

COST BENEFIT OF GROWING RED SOKOTO BUCKS FED GRADED LEVELS OF MISTLETOE PLANT (*Viscum album*) MEAL FROM SEMI-ARID BROWSES OF JIGAWA STATE, NIGERIA

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ABSTRACT

A feeding trial was conducted to determine the cost of feed per kilogram live weight gain of Red Sokoto buck fed diets containing graded levels of mistletoe. Sixteen (16) young Red Sokoto bucks, weighing averagely 15.69 ± 0.79 kg were allotted to four treatments in a Completely Randomized Design (CRD) with four (4) replications. Four (4) diets containing mistletoe plant meal (MTPM), at 0, 10, 20 and 30% were fed at 3.5% body weight /day for a period of 84 days. All bucks gained weight irrespective of the inclusion levels of (MTPM), but 20% in (T₃) was better (65.48 g/day) and had the lowest value of cost of feed/kg LWG (₦971.20) with corresponding higher cost saving (42.00%) and therefore, recommended.

Keywords: Cost of feed, Mistletoe, Bucks, Plant meal, Cost of savings.

INTRODUCTION

More attention has been paid to small ruminant production in the tropics as their advantages are becoming more understood than ever before, particularly for their ability to produce meat, milk and skin, even in hostile environments (Okoruwa *et al.*, 2012 ; Makun *et al.*, 2013). Goat is a multi-functional animal that constitutes a very important part of the livelihood of livestock farmers in Nigeria (Okoruwa *et al.*, 2013). Nevertheless, the potential of goat production has not been fully harnessed due to poor feeding. Insufficient quality feeds all year round is one of the major constraints to goat production (Okoruwa *et al.*, 2013). The availability of feed resources and their rational utilization for livestock and poultry represent the most compelling task facing Animal Scientists in Nigeria and indeed affecting most parts of the developing countries of the world (Ibrahim *et al.*, 2014). Goats depend on browse plants to supplement their diets especially during drought periods in the semi – arid region, when grasses are quantitatively low and of poor quality (Madibela *et al.*, 2002 ; Ndagurwa and Dube, 2013). Browse plants are the palatable portions of a woody forage plants such as the leaves, tenderwigs, shoots, flowers, fruits and pods (Amodu and Oturu, 2004). Mistletoe species are potential sources of quality browse for goats when alternative sources of dietary feeds are limited (Garnett *et al.*, 2006). *Viscum* species (Mistletoes) can therefore, be alternative forage sources for ruminant feeding (Madibela *et al.*, 2000). The main problem confronting ruminant livestock producers in Nigeria to day is the seasonal fluctuation in the availability of forages for ruminants (Bukola *et al.*, 2022). The use of leaves from trees that retain their leaves during the long dry season, to feed ruminants during the difficult period is very important (Bukola *et al.*, 2022). In Nigeria, there are numerous tree leaves used as fodder (Njidda *et al.*, 2018), *Viscum* species (Mistletoes) can therefore, be alternative forage sources for ruminant feeding (Madibela *et al.*, 2000). However, the main objective of this research is to determine the cost of feed per kilogram live weight gain of Red Sokoto bucks fed diets containing graded levels of mistletoe.

MATERIALS AND METHODS

Description of the Study Area

The study was conducted in Jigawa State, and it is located between latitude 11°N 13°N and longitude 8°E 10°35'E, at an altitude of 485m above sea level. Jigawa state has an estimated land size of 23,154km² (Google Earth, 2012). The state is situated within the Sudan savannah vegetation zone, but there are traces of guinea savannah in the southern part of the state. The regions are characterized by a long dry season of 7-8 months. The annual rainfall ranges from 600 to 1000mm with a peak in August. The average minimum and maximum temperature and relative humidity ranges are 12°C and 40°C, 40% and 78%, respectively. Lowest temperatures occur during the harmattan (November - February) and highest from March to June (Olofin, 2008).

Experimental Materials and Diets

The mistletoe was obtained and air-dried under shed until dried. The air-dried samples were milled in to coarse texture, using machine to produce mistletoe plant meal (MTPM). The MTPM was added to other feed ingredients and manually mixed to compound complete diets, as shown in Table1.

Experimental Animal, Treatments and Design

Sixteen (16) young Red Sokoto bucks, weighing averagely 15.69 ± 0.79 kg were allotted to four treatments in a Completely Randomized Designed (CRD) with four (4) replications. Four (4) diets containing mistletoe plant meal (MTPM), at 0, 10, 20 and 30% were fed at 3.5% body weight/day for a period of 84 days were used.

Table1. Ingredients Composition (%) of the Experimental Diets Containing Graded levels of MTPM

Ingredients Treatments	T1 (0%)	T2 (10%)	T3 (20%)	T4 (30%)
Mistletoe plants meal	0.00	10.00	20.00	30.00
Wheat bran	22.00	22.00	24.00	22.00
Cowpea husk	22.00	21.00	22.00	20.00
Rice milling residue	18.00	16.00	10.00	10.00
Ground nut haulms	20.00	15.00	15.00	10.00
Sorghum chaff	17.00	15.00	08.00	07.00
Salt	1.00	1.00	1.00	1.00
TOTAL	100	100	100	100

RESULTS

The cost of feeds/kgLWG of the experimental animals were presented in Table 2. Cost of feed consumed/day (₦/Kg) was significantly ($P<0.05$) higher in T₃ (67.07), other treatments were similar. Feed cost/Kg live weight gains was significantly ($P<0.05$) higher in T₁ (1716.60), followed by T₂ and T₄, with lowest value in T₃. Percentage cost saving (%) was significantly ($P<0.05$) lower in T₄.

Table 2. Cost of Feeds/Kg Live Weight Gains of Red Sokoto Bucks Fed Different Inclusion Levels of MTPM

Parameters	Treatments				SEM
	T ₁ (0%)	T ₂ (10%)	T ₃ (20%)	T ₄ (30%)	
Feed cost / kgdiet (₦/Kg)	88.45	84.96	81.86	77.26	1.625
CFC / day (₦/)	57.77 ^b	55.26 ^b	67.07 ^a	52.15 ^b	1.324
Feed cost / KgLWG (₦/)	1716.60 ^a	1337.00 ^{ab}	971.20 ^b	1578.40 ^{ab}	1.131
Cost Saving (%)	-	20.00 ^{ab}	42.00 ^a	13.00 ^b	1.094

^{ab}Means within the same row with different superscript differs significantly ($P<0.05$), SEM = Standard Error of Means. CFC/day (Cost of feed consumed per day);

DISCUSSION

The reduction in the cost of feed/kg, with the increase in inclusion levels, might be due to lower cost of mistletoe plant meal (MTPM). This is in line with the report of Adegbola and Okonkwo (2000) who stated that replacement of conventional feed ingredients with unconventional feed ingredients reduced cost of feeds. Also, in line with the study of Maigandi and Nasiru (2006) who obtained a reduction in the cost of feed per kilogram live weight gains by including fresh pods of a browse plant (*Faidherbia albida*) in the diets of fattening and growing Uda Sheep. This suggested that, feeds can cheaply be produced at lower cost using mistletoe plant meal (MTPM), in the diets of growing Red Sokoto goats. The reduction in cost and savings could be attributed to the use of less expensive ingredients (mistletoe plants). Cost/KgLWG were reduced as a result of mistletoe plants meal was cheaper and available for the animals to convert it to flesh.

CONCLUSION

All bucks gained weight irrespective of the inclusion levels of (MTPM), but 20% in (T₃) was better and had the lowest value of cost of feed/kgLWG (₦971.20) with corresponding higher cost saving (42.00%) and therefore, recommended. Inclusion of MTPM, up to 20% in the diets of Red Sokoto bucks resulted in lower cost of feed/KgLWG (₦971.20) and correspondingly higher cost saving (42.00%). Increased in inclusion levels of MTPM, with similar or other breed/specie of the animals should be handled.

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