

Minimizing Cost of Production- Impact Of Graded Levels Of Non-Conventional Ingredients On Growth Performance Of Layers (Breadfruit Waste/Chaff)

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Abstract

This study was conducted for 12 weeks (8-20 weeks) to evaluate the effect of graded levels of dried breadfruit wastes (chaff) on the growth performance of layers, using eight weeks (8) old pullets. One hundred and fifty (150) growing pullets were allotted to five dietary treatment (T1,T2, T3, T4 and T5). The dietary treatment contained, 0%, 5%, 10%, 15% and 20% levels of breadfruit waste respectively with thirty birds (30) per treatment at ten birds in three replicates under the randomized complete experimental design. Growth parameters such as body weight, feed intake, feed conversion ratio, feed efficiency and feed cost were monitored on weekly basis from 9th-19th weeks of age of the birds. The data obtained were subjected to analysis of variance. Results from grower's phase showed significant differences ($p < 0.05$) among treatment groups for all the performance parameters measured except mortality. The study revealed that the inclusion of breadfruit wastes in the diets of layers does not have adverse effect on the growth of layers.

Keywords: Cost, Impact, Graded-levels, Non-Conventional, Ingredients (Bread fruit waste), Layers

Introduction

Entrepreneurship signifies the practical application of enterprise qualities, such as initiation, creativity and risk taking in the work environment either in self-employment or employment in small start-up firms using appropriate skills necessary for success in that environment (Adepeju, 2009). The Government is very aware of the importance of engaging the citizens especially the youths in Agriculture with the high rate of unemployment in the

country. It was in realization of this scenario, that the Federal Government of Nigeria approved the inclusion of entrepreneurship education in the curriculum of tertiary institutions as a way of promoting entrepreneurship spirit among Nigerian graduates to take up self employment especially in Agriculture. This type of entrepreneurship can be applied to the Agricultural sector. The implication is that agriculture and specifically livestock farming as well as livestock related enterprise can become a reliable means of livelihood for the young people.

Livestock production represents a major investment of significant economic, nutritional and social considerations in the developing countries. The levels of animal protein consumption however, have been reported to be very low and generally influencing the health and well-being of the ever increasing population (Ahaotu et al 2018). Animal production is still highlighted as very pivotal to food security and development of any nation (Olarotimi et al.,2017). Ending poverty and hunger as well as improving health are among the key milestones of the United Nations Sustainable Development Goals (SDG) (UN,2014).

As regular sources of meat become expensive in Nigeria, attention is being focused on the inclusion of non-conventional feed stuffs in animal diets. The high price of livestock feed can be reduced by use of non-conventional feed stuffs like bread fruit waste. The high price of feedstuffs has been attributed to competition between Man, Industries and Monogastric animals (Aduket et al.,1990; Akinmutimi 2001). In order to reduce high production cost due to the rising poultry production it is important to diversify component of Nigerian's agriculture with chicken production being the predominant part. It stands out as one of the most promising high demand (Madubuike and Ekenyen 2005). According to Odunsi 2003, the rapid growth of human and livestock populations which is creating increasing need for food and feed in the less developed countries demand that alternative feed resources be identified and evaluated. A possible way of increasing feed in poultry is by reducing the cost of production through the use of cheaper, less competitively demanded protein feeding resources (Fanimu et al.,1998). Akpodiete and Okagbare (1999) reported also that one possible option to try reducing the cost of the finished feed is by exploring the alternatives which do not form food for humans thus eliminating competition. Another option is to go into a very large scale production of the conventional ingredients to outweigh demands for

man and animal alike which possibilities isn't easy to achieve. The exploration into feed substances that are not edible to man (non-conventional) appears more promising (Akpodiete et al.,1999). Care however needs to be taken to prevent extraneous substances which could constitute health hazards to animals and the ultimate consumer, man.

However,the utility of non-conventional ingredients as animal feed supplement is limited by the presence of anti-nutritional factors (ANFS) (Isikwenu et al., 1999, Olarotimi et al.,2017) also emphasized that the efficient utilisation of feeding stuffs depend on the elimination of these agents before incorporation into animal feed, since food is the largest costing item in livestock production. The African breadfruit waste/chaff is one of the non-conventional ingredients known to contain anti-nutritional factors in its raw state like other legumes. In a phytochemical screening carried out, it was observed that African breadfruit waste/chaff contains Flavonoids, Polyphenols, Anthraquinone, Saponins and cardiac glycosides (Betu et al., 2019). (Ahaotu et al.,2017) reported that the low content of hydrocyanide,oxalate and phytase in the seed makes it both non-toxic and non-poisonous when used as a feed. It is wise to treat and process these waste before incorporating them into feed for birds.

Statement Of Problem

The current prohibitive cost of feeding animals especially poultry is due to high cost of conventional ingredients as a result of pressure in them by humans and industries. This high cost of feeds has led to high cost and not reachable to these animal products (meat, egg) to the populace. So,this has necessitated the need to intensify efforts in the discovery of alternative feed ingredients (non-conventional ingredients).

Objectives of the Study

- 1) To evaluate the growth parameters (body weight, weight gain, growth rate, feed intake, feed conversion ratio and feed efficiency) of bird fed with this bread fruit waste
- 2) To minimize the cost of production thereby reducing the cost from the Poultry products in the market

Justification of Study

Poultry has been recognised as an affordable source of high quality protein in form of meat and egg. The poultry sector has become the largest meat sector in the world as at the year 2020. Again, the sector continues to record a high global output of eggs (70 million meter tonnes in 2014) as additional high-quality protein food (Herbert, 2017). The rapid growth of the Poultry sector is fueled by several factors such as an ever increasing human population, greater purchasing power in developing economies, increasing urbanisation etc. Feeds have been recognized as the most important of these factors controlling profitability and product quality.

This study therefore, will not only go a long way in reducing the stiff competition between Man and poultry for conventional ingredient but will also reduce the cost of feeding the birds.

Materials And Methods

The experiment was carried out at the poultry unit of the Chukwuemeka Odumegwu Ojukwu University Teaching and Research Farm, Department of Animal Science, Faculty of Agriculture, Igbariam campus, Anambra State, Nigeria. The experimental birds were procured at day old, brooded and reared until they attained 8 weeks of age when the dietary treatment commenced. It lasted for 12 weeks covering the growth phase.

Experimental Animals And Housing

The pullets were sourced at day old and brooded till they reached 8 weeks of age. At this brooding stage, they were fed with commercial diet (Chick mash) before the commencement of the dietary treatment at 8 weeks.

Experimental Diet

Boiled breadfruit (ukwa) wastes were procured from Ose market, Onitsha in Anambra state where large quantities of the wastes were located and deposited by the commercial dealers in breadfruits. The heaps of the wastes were by the human public referred as refuse dumps.

Experimental Layout And Management

One hundred and fifty birds were randomly distributed into five treatment groups of 30 birds. Each treatment group replicated the three times of 10 birds on each unit. The birds were managed in a deep litter system. Feed and water were provided ad libitum. Good sanitation practices and routine vaccination were properly carried out. The diets were designated as T1(Control groups, T2 (5% of breadfruit wastes), T3 (10% of breadfruit wastes), T4 (15% of breadfruit wastes) and T5 (20% of breadfruit wastes)

Table 1: Percentage Composition Of Experimental Diets For Growing Birds

Ingredients.	T1.	T2.	T3.	T4.	T5
Maize	35.90	30.90	25.90	20.90	15.90
Breadfruit chaff	—	5.00	10.00	15.00	20.00
Soyabean	15.00	15.00	15.00	15.00	15.00
Wheat offal	35.80	35.80	35.80	35.80	35.80
Fish meal	3.00	3.00	3.00	3.00	3.00
Bone meal	9.50	9.50	9.50	9.50	9.50
Salt	0.20	0.20	0.20	0.20	0.20
Premix	0.30	0.30	0.30	0.30	0.30
Methionine	0.30	0.30	0.30	0.30	0.30
Total	100.00	100.00	100.00	100.00	100.00

Data Collection

Body weight: Record on this parameters were taken weekly from the 9th week to the end of the 19th week (growth phase). Mean body weight of the birds was obtained by getting the

total weights of all the birds weighed in each treatment and dividing with the number of birds weighed therein.

Weight gain: This was obtained by subtracting the initial body weight of the bird while the weekly weight gain was determined by subtracting the previous week's body weight from the current weeks weight

Feed Intake

This was measured weekly from (9-19) weeks by subtracting the weight of the leftover feed from the initial weight of the feed supplied to the bird.

Feed Conversion Ratio

This was determined by dividing the cumulative amount of feed consumed by the body weight gain for each treatment.

Feed Efficiency

This refers to the ratio of average body weight gain to the feed consumed, determined by dividing the amount of the mean body weight gained by the average amount of the feed consumed by the bird.

Experimental Design

Data collected from the experiment were subjected to analysis of variance (ANOVA) in randomised complete design (Steel and Tonne 1980). Significant means at ($P < 0.05$) were separated using the SPSS software's new Duncan multiple range tests.

Analysis/Result

Table 2: Effect of dietary levels of breadfruit wastes on growth performance of growing pullets

Parameters	T1	T2	T3	T4	T5	SEM	LOS
Initial weight(g)	532.00	529.00	529.67	529.67.	532.68	0.07	NS
Final weight(g)	1353.33.	1356.67.	1268.68.	1234.67.	1200.86.	0.88	*

Body weight gain(g).	821.33.	827.67.	739.01.	705.00.	668.19.	0.08.	*
Av. daily bodyweight gain (g/bird)	10.67.	10.75.	9.60.	9.16.	8.68.	0.001.	*
Total feed intake(g)	4916.56	4969.03	4834.74	4737.58	4741.87	18.62.	*
Av. daily feed intake (g/bird)	63.85	64.53	62.79	61.51	61.58	0.24	*
Feed conversion ratio	5.99	6.00	6.55	6.75	7.13.	0.02	*
Feed cost/kg ().	321.67.	305.17.	288.67.	272.17.	255.67.	0.00	*
Feed cost/kg weight gain ().	1925.34.	1832.75.	1892.20.	1835.57.	1823.60	6.74	*
Mortality (%).	0.00.	0.00.	0.00.	0.00.	0.00.	0.00.	*

The result showed significant differences ($P < 0.05$) among treatment groups for all performance parameters measured except mortality. The highest bodyweight gain and average daily weight gain obtained at T2 (5% inclusion of breadfruit) disagree with the work of Ogunkunle 2015 who reported highest bodyweight gain at 50% and 75% replacement of maize with dried breadfruit peel meal in formulated diet of giant African land snail. The concern of the researcher is that the feed cost per kg decreases as the inclusion of breadfruit waste increases and T5 which had the lowest and best feed cost per kg weight gain. Also was no mortality was recorded and the birds were apparently healthy during the experiment.

Discussion/Conclusion

The result showed significant differences ($P < 0.05$) among treatment groups for all performance parameters measured except mortality. Observed values for feed cost per kg weight gain showed significant difference ($P < 0.05$) across treatments. Diets containing 20%

breadfruit wastes were consistently the most economical while the control 0% was the least in parameters. It seems that the inclusion of breadfruit wastes in diets has the capacity to increase profitability as a result of reduction in cost production due to cheapness of breadfruit wastes. Thus agreeing with the work of Adene et al. 2006 who had earlier reported a similar finding in layers.

The study established that the cost of layers production generally and egg production specifically can be reduced by partial substitution of maize with dried breadfruit waste in the diet of laying birds as Ahaotu et al.,2019, pointed out.

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