*SHORT COMMUNICATION*

# ECONOMICS OF PRODUCTION OF BROILER CHICKENS FED MAGGOT MEAL AS REPLACEMENT FOR FISH MEAL

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## ABSTRACT

**The economics of production of broiler chickens considered for 0-35 days, 35-56 days , and 0-56 days was compared for fishmeal (FM) and maggot meal (MM) diets. The maggot meal diet had a replacement of the fish meal at 75% on protein basis. Replacing FM at 75% with MM resulted in reduced cost of feed as well as cost /kilogramme weight gain of broiler chicken at starter, finisher and the overall production period. Consequently, net returns was raised by 15.79% , 12.28% and 13.63%. respectively at the starter, finisher and during the overall production period. The increase in net returns are encouraging as the least -cost diet had no negative effect on the performance of the birds. Therefore the profit-maximising objective of commercial broiler enterprises is achieveably by MM utilization in broiler feed as replacement for FM under this condition of reduced cost of production.**

**Keywords:** Economics of production. maggot meal, fishmeal , net returns

## INTRODUCTION

In recent times, research interest has been awakened in the area of alternative feed resources, especially waste for monogastric feeding. This has stimulated much interest in the area of poultry waste and one aspect of it has been on the possible ways of improving the biological value of the lowly utilised poultry dropping. One way of doing this is by culturing fly larvae in the droppings, harvesting and consequently processing for use in feed formulation (Akpodiete *et al* 1997)

Maggot meal utilisation in poultry feed resources as replacement for soyabean meal (Teotia and Miller , 1974; Atteh and Oyedeji 1990) and fish meal in laying hens (Atteh and Ologenla, 1993; Ologhobo and Akpodiete , 1998) has been shown to be beneficial. Since the goal of any business enterprises is to maximise net returns, this paper thus considered the economics of production of broiler chickens (From 0-56days) fed maggot meal as replacement for fish meal.

## MATERIALS AND METHODS

Maggot meal was obtained by culturing maggots in palm oil enriched poultry droppings. The matured maggots were harvested by the floatation method, fried, dried and milled as described by Akpodiete *et al* ( 1997).The cost of palm oil and processing of maggot meal per kilogramme was computed. The cost/kilogramme of feed compounded for each replacement level was calculated from prevailing prices of ingredients as at the time of experiment (Table 3).

The diets were formulated for the starter and finisher phases respectively . At the starter phase (0-35 days) , diet 1 (control ) contained 57kg fishmeal /tonne of feed while at the finisher phase ( 35-56days), diet 1 (control ) contained fishmeal at 34 kg/tonne of feed. These diets were replaced for their fishmeal (FM) composition at 25, 50, 75 and 100% levels with maggot meal (MM ) on protein -equivalent basis.

Feed intake per bird for the period was used to multiply the cost/kilogramme of feed to obtain the cost of feeding a bird for the period. The cost/kilogramme weight gain was calculated by dividing the cost of feeding by the weight gain (kg) . The cost differential and relative cost benefit of the diets in relation to the control diet (without maggot meal ) were derived as follows:

Cost Differential (X) = Cost/kg weight gain of control diet less cost/kg weight gain of test diet.

$$\text{Relative Cost Benefit(\%)} = \frac{\text{Cost Differential}}{\text{Cost/kg weight gain of control diet}} \times \frac{100}{1}$$

where relative cost benefit describes the percentage gain realised by feeding maggot meal at the desired level in relation to fish meal.

The broiler chicks (Hubbard strain) used for the study were purchased at day old from S & D Farm along Ibadan-Lagos express way and g iven similar management schedule as specified by Oluyemi and Roberts (1979). The chicks were randomly assigned to the dietary treatments and data on feed intake were collected daily while weight gains were measured weekly, These data were collected for a period of 8 weeks , and they form the basis of the economic analysis of production of birds fed the diet with 75% replacement of fishmeal with maggot meal. The choice of this treatment for the study was based on the comparable performance of birds on this diet and the control as regards market demand.

## RESULTS AND DISCUSSION

The comparative performance of broiler chickens fed the two diets are shown in Table 1. Final live weight, weight gain per day, feed intake per bird per day, feed to gain ratio,mortality and operative protein efficiency ratio of the birds fed the two diets were not significantly (P>0.05) different at both the 0-35 days and the 35-56 days rearing periods. The resu''s on these parameters compared favourably when maggot meal replaced fish meal at 75% of the control diet, indicating no detrimental effect. This agrees with antecedent findings (Atteh and Ologbenla, 1993, Akpodiete and Ologhobo, 1998a; Ologhobo, and Akpodiete, 1998). The similarity of results for these two diets formed the basis of this comparative study.

Table 2 shows the result of the economic analysis of production of broilers fed the two diets. The cost of total fed consumed per bird during the 0-35 days, 35-56 days and 0-56 days periods were lower for birds fed the 75% replacement diet compared to the control. Similar trends were observed for cost /' kilogramme feed and cost/kilogramme weight gain of birds. This findings agree with Viroje and Malin (1998) and Atteh and Ologbenla (1993) .The cost differential per kilogramme gain and relative cost benefit per kilogramme gain show improved savings with the use of maggot meal as compared with fish meal in broiler diet. The improved savings with the use of maggot meal is a result of lower cost of maggot meal compared to fish meal since performance of the birds were similar. It could be seen that while a kilogramme of the control feed ( 100% FM) cost ₦19.43, N 18.32 and ₦18.83 for the starter (0-35days) , finisher (35 - 56 days) and the overall production period ( 0-56 days ) cost./ kg feed was reduced to ₦16.11; ₦15.61 and ₦15. 86 respectively for the maggot meal -based diets. The resultant effect is a lower cost /kg weight gain of ₦33.34, ₦55.13 and ₦44.24 in the test diet as against ₦39.59 , ₦62.85 and ₦51.22 respectively for the control. This relationship is in consonance with the findings of Viroje and Malin ( 1989). The

**TABLE 1: PERFORMANCE CHARACTERISTICS OF BROILERS FED DIETS CONTAINING MAGGOT MEAL AS REPLACEMENT FOR FISH MEAL BETWEEN O AND 56 DAYS OF AGE.**

| Characteristics | 0%MM 100%FM | 75%MM 25%FM | SEM |
|---|---|---|---|
| Initial liveweight(g) | 40.00 | 40.00 | - |
| Final liveweight(g) | | | |
| 0-35d | 995.50 | 978.50 | 9.88 |
| 0-56d | 1750 | 1740.00 | 6.20 |
| Weight gain (g/bird/day) | | | |
| 0-35d | 27.31 | 26.83 | 0.01 |
| 35-56d | 35.91 | 36.24 | 0.06 |
| 0-56d | 30.54 | 30.36 | 0.06 |
| Feed intake(g/bird/day) | | | |
| 0-35d | 55.91 | 55.51 | 0.90 |
| 35-56d | 123.19 | 127.95 | 0.15 |
| 0-56d | 81.14 | 82.71 | 0.20 |
| Feed: gain ratio; | | | |
| 0-35d | 2.03 | 2.07 | 0.01 |
| 35-56d | 3.45 | 3.54 | 0.13 |
| 0-56d | 2.66 | 2.74 | 0.05 |
| Mortality (%) | | | |
| 0-35d | 0.00 | 0.00 | - |
| 35-56d | 3.00 | 3.00 | - |
| 0-56d | 3.00 | 3.00 | - |
| Operative Protein Efficiency Ratio (PER) | | | |
| 0-35d | 2.12 | 2.10 | 0.23 |
| 35-56d | 1.46 | 1.42 | 0.16 |
| 0-56d | 1.76 | 1.76 | 0.17 |

SEM - Standard error of means
d - Day, MM -Maggol meal, FM - Fish Meal
0-35d - Between day one and day 35
35-56d - between day 35 and day 56 0.56d - between day 0 and day 56

implication of this is that the sum of ₦6.25 ,₦7.72 and ₦6.98 is saved per kilogramme weight gain during 0-35 days, 35-56days and 0-56 days periods of production when 75% of fish meal is replaced with maggot meal in broiler chickens diet. This makes economic sense which is very important in view of the high cost of feeds in total operating costs and its effect on profitability in commercial broiler operations.

From the relative cost benefit/kg gain parameter, it could be seen that the use of maggot meal compared to fishmeal in compounding broiler diets, has the effect of raising net returns by 18.75% , 14.00% and 15.78% at the 0-35 days, 35-56 days and during the overall production period (0-56 days) respectively. The general reduction in production cost/kg weight gain when MM supplemented 75% of FM is in agreement with other findings (Viroje and Malin, 1989; Atteh and Ologbenla, 1993) .The reduction in production cost was due to the lower cost/kg of the feed containing 75% MM replacement, and the approximate performance of birds fed the two different diets. While it cost only N13.50 to produce a kilogramme of MM, fishmeal was purchased at N100.00/kg .This price differential contributed largely to the reduced production cost of broiler due to maggot meal utilisation. Since the

**TABLE 2: ECONOMIC ANALYSIS OF PRODUCTION OF BROILER CHICKENS FED DIETS CONTAINING MAGGOT MEAL AS REPLACEMENT FOR FISH MEAL , BETWEEN 0 AND 56 DAYS OF AGE.**

| Parameterers | 0%MM 100%FM | 75%MM 25%FM |
|---|---|---|
| Total feed consumed (kg/bird) | | |
| 0-35d | 1.96 ± 0.12 | 1.94 ± 0.04 |
| 35-56d | 2.56 ± 0.05 | 2.69 ± 0.02 |
| 0-56dd | 4.54 ± 0.09 | 4.63 ± 0.03 |
| Cost of total feed consumed /bird (₦) | | |
| 0-35d | 37.85 ± 0.02 | 31.13 ± 0.11 |
| 35-56d | 47.39 ± 0.04 | 41.95 ± 0.12 |
| 0-56d | 85 .24 ± 0.04 | 73.26 ± 0.11 |
| Cost/kilogramme feed (₦) | | |
| 0-35d | 19.34 ± 0.14 | 16.11 ± 0.10 |
| 35-56d | 18.32 ± 0.01 | 15.61 ± 0.10 |
| 0-56d | 18.83 ± 0.11 | 15.86 ± 0.10 |
| Cost /kg weight gain (₦) | | |
| 0-35d | 39.59 ± 0.04 | 33.34 ± 0.02 |
| 35-56d | 62.85 ± 0.02 | 55.13 ± 0.05 |
| 0-56d | 51.22 ± 0.03 | 44.24 ± 0.03 |
| Cost differential/kg gain (₦) | | |
| 0-35d | - | 6.25 |
| 35-56d | - | 7.72 |
| 0-56d | - | 6.98 |
| Relative cost benefit/kg gain (%) | | |
| 0-35d | - | 15.79 |
| 35-56d | - | 12.28 |
| 0-56d | - | 13.63 |

**TABLE 3: COST OF DIETARY INGREDIENTS (N/Kg)**

| Ingredients | Cost (₦/Kg) |
|---|---|
| Maize | 7.50 |
| Full-fat soyabean | 24.00 |
| Fish meal | 100.00 |
| Maggot meal | 13.50 |
| Blood meal | 60.00 |
| Maize meal | 7.00 |
| Bone meal | 30.00 |
| Oyster meal | 10.00 |
| Premix | 200.00 |
| Salt | 20.00 |
| Methinoine | 540.00 |

replacement of FM with MM did not hamper growth in broilers , its production and utilisation in feed making could be encouraged . This is expected to bring about a reduction in the price of poultry meat products to a level affordable by a majority of consumers. It is further expected that such a replacement would reduce competition between man and animals for fish as food with a consequent reduction in the market price of fish.

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