

## An Assessment Of The Use Of Varying Levels Of *Moringa oleifera* Leaf Meal As A Substitute For Vitamin+mineral Premix In Finisher Broiler Diet.

IGUGO, R. U.

Animal Science Dept, Enugu State University Of Science  
And Technology Enugu, Nigeria.

E-mail: [Igugoraymond@gmail.com](mailto:Igugoraymond@gmail.com)

\*Author For Correspondence

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### ABSTRACT

One hundred and twenty(120) 4 weeks old unsexed broiler chicken were used in a twenty eight days feeding trial to evaluate the use of *Moringa oleifera* leaf meal as a replacement for vitamin+mineral premix in finisher broilers. The birds were assigned to four treatment group with three replicates per group .The treatment groups includes T1, T2, T3, and T4 representing 0, 2.5, 5.0 and 7.5% inclusion levels of *Moringa oleifera* leaf meal as a replacement for vitamin+mineral premix. The result of the study showed that average final weight gain, average feed intake and feed conversion ratio differed significantly ( $P<0.05$ ) in favour of T4 and T3 .The dressing percentage as well as organ (gizzard, liver and heart) weights also differed significantly( $p<0.05$ ). The study thus indicate that the inclusion of *Moringa oleifera* leaf meal at 5% and 7.5% can successfully be used to replace vitamin+mineral premix in finisher diet.

**Keyword;** Finisher broiler, *Moringa oleifera* leaf meal, growth parameter, carcass and organ.

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### INTRODUCTION

The high cost of feed ingredients in Nigeria, especially protein and carbohydrate sources has resulted in declining productivity as well as profitability of intensive poultry production system. Broilers are the most efficient in converting raw feedstuff and by-products into high protein food which is urgently needed to improve the nutritional standard of humans (Mukhter, 2007). Leaf meal supplementation has been included in the diet of poultry as a means of reducing high cost of conventional protein sources and to improve profit margin (Odunsi et al, 1999; Iheukwumere et al., 2008; Nworgu et al., 2007; Onyimonyi et al., 2009 and Emenalom et al., 2009). Leaves can also be used as a feed additives for the biological function of birds such as vitamin and trace elements as growth promoters, absorption enhancers, antimicrobial-agents and metabolic modifiers (Hassan et al., 2004; Hassan et al., 2007; Abaza, 2001; Dickens and Ingram, 2001; Harman , 1984). Leguminous multipurpose trees and shrubs has been suggested to be a viable alternative source of proteins , vitamins

and minerals for poultry feeding (Church, 1991).

Venhatarman (1987) was of the opinion that moringa oleifera leaves are packed with nutrient needed by humans as well as animals. *Moringa oleifera* is one of the plants that has the potential of being utilized in the preparation of poultry feed .The plant is a good source of vitamins and minerals and is rich in amino acids(Makka and Becker, 1999). *Moringa* also known as the "miracle tree" has medicinal values, and is used in treating numerous diseases (Lockette, 2000; Loren,2007;and Olugbemi et al., 2010). The *Moringa* leaf is used in treating obesity due to its hypocholestrolemic property (Loren, 2007). The leaves have the calcium equivalent of 4 glasses of milk , 3 times the iron of spinach and 4 times the amount of vitamin A in carrot (Loren, 2007; Dahot,1988; Murro et al., 2003). The leaf is also rich in the following vitamins A, B, C as well as I protein (Janick et al.,2008; Schill, 2008; Folkard and Sutherland,2002).The high vitamin and mineral content of *Moringa oleifera* leaf meal justify its use in the study to replace

vitamin+mineral premix.

### MATERIALS AND METHODS.

The experiment was carried out at the Teaching and Research Farm of the Department of Animal /Fisheries Science and Management, Faculty of Agriculture and Natural Resources Management, Enugu State University of Science and Technology.

One hundred and twenty (120) 4-weeks old unsexed Agrited broilers chickens was allotted to four treatments with three replicates (ten birds per replicate).

Each treatment group was fed one of four experimental diet containing 0%, 2.5%, 5% and 7.5% *Moringa oleifera* leaf meal .The experimental birds were raised in a deep litter system. Records of growth rate were taken at

the end of every week, whereas record of feed intake was taken daily throughout the twenty eight days of study. Data collected were subjected to analysis of variance (ANOVA) using the SPSS, (2001). Fresh matured *Moringa oleifera* leaves were harvested and dried in a shade on clean floor until it became crispy while still retaining its greenish colouration. The dried leaves were milled using an attrition mill. The milled leaves were then incorporated into the diets at varying levels. On the 28<sup>th</sup> day of the experiment, three birds per treatment (one from each replicate) were randomly picked and processed for carcass and organ evaluation.

### PROXIMATE COMPOSITION OF MORINGAOLEIFERALEAF

Moisture 8.39

**TABLE 1 PERCENTAGE COMPOSITION OF THE FINISHER EXPERIMENTAL DIETS.**

<b>Ingredients</b>	<b>T1</b>	<b>T2</b>	<b>T3</b>	<b>T4</b>
Maize	55.00	55.00	55.00	55.00
Soyabean	30.00	30.00	30.00	30.00
Fish meal	2.00	2.00	2.00	2.00
Blood meal	2.00	2.00	2.00	2.00
Wheat offal	8.00	8.00	8.00	8.00
Bone meal	1.00	1.00	1.00	1.00
Limestone	1.30	1.30	1.30	1.30
Common salt	0.25	0.25	0.25	0.25
Methionine	0.10	0.10	0.10	0.10
Lysine	0.10	0.10	0.10	0.10
MOLM	0.00	2.50	5.00	7.50
Vit/mineral premix	0.25	-	-	-
TOTAL	100kg	100kg	100kg	100kg
Cal (CP%)	23.26	23.40	23.69	23.80
<b>ME(kcal/kg)</b>	<b>2879.13</b>	<b>2873.27</b>	<b>2869.10</b>	<b>2860.23</b>

**RESULTS AND DISCUSSION**

The study showed a significant difference ( $p < 0.05$ ) among the treatment group with regard to average final weight gain, average daily weight gain and feed conversion ratio. The average final weight gain was highest for T<sub>4</sub> (2676.18g) followed by T<sub>3</sub> (2343.15g), T<sub>1</sub> (2143.30g) and T<sub>2</sub> (1965.10g). Average daily weight gain also differed significantly ( $p < 0.05$ ) from T<sub>4</sub> (77.32g) and T<sub>4</sub> (65.48g). However there were no significant difference ( $p > 0.05$ ) between T<sub>3</sub> and other treatment. Significant difference ( $p < 0.05$ ) was observed in their feed conversion, T<sub>4</sub> has higher value than the other groups. This was followed by T<sub>3</sub>, T<sub>2</sub> and T<sub>1</sub>. The inclusion of *Moringa oleifera* leaf meal in the diet of the broilers at 5% and 7% levels positively affected the birds than at 2.5%. However birds fed; *Moringa* leaf meal at 7.5% performed better than the other birds. This is because the minerals, vitamins as well as amino acid in *moringa oleifera* leaf meal which have higher biological functions which acted as growth promoters, absorption 1999,

enhancers, antimicrobial agents and absorption enhances, antimicrobial agents and metabolic modifiers (Gill, 1999, Abaza, 2001; Al –Harthi, 2002 and Hassan *et al.*, 2007) the birds differ significantly ( $p < 0.05$ ) from other treatment groups. The study agreed with the findings of El-Husseiny *et al.*, (2002) that using medicinal plants mixture improves digestibility of broiler birds.

There was significant difference ( $p < 0.05$ ) among the four treatment with regards to average final weight gain, average daily weight gain and feed conversion ratio. However, it was observed that the inclusion of *Moringa Oleifera* leave meal at 5% and 7.5% respectively enhanced better feed intake when compare to the control. It could be due to the fact that *Moringa Oleifera* leave meal has abundant vitamins, protein and minerals which aided feed consumption (Mahadevan and Pradeep, 2009). The high content of vitamins and mineral by *Moringa oleifera* help to enhance the appetite of the birds (Mahaderan and Pradeep, 2009). This is also evident by the higher weight gain of T<sub>3</sub> and T<sub>4</sub>.

**Table 2: Growth performance of broiler finisher fed *Moringa oleifera* leaf meal.**

Parameter	Dietary Treatment			
	T1(0%)	T2(2.5%)	T3(5%)	T4(7.5%)
Average final weight gain(g)	2143.3 <sup>b</sup>	1965.10 <sup>b</sup>	2343.15 <sup>ab</sup>	2676.18 <sup>a</sup>
Initial average weight gain (g)	511.73	510.26	509.62	511.23
Average daily weight gain (g)	58.26 <sup>b</sup>	51.96 <sup>b</sup>	65.48 <sup>ab</sup>	77.32 <sup>a</sup>
Average feed intake (g)	134 <sup>ab</sup>	131 <sup>ab</sup>	137 <sup>a</sup>	40 <sup>a</sup>
Feed conversion ratio	2.52 <sup>b</sup>	2.30 <sup>ab</sup>	2.09 <sup>a</sup>	1.81 <sup>a</sup>

Means within rows with different superscripts are significantly different ( $p < 0.05$ )

**Table 3: Carcass and organ characteristics of broilers fed varying levels of *Moringa oleifera* leaf meal.**

Parameters	Dietary levels of <i>Moringa oleifera</i> leaf meal			
	T1	T2	T3	T4
Live weight (g)	2130 <sup>b</sup>	1937 <sup>b</sup>	2301 <sup>ab</sup>	2503 <sup>a</sup>
Dressed weight (g)	1514	1317 <sup>b</sup>	1710 <sup>ab</sup>	1910 <sup>a</sup>
Dressing (%)	71.08 <sup>b</sup>	68 <sup>b</sup>	74.32 <sup>ab</sup>	76.31 <sup>a</sup>
Gizzard (%)	1.69 <sup>b</sup>	1.77 <sup>ab</sup>	2.23 <sup>a</sup>	2.46 <sup>a</sup>
Liver (%)	1.85 <sup>ab</sup>	1.65 <sup>b</sup>	2.53 <sup>a</sup>	2.58 <sup>a</sup>
Heart (%)	0.47 <sup>ab</sup>	0.43 <sup>ab</sup>	0.52 <sup>a</sup>	0.55 <sup>a</sup>

Means within row with different superscripts are significantly different ( $p < 0.05$ ).

The carcass and organ qualities of the birds (Table 3) showed there were significant differences ( $p < 0.05$ ) among the treatment with regards to the inclusion of *Moringa oleifera* leave on dressed weight, dressing percentage as well as organ weight. This shows that *Moringa oleifera* leave meal because of its richness in mineral, vitamins and protein can effectively be used to replace synthetic minerals/vitamins premix presently employed in broiler feeding. The dressed weights of the birds were highest for T4, T3, T1, and T2. The organ characteristic gizzard, liver and heart were higher for T4, followed by T3, T1 and T2 respectively.

### CONCLUSION

The inclusion of *Moringa oleifera* leaf meal at 5 percent, and 7.5 percent support higher final weight gain, average daily weight gain, dressed weight, dressing percentage as well as organs such as gizzard, liver and heart. The study reveals the mineral, vitamin and protein content of *moringa oleifera* leaf meal can compare favourably with the synthetic mineral + vitamin premix presently used broiler production. This is promising work especially now that many countries have banned the usage of synthetic drugs including antibiotics and other growth promoters due to their side effects on both poultry and human.

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