

PERFORMANCE AND HAEMATOLOGICAL PARAMETERS OF BROILER STARTER CHICKS FED GRADED LEVELS OF *MUCUNA PRURIENS* SEED MEAL

^{*1}Akure, C. O., ²Abeke, F.O., ¹Olukotun, O. and ¹Ayodele. J.T.

¹Federal College of Forestry and Mechanization, Afaka, Kaduna

²National Animal Production Research Institute, Ahmadu Bello University, Zaria

*Corresponding Author: akurechristy@yahoo.com

ABSTRACT

A four week feeding trial was conducted to determine the effect of boiled *Mucuna* seed meal (BMSM) on the growth performance of broiler starter chicks. To achieve this, three hundred (300) five-week old broiler starter chicks were randomly allocated to five experimental diets in a completely randomized design (CRD). Each treatment was replicated three times having twenty birds per pen. Boiled *Mucuna* seed meal was prepared and fed in graded levels of 7.5, 15.0, 22.5, and 30.0 alongside, control. The parameters measured and calculated include final weight, weight gain, feed intake, feed to gain ratio and feed cost per kilogram gain. The haematological parameters were measured. The results showed that dietary levels of inclusion of BMSM had significant ($P < 0.05$) effect on these parameters. The final weight, the weight gain and feed intake of the birds fed 0.0 and 7.5%BMSM 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 BMSB diets. The highest mortality rate was observed on birds fed 30%BMSM diet. There were no significant differences ($P > 0.05$) between the treatment means for packed cell volume (PCV), haemoglobin (Hb) and Total protein (Tp). It was concluded that inclusion of BMSM in the diets of broiler starter chicks has beneficial effects.

Keywords: Boiling, Performance, *Mucuna pruriens*, Broiler finisher, graded levels

INTRODUCTION

Livestock is an integral part of the agricultural sector and encompass a great impact on the national economy. In many developing countries, like Nigeria poultry production is largely limited by unavailability and high cost of quality feeds. Feed cost was estimated to be about 70% of the total cost of production (Ogundipe *et al.*, 2003). This high cost has been attributed to the over-dependence on the expensive conventional feed stuffs such as soybean and groundnut cake which is mainly used in poultry feed formulation as a major source of protein. Poultry farmers and nutritionists are mostly interested in the total cost of production and the final returns after sales and the major thrust for them is to lower cost without compromising quality. This high cost of feed necessitates research into non-conventional feedstuffs (NCF) that are readily available, cheap and nutritionally safe. 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 and haematological parameters of broiler finisher fed graded dietary levels of boiled *Mucuna* seed 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. Haematological samples were collected into a sterile,

universal bottles containing Ethylene diamine tetraacetic acid (EDTA) and assayed. The result obtained from performance 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 Broiler starter diets containing Boiled *Mucuna* seeds meal (BMSM)

Ingredients (%)	0	7.5	15.0	22.5	30.0
Maize	48.45	47.78	45.35	43.91	39.90
Groundnut cake	31.60	24.77	19.70	18.70	10.15
<i>Mucuna</i> seed meal	0.00	7.50	15.00	22.50	30.0
Soybean meal	8.00	8.00	8.00	8.00	8.00
Maize offal	5.00	5.00	5.00	5.00	5.00
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
Total	100	100	100	100	100
Calculated Analysis (%)					
ME (kcal/kg)	2924	2911	2908	2902	2900
Crude Protein	23.00	23.00	23.00	23.00	23.00
Crude fibre	3.40	4.56	6.25	7.43	7.50.
Ether Extract	6.80	6.92	6.45	6.00	6.95
Ash	6.40	6.45	6.45	6.42	6.15
Calcium	1.21	1.23	1.12	1.19	1.20

RESULTS AND DISCUSSIONS

Table 2 shows the performance of broiler starter chicks fed *Mucuna* seed meal. The final weight, weight gain, feed intake and feed to gain ratio, of birds fed 0 and 7.5% boiled *Mucuna* seed meal (BMSM) were similar, higher and better than those on other treatments, this could be an indication that chicks were able to efficiently utilize BMSM at 7.5% better than other levels. This result of better feed to gain ratio observed for birds fed 7.5% BMSM 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 cooked *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 BMSM increased. The feed cost per bird and per kilogram gain were significantly ($P < 0.05$) better for all the BMSM diets compared to the control diet, This was because *Mucuna* seeds were cheaper and readily available without much competition from humans as they are not cherished as human food.

Table 3 shows the result of the effect of BMSM in broiler diets on some haematological parameters of broiler finisher chicks. There were no significant differences ($P > 0.05$) between the treatment means for Packed cell volume (PCV), haemoglobin (Hb) and total protein (Tp). The non-significant ($P > 0.05$) difference shown in the PCV, Hb and Tp showed that any of the diets was good enough to supply sufficient nutrients for birds. This agreed with the findings of Tuleun *et al.*, 2009 who reported a non-significant ($P > 0.05$) difference in PCV, and Hb values of broiler chickens fed 20% boiled *Mucuna* seed meal and those fed the control diet.

CONCLUSION

From the results of the experiment, it was concluded that up to 7.5% of BMSM may be included in the diets of broiler chicks without any significant negative effect on growth performance.

Table 2: Effects of feeding diets containing boiled *Mucuna* seed meal on performance of Broiler starter chicks

Measurements	0.0	7.5	15.0	22.5	30.0	SEM
Initial weight (g/bird)	104.00	104.00	104.00	104.00	104.00	0.00
Final weight (g/bird)	861.11 ^a	857.67 ^a	780.00 ^b	729.67 ^c	680.60 ^d	4.21
Weight gain (g/bird)	757.11 ^a	753.67 ^a	676.00 ^b	625.67 ^c	571.67 ^d	4.23
Feed intake (g/bird)	1455.17 ^a	1440.28 ^a	1422.82 ^{ab}	1399.78 ^b	1320.10 ^c	9.45
Feed to Gain Ratio	1.90 ^a	1.90 ^a	2.10 ^b	2.24 ^c	2.29 ^d	0.01
Feed cost/bird (₦)	380.44 ^d	367.58 ^c	365.24 ^{bc}	362.48 ^b	356.32 ^a	0.47
Feed cost/Kg weight gain (₦)	155.73 ^e	144.03 ^d	129.87 ^c	129.22 ^b	121.61 ^a	0.88
Mortality (%)	-	-	-	-	-	-

^{abcd}Means within the same row with different superscripts differ significantly (P<0.05)

Table 3: Effects of boiled *Mucuna* seed meal based diets on some blood parameters of broiler starter chicks

Parameters	0.0	7.5	15.0	22.5	30.0	SEM
PCV (%)	34.57	34.56	34.55	34.53	34.50	1.07
Hb (g/dl)	11.62	11.60	11.60	11.62	11.63	0.54
TP (g/dl)	4.43	4.42	4.30	4.30	4.30	0.23

PCV= packed cell volume Hb= haemoglobin Tp= Total protein SEM = standard error of means

REFERENCES

- Akinmutimi, A. H. and Okwu, N.D. (2006). Effect of quantitative substitution of Cooked *Mucuna utilis* seed meal for soybean meal in Broiler finisher Diet. *International Journal of Poultry Science*, 5: 477 – 481.
- Ogundipe, S.O., Abeke, F.O., Sekoni, A.A. Dafwang, 1.1. and Adeyinka, I.A. (2003). Effects of duration of cooking on the utilization of lablab purpureus beans by pullet chicks In: *Proceedings of the 28th Annual Conference, Nigeria Society for Animal Production*, pp. 233-235.
- Oke, D. B. Oke, M.O. and Adeyemi, O. A. (2003). Predictions of cowpea seed protein quality through total sulphur determination. In: *Proceedings of the 7th Annual Conference, of Animal science Association of Nigeria*, September 16-19th pp.121.
- Statistical Analysis System (SAS) (2002). User guide statistics, Version 9 Edition, SAS Institute Inc. Cary. North Carolina, U.S.A.
- Tuleun, C.D., Carew, S.N. and Ajiji, I. (2008). Feeding value of velvet beans (*Mucuna utilis*) for laying hens. *Livestock Research Rural Development*, 20 (81).
- Tuleun, C.D., Patrick, J.P. and Tiamiyu, L.O. (2009). Evaluation of raw and boiled Velvet Bean (*utilis*) as feed ingredients for Broiler chickens. *Pakistan journal of nutrition* 8(5): 601-606.