

## PERFORMANCE OF PULLET CHICKS FED GRADED DIETARY LEVELS OF *MUCUNA PRURIENS* SEED MEAL AS PROTEIN SOURCE

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### Abstract

A total of three hundred and seventy five day old Bovan brown pullet chicks were fed graded levels of (MSM) seed meal in an eight week feeding trial to determine the effect of MSM on the growth performance of pullet chicks. There were five treatments in the study containing 0, 7.5, 15.0, 22.5 and 30.0% MSM with each replicated three times with twenty five birds per replicate in a completely randomized design. Parameters measured and calculated include final weight, weight gain, feed intake, feed to gain ratio and feed cost per kilogram gain. The final weight, the weight gain and feed intake of the birds fed 0.0, 7.5% and 15.0% MSM were statistically ( $P>0.05$ ) similar and significantly ( $P<0.05$ ) higher than those of other treatments. Cost of feed per birds and feed cost per kilogram gain were lower for all MSM diets. The cost of feed decreased as the level of MSM increased in the diet. It was concluded that inclusion of MSM in the diets of broiler starter chicks has beneficial effects.

**Keywords:** Boiling, Performance, *Mucuna pruriens*, pullet chicks, graded levels

### Introduction

Animal husbandry is an essential part of the agricultural industry and plays a major role on the national economy. In many developing countries, like Nigeria the major constraint of poultry production has always being high cost of quality feeds. Feed cost was estimated to be about 67-75% of the total cost of production (Ogundipe, et. al. 2003; Akure, et al., 2020). This high cost has been attributed to the over-dependence on the expensive conventional feed stuffs such as maize which mainly used in poultry is feed formulation as a major source of energy. This high cost of feed necessitates research into non- conventional feedstuffs (NCF) that are readily available, cheap and nutritionally safe for the consumption of poultry. Utilization of *Mucuna pruriens* seeds which has crude protein of about 33.4% in poultry feed can lower feed cost because they are cheaper and are not consumed as food by humans. The seeds however, contain anti- nutritional factors such as trypsin inhibitor, tannins, phytic acid (Oke et al., 2003) which need to be detoxified before they are fed to poultry (Akinmutimi and Okwu, 2006). Heat treatment such as boiling is frequently used to improve the utilization of the nutrients in legumes by animals (Tuleun et al., 2008). This study was designed to evaluate the growth performance of pullet chicks fed graded dietary levels of sweet potatoes peel meals.

### Materials and methods

The experiment was conducted at the poultry section, Department of Livestock, Ministry of Agriculture, Mariri, in Kumbotso Local Government Area of Kano State. Five experimental diets of boiled *Mucuna* seed meal at 0.7.5, 15.0, 22.5 and 30.0% levels for T1, T2, T3, T4 and T5 were formulated respectively. The feed composition for the chicks is shown in Table 1. The birds were randomly assigned to pens in a completely randomized design (CRD). There were five treatments and three replications of the five treatments each with 15

birds per pen. The management of the birds was carried out according to the standard procedures for brooding, vaccination and medication. The birds and feeds were weighed weekly. The performance characteristics were measured in terms of weight gain, feed intake, and feed to gain ratio. The result obtained from performance of pullet chicks was subjected to analysis of variance (ANOVA) using procedure of SAS (2002), significant levels of differences among treatment means were determined using the Duncan's multiple range test.

**Table 1: Gross composition of pullet chicks diets containing Boiled Mucuna seeds meal (BMSM)**

| Ingredients (%)                | 0          | 7.5        | 15.0       | 22.5       | 30.0       |
|--------------------------------|------------|------------|------------|------------|------------|
| Maize                          | 55.85      | 48.0       | 42.00      | 34.00      | 28.50      |
| Mucuna seed meal               | 0.00       | 7.50       | 15.00      | 25.50      | 30.00      |
| Groundnut cake                 | 0.00       | 22.50      | 22.50      | 22.50      | 22.50      |
| Soybean meal                   | 6.00       | 6.00       | 6.00       | 6.00       | 6.00       |
| Maize offal                    | 7.00       | 7.00       | 7.00       | 7.00       | 7.00       |
| Fish meal                      | 2.00       | 2.00       | 2.00       | 2.00       | 2.00       |
| Bone meal                      | 3.00       | 3.00       | 3.00       | 3.00       | 3.00       |
| Limestone                      | 1.00       | 1.00       | 1.00       | 1.00       | 1.00       |
| Common salt                    | 0.30       | 0.30       | 0.30       | 0.30       | 0.30       |
| Methionine                     | 0.30       | 0.30       | 0.30       | 0.30       | 0.30       |
| Lysine                         | 0.10       | 0.10       | 0.10       | 0.10       | 0.10       |
| *Vitamin /trace min. premix    | 0.25       | 0.25       | 0.25       | 0.25       | 0.25       |
| <b>Total</b>                   | <b>100</b> | <b>100</b> | <b>100</b> | <b>100</b> | <b>100</b> |
| <b>Calculated Analysis (%)</b> |            |            |            |            |            |
| ME ( kcal/kg)                  | 2894       | 2811       | 2848       | 2902       | 2900       |
| Crude Protein                  | 20.00      | 20.00      | 20.00      | 20.00      | 20.00      |
| Crude fibre                    | 4.05       | 4.66       | 5.35       | 6.43       | 6.50.      |
| Available phos.(%)             | 6.80       | 6.92       | 6.45       | 6.00       | 6.95       |
| Ash                            | 6.40       | 6.45       | 6.45       | 6.42       | 6.15       |
| Meth.(%)                       | 0.57       | 0.57       | 0.56       | 0.55       | 0.54       |
| Lysine (%)                     | 1.05       | 1.06       | 1.06       | 1.07       | 1.07       |
| Calcium                        | 1.21       | 1.23       | 1.12       | 1.19       | 1.20       |
| Cost/kg(N)                     | 120        | 110        | 90         | 75         | 68         |

## Results and discussion

The result of the performance of pullet chicks fed Mucuna pruriens seed meal for eight weeks are shown in Table 3. There were significant differences  $p(<0.05)$  between treatments with respect to final weight, feed intake weight gain feed/gain ratio and live weight. Feed consumption decreased significantly ( $p<0.05$ ) with inclusion level of MSM. The final weight, weight gain, and feed to gain ratio, of birds fed 0 and 7.5 % MSM were similar, higher and better than those on other treatments, this could be an indication that chicks were able to efficiently utilize MSM at 7.5% better than other levels. This result of better feed to gain ratio observed for birds fed 7.5% MSM could also be due to the fact that there were sufficient digestible nutrients that were better utilized at this level. The results of the feed intake from this study agreed with the findings of Akinmutimi and Okwu, (2006) who reported reduced feed intake in cooked Mucuna seed meal as dietary levels of inclusion of boiled Mucuna seed meal increased in the diets of broiler chickens. There was significant ( $P<0.05$ ) decrease among treatment means for feed cost per bird and cost per

kilogram gain, which decreased as the dietary levels of MSM increased. The feed cost per bird and per kilogram gain were significantly ( $P<0.05$ ) better for all the MSM diets compared to the control diet, This was because MSM was cheaper and readily available without much competition from humans as they are not cherished as human food.

**Table 2: Effects of feeding diets containing boiled MSM on performance of pullet chicks**

| Measurements                 | 0.0                  | 7.5                  | 15.0                 | 22.5                 | 30.0                 | SEM  |
|------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|------|
| Initial weight (g/bird)      | 35.00                | 35.00                | 35.00                | 35.00                | 35.00                | 0.00 |
| Final weight (g/bird)        | 420.20 <sup>a</sup>  | 428.60 <sup>a</sup>  | 438.30 <sup>a</sup>  | 460.65 <sup>b</sup>  | 430.60 <sup>c</sup>  | 3.21 |
| Weight gain (g/bird)         | 385.20 <sup>a</sup>  | 393.60 <sup>a</sup>  | 403.30 <sup>a</sup>  | 426.65 <sup>b</sup>  | 395.60 <sup>c</sup>  | 2.23 |
| Feed intake (g/bird)         | 1235.15 <sup>a</sup> | 1225.25 <sup>a</sup> | 1210.85 <sup>b</sup> | 1200.74 <sup>b</sup> | 1188.20 <sup>c</sup> | 9.45 |
| Feed to Gain Ratio           | 1.90 <sup>a</sup>    | 1.90 <sup>a</sup>    | 2.10 <sup>b</sup>    | 2.24 <sup>c</sup>    | 2.29 <sup>d</sup>    | 0.01 |
| Feed cost/bird (₦)           | 380.44 <sup>d</sup>  | 367.58 <sup>c</sup>  | 365.24 <sup>bc</sup> | 362.48 <sup>b</sup>  | 356.32 <sup>a</sup>  | 0.47 |
| Feed cost/Kg weight gain (₦) | 155.73 <sup>e</sup>  | 144.03 <sup>d</sup>  | 129.87 <sup>c</sup>  | 129.22 <sup>b</sup>  | 121.61 <sup>a</sup>  | 0.88 |
| Mortality (%)                | -                    | -                    | -                    | -                    | -                    | -    |

<sup>abcd</sup>Means within the same row with different superscripts differ significantly ( $P<0.05$ )

### Conclusion

From the results obtained in this study, it was concluded that inclusion of MSM in the diet of pullet chicks at all the levels reduced the feed cost per kg gain as inclusion level increased. However, feeding of 7.5% MSM was more efficient compared to other levels of MSM. BMSM has no detrimental effect on the growth performance of pullet chicks.

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