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EFFECTS OF PARTIAL REPLACEMENT OF GROUNDNUT CAKE WITH FULL FAT SOYA ON INDIGENOUS GROWER CHICKS

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ABSTRACT
The effects of partial replacement of groundnut cake (GNC) with full fat Soya (FFS) on indigenous grower chicks' growth rate, performance efficiency ratio, weight gain and eviscerated weight was carried out. One hundred unselected, unsexed grower chicks with an average weight of 65 ± 0.12gm assigned to 4 treatment groups containing 20.0% GNCIO% RFFS 15% GNC/5% RFFS, 10% GNC/10% RFFS and 5% GNC/15% RFFS levels were used. Results indicated an average daily weight gain of 4.2gm, 4.8gm and 5.5gm for the treatment diets respectively. The 5% GNCI15% RFFS induced higher weight gain and feed conversion efficiency and performance efficiency ratio and carcass weight. Although there was negative correlation between full fat soya levels and the feed conversion efficiency while there was positive correlation between full fat soya level and growth rate performance efficiency and feed intake.

Key Words: Indigenous chickens, Fulfat soya, Groundnut cake, Performance

INTRODUCTION
For many years local farmers have reared local chicken as a part of their culture in traditional ways. Local chickens are important to the livelihoods of many farmers in Nigeria, where they are raised in low input traditional management systems. The chickens scavenge for feed which includes kitchen waste, insects, worms, grasses and vegetables. There is a tremendous potential for genetic improvement of indigenous chickens due to large genetic variation in production traits. Compared with the Exotic fowls, little is known about the effects of nutrient supplement on the performance characteristics of the local indigenous breeds of fowls which are hardly fed by their owners with nutritionally balanced diet. Poor reproductive performance, poor growth rates, diseases, mortality, predation and low level of literacy among farmers are some of the major constraints in indigenous chicken production (Salum et al., 2002; Conroy et al., 2005). The indigenous chickens have small body size, small eggs with white ·shells, white ear lobes, produce about 50 eggs yearly (Olomu 1978). The rural poultry population in Africa accounts for more than 60 % of the total national poultry population (Kitalyi 1998). Village chickens exhibit remarkable adaptation to local environments.They are kept on subsistence level to provide families with eggs and meat but are poorly housed and most vaccines and drugs applied to protect the exotic fowls are rarely used on them. It has been observed that the indigenous fowl compared favourably with some imported light breeds on egg production under good management, but the generally low level of performance of different strains made this evidence inconclusive on the potentialities of the indigenous fowl.

Adesimi (1988) observed that high cost of feeds, poor quality of day old chick (DOC) and brooding techniques involved has been the bane to industrial poultry production in Nigeria. These problems associated with industrial poultry production makes household local chicken production in Nigeria popular. Local chicken production contributes significantly in food security, poverty alleviation and ecologically sound management of natural resources.

The scope for utilizing local chicken as a source of poultry meat is high because consumers prefer its hard meat. There is a growing demand of local chicken in restaurants because of its sizes, low prices and their palatable meat when compared to exotic breed of poultry. The total poultry population in Nigeria has been estimated at between 133 – 165 million (FLDPS/RIM, 1991). However, there is consensus that about 90% of the figure derives from the local poultry stocks which is in turn composed of chickens (91%), guinea fowl (4%), ducks (3%), turkeys and others (2%). Poultry, which is next only to ruminants as a source of animal protein in Nigeria, accounts for almost 25% of local meat production.The performance of the domestic fowl is largely determined by environmental factors of which the nutritional regime is an important component. Limited attention was given to the nutritional quality of feed fed to local chickens, some farmers offered them low quality grains that have been infested with weevils and unfit for planting and sale or household/kitchen wastes as supplements to prevent wastage. In some cases such left-overs were already decaying or spoilt with little or no nutritional contribution to the chickens which serves as a pointer to one of the underlying factors for poor performance of local fowls besides limited genetic potential compared to exotic breeds that are intensively managed. Though reports from some African countries indicated that supplements fed to chicken contributed to increased flock sizes, high growing and fertility rates and decrease vulnerability to pathogens (Roberts and Gunaratne 1992; Tadelle and Ogle 2001; Ogle *et al* 2004). The scavengable feed resource base does not meet the nutrient requirements of indigenous birds.There is need therefore, to improve the nutrition so as to increase the productivity of the birds. (Aboe *et al*. (2006).Full fat soya bean is the granular material resulting from the grinding of the dehulled and roasted whole soya bean (Olomu, 2011). Presently, there is increasing interest in the use of full fat soya in poultry to take advantage of the high protein and energy content of full fat soya beans as opposed to high protein and low energy found in soya bean meal. The present study was undertaken to examine the effects of replacing groundnut cake with full fat soya beans in the diets of indigenous grower chicks at different levels for recommendation to rural semi-intensive poultry keepers. The parameters studied are performance efficiency, growth rate, weight gain and cut up parts.

MATERIALS AND METHODS

Management of the Birds

A total of 200 local chicks of both sexes were brooded using stoves on a deep litter floor. During the brooding, the chicks were vaccinated against new castle, infectious bursal disease and fowl pox while sulphanamide drug was given in water against pullorum and coccidiosis. The chicks were fed together on commercial chick mash for the first 7 weeks and grower mash was compounded in the succeeding 6 weeks. Water was provided ad-libitum.

Experimental Rations:

The composition of the grower ratios is shown in Table I. The full fat soya beans were roasted before milling. The soyin (trypsin inhibitor) of the soya beans must have been largely removed by roasting and processing since the soyin is volatile. As such, it is believed that the Trypsin inhibitor could not exert significant detrimental effects on the birds. The diets were made to be isocaloric and isonitrogenous

Table 1: Level of replacement Diets Composition

Treatment	1	2	3	4
Maize	45.75	45.75	45.75	45.75
Maize offal	16.25	16.25	16.25	16.25
DBG	7.00	7.00	7.00	7.00
GNC	20.00	15.00	10.00	5.00
RFFS	0.00	5.00	10.00	15.00
Fish Meal	1.20	1.20	1.20	1.20
Rice bran	3.50	3.50	3.50	3.50
Palm oil	2.55	2.55	2.55	2.55
Bone Meal	2.00	2.00	2.00	2.00
Oyster Shell	1.00	1.00	1.00	1.00
Premix	0.50	0.50	0.50	0.50
Salt	0.25	0.25	025	0.25
Total	100	100	100	100
Calculated ME	2.80	2,80	2;82	2.85
CP	17.15	17.10	17.20	17.85

GNC Contains (%) CP-45, Fat - 5, Fibre - 5, Ash - 5.50 Ca - 0~20 P -0.24 Roasted full fat soya (%) CP - 42, Fat -17, Fibre - 8, Ash - 4.6, Ca - 0.25, P - 0.59. .

Feeding Experiment

One hundred birds of 8 weeks old indigenous chicks randomly selected from a population of200 were used. for the experiment. They were divided into 4 groups of 25 birds per replicate of 10 cockerels and 15 pullets in each treatment. The control group was fed the diet containing 0% full fat soya, while the other groups had diets containing, 5%,10% and 15% full fat soya respectively. All the treatments were run concurrently for 7 weeks including 1 week adjustment period. The feeds were supplied at the rate of 80g per bird daily between 0700 and 0900 hrs.

Slaughtering and Dressing

Two cockerels randomly selected from each replicate were kept off from feed for 12 hours before slaughtering but had access to water till the time of weighing prior to slaughtering. Each bird was killed by external throat cut, bled and defeathered manually after scalding in hot water. It was weighed to obtain the dressed weight and then clean dressed to obtain eviscerated weight and cut up pieces as described by Oluyemi and Robers (1979). The four groups of chickens were randomly assigned to the treatments using completely randomized design as described by Little and Hills (1978) with the treatment as ' the only source of variability apart from the experimental error. The following data were collected for 6 weeks: daily feed intake number of dead birds found in each pen weekly, live weight gain (taken before the day's feed and water were supplied). At the end of the 6 weeks data collection, average daily feed consumption per bird per day (g), average initial and final live weights per birds (g), growth rate per bird per day (g) during the experimental period and feed conversion ratio, performance efficiency ratio cut up parts were computed. The correlation between full fat soya and feed intake, feed. Conversion ratio, performance efficiency and growth rate were determined while. the daily feed consumption, final live weight and growth rate were subjected to analysis of variance and the fisher s ratio was used to test for significant differences among treatment means. Where significant differences were obtained, the Least Significant Difference (LSD) was used to separate the treatment means (Little and Hills 1978).

RESULTS AND DISCUSSION

Table 2. Performance of Indigenous chicks fed Full Fat Soya

SIN	Parameters	FFS Levels			
		Trt l	Trt 2	Trt 3	Trt 4
1.	Feed Conversion Ratio per	2.15±0.48	2.51±0.73	2.45±0.70	1.76+0.15
2.	Feed intake per bird (g)	381±0.20	626±0.30	526:±O.23	416±0 21
3.	Average Weight gain (g) :	42.00	48.01	48.02	55.00
4.	Performance efficiency ratio	0.485±0.12	0.436+0.16	0.436+0.13	0.573±
5.	Average cost of feed intake	0.61	0.83	0.83	0.6
6.	Eviscerated weight of birds (g) sample	300.00	420.00	400.00	420.00·

Table 3 Correlation of Parameters

Parameters	Coefficient of Correlation
FFS/FCR	-0.213
FFS/Growth rate	0.298
'FFS/PER	0.301
FFS/Feed Intake	0.44

The feed intake, performance characteristics, Feed efficiency ratio, growth rate, feed conversion ratio, cost of feed consumed per bird per day are presented in Table 2 The coefficient of correlation between various levels of FFS; feed conversion ratio, growth rate, performance efficiency ratio and feed intake are in Table 3.

The birds on Treatment 4 appeared to utilize the least quantity of feed 1.769 ± 0.227 for a unit weight gain, though the difference with other treatments was not significant. The highest average weekly feed intake was recorded in treatment 3 with 20% FFS and 8.5% GNC with 3.156kg intake while the control treatment had the least intake. This low intake could be attributed to maximum utilization of the feed due to absence of FFS. The highest feed intake in. treatment 3 could be due to the fact that the level of RFFS and GNC are average in percentage level giving the birds' opportunity to utilize the feed conveniently, though there was no significant difference in feed intake. The mean weight gain varied slightly between 5.5gm in Treatment 4 and 4.2gmin treatment 1 inclusion which had the least intake and least weight gain. Though there was no statistical difference. in the weight gain, the birds in the Treatment IV with 25% FFS had the best performance efficiency ratio 0.57 while those in treatment III with 20% FFS had the least with 0.44. The correlation between FFS level and FCR r = 0.213, that of growth rate is r = 0.298, that of performance efficiency ratio is r = 0.301 and feed intake is r = 0.44. This indicated that increase in the level of RFFS inclusion in the birds diet led to increase in weight gain, PER, and feed intake. The birds in treatment IV had the highest eviscerated weight but the least feed cost was the control treatment followed by treatment IV, treatment III with 10% RFFS was the costliest.

Therefore for economic yield of local poultry meat and from the observation made in this study it appears that the inclusion of 15% RFFS+ 5% GNC gave the best result in performance, weight gain, growth rate and eviscerated weight. So it could be advisable after further work is done that farmers should not use GNC only to replace RFFS but use them in combination for best results due to amino acid balancing (Bamgbose *et a1* 1996). Though this study is not conclusive, further work is yet to be done for a longer period and on other types of birds such as broilers, layers and ducks to enable adequate comparison and viable recommendations to be made for large scale use in poultry production in Nigeria.

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