratio followed a pattern that deviated from that of feed intake being significantly ($p < 0.05$) higher in treatment 4 (25% Moringa leaves + 75% cassava peels). The crude protein of Moringa leaves was 21.74% which fell within the range of 10 to 37% for protein content reported for browse plants by Mecha and Adegbola (1980). The reported value in this study may be affected by some factors such as time of harvesting and nutrient composition of the soil in which it is planted (Odeyinka and Ademosu, 1995). With the level of inclusion of Moringa leaves there are significant differences in the weight gain across the diets. As the level of inclusion of Moringa leaves reduces the inclusion of cassava peels increases and the weight gain of the animals were also affected. The highest weight gain was the treatment 1 (100% Moringa leaves). The best feed efficiency was also recorded in animals that were on treatment 1 which was indication that they had the best utilization of most of the nutrients. This was also supported by Church and Pond (1978) in their assertion that digestibility of ruminants diets is determined by the factors (ruminations and turn over) within the gastro intestinal system of that particular animal and it is not solely a characteristic of the consume diets.

Table 3: Performance of male WAD Sheep fed graded leaves of Moringa leaves

Performance parameters	Treatments					SEM
	1	2	3	4	5	
Initial body weight (kg)	9.49	9.12	9.55	9.44	10.45	0.96
Final body weight (kg)	16.36	15.38	14.92	13.65	14.22	0.49
Body weight gain (kg)	6.57	6.26	5.37	4.21	3.72	0.31
Average daily weight gain (g)	73.00	69.55	59.66	46.77	41.33	3.16
Total feed intake (g)	442.38	42023	41044	34812	39214	713.28
Average feed intake (g)	491.53	466.92	456.04	386.8	435.71	0.79
Feed conversion ratio	6.70	6.71	7.64	8.27	10.54	0.92

SEM – Standard Error of Means**Conclusion**

It could be concluded that the use of Moringa leaves improved the performance of male WAD sheep in terms of feed intake, weight gain and feed efficiency since the animals that consume Moringa leaves in the highest percentage had better utilization of the available nutrients. It could be recommended that the same experiment could be carried out on the female (Ewe) WAD sheep to ascertain the extent of performance.

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