

## Short Communication

# The effect of dietary inclusion of *Mansonia altissima* on feed intake, feed efficiency, and feed conversion of laying birds and cocks

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**An experiment was conducted to determine the effect of dietary inclusion of *Mansonia altissima* on feed intake, feed efficiency, and feed conversion of laying birds and cocks. A total of 60 birds consisting of 48 layers and 12 cocks were used in a completely randomized design of four treatment groups, A, B, C, D of 15 birds each. Results showed that significant differences ( $P < 0.05$ ) existed at the level of inclusion of 30 and 40 g/kg feed, respectively. There were no significant differences ( $P > 0.05$ ) in feed intake (consumption), but there were significant differences ( $P < 0.05$ ) in feed conversion, between treatment groups. It was therefore concluded that *M. altissima* can be used as a growth promoter in chicken at the inclusion level of 30 g/kg feed without causing increased feed consumption by the birds.**

**Key words:** feed, efficiency, conversion, consumption, laying birds, cocks.

## INTRODUCTION

Poultry farming is an important means of rapidly increasing the availability of animal protein in the developing countries where malnutrition is a great problem. In Nigeria for example, livestock production is small because of the capital intensive nature of livestock enterprise. This has resulted to low availability of livestock products. Due to the high cost of scarce livestock products, Nigerians are unable to afford a balanced protein and energy diet, resulting in widespread nutrition particularly in children. The need therefore, of increasing the productivity of chicken as per poultry meat in order to maintain the lead in this direction has prompted many researchers in Animal Science to continue to evolve newer methods that would enhance the productivity of chicken in growth rate, weight gain, and disease control or prevention. To this end, some antibiotics and non-antibiotics, chemical agents, some tree parts, shrubs, and

brownses, have been used.

While the use of an antibiotic to enhance the productivity of chicken and young pigs was first reported by McGinis (1949), Coates (1955), observed an increase in growth rate of conventional chicks and other animals fed antibiotic supplemented diets. Forbes and Park (1959) also reported similar increases. Griffin (1979) reported that penicillin, zinc bacitracin and nitrovin, produced consistent improvement in body weight gain and feed conversion. Taylor (1988) reported an increase in weight gain, improved feed efficiency and feed conversion, when he compared the effects of feeding various antibiotics namely ampicillin terramycin and cloxacillin on growth rate of broilers in the tropics. Wekhe and Taylor (1992) reported that the addition of Nystatin, an antifungal agent at the rate of 12,500 IU/kg body weight caused a significant increase in body weight of broilers when administered in combination with ampicillin but not with cloxacillin and terramycin. Wekhe and Olowo (1994) have shown optimization of growth promoting qualities of ethylestrenol and ampicillin in broiler industry in the humid tropics.

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**Table 1.** Effect of *M. altissima* on feed intake (Mean + Std. Error).

Week	A (0 g/kg feed) (kg)	B (30 g/kg feed) (kg)	C (40 g/kg feed) (kg)	D (50 g/kg feed) (kg)
1	4.23 ± 0.12	4.29 ± 0.14	4.38 ± 0.04	4.28 ± 0.14
2	4.02 ± 0.23	4.35 ± 0.05	4.07 ± 0.18	4.24 ± 0.24
3	4.25 ± 0.12	4.25 ± 0.11	4.16 ± 0.13	4.38 ± 0.09
4	4.33 ± 0.04	4.36 ± 0.06	4.17 ± 0.04	4.38 ± 0.12
5	3.98 ± 0.04	4.18 ± 0.11	4.06 ± 0.12	4.04 ± 0.08
6	4.23 ± 0.11	4.37 ± 0.03	4.33 ± 0.16	4.47 ± 0.03
Overall Final Mean	4.18 ± 0.06	4.30 ± 0.04 <sup>a</sup>	4.20 ± 0.05 <sup>a</sup>	4.30 ± 0.06 <sup>a</sup>
Average Feed conversion ratio	1.16 <sup>a</sup>	0.71 <sup>ab</sup>	1.06 <sup>a</sup>	0.46 <sup>b</sup>
Average feed efficiency	1.10 <sup>c</sup>	1.62 <sup>b</sup>	1.16 <sup>c</sup>	2.29 <sup>a</sup>

Means along the same row with the same superscripts do not differ significantly ( $P > 0.05$ ).

Algeier et al. (1967) reported that *Mansonia altissima*, the popular West African timber tree (African black walnut) also called Ofun (Nigeria), contains mansonin and minute quantities of 30 other cardenolides derived mostly from strophanthidin and nigrescigenin. Oliver Bever (1980), reported that the bark of *M. altissima* has been used in Ivory Coast as an arrow poison and in the treatment of leprosy, as well as an aphrodisiac. Mansonin is a 2-3-di (O-methyl)-6-deoxy-B-D-glucopyranoside of strophanthidin. *M. altissima* also contains a series of haphthoquinones, one of which is mansonone E10, an optically active reagent (Wayne and Wege, 1981).

The bark of *M. altissima* tree was later found to have growth effects on broilers and laying hens. Wekhe (2000) reported that *M. altissima* has a growth promoting effect on broilers. Following these observations, this study was therefore designed to investigate the effect of the dietary inclusion of *M. altissima* in the feed of hens and cocks, with regard to feed intake, feed efficiency, and feed conversion.

## MATERIALS AND METHODS

A total of 60 birds consisting of 48 Isa-Brown layers and 12 cocks were completely randomized into four treatment groups, A, B, C, D of 15 birds each. Each treatment group was replicated thrice, each containing 5 birds of both sexes (4 females and 1 male). Birds in group A were used as control, while those in treatments B, C, D were fed *M. altissima* powder previously weighed and graded, at the rate of 30, 40 and 50 g per kilogram feed daily for eight weeks, respectively, with two weeks acting as a stabilization period. The *M. altissima* barks were obtained from Nkpolu – Port Harcourt, Timber market. It was washed, sun-dried for two weeks, and ground into powder using motorized grinder at the Port Harcourt (Diobu, Mile 1) market. The pulverized *M. altissima* was weighed into required dosages of 10, 15, 20, and 30 g, for ease of administration using Mettler Electro Balance Model AE 163 electronic weighing scale. A reservoir stock of *M. altissima* of about 30 kg was thus obtained and used as desired. The exact quantity of feed consumed daily by each replicate or group was determined by weighing the left-over

feed and subtracting it from the initial weighed quantity that was given. The final weights of the birds were taken on the last day of the experiment.

The experiment was carried out in deep litter, in the Teaching and Research Farm of Rivers State University of Science and Technology, Nkpolu – Port Harcourt, Nigeria. The data collected were subjected to statistical analysis using the Analysis of Variance (ANOVA) according to Steel and Torie (1980) and where differences existed, means were compared using Duncan Multiple Range Test (DMRT) according to Statistical Analysis System Procedures of SAS (1999).

## RESULTS AND DISCUSSION

The initial mean weights were 1.50 and 1.72 kg (for males and females, Control A), 1.29 and 1.80 kg (group B), 1.38 and 1.65 kg (group C), and 1.53 and 1.66 kg (group D). The mean weights of the birds at the end of the experiment were 1.72 and 1.80 kg (for the males and females in the control group A), 1.47 and 1.86 kg (group B), 1.53 and 1.72 kg (group C), and 1.73 and 1.80 kg (group D).

There was no significant difference ( $P > 0.05$ ) in the body weight of the birds at the inclusion level of 50 g/kg feed (group D), at the end of the experiment. However, a significant difference ( $P < 0.05$ ) existed at the level of inclusion of 30 g/kg feed (group B) and 40 g/kg feed (group C). So it means that the dosages 30 g/kg and 40 g/kg are the effective dosages for weight increase. The dosage 30 g/kg is economically preferable. There were no significant differences ( $P > 0.05$ ) in feed intake (consumption) between groups (Table 1).

There were significant differences ( $P < 0.05$ ) in feed conversion between the treatment groups. The conversion enhanced with increasing dosage. This means that incorporation of pulverized *M. altissima* in the feed of laying hens and cocks leads to better feed conversion by the birds. This finding however corroborates earlier report (Wekhe, 2000) of weight

increase in broilers fed *M. altissima*. The observation that feed intake was not significantly affected ( $P > 0.05$ ) and that positive significant differences existed as the dosage increased ( $P < 0.05$ ) in the treatment groups, means that *M. altissima* has brought about an increased feed conversion by the birds. Therefore the inclusion of *M. altissima* in the feed will bring about an economic reduction in the quantity of feed required to raise or maintain birds. This is of a great advantage to the farmer; especially when the added *M. altissima* is economically insignificant while both the feed saved and the weight added are economically significant.

In conclusion, pulverized *M. altissima* can be used as a growth promoter in chicken at the inclusion level of 30 g/kg feed without causing increased feed consumption by the birds. Farmers should therefore be encouraged to utilize the barks of *M. altissima* timber lying waste in timber sheds.

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