NSAP 47th Annual Conference (JOS 2022) CONFERENCE PROCEEDINGS
THEME: SECURING ANIMAL AGRICULTURE AMIDST GLOBAL CHALLENGES

THE PERFORMANCE OF WEST AFRICAN DWARF WEANER BUCKS FED GRADED LEVELS OF GROUNDNUT TESTA AS REPLACEMENT FOR FULL FAT SOYBEAN

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ABSTRACT
A total of nine (9) West African Dwarf weaner bucks were used to evaluate their performance when fed diets in which groundnut testa composite replaced soybean meal at graded levels. A Completely Randomized Design was used and animals were grouped randomly into three treatments of three replicate, each animal served as a replicate and were designated as T_1 (control), T_2 (50%) and T_3 (100%). Three diets were formulated designated diet 1, 2 and 3 with 0% (control), 50% and 100% for T_1, T_2 and T_3,respectively. Results revealed no significant ($P>0.05$) difference in final mean weight. Significant ($P<0.05$) difference was observed in weight gain and feed intake as both increased with increasing groundnut composite level in the diets, this was attributed to the diets' acceptability and palatability. FCR was best in value in T_1 but was not statistically different from T_2 and T_3. It can be concluded that groundnut testa can adequately replace soybean in the diet of goats for optimal productivity and profitability.

Key words: Bucks, Full Fat Soybean, Groundnut Testa, Performance and Replacement

INTRODUCTION
Goat is a multi-functional animal that constitutes a very important part of the livelihood of livestock farmers in Nigeria (Okoruwa *et al*. 2013a). Goats offer the cheapest source of meat in the tropics because of their high fecundity and low feed requirement when compared to cattle (Tsado, 2009).
Nevertheless, the potential of goat production has not been fully harnessed due to poor feeding. Insufficient quality feeding all year round is one of the major factors contributing to goat production (Okoruwa *et al*., 2013a). Aye (2007) indicated that low productivity of goats in Nigeria is associated with problems of meeting their nutritional requirements. Small ruminants suffer 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. Ahamefule and Elendu (2010) identified feed shortage as a major constraint. Native pasture available produces the cheapest source of nutrients for goats but could not supply sufficient nutrients for better productivity. Considering this fact, ruminant farmers need to place the animals on the feed that is relatively cheap which will meet the nutrients requirement of these animals at this crucial situation and ensure all year round of feeds for animals.
Agro-industrial by-products stands the greater chance of effective and efficient utilization at this period because of its availability and storability. The use of residues and agricultural by-products in animal feeding is a very common practice in tropical countries especially Nigeria (Akinfemi *et al*., 2012). Crop products and agricultural by-products were evaluated and reported that the nutritive value of these available feed resources could make an important contribution to the nutrition of livestock during the dry season (Akinfemi *et al*., 2012).
Groundnut (*Arachis hypogea*) is one major staple widely cultivated and consumed crops in Nigeria. It is a member of the legume family (*leguminacae*). It is useful in various ways both as human food, animal feed and industrial raw material grown in temperate and tropical countries (FAO, 2009). Nigeria is the fourth on the top ten producers of groundnut (2018/2019 production year) and contribute about 1.5 million tons

to the world production. Groundnut testa is produced in hundreds of thousands of tons annually as a by-product of the groundnut industry but still not have any significant use. Groundnut testa (seed coat) consists of skins from processed groundnuts, broken nuts and sometimes nuts that may have been rejected during the preparation for human consumption. Groundnut testa is known to contain some fats, salt and 16-18% crude protein (Ahmed and Young,2018).

Sigh and Diwaka (2014) also reported that groundnut testa as a by- product obtained in large quantities even from local groundnut oil mills which constitute a waste management problem seems to have nutritional benefits to livestock as feed ingredient especially to the ruminant animals due to its high protein, fat and fibre composition. According to Hale and McCormick (1986) groundnut testa contain the following nutrients Water 8.3%, Ash 2.5%, Ether Extract (EE) 20.88%, Crude Protein (CP) 16.1%, Nitrogen Free Extract 4.30% and Crude Fibre 12.0%. Because of its high protein and fat content and low fibre, groundnut testa can be an excellent feed source to replace soyabean meal (SBM) in ruminant diets (Utley and Newton, 1993).

Jung and Fahey, (1983) evaluated groundnut testa as feed ingredients for growing finishing cattle that grazed natural pasture and reported greater gain and performance for the supplemented group. Groundnut testa has also been used as concentrate supplement for feeding Gulf Coast and Ewe lambs with no adverse effect on the parameters measured (Abdelrahim *et al*., 2012)**.** The study is therefore designed to access the growth performance of West African Dwarf Weaner bucks fed diets containing groundnut testa composite mill (GTCM) as a replacement for soybean.

MATERIALS AND METHODS

Study Area: An 8 weeks feeding trial was conducted at Akperan Orshi Polytechnic Yandev Teaching and Research farm, in the sheep and goat unit. Yandev is located within the southern guinea savannah agro-ecological zone of Benue state on latitude 7^{o} 21 North and longitude 9^{0} 02 east of equator (AOPOLY, 2020)

Experimental animals/Design

A total of nine (9) weaner West African Dwarf bucks of 4-5 months of age were used for the study. The nine goats were obtained from Gboko medium scale small ruminant producers. A completely randomized design comprising of three treatments and three replicates were adopted for the study and designated as T_1, T_2, and T_3 where three animals were randomly allocated and replicated in each of the treatment. The T_1 was served as the control while T_2, and T_3 were given a diet containing groundnut testa at different levels.

Experimental diets and management practices:

Groundnut testa, rice offal, maize offal, full fat soyabean, bone meal and common salt were used to formulate three diets for the three treatments (T_1, T_2, and T_3) respectively. Treatment one (T_1 0%) was controlled with zero percent of GTCM while in the other diets T_2, and T_3 soyabean was replaced by GTCM at 50% and 100% as shown in Table 1, respectively. All management practices were fully observed. Animals were fed daily between 9:00hrs and 10:00hrs with a known and recorded quantity of fresh feed. Fresh cool clean water was also supplied daily after washing the drinkers.

The animals were weighed on weekly basis and the average daily weight gain was obtained by subtracting the previous week's weight from the present weight and divided by 7. Feed conversion ratio (FCR) was computed as the ratio of the average daily total feed consumed to the average daily weight gain.

Data obtained for each parameter was subjected to analysis of variance (ANOVA) for Complete Randomized Design (CRD) and the significant differences where indicated were separated using Duncan Multiple's Range Test (DMRT) according to the statistical package (SPSS, 2021).

RESULTS AND DISCUSSIONS.

The result of the study carried out on weaner west African Dwarf bucks fed diets in which soybean was replaced by groundnut testa is presented in Table 2.The initial weights of the bucks were 8.3, 8.1 and 8.10

kg for $T_{1\ (0\%)}$, $T_{2\ (50\%)}$ and $T_{3\ (100\%)}$, respectively. The result showed no significant different (P>0.05) in final weight which was 11.20, 11.42 and 11.50 kg for T_1, T_2 and T_3, respectively. However, a significant different (P<0.05) was observed in average daily feed intake with T_3 having the highest daily feed intake followed by T_2 and lastly T_3 (255.00, 40.00 and 207.00kg). This finding agrees with the report of Mashi *et al., (*2016) who fed a mixture of groundnut testa and maize offal in equal proportion to West African dwarf bucks, also Yaikyur *et al* (2019) reported similar values for bucks fed *Gmilana arborea*as basal diet and supplemented with a mixture of brewers dried grain and Maize offal in equal proportion. Total feed intake and weight gain also followed the same trend with T_3 having the highest value followed by T_2 and T_1 which differed significantly (P<0.05) from each other. The increased in feed intake could be as a result of palatability and acceptability of diet by the weaner bucks. Feed conversion ratio (FCR) was best in treatment one though was not significantly (P>0.05) from T_2 and T_3.

Table 1: **Dietary composition of experimental diets for West African Dwarf Weaner Bucks'**

Ingredients (%)	**Experimental Diets**		
	T1 (0%)	**T2 (50%)**	**T3 (100 %)**
Maize offal	49.85	49.85	49.85
Rice offal	20.00	20.00	20.00
Soyabean	27.15	13.57	-
GTCM	-	13.58	27.15
Bone meal	2.00	2.00	2.00
Salt	1.00	1.00	1.00
Total	**100.00**	**100.00**	**100.00**
Calculated Analysis			
Crude protein	17.00	14.13	11.13
Crude fibre	14.78	17.18	19.87
Ether extracts	6.85	6.57	6.32
Calcium	0.82	1.06	1.13
Phosphorus	0.59	0.72	1.13
ME (KCal/Kg)	2406.00	2370.89	2302.14

GTCM=Groundnut Testa Composite Meal

Table 2: Performance of weaner West African Dwarf bucks fed groundnut testa as a replacement for soybean

Parameters	**Treatments**			
	T_1 (0%)	**T_2 (50%)**	**T_3 (100%)**	**SEM**
Initial mean weight. (kg)	8.30	8.1	8.10	0.12
Final mean weight (kg)	11.20	11.42	11.50	0.12
Total weight gain (kg)	2.90^{c}	3.30_{b}	3.40^{a}	0.25
Average Daily wt. gain (g)	48.30^{c}	55.0^{b}	67.67^{a}	0.36
Average daily feed intake (g)	207.00^{c}	330.00^{b}	340.00^{a}	0.86
Total feed intake (g)	12420^{c}	14400^{b}	15300^{a}	6.31
FRC	4.28	4.36	4.50	1.06

a, b, c…. Means within the same row bearing different superscripts differ significantly (P<0.05)

CONCLUSION

It can be concluded that groundnut testa can adequately replace soybean in the diet of goats for optimal productivity and profitability

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