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CARCASS CUT PARTS AND NUTRIENT COMPOSITION OF TURKEY POULTS FED GRADED LEVELS OF TIGERNUTS (*CYPERUS Esculentus L*) SEED MEAL

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Abstract
Non-conventional feed resources from agro-industrial based are cheaply, easily and underutilized which offer the best alternatives for reducing the cost of meat thereby making animal protein available to Nigerian populace. An experiment was conducted to determine the carcass cut parts and carcass nutrient composition of turkey poults fed graded levels of tiger nuts offal meal. The inclusion levels of tiger nut offal meal in the diets were 0, 10, 20, 30 and 40 percent respectively. A total of 150 turkey poults were used to conduct the experiment in a Completely Randomized Design. Feed and water were given *ad libitum*. Data were collected on carcass cut parts and carcass nutrient composition. There was significant difference in the carcass cut parts, except the wing and back. The slaughter weight of turkeys fed diet 1 (750g) was significantly higher ($P<0.05$) than others (400-700g). The breast, drumstick and thigh of birds fed diet 3 was significantly higher ($P<0.05$) than others respectively. The crude fat of turkeys fed diet 1 was significantly higher significantly higher ($P<0.05$) than others. Turkeys fed diets 3 containing (20%) tiger nut offal meal performed better than others and therefore can be included in the diet of turkeys for improved performance.
Keywords: Tiger nut, Turkey poults, cut parts, Carcass nutrient composition

INTRODUCTION

Animal protein consumption in Nigeria has been reported to be very low as compared to developed countries owing high cost of feed ingredients (Onunkwo and Ekine, 2020). Among these feed ingredients is tiger nut offal. According to Sanchez *et al*. 2012, tiger nut (*Cyperus esculentus)* offal meal is an underutilized by product of the family *Cyperceae,* that produce rhizomes from the based and tubers which contain soluble glucose of about 21%. It has been reported by Onunkwo and George, 2015 that tiger nut was cultivated for its nutritive edible nuts, and it is rich in vitamin E and C. The offal was believed to have gotten from local kunun aya (Tiger nut milk) processors. It has been underutilized and thrown waste causing environmental pollution within town and villages.

Therefore, the aim of this study was to investigate the effect of feeding Tiger nut offal meal-based diet on carcass cut parts and carcass nutrient composition of turkey poults. Tiger nut is produced in large quantities in Northern part of Nigeria. It is served as snack, and it is rich in oil which can be extracted for cooking and for industrial uses. Tiger nut is sugary which suggests that it could be a good source of energy, high fibre and protein like palm kernel meal (PKM) and if fully utilized can be a substitute for maize. This has a correspondence with

Ugwuene *et al.* 2015 who used full-flat palm kernel meal to efficiently replace up to 40 percent maize in broiler ration.

Turkey production is next to chicken production and these species contribute substantially to the quality of animal products supplied to Nigerians. Animal products such as turkey and chicken meat contribute immensely to economic and nutritional status of Nigerians (Oluyemi and Roberts, 1979).

Materials and methods

The experiment was conducted at Poultry Unit of the Teaching and Research of Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria. The study lasted for eight weeks. The design of this study was Completely Randomized Design with five treatments, replicated thrice. A total of 150 turkey poults were procured from a reputable hatchery at Owerri, Imo State, Nigeria Five experimental treatment diets where tiger nut was added at 0, 10, 20, 30, 40% respectively were formulated for the study (Table 1). The diets were formulated to conform with the nutrient requirements of turkey poults. The 150 turkey poults were randomly allotted to the 5 treatment diets replicate thrice with each replicate hiving ten turkey poults and 30 turkey poults per treatment. Tiger nut offal was sourced from the local kunun Aya processors and sun- dried for 2-3 days under natural condition while other ingredients were purchased from a registered dealer of animal feed ingredients. The birds were fed the treatment diets and water supplied *ad libitum* using the appropriate feeding and watering troughs. The liter was replaced routinely with fresh wood shavings.

Table 1: Percentage composition of experimental diets

	Experimental diets				
Ingredients	T1	T2	T3	T4	T5
Tiger nut offal	0	10	20	30	40
Maize	42	31	21.5	11.5	3
Soy bean	48	48.5	48.5	48	47.5
Fish meal	6.5	7.0	6.5	7.0	6.0
Bone meal	3.0	3.0	3.0	3.0	3.0
Salt	0.25	0.25	0.25	0.25	0.25
Vit/min Premix	0.25	0.25	0.25	0.25	0.25
Total	100	100	100	100	100
ME (kcal/kg)	2810	2813	2826	2837	2846

At the end of eight weeks, the turkey poults were stunned before bleeding. Thereafter, they were soaked into hot water, defeathered, washed and cut to different parts. The weight of breast, thighs, drumstick, wings and back were respectively expressed as a percentage of dressed weight. Equal quantity of meat was cut from breast, thigh and drumstick, oven dried before taken for proximate analysis in the laboratory.

All data generated were subjected to analysis of variance (ANOVA) and treatment means that were significantly different were separated using Duncan's Multiple Range Test (Duncan, 1955) according to Steel and Torrie, 1980 using computer software IBM SPSS Statistic version 20 (SPSS, 2012).

Results and Discussion

The results of carcass cut parts of turkey poults fed graded level of tiger nut offal meal is presented in Table 2. The results obtained did not followed no definite pattern with increase in level of inclusion of tiger nut in the diets. Significant differences ($P<0.05$) existed in the

other carcass cut parts except wing and back. The slaughter weight of turkeys fed diet 1 was significantly higher (P<0.05) than that of diets 3, 4 and 5. There was no significant difference in dressed weight of turkeys fed diets 1, 2, 3 and 5.

The breast of turkeys fed diets 2 and 4 were significantly higher (P<0.05) than that of diets 1 and 5 but were not significantly different (P>0.05) from that of turkeys fed diet 3. The values of thigh and drumstick of birds fed 2, 3 and 4 were not significantly different (P>0.05) from one another but were significantly higher (P<0.05) than that of diet 1. Since breast region has the highest edible protein content (Summers *et al*., 1985) and the production of edible protein is the major consideration of any livestock industry, it could be recommended that tiger nut be used in the formulation of turkey poults diets especially at 10, 20 and 30% (Olomu, 1995).

Table 2: Carcass cut parts of turkeys fed graded level of tiger nut offal meal

	Treatment					
Parameters	**1 (0%)**	**2 (10%)**	**3 (20%)**	**4 (30%)**	**5 (40%)**	**SEM**
Slaughter (%)	750.00^{a}	700.00^{ab}	650.00^{b}	675.00^{b}	400.00^{c}	33.62
Dressed weight (%)	63.34^{ab}	57.15^{ab}	57.74^{ab}	53.08^{b}	69.62^{a}	2.21
Breast (%)	24.75^{b}	32.37^{a}	29.70^{ab}	33.04^{a}	25.35^{b}	1.19
Thigh (%)	15.89^{bc}	18.89^{ab}	16.71^{abc}	19.34^{a}	15.75^{c}	0.53
Drumstick (%)	18.43^{b}	22.30^{ab}	21.21^{ab}	22.79^{a}	18.76^{ab}	0.68
Wing (%)	20.49	25.34	22.85	23.53	20.80	0.97
Back (%)	15.67	17.95	15.46	17.40	14.95	0.52

a-b means with different superscripts are significantly different (P<0.05); SEM-Standard error of the mean.

The result of the carcass nutrient composition of turkey poults fed graded level of tiger nut offal meal is shown in table 3. The crude protein of birds fed diet 3 was significantly higher (P<0.05) than others, followed by that of diets 4 whereas that of diets 1 and 5 were not significantly different (P>0.05) from each other. The carcass crude protein increased with the level of inclusion up to diet 3 before decreasing. This result was in an agreement with the findings of Lesson and Summers, (1980) but higher than 44.5-52% and less than value (77.00%) reported by Obioha, 1992 respectively. The crude fat of turkeys fed diets 2 and 5 were not significantly different (P>0.05) but are significantly higher (P<0.05) than others.

The range of carcass fat observed here (13.02-14.23%) was less than 43.00 and 25.15% reported by Ugwuene *et al.,* (2005) and Summers *et al*, (1985) respectively for heavy breed turkeys. This result also confirms the report of Summers *et al*, (1985) that dietary composition could have had marked effect on carcass composition of turkeys because the oil from the tiger nut may have influenced the result. The total ash content of turkeys fed diet 1 was significantly higher (P<0.050) than others followed by that of diet 4 whereas there was no significant difference (P>0.05) on the total ash of turkeys fed diets 2, 3 and 5. Similarly the nitrogen free extract of birds fed diet 1 was significantly higher (P<0.05) than others. Since protein content is an index to measure meat quality, birds fed diet 3 seemed to have performed better than others (Ugwuene *et al.,* 2005)

Table 3: Carcass nutrient composition of turkey poults fed graded level of tiger nut offal meal

	Treatment					
Parameters	**1 (0%)**	**2 (10%)**	**3 (20%)**	**4 (30%)**	**5 (40%)**	**SEM**
Crude protein (%)	62.88^{c}	62.77^{d}	63.70^{b}	63.7^{b}	62.88^{c}	0.10
Crude fat (%)	13.37^{b}	14.20^{a}	13.02^{d}	13.27^{c}	14.23^{a}	0.13

Total ash (%)	12.45[a]	12.20[c]	12.20[c]	12.33[b]	12.20[c]	0.03
Dry matter (%)	89.20	89.77	88.86	89.13	89.86	0.14
Nitrogen free extract	58.65[a]	54.65[c]	41.32[c]	49.39[d]	56.48[b]	1.66

a, b, c means in the same row with different superscripts are significantly different (P<0.05); SEM=Standard error of the mean

Conclusion and Recommendation

The inclusion of tiger nut offal meal up to 10-30 percent gave good results in terms of carcass cut parts and carcass nutrient composition of turkeys. The result of the cut-parts shows that the percentage of inclusion level of tiger nut will realize good carcass, cut parts with regards to prime cuts (breast, thigh, and drumstick).

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