

THE ECONOMICS OF PRODUCTION OF FINISHER BROILER CHICKENS FED VARYING GRITS (Feldspar grit) WITH TIGER NUT RESIDUE BASED DIET

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ABSTRACT

An experiment was conducted on the economics of production of finisher broiler chickens fed grit and tiger nut residue based diet. Ninety (90) 4-week-old birds were used. They were divided into three treatment of 30 birds and each treatment was replicated three times with 10 birds. Two experimental diet were formulated with 0% and 20% tiger nut residue inclusion levels. Before feeding the birds the experimental diet, grit was fed at levels 0g, 4g and 8g per bird per month to birds in T₁ (Control), T₂ and T₃ respectively in a completely randomized design. Data obtained on Economic of production (price of birds at 4 weeks, cost of 1 kg of feed, cost of total feed intake, operational cost, selling price of birds and profit). The results obtained were subjected to ANOVA. There were significant differences ($P < 0.05$) in cost per kg of feed and profit with increased grit level and tiger nut. Value for cost of production was higher in Treatment 1 (Control). It was concluded that tiger nut residue can replace maize up to 20% with 8 g grit feeding in broiler finisher. It is recommended that higher level of grit and tiger nut residue should be studied in finisher broiler.

Keywords: Economics, Broiler, Grit, Tiger nut residue

INTRODUCTION

Broiler chicken production is one of the ways of addressing food insecurity and low protein consumption in Nigeria because of its fast growth rate and short production cycle (Williams *et al.*, 2017). However, the cost of production of broiler chickens is concerning due to feed waste and alarming cost of conventional feed ingredient (Usoro *et al.*, 2023; Evans *et al.*, 2023), necessitating the use of alternative feed ingredients. Alternative feed ingredients are mostly by-products of agriculture, agro industrial wastes not regarded by man as food but may be accepted by animals. They include brewery spent grains, shrimp waste, cassava peels Etc (Assam *et al.*, 2024; Christopher *et al.*, 2024; Evans *et al.*, 2023, Usoro and Christopher 2022, Ndak *et al* 2022, Assam *et al*, 2024).

Tiger nut residues is one of the alternative ingredients that is recently attracted to animal nutrition. Tiger nut residue is a by-product of tiger nut generated from the extraction of milk from the nuts. Tiger nut residue is reported to have high energy, vitamins and minerals and can be used to replace maize up to 75%. Like other alternative ingredients, the outstanding challenge of the usage of tiger nut residue is the possession of high fibre. Many researches have been conducted to address this limiting factor in the use of these feed ingredients with high fibre content in monogastric animals with inclusion of feed additives such as enzymes and grit (Usoro *et al.*, 2021), probiotics (Ukpana *et al.*, 2023) to address the contaminants and release of nutrients embedded in the fibre matrix of these feed stuff.

Stone grit is additive the remnants of crushed stones between the sizes of 2mm-5mm. They are provided to intensively raised birds fed high fibre diets in effort to mimic the natural phenomenon of picking particles of stones by the extensively raised birds while scavenging for food. This feature by the extensively raised birds is suggested to help gizzard in mechanical abrasion of the coarse feed consumed. It is possible that the feeding of stone grit to broiler chicken fed tiger nut residue base diet may enhance digestion of diet. This study aims at studying different levels of grit and tiger nut residue-based diet on cost of production of broiler chickens

METHODOLOGY

The experiment was conducted at the poultry unit of the Teaching and Research Farm of the Department of Animal Science, Obio Akpa Campus, Akwa Ibom State University.

Tiger nut residue and feldspar stone were gotten within the University community. The tiger nut residue was sun dried for 3 days while the stones were washed, dried and hammer milled, and sieved into 2-5mm sizes. Two basal experimental diets were formulated consisting of 0% and 20% tiger nut residue. Percent ingredients composition and calculated analysis of feed is presented on Table 1. Ninety (90) 4-week-old broiler birds were used for the experiment. They were weighed, divided into three treatments with 30 birds and were replicated three times with 10 birds. Before feeding the birds the experimental diet, grit was fed to the birds at levels 0g, 4g and 8g/ bird/month in a completely randomized design birds in Treatment I (control) had 0g grit, birds in Treatment II had 4g grit while birds in Treatment III had 8g of grit. The birds were weighed weekly. Feed and water were given *ad libitum*.

Routine management practices were observed and the experiment lasted for 28 days. The indices used to assess the economics of production of birds were; cost of bird – the price of birds at 4 weeks old. Cost of 100kg feed - the sum total of cost of all the ingredients. Cost of 1 kg of feed – the value of cost of 100 kg of feed divided by 100. Cost of total feed intake - cost per kg of feed multiply by total feed consumed. Operational cost - the sum of all expenses. Selling price of bird - the market price of the bird at 8 weeks old. Profit is the amount left, after subtracting operational cost from revenue

Statistical analysis

All data obtained were subjected to one-way analysis of variance and means separated using New Duncan Multiple Range Test.

Table 1: Gross ingredients and calculated nutrients composition of the experimental Diets

Ingredient	T1	T2
Maize	58.00	38.00
Tiger nut meal	0.00	20.00
Soya bean meal	12.00	12.00
Groundnut cake	11.00	11.00
Fish meal	3.00	3.00
Wheat offal	12.20	12.00
Bone meal	3.00	3.00
Salt	0.25	0.25
Finisher premix	0.25	0.25
Lysine	0.20	0.20
Methionine	0.10	0.10
Total	100.00	100.00
Calculated Nutrient composition		
Crude protein	20.02	18.00
Metabolizable Energy (Kcal/kg)	2900.00	2800.00
Crude fibre	4.36	6.86
Fat	7.75	10.71
Calcium	2.92	3.01
Phosphorus	4.43	4.71

RESULTS AND DISCUSSION

The results of economics of production of finisher broiler chickens fed grit and tiger nut residue based-diet are presented in Table 2

Table 2: Economics of production of finisher broiler chickens fed-grit and tiger nut residue-based diet.

Economic indices	T ₁ (0 g)	T ₂ (4 g)	T ₃ (8 g)	SEM
Cost of Purchase of birds (₦)	2400.00	2400.00	2400.00	28.87
Cost Per Kg of feed (₦)	328.00 ^a	298.00	298.00 ^c	4.34
Cost of total feed intake (₦)	1395.09	1297.91	1162.20	45.73
Cost of Medication (₦)	65.00	65.00	65.00	0.29
Operational Cost (₦)	3860.09	3741.24	3627.20	46.13
Revenue (₦)	4000.00	4000.00	4000.00	288.58
Profit (₦)	139.91 ^a	258.76 ^b	372.80 ^c	45.40

There were significant ($P < 0.05$) difference in the operational cost and profit of birds.

The control treatment had higher value (N328.00) cost per /kg of feed. This was probably due to the difference in cost of tiger nut residue (N100/kg) and maize which was N300.00/kg, meaning that the cost of maize per kg tripled the cost of tiger nut residue. This agrees with Evans *et al*, (2023) who reported that alternative feed resource reduces cost of feed. Cost of feed intake of broilers decreased in grit and tiger nut residue fed birds

Feed intake measures the quantity of feed consumed by animals. It is affected by many factors which include palatability of feed, the high fibre content of feed and feed waste Usoro *et al* (2023). In this study, the results showed that cost of feed intake was significant ($P < 0.05$) in all treatments with treatment I having the highest value (N1395.09), treatment II (N1297.91) and treatment III (N1162.20). It is obvious that cost of feed intake was not only influenced by cost per kg of feed but also by grit level inclusion. The possibility for this low cost of feed

intake may be that the higher level of grit (8g) in treatment III greatly aided the gizzard to make available nutrient to the birds from the tiger nut residue based diet compared to the lower levels of grit in treatments I and II (0g and 4g grit levels) This agrees with Usoro and Christopher (2022) who reported decreased feed intake of grit fed birds. The values for revenue from sales of birds were the same in all treatment indicating that there were no price disadvantaged birds amongst the treatment groups. The significant ($P<0.05$) effect observed in profit from sales of birds showed that birds fed tiger nut residue-based diet showed a more economic value than birds fed the control diet. Additionally, the profit margin improved in treatment III - 8g grit fed-birds and this resulted in a higher profit margin in Treatment III.

CONCLUSION

Grit feeding influences quantity of feed intake, and cost of feed intake while maintaining nutrient absorption by birds. From this study it is concluded that feed cost and cost of feed intake can be reduced when feeding broilers 8g grit and tiger nut residue-based diet.

RECOMMENDATION

It is recommended that feldspar stone grit be fed at 8 g per month for broiler birds when feeding tiger nut residue diet. Higher levels of grit and tiger nut should be studied.

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