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PERFORMANCE AND COST ANALYSIS OF BROILER STARTER CHICKS FED GRADED DIETARY LEVELS OF SOAKED*MUCUNA PRURIENS* SEEDMEAL

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Abstract

A four week feeding trial was conducted to determine the effect of soaked Mucuna seed meal (SMSM) on the growth performance of broiler starter chicks. Three hundred and fifteen (315) day 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 one (21) birds per pen. Soaked Mucuna seed meal was prepared and feeding graded levelsof5.0, 10.0, 15.0, and20.0 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 results showed that the dietary treatments of SMSM had significant (P<0.05) effect on all the parameters measured. The final weight, the weight gain and feed intake of the birds fed 0.0 and5.0%SMSM were statistically (P>0.05) similar and significantly (P<0.05) higher than those of other treatments. Feed cost per kilogram gain were lower for all SMSM diets, while treatment five (T5) presents the highest cost benefits. It was concluded that inclusion of 5% SMSM in broiler starter diets has beneficial effects on the performance of broiler starter chicks without any deleterious effects.

Keywords: Soaked, Performance, *Mucuna pruriens*, Broiler starter, graded dietary level

INTRODUCTION

The contribution of the poultry industry to livestock and rural agriculture forms a basis and integral drive towards attaining food security, enhancing poverty alleviation and securing national economic stability (FAO, 2020b). 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 78.8% of the total costof production (Akure, 2013). This high cost has been attributed to the over-dependence on expensive conventional feed ingredients. This high cost of feed necessitates research into non- conventional feedstuffs (NCF) that are readily available, cheap and nutritionally safe. *Mucuna pruriens* was identified as one of these non- conventional feedstuffs, 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). The seeds 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). There is a need to explore other methods of detoxification that is cheaper than

boiling. This study was designed to evaluate the growth performance of broiler chicks fed graded dietary levels of soaked *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 soaked *Mucuna* seed meal at 0.5.0, 10.0, 15.0 and 20.0% 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 twenty one (21) 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 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.

Table1:Gross composition of Broiler starter diets containing Soaked *Mucuna* seeds meal(SMSM)

Ingredients(%)	0	5.0	10.0	15.0	20.0
Maize	49.45	48.98	43.35	40.91	38.90
Groundnut cake	30.60	26.07	26.70	24.14	21.15
Mucuna seed meal	0.00	5.00	10.00	15.00	20.00
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)	2920	2921	2900	2902	2901
Crude Protein	23.00	23.00	23.00	23.00	23.00
Crude fibre	3.50	4.96	6.75	7.83	7.90.
Ether Extract	6.80	6.92	6.45	6.00	6.95
Ash	6.40	6.95	6.85	6.82	6.75
Calcium	1.22	1.24	1.15	1.18	1.22

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 5.0% SMSM were similar, higher and better than those on other treatments, this could be an indication that chicks were able to efficiently utilize SMSM at 5.0% better than other levels. This result of better feed to gain ratio observed for birds fed 5.0% SMSM could also be due to the fact that

there were sufficient digestible nutrients that were better utilized at this level. 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 SMSM increased. The feed cost per bird and per kilogram gain were significantly (P<0.05) better for all the SMSM diets compared to the control diet, This finding is in agreement with Tuleun *et al*. (2009) and Akure, (2020), which confirms a decrease in the feed cost and feed cost per kilogram gain in the diets containing Mucuna seeds. This was because *Mucuna* seeds were cheaper and readily available without much competition from humans as they are not cherished as human food.

Table2:Effects of feeding diets containing soaked *Mucuna* seed meal on performance of Broiler starter chicks

Measurements	0.0	5.0	10.0	15.0	20.0	SEM
Initial weight(g/bird)	80.00	80.00	80.00	80.00	80.00	0.00
Final weight(g/bird)	600.11^{b}	690.57^{a}	600.00^{b}	550.67^{c}	530.60^{c}	3.21
Weight gain(g/bird)	520.11^{a}	610.57^{a}	520.67^{b}	470.67^{c}	450.00^{c}	4.31
Feed intake(g/bird)	1030.17^{a}	1210.28^{a}	1050.28^{b}	1009.78^{b}	990.10^{c}	7.83
Feed to Gain Ratio	1.98^{a}	1.98^{a}	2.00^{b}	2.10^{c}	2.20^{d}	0.12
Total feed cost (₦)	247.20	223.85	178.50	151.75	133.85	0.23
Feed cost₦/kg gain	475.38	366.37	342.61	322.19	297.44	0.88

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

Cost-benefit of feeding graded levels of SMSM to broiler chicks

Table 3 shows the cost-benefit of feeding graded dietary levels of SMSM to broiler starter chicks.T5 had the least cost/kg diet of ₦ 135.20 which differed from ₦ 240.00, ₦ 185.52,₦ 170.00 and ₦150.25 values obtained from T1, T2 T3 and T4 respectively. The cost difference indicates that the diet of T5 was the most cost effective having a cost saving of ₦177.94, better than T4, T3 and T2 having ₦153.19, ₦132.77 and ₦132.77 respectively.

Table 3: Cost-benefit of feeding graded levels of SMSM to broiler chicks

Parameters	T1	T2	T3	T4	T5
Feed cost (₦/ kg)	240.00	185.00	170.00	150.25	135.20
Total feed intake (Kg)	1.030	1.210	1.050.	1.010	0.990
Total feed cost (₦)	247.20	223.85	178.50	151.75	133.85
Total weight gain (Kg)	0.520	0.611	0.521	0.471	0.450
Feed cost ₦/kg gain	475.38	366.37	342.61	322.19	297.44
Cost savings (₦)		109.01	132.77	153.19	177.94

CONCLUSION AND RECOMMENDATION

The results of this study showed that Mucuna seed meal can replace groundnut cake up to 5.0% level in broiler starter diets without compromising performance and with a cost saving of ₦109.01per kilogram gain. The replacement of groundnut cake with Mucuna seed meal at 5.0% inclusion level is hereby recommended in diets of starter broiler chickens. Further research on other classes of poultry such as layers, quails and turkeys is also recommended.

REFERENCES

Akinmutimi, A. H. and Okwu, N.D. (2006). Effect of quantitative substitution of Cooked *Mucunautilis* seed meal for soybean meal in Broiler finisher Diet.*International Journal ofPoultry Science*, 5: 477 – 481.

Akure, C.O. (2013). Evaluation of the nutritive value of differently processed *mucuna pruriens* seed meal (MSM) on the performance of broiler chicken. PhD Dissertation submitted to the Department of Animal Science, Faculty of Agriculture Ahmadu Bello University Zaria, Kaduna State, Nigeria.

Akure, C.O., Sekoni, A. A., Abeke, F.O., Vantsawa, P.A., Babasanya, B., Olukotun,O. and Ayodele. J.T. (2020). Growth performance and carcass characteristics of finisher broilers fed fermented *mucuna pruriens* seed meal. *Journal of Animal Production Research*, 32 (1): 92-99.

FAO. 2020b. Mitigating the impacts of COVID-19 on the Livestock sector. Rome http://doi.org/10.4060/ca8799en

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*, September16-19thpp.121.

StatisticalAnalysisSystem(SAS)(2002).Userguidestatistics,Version9Edition,SASInstituteInc.
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.andTiamiyu, L.O. (2009).Evaluation of raw and boiled Velvet Bean (utilis)asfeedingredientsforBroilerchickens.Pakistan journalofnutrition8(5):601-606.