# EFFECT OF MAIZE REPLACED WITH COCONUT CAKE MEAL ON GROWTH PERFORMANCE, CARCASS CHARACTERISTICS AND ECONOMICS OF PRODUCTION OF NOILER STRAIN OF CHICKEN

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## ABSTRACT
A research was conducted to evaluate the effect of replacing maize with varying levels of coconut cake meal (CCM) in the diet on the performance, carcass characteristics and economics of production of noiler strain of chicken. Five treatment diets were formulated in which CCM replaced maize at 0, 10, 20, 30 and 40% levels using a completely randomized design in two replications with ten birds per replicate. The study lasted for 8 weeks during which growth performance, carcass characteristics and economics of production were assessed after the experiment. The results showed that feed intake were significantly higher ($P<0.05$) in noiler fed 30-40% levels of maize replaced with CCM when compared with the control. Also, tested diets have no significant effect on the final weight, total and daily weight gain of birds fed the 40% level of maize replacement with CCM when compared with the control. Price/Kg feed reduced with increased level of CCM in the diet. Also, Price/Kg bird produced reduced for birds at 40% level of maize replacement but not statistically ($P>0.05$) different. Tested diets exert no significant difference ($P>0.05$) on the percentage weight of primal parts and vital organs of the noiler birds. It could therefore be suggested that maize could be replaced with CCM up to 40% level in noiler diet as this will reduce the Price/Kg of feed and the competition for maize between man and livestock industry.
**Keywords:** Carcass Characteristics, Coconut Cake Meal, Growth Performance, Maize, Noiler.

## INTRODUCTION
Poultry is one of the fastest means to achieving appreciable improvement in the nutritional standard of the populace because of its short generation interval, quick turnover rate and relatively low capital investment (Ani and Okeke, 2011).

In Nigeria, where the production of animal protein falls far short of meeting the demands of a rapidly growing population, poultry is the most common livestock kept (Obi, 2001). With the increasing population in Nigeria, there is need to fast track the process of poultry production especially meat and egg so as to meet up with protein needs of the population. To achieve this, a dual purpose chicken breed like Noiler is unavoidable. Noiler is an hybrid of broiler and cockerel with high resistance of cockerel and meat characteristics of broilers (Agricinfo.com, 2018).

Feed remains the most expensive input in poultry production with cereal grain constituting more than 40% of the feed cost (Oyedeji *et al,* 2003). Several workers have emphasized the need for utilizing alternative feed ingredients which have no competition between human and livestock industry (Fanimo *et al., 2007*; Nsa *et al.*, 2010).

Coconut meal is a by-product of coconut extraction. It is relatively high in residual oil which makes it a valuable energy source with high potential to serve as alternative to maize in ration formulation (Daghir, 2008)and noiler diet. Sundu *et al.*, ( 2009) reported possible utilization of coconut meal in broiler diet, However little or no information is available on the utilization of coconut cake meal as partial replacement of maize in noiler diet. This research is therefore conducted to assess the effect of replacing maize with coconut cake meal on growth performance, carcass characteristics and economics of production of noiler strain of chicken.

## MATERIALS AND METHODS
One hundred, five weeks old noilers were used for this experiment. The birds were randomly allotted to five experimental groups, replicated twice with ten (10) birds per replicate in a completely randomized design.. The initial weights of the birds were taken before the commencement of the trail. Experimental diets were formulated such that maize was replaced with coconut cake meal at 0, 10, 20, 30, and 40% levels.

**Table 1:** Percentage Composition of Experimental Diet

| Ingredients | Levels of Replacement (%) | | | | |
|---|---|---|---|---|---|
| | 0 | 10 | 20 | 30 | 40 |
| Maize | 65.0 | 58.5 | 52.0 | 45.5 | 39.0 |
| Coconut Cake | 0.0 | 6.5 | 13.0 | 19.5 | 26.0 |
| Concentrate | 27.5 | 27.5 | 27.5 | 27.5 | 27.5 |
| Wheat Offal | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 |
| Total | 100 | 100 | 100 | 100 | 100 |

Birds were fed twice daily for a period of 56 days. Feeds were weighed before given to birds and the weight of leftover were also taken on daily basis to determine the feed consumption. Weekly weight gain were determined throughout the experimental period.

At the end of the eight weeks feeding trial, 4 birds were selected per treatment making a total of 20 birds for carcass and organ evaluation. The birds were slaughtered following the conventional method and allowed to bleed. These were later defeathered eviscerated and cut into primal parts. The weights of parts and organs were taken. Cost of diets was calculated by summing up the cost of each ingredient that make up 25kg of each treatment diet, which was thereafter reduced to cost in naira per kilogramme of diet.
Data collected were analyzed using Analysis of Variance (ANOVA) and the significant differences between means were separated using Duncan Multiple Range Test with the aid of Statistical Package for Social Sciences (SPSS) Version 20.

## RESULTS AND DISCUSSION

**Table 2:** Effect of replacing maize with coconut cake meal on the growth performance and economics of production of Noiler strain of chicken.

| Parameters | Levels of Replacement (%) | | | | | SEM |
|---|---|---|---|---|---|---|
| | 0 | 10 | 20 | 30 | 40 | |
| Initial Weight (g) | 460.50 | 466.25 | 472.0 | 455.5 | 477.5 | 6.20NS |
| Final Weight (g) | $1881.0^{b}$ | $1746.0^{ab}$ | $1885.0^{b}$ | $1673.0^{a}$ | $1768.0^{ab}$ | 24.09 |
| Total Weight Gain (g) | $1419.5^{b}$ | $1279.75^{ab}$ | $1414.15^{ab}$ | $1233.5^{a}$ | $1290.5^{ab}$ | 23.81 |
| Weekly Weight Gain (g) | $177.44^{b}$ | $159.97^{ab}$ | $176.63^{b}$ | $151.82^{a}$ | $157.06^{ab}$ | 2.96 |
| Daily Weight Gain (g) | $25.35^{b}$ | $22.85^{ab}$ | $25.23^{b}$ | $21.69^{a}$ | $23.05^{ab}$ | 0.43 |
| Total Feed Intake (g) | $5223.2^{a}$ | $5425.85^{b}$ | $5538.5^{c}$ | $5571.0^{c}$ | $5657.50^{d}$ | 16.17 |
| Weekly Feed Intake (g) | $672.0^{a}$ | $676.55^{a}$ | $692.10^{b}$ | $696.38^{b}$ | $706.10^{c}$ | 1.84 |
| Daily Feed Intake (g) | $95.10^{a}$ | $96.65^{a}$ | $98.87^{b}$ | $99.49^{b}$ | $100.10^{c}$ | 0.026 |
| Feed/ Gain Ratio | $3.88^{a}$ | $4.39^{abc}$ | $4.04^{ab}$ | $4.66^{c}$ | $4.54^{bc}$ | 0.08 |
| Feed Efficiency | $0.27^{c}$ | $0.24^{ab}$ | $0.26^{bc}$ | $0.22^{a}$ | $0.25^{a}$ | 0.01 |
| Price/Kg Feed (₦) | $126.1^{e}$ | $118.93^{b}$ | $111.78^{c}$ | $104.64^{b}$ | $97.68^{a}$ | 1.01 |
| Feed /Kg Bird (₦) | $489.90^{ab}$ | $522.10^{b}$ | $451.37^{ab}$ | $485.59^{ab}$ | $443.47^{a}$ | 9.08 |

**abc:** Mean value within row carrying different super scripts differ significantly (P<0.05).
**NS:** Non Significant

The result shows that there is no significant ( P>0.05) difference in the initial weight of birds used for this experiment and thus has no influence on final weight gain.

There is no significant difference in the final weight, total and daily weight gain of birds fed 40% level of maize replaced with coconut cake meal when compared with those fed the control. This result is contrary to the observation of Bernade *et al,* (2001) who reported that the final weight of the broiler birds fed coconut cake meal based diet was significantly higher when compared with the control.

Result shows that the total and daily feed intake of noiler fed maize replaced with coconut cake diet at 30-40% level of replacement were significantly higher when compared with the control. This result is similar to that of Bawa *et al.*,( 2006) who reported that feed intake is significantly higher in rabbit fed 40% levels of graded palm kernel cake when compared with the control while feed efficiency is significantly lower at these levels of replacement when compared with the control. Price/Kg feed reduced with increased levels of coconut cake meal in the diets. The cost of the diets was influenced by the low cost of CCM when compared with maize that was replaced Price/Kg bird produced in naira is lower in birds fed 40% level of maize replacement when compared with the control though not statistically (P>0.05) different. This results was in conformity with that of Onunkwo *et al* (2018) when they fed duck with maize replaced with Palm Kernel Cake Meal (PKCM) . They reported significant low reduction in the price of feed and that of duck eggs produce with maize replace with PCKM diets.

**Table 3: Effect of replacing maize with coconut cake meal on carcass characteristics of Noiler strain of chicken.**

| | Levels of Replacement (%) | | | | | |
|---|---|---|---|---|---|---|
| **Parameters** | **0** | **10** | **20** | **30** | **40** | **SEM** |
| Live Shrunk Weight (g) | 1812.50$^{a}$ | 1853.75$^{ab}$ | 1950.00$^{b}$ | 1750.00$^{a}$ | 1980.00$^{b}$ | 36.27 |
| Defeathered WT (g) | 1905.00$^{c}$ | 1740.00$^{b}$ | 1785.00$^{bc}$ | 1582.50$^{a}$ | 1725.00$^{ab}$ | 30.45 |
| Dress Carcass (g) | 1319.26 | 1273.52 | 1313.87 | 1169.12 | 1310.37 | 28.26 NS |
| Thigh Weight (%) | 16.75 | 16.65 | 16.24 | 14.59 | 14.60 | 0.41 NS |
| Drum Stick WT (%) | 16.34 | 14.06 | 15.03 | 15.38 | 16.51 | 0.39 NS |
| Breast WT (%) | 26.39 | 25.10 | 23.17 | 26.24 | 24.34 | 0.55 NS |
| Back WT (%) | 18.24 | 17.32 | 19.80 | 19.74 | 20.21 | 0.52 NS |
| Wing WT (%) | 17.49 | 17.71 | 16.40 | 15.81 | 15.73 | 0.49 NS |
| Neck WT (%) | 8.31 | 8.70 | 9.33 | 8.24 | 8.17 | 0.26 NS |
| Gizzard WT (%) | 2.97 | 2.56 | 2.48 | 3.25 | 3.11 | 0.17 NS |
| Liver WT (%) | 1.80 | 2.01 | 1.80 | 1.85 | 1.93 | 0.08 NS |
| Heart WT (%) | 1.30 | 0.51 | 0.46 | 0.47 | 0.47 | 0.17 NS |
| Shank WT (%) | 4.06 | 4.49 | 4.50 | 5.53 | 4.75 | 0.22 NS |
| Pluck WT (%) | 0.59 | 0.58 | 0.50 | 0.41 | 0.44 | 0.02 NS |
| Heat WT (%) | 3.23 | 3.50 | 3.61 | 3.78 | 3.44 | 0.11 NS |
| Fat WT (%) | 1.38 | 1.80 | 1.98 | 2.39 | 2.38 | 0.22 NS |
| Intestine WT (%) | 3.93 | 4.28 | 4.77 | 4.23 | 3.90 | 0.16NS |

**abc:** Mean within a row carrying different super scripts differ significantly (P<0.05).
**NS:** Non Significant; SEM- Standard Error of the Mean

The result shows that there is no significant difference in the percentage weight of primal parts of noiler fed maize replaced with coconut cake meal across the treatments. Test diets exert no significant difference on the internal and external offals of the experimental bird. This result is in agreement with Medegu, (2010) who reported no significant difference in the fat weight of broiler placed on varying levels of coconut cake meal diet.
Percentage weight of vital organs like heart and liver were not influenced by the diets which suggests that inclusion of coconut cake meal in noiler diet is not deleterious to the birds.

## CONCLUSION

Coconut cake inclusion in noiler diet significantly increased bird feed intake at 30-40% levels of maize replacement. However, the diet exerts no significant difference in birds final weight, total and daily weight gain at 40%level of maize replacement when compared with the control. Birds primal parts and offals percentage weights were not influenced by the tested diets. It could therefore be suggested that coconut cake meal could be incorporated in noiler die up to 40% level of inclusiont,

this will reduce the Price per Kg of feed and the Price/Kg of birds produced, particularly in Nigeria where the waste is of no economic value in human diet.

## RECOMMENDATION

The following recommendations were made

i. Coconut cake meal may replace maize up to 40% with satisfactory results in the diets of noiler.
ii. Maize replaced with coconut cake meal at 40% gave the satisfactory result economically.
iii. Coconut cake meal to be used should not be stored for long time before use to avoid rancidity of the feed ingredient.

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