

Cost - Benefit Analysis of Broiler Birds Fed on Different Graded Levels of *Moringa oleifera* Leaf Meal

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ABSTRACT: An exploratory study investigating the cost-benefit analysis of broiler birds fed different graded level of *Moringa oleifera* leaf meal as a protein source in poultry production was carried at Federal College of Forestry Mechanization, Afaka, Kaduna poultry unit. Yellow maize, and Moringa leaf meal (MOLM) was included in both broiler starter and finisher diets. One hundred and forty- four (144) day old broiler chicks were randomly allocated to four treatment diets. T₁ (0% MOLM), T₂ (2.5% MOLM), T₃ (5% MOLM) and T₄ (7.5% MOLM) in a completely randomized designed. Birds were managed under deep litter system with 12 compartments for a period of 8weeks. Weekly weight gain and feed intake were recorded throughout the period. Proximate analysis of *Moringa oleifera* leaf meal in broiler starter and finisher diets were carried out. To determine the cost-benefit in this study, cost of feed per kilogram, total feed intake, total weight gain, total production cost and the gross margin were determined. The statistical analysis was carried out using SPSS software version fifteen. The significant differences were noted in the amount of feed taking by broilers birds under different treatments of *moringa oleifera* leaf meal and significant differences in feed conversion ratio were noted. It was therefore concluded that inclusion of *Moringa oleirefa* leaf meal as protein supplement in broilers diet at 2.5% inclusion level produces broilers of similar weight in growth rate compeered to those fed under conversional commercial feds (p>.05) .

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I. INTRODUCTION

Background of the Study

Research into the use of non-conventional feed ingredients poultry diets is being intensified with the view to bringing down cost of feed and hence poultry products (Kwans, 2004). This competition for conventional feedstuffs between man and livestock has contributed immensely to their high cost in the local market. Feed alone account for 70% of the total cost of poultry production (Oloredo and Longe, 1999). Feed cost represents the annual operating cost for most commercial birds' enterprise. Alphonsus (2008), stated that in recent time, the use of groundnut cake which used to be a plant protein of choice in poultry diets is being limited in recent time due to high cost of production

Gadzirayi (2012) also asserted that the role of poultry industry in terms of its contribution to provision of animal protein cannot be over emphasized. Broiler birds as an integral part of poultry usually raised for economic benefits are very important. In Nigeria like other developing countries, poultry production is bedevilled with series of challenges including that of high cost of production resulting from high cost of feed. There is continued scarcity and consequently high prices of conventional protein (soya bean) and energy sources for livestock in tropics and this hinder poultry production D'mello (2000). Therefore, the research into the use of alternative sources of protein, vitamins and minerals for poultry feed is a welcome development. This will encourage farmers to venture into commercial production that could lead to the achievement of the objectives of self-sufficiency in food production, ensuring food security in Nigeria. However, this cannot be effectively be achieved without adequate attention being given to the benefits and cost derivable from the outcome of such research efforts aimed at encouraging increased production of broiler birds through the use of alternative sources of protein such as *Moringa oleifera* in feed composition. Cost and benefits are used to determine the profitability that accrues to an economic venture like that of broiler birds' production. For proper implementation of any project or policy like that of food security and economic empowerment, there is the need for adequate information or returns to investment, including that of broiler birds.

In Nigeria, farmers are engaged in poultry farming but output has remained low due to numerous problems which include, expensive feed ingredients, scarcity of conventional feed, and competition for conventional feed ingredients between man, and animals. In an attempt to address this problems, research effort

at sourcing viable alternative plant poultry, feeds are being carried out but adequate attention has not being given to the benefits and cost aspect of it. This is the gap that this research work was conceived to fill. To effectively do this, the study attempted to; examine the cost-benefits of broiler birds fed on different graded levels of *Moringa oleifera* leaf meal.

II. MATERIALS AND METHODS

Experimental Site

This experiment was conducted at the poultry unit of Federal College of Forestry Mechanization Afaka, Kaduna, which lies between latitude 37° to 41° N and longitude 7° to 47° E Kaduna, in North guinea savannah zone of Nigeria, along Kaduna air port road and Lagos express way.

Materials and Sources

Fish meal, bone meal, maize, lysine, premix, salt, wheat offal, soya beans and *Moringa* leaf meal were purchased from Courage Farm Enterprise, Ibadan. Medications were purchased from Central Market, Kaduna. One hundred (144) day old boiler birds, purchased from Courage Farm Enterprise, Ibadan were used for the experiment.

Experimental diet formulation

Four (4) diets were formulated such that diet one contains no leaf meal, while diets 2, 3 & 4 contained 2.5%, 5% and 7.5% levels of *Moringa oleifera* leaf meal respectively for broiler birds. The four (4) diets for the study are iso-nitrogenous and iso-caloric in nature that contain the following ingredients; Fish meal, bone meal, maize, lysine, premix, salt, wheat offal, soya beans and *Moringa* leaf meal.

Experimental design

One hundred and forty-four day old broilers were randomly and equally allotted into four experimental diet treatments in a completely randomized design (CRD). Each treatment was replicated three times. Each replicate was allotted twelve broilers birds making a total of thirty-six broiler birds per treatment.

Management of birds

The birds were housed in a pen in a poultry house. The poultry house was well ventilated. Each pen was provided with a drinker and feeder. The diets and water were provided ad-libitum. All management practices such as sanitation, administration of drugs and vaccination, were strictly adhere to and the broilers were treated with anti-biotics and anti-stress drugs as required. The experiment lasted for eight weeks (56) days.

Statistical analysis

The data obtained were subjected to analysis of variance using SSPS version 15 package. The data were separated by the method of Duncan Multiple Range Test (DMRT) using the same package.

Gross margin analysis

$$GM = GI - TVC$$

Where:

GM = Gross margin

GI = Gross farm income

TVC = Total variable cost

Gross margin analysis involves evaluating the efficiency of individual enterprise it is defined as the difference between the gross farm income and the total variable cost

Benefit-cost ratio is a measure of return in investment. It is a discounted measure of project worth.

III. RESULTS AND DISCUSSION

Table 1: Gross margin analysis starter broilers fed of different graded level of MOLM.

Parameters	T ₁	T ₂	T ₃	T ₄	SEM	LS
COF	90.83b	91.13a	90.23c	89.33d	0.21	*
TFT	2.36	3.39	2.39	2.36	0.01	NS
TWG	0.39a	0.31b	0.43a	0.43a	0.02	*
COFI	214.66	218.11	215.95	241.12	7.01	NS
COFRG	547.40b	712.01a	502.58a	510.99a	26.56	*
TPC	424.62ab	428.07a	425.91a	421.08b	0.97	*
REV	483.33	450.00	500.00	500.00	7.11	NS
GM	58.71ab	21.93b	57.42ab	78.92a	7.92a	*

SEM: Standard Error of Mean

LS: Level of significant

*: Row with different superscript letters are significant

NS: No Significant

The result of gross margin analysis for starter broiler birds fed on different graded level of MOLM is represented in Table 1. The feed cost per kg, total weight gain, total production cost and gross margin were significantly different ($p < 0.5$) across the dietary treatments. The feed cost showed a reduction of 90.83 to 90.23 and 89.33 ₦/kg from the control treatment (0% MOLM) to diet 2 (2.5% MOLM), diet 3(5% MOLM) and diet 4(7.5% MOLM) respectively. Similarly, cost of feed per kg body weight gain reduced significantly from the control diet 0% MOLM, (₦547.40) to (₦502.58) in diet 3 which contain 5% MOLM. There was significant $p < 0.05$ decrease recorded in the gross margin of ₦58.71, although the least gross margin value of ₦21.83 was obtained in the broilers fed on diet 2 containing 0.25g MOLM. The result is similar to that obtained by Olafadehan (2011) in which there was reduction in cost of feed/kg, and body weight gain of rabbit fed on cassava peeled meal compared to the control which have 0% cassava meal.

Table 2: Gross margin analysis of producing broiler birds at 8 weeks fed of different graded level of MOLM.

Parameters	T ₁	T ₂	T ₃	T ₄	SEM	LS
COF	88.38b	88.68a	87.78c	86.88d	0.21	*
TFI	2.78c	2.87b	2.98b	2.91b	0.02	*
TWG	1.26	1.23	1.18	1.16	0.02	NS
COFI	245.99c	254.51ab	261.58a	250.21bc	1.98	*
COFRG	199.74b	207.22ab	220.91a	215.75ab	3.45	*
TPC	455.95c	464.47ab	470.54a	460.17bc	1.98	*
REV	800	800	800	800	0.00	NS
GM	344.28a	335.53bc	328.46c	339.83ab	1.98	*

SEM: Standard Error of Mean

LS: Level of significant

*: Row with different superscript letters are significant

NS: No Significant

The gross margin analysis of finisher broiler fed on different graded level of MOLM is represented in Table 2. The cost of feed per kg, total feed intake, body weight gain, total production cost and gross margin were all significant ($p > 0.5$) across the dietary treatments, diet T₄ with 7.5% MOLM recorded the lowest value of cost of feed which is ₦86.88 per kg, followed by diet T₃ (5% MOLM) ₦88.38. The cost of feed /kg, favoured the control diet compared to the diet supplemented with MOLM. The gross margin analysis revealed that the control diet has the highest gross margin compared to the supplemented diets with MOLM. This showed that inclusion of MOLM does not significantly influence the growth of finisher broiler birds compared to the starter broiler birds.

Table 3: Net profit analysis of producing broiler birds at 8 weeks fed of different graded level of MOLM.

Parameters	T ₁	T ₂	T ₃	T ₄	SEM	LS
TCP	683.58	592.55	683.27	681.26	3.26	NS
REV	1200	1200	1200	1200	0.00	*
GM	516.41	507.45	516.73	518.74	3.26	*
Net profit	406.21	397.25	406.53	408.54	3.26	*

Source: Field Experimentation, 2014

SEM: Standard Error of Mean

LS: Level of significant

*: Row with different superscript letters are significant

NS: No Significant

TCP = Total Cost of Production

REV = Revenue

GM = Gross Margin

NP = Net Profit

The result of Net profit analysis of broilers raised in 8 weeks with diets containing graded level of MOLM is shown in Table 3. The total cost of production and the net profit were not significant across the treatments. However, the gross margin and the net profit values revealed that T₄ and T₃ which were supplemented with MOLM recorded high values of ₦518.74 and ₦516.73 as gross margin and ₦408.54 and

₦406.53 respectively. While net profits of ₦14,623.56, ₦14,301, ₦14,635.08, ₦ 14,707.44 were obtained for treatments T₁ (0.00%), T₂ (2.5%), T₃ (5%) and T₄ (7.5% MOLM) respectively. i.e. a total of ₦58,267.08 was realised as a net profit from 144 birds raised from day old to 8 weeks.

IV. CONCLUSION

The result obtained in this study confirms the aim of alternative feed stuffs in ration formulation, which is to reduce the cost of production and benefits accruable to farmers without compromising the carcass characteristics and meat quality. It is therefore concluded that inclusion of MOLM in the diet of broiler up to 7.5% have no negative effect on the profitability of raising birds.

V. RECOMMENDATION

It is therefore recommended that treatment four T₄ MOLM should be included in the diet of broiler birds for more economic benefits.

REFERENCES

- [1]. Alphonus, (2008). The use of groundnut cake in poultry diet is becoming limited due to high cost of production. Asian Australian journal of annual science.
- [2]. Boanet, D'nallo, (2001). The Use of moringa on health status of young animals. Ed.c. Devendra, proceedings of a workshop in Denpasar, Indonesia 24-29, July 1989. IDRC-276E.IDRC Canada, pp. 61-75
- [3]. Bostock wood, (2005). Tree in society in rural karmatica, India, (NRI Clintham).
- [4]. Clarke, (2003). Building on indigenous natural resource management forestry practice in Zimbabwe communal areas.
- [5]. Disa Godwin, (2006). Estimation of world population of poultries and breeding stocks. Poultry science 4(1) 7 -1. Story books ISBN 0-88266-897-8.
- [6]. D'mello James, (2000). The scarcity of consequent
- [7]. Frank Jethro, (2012), in the U.S in 2001, the average feed conversion ratio of broilers was 1.91 pounds of feed per pound of live weight.
- [8]. Gadzirayi, (2012). Poultry breeding has shanked todays industry. Retrieve July, 2012.
- [9]. High process of conventional feed for livestock production. Agric science. 128:311-322 story book.
- [10]. Kate Eric (2009), the majority of multivitamins available in the super market today are created in the laboratories, where ingredients are synthesized and packed into small pill.
- [11]. Kwan John (2004). Bandura University Zimbabwe, non-conventional feed ingredients in poultry diet Lowers the feed cost in poultry production.
- [12]. Lopez (2000). Detailed chemical composition of *leucana*, *leucocekhala* and effect of illusion on performance, forest ecol manage, 64:249-257.
- [13]. Makker and Ford (2001). The potential of *moringa oleifera* for Agricultural and industrial uses. The miracle tree. The multi uses of *moringa*. Ed Lowel J.Fugile, CTA Wageninggen, the Netherland. Pp.45-76.
- [14]. Makker and Becker (1990). Nutrient and anti quality factors on different morphological parts of the *moringa* tree. J. Agric sci. 128:311-322.
- [15]. Nautiyal and Venhataraman, (2006). Drumstick and ideal tree for social forestry. Growing conditions and uses My forest, 23: 53-58. Encyclopedia britannical.
- [16]. Olafudehan O. A. (2011). Carcass quality and cost benefit of rabbit fed on cassava pealed meal. Archives de Zootenia 6 (231): 757-765.
- [17]. Olorede and Longe, (1999). Feed cost represents the annual operating cost for most commercial birds enterprise. College of Agriculture, Zimbabwe, Poultry Science and story book. ISBN. 3425.

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