
EFFECTS OF FEEDING RED SOKOTO BUCKS GRADED LEVELS OF *MORINGA OLEIFERA* LEAF ON GROWTH PERFORMANCE IN SEMI-ARID REGION OF NIGERIA

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ABSTRACT

The study was conducted to evaluate the effects of *Moringa oleifera* leaf meal based diets on growth performance of red Sokoto bucks. Twenty (20) red Sokoto bucks, average age of twelve months (12) were used for the study. Animals were allocated into five (5) dietary treatments T1 (0%), T2 (5%), T3 (10%), T4 (15%), and T5 20% representing *Moringa oleifera* inclusion levels with four animals per treatments, in a completely randomized design. The study lasted for 14 weeks. The result obtained showed that animal in T5 fed 20% *Moringa oleifera* leaf had significantly ($P < 0.05$) higher in final body weight compared to other treatments. The result indicated there were significant ($P < 0.05$) differences between body weight gain, feed intake and feed efficiency. It was therefore recommended that, *Moringa oleifera* leaf could be included up to 20% level in the diet of Red Sokoto Bucks without any adverse effect on performance.

Keys: *Moringa oleifera* leaf, performance and Red Sokoto bucks.

INTRODUCTION

Nutritional composition of the plant plays a significant role in nutritional, medicinal and therapeutic values (Al-Kharusi *et al.*, 2009). Nutrition plays a major role in animal's ability to overcome the detrimental effects of parasitism and diseases (Anwar *et al.*, 2007). Studies from many tropical countries indicate that *Moringa oleifera* leaves have immense nutritional value such as vitamins, minerals and amino acids (Anwar *et al.*, 2007). Therefore, the leaves have been used to combat malnutrition, especially among infants and nursing mothers. It offers a good alternative source of protein to humans and ruminants wherever they thrive (Nouala *et al.*, 2006). There has been an increasing interest in the use of *Moringa* as a protein source for livestock (Sarwatt *et al.*, 2004; Asaolu *et al.*, 2009). Sarwatt *et al.* (2004) reported that *Moringa* foliages are a potential inexpensive protein source for livestock feeding. Therefore, the study aimed at evaluating performance of Red Sokoto bucks fed graded levels of *Moringa oleifera* leaf.

MATERIALS AND METHODS

Study Area

The study was conducted at Teaching and Research Farm of the Department of Animal Science, Gaya, Kano University of Science and Technology Wudil, Kano State. Gaya is located within the Sudan savannah region of Nigeria. The experimental site is located on the latitude 11° 37'N and longitude 8° 58'E and at an altitude of 403 m above sea level. The annual rainfall ranges from 550 mm – 750 mm with minimum and maximum temperature of 30°C and 40°C, respectively. The relative humidity of the region is always low and ranges between 40% - 51% (Olofin *et al.*, 2008).

Experimental Animals and their Management

Twenty (20), Twelve (12) month old Red Sokoto bucks, with average initial weight of 12.5±1.83 kg were used for the study the animals were purchase from Wudil Livestock Market, Kano State. Animals were treated for endo and ecto parasites using albendazole and acaricide, at a dose a rate of 10mg/kg body weight and 1m/Lof water respectively. Animals were given antibiotic prophylaxis using oxytetracycline (20%) Long acting at a dose rate of 10mg/kg body weight using intra muscular

route. Animals were housed in a clean and disinfected pen and they were fed with experimental diets in groups of four animals each. Mineral salt lick and water were provided *ad libitum*.

Preparation of Experimental Diets

The fresh *Moringa oleifera* leaves were purchased from the Teaching and Research Farm of the Department of Forestry, Kano University of Science and Technology Wudil, air dried under shed for seven days prior to feed formulation. After drying it was milled to produce leaf meal, other feed ingredients were sourced from the Wudil markets which include cowpea husk, wheat offal, cotton seed cake, groundnut haulms, bone meal and salt. Five complete diets were formulated using graded levels of *Moringa oleifera* leaf at 0, 5, 10, 15 and 20% inclusion levels designed as treatments T₁, T₂, T₃, T₄ and T₅, respectively.

Experimental Design and Procedure

The animals were allocated into five (5) dietary treatments in a Completely Randomise Design (CRD) with four animals per treatment. The experimental pens was cleaned, washed and disinfected before the onset of the experiment.

Statistical Analysis

The data generated were coded and subjected to analysis of variance (ANOVA) using the SAS statistical package (2000), where significant difference between the means exists, Duncan Multiple Range Test (DMRT) was used to separate the means at 5% (Duncan, 1955).

RESULTS AND DISCUSSION

Proximate composition (%) of the experimental diets.

The results of the proximate composition of the test material and experimental diets are presented on Table 1. Dry matter varied from 93.50% in control diet (T₁) to 94.36% in T₂. (2%). Crude protein content increased numerically with increased level of *Moringa oleifera* leaf (13.19% – 14.80%) Also, the same trend was observed in CF where it increased numerically with increases level of *Moringa* leaf. For ether extract the control T₁ (0%) has the highest value (4.17%) while T₃ (10%) inclusion level has lowest value (3.64%). Furthermore, ash and nitrogen free extract content of the feeds were higher in control group compared to other treatments with inclusion levels of *Moringa oleifera*. The reported high dry matter values in the presence study might be due to the feed ingredient use in the diets which were all dry materials. The crude protein levels obtained in the present study for the diet were lower than the range 16-18% recommended by Norton (2003) for growing sheep and goats but close range of 10-12% CP as the moderate level for ruminant production was reported by (Gatenby 2002). The implication is that the CP requirement of the animals used would be reached.

Table 1. Proximate Composition (%) of the Experimental Diets

Parameters (%)	Treatments				
	T ₁ (0%)	T ₂ (5%)	T ₃ (10%)	T ₄ (15%)	T ₅ (20%)
Dry matter	93.50	94.36	94.15	94.20	94.31
Crude protein	13.19	14.00	14.60	14.70	14.80
Crude fiber	8.95	13.90	15.20	15.30	15.80
Ether extract	4.17	4.00	3.64	3.70	3.77
Ash	6.80	6.15	5.84	5.88	5.60
Nitrogen free extract	60.30	56.20	54.70	54.46	54.20

Growth performance of Red Sokoto bucks fed graded levels of *Moringa oleifera* Leaf

The results of growth performance of Red Sokoto Bucks fed graded levels of *Moringa oleifera* is presented in Table 2. It indicated that there were significant ($P < 0.05$) difference between final weight, weight gain, average daily gain, feed intake and feed efficiency. Final live weight was significantly ($P < 0.05$) higher in T₅, the values of weight gain and average daily gain were significantly ($P < 0.05$) higher in animals on T₄ and T₅. However, feed intake and feed efficiency were significantly ($P < 0.05$) higher in T₅ than the values recorded in animals for other treatments. *Moringa oleifera* supplementation has been reported to improve the growth performance of ruminants when supplemented as fresh, fodder, hay, or as part of a concentrate diet (Jiwuba *et al.*, 2016). This is in agreement with the results of this study, because the supplementation of MOLM had positively influenced the growth parameters.

Table 2. Growth performance of Red Sokoto bucks fed graded levels of *Moringa oleifera* Leaf

Parameters	Treatments %					SEM
	T ₁ (0%)	T ₂ (5%)	T ₃ (10%)	T ₄ (15%)	T ₅ (20%)	
Initial body weight (kg)	12.12	12.50	12.37	12.12	12.62	1.022
Final body weight (kg)	13.47 ^b	14.09 ^{ab}	14.69 ^b	15.34 ^{ab}	15.64 ^a	0.964
Total body weight gain (kg)	1.34 ^b	1.84 ^b	2.32 ^{ab}	3.22 ^a	3.26 ^a	0.677
ADG (g/d)	13.69 ^b	18.77 ^b	23.87 ^{ab}	32.85 ^a	33.31 ^a	6.905
Feed intake (g/d)	2172.20 ^b	2252.80 ^b	2266.60 ^b	2303.60 ^b	2500.30 ^a	78.532
Feed efficiency (g/d)	0.065 ^b	0.084 ^b	0.109 ^b	0.144 ^b	0.329 ^a	0.084

^{ab} Means within the same row with different superscript differs significantly (P<0.05), SEM = Standard Error of means. Average daily body weight gain (ADG)

CONCLUSION

Based on the results of this study, it can be concluded that inclusion of *Moringa oleifera* leaf in conventional supplement up to 20% level had no adverse effect on the growth performance Red Sokoto bucks.

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