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GROWTH PERFORMANCE OF BROILER CHICKENS FED DIETS CONTAINING FERMENTED POULTRY DROPPINGS

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ABSTRACT

This study was carried out to investigate the growth performance of broiler chickens fed diets containing fermented poultry droppings at starter phase. The birds were randomly allotted into five dietary treatments and three replicates in a completely randomized design with thirty (30) birds per replicate. They were fed five experimental diets containing 0% fermented poultry droppings and 5% poultry droppings fermented for 24, 48, 72 and 96 hours respectively. Data obtained were subjected to analysis of variance and significant differences were separated using Duncan Multiple Range Test. The result showed that there were no significant differences (P>0.05) in the values obtained for final body weight, average body weight gain, feed conversion ratio and Mortality. However, there were significant (P<0.05) differences in the values obtained for average feed intake. Broiler birds fed diets containing 5% poultry droppings fermented for 72 hours had the highest average final body weight (579.63 g) while those fed with diets containing 0% fermented poultry droppings (control) had the least average final body weight gain (519.80 g).the best feed conversion ratio (01.87) was recorded in broiler birds fed with diets containing 5% poultry droppings fermented for 96 hours while the poorest feed conversion ratio (2.00) was observed on broiler birds fed diets containing 5% poultry droppings fermented for 24 hours. In conclusion, fermented poultry droppings could be used up to 5% substitution for conventional protein feed stuffs in broiler diet without any adverse effect on the growth performance.

Keywords: Growth performance, broiler, fermented periods, Poultry droppings.

INTRODUCTION

Poultry production remains the most widespread of all livestock enterprises, constituting an important pillar for improving food security, as well as sociocultural and economic development in Nigeria (Dieye *et al.*, 2010). However, high feed to gain ratio and increase in the cost of feed due to high prices of feed ingredients are impediments to the growth of this industry in Nigeria (Abbas, 2013). In broiler production, feed cost alone accounts for about 60 to 70 % of the total cost of production and is a major factor that affects the production cost (Srivastava *et al.*, 2013). The cost of production of broiler meat has remained high due to high cost of feed. Groundnut cake (GNC) has been used as a protein supplement in broiler diets (Yahaya, 2014) but its price has continued to increase in our markets. Presently, a lot of emphasis is being placed on research on the use of agro industrial by- products and animal wastes, which do not offer much competition as food for man and animals. Poultry waste has drawn attention as potential feed ingredients due to its nutrient composition. The use of fermentation can be used to enhance the quality of poultry waste. Fermentation process serves as a means of providing a source of nourishment for large rural populations. Fermentation enhances the nutrient content of foods through the synthesis of protein, vitamins and essential amino acids. (Zhan *et al.*, 2010).

MATERIALS AND METHODS

Experimental site

The experiment was conducted at the Animal Unit of the Teaching and Research Farm, School of Agriculture and Agricultural Technology, Federal University of Technology, Minna. The experimental site lies in the guinea Savanna Zone of North Central Nigeria on Latitude 9.5248^0 35'N and Longitude 6.4344^0 33'E. The average minimum temperature is 23^0C and maximum average temperature is about 27.5^0C. (FMSN, 2015).

Collection and Preparation of Sample

Preparation of supernatant decanted solution.

Five kilogramme of maize (*Zea mays*) was cleaned and soaked in 6 litres of water in a plastic container for 3 days. It was decanted and the grains was wet-milled before sieving with a muslin cloth and allowed to sediment. The impurity was discarded and the starch suspension was allowed to sediment and the supernatant water collected was used for fermentation.

Preparation of fermented poultry droppings

The poultry dropping (PD) was sourced from a battery cage poultry house free of wood shavings within Minna metropolis. The test material was sieved using a metal sieve with a mesh size of 5mm2 to remove caked material and unwanted items such as feathers, metal objects, and stones. It was thereafter sun dried, the drying method of Couch (2007) was adopted by allowing the wet samples to be air dried under open environment, while a modified fermentation process was equality adopted and fermented using supernatant decanted solution (SDS). 5kg of dried poultry droppings were thoroughly mixed with 2liters of supernatant decanted solution with variation in the time of fermentation (24 hours, 48 hours, 72 hours and 96 hours) for treatment 2, 3, 4, and 5, respectively to produce fermented poultry droppings (FPD) and were all sundried after fermentation.

Experimental Diets

Five experimental diets were formulated and were; Treatment 1 = diet without fermented poultry droppings, Trearment 2= diet containing 5 % poultry droppings fermented for 24 hours, Treatment 3= diet containing 5 % poultry droppings fermented for 48 hours, Treatment 4= diet containing 5 % poultry droppings fermented for 72 hours, Treatment 5= diet containing 5 % poultry droppings fermented for 96 hours.

Experimental Birds and their management

One hundred and fifty (150) day-old Olam broiler chicks of mixed sexes were used for the experiment. Before the arrival of birds, the experimental poultry house was washed, fully disinfected and brooding pens were heated to a temperature of about 35 °C which was reduced by 3 °C per week until 21 °C room temperature was accomplished. The chicks were randomly allotted into five (5) dietary treatments in a Completely Randomized Design (CRD). Each treatment had three replicates with ten (10) chicks per replicate. Rechargeable lamps and charcoal pots were used as sources of light and heat respectively. Birds were reared on deep litter system for 28 days. Vaccinations and medications were strictly followed, feed and water were supplied *ad-libitum*.

Table 1: Proximate composition of fermented poultry droppings based diets

Parameters	T1	T2	T3	T4	T5
	0 %	5 % FPD	5 % FPD	5 % FPD	5 % FPD
Dry matter	91.80	92.00	90.80	90.60	91.60
Crude protein	21.70	20.25	20.25	21.05	20.30
Crude fibre	04.86	04.31	05.50	04.93	05.11
Ether extract	06.84	05.89	06.33	06.08	06.22
Ash	07.28	07.44	06.32	08.14	07.49
Nitrogen free extract	51.12	54.11	52.40	50.40	52.48

Keys:
T1 = diet without fermented poultry droppings, T2= diet containing 5 % poultry droppings fermented for 24 hours, T3= diet containing 5 % poultry droppings fermented for 48 hours, T4= diet containing 5 % poultry droppings fermented for 72 hours, T5= diet containing 5 % poultry droppings fermented for 96 hours, %=Percentage.

RESULTS AND DISCUSSIONS

Table 2 shows the growth performance of broiler chickens fed diets containing differently processed poultry droppings. The result showed that there were no significant differences (P>0.05) in the values obtained for average final body weight (AFBW), average body weight gain (ABWG), feed conversion ratio (FCR) and Mortality (MRT).

However, there were significant (P<0.05) differences in the values obtained for average feed intake (AFI). The highest feed intake (1022.60) g) was observed in broiler chickens fed diet containing poultry droppings fermented for 24 hours, this was closely followed by those fed with diets containing poultry droppings fermented for 72 hours (1007.90). Broiler birds fed with diets containing poultry droppings fermented for 48 and 96 hours had similar average feed intake (950.70 g and 977.57 g respectively) while broiler birds fed the control diet had the lowest feed intake.

Possible reason for significant (P<0.05) differences observed in the average feed intake of broiler birds fed with diets containing fermented poultry droppings may be due to the fact that fermentation enzyme speeds up the flow of the digesta in the digestive system of broilers (Sundu, 2009).

Table 2: Growth performance of broiler chickens fed diets containing differently processed poultry droppings

Parameters	T1	T2	T3	T4	T5	SEM	P-value
	0%	5 %FPD	5 % FPD	5 % FPD	5 % FPD		
AIBW (g/bird)	38.44	38.44	38.42	38.43	38.44	00.01	0.79
AFBW (g/bird)	519.80	553.27	526.10	579.63	570.77	16.35	0.67
ABWG (g/bird)	481.36	514.83	487.68	541.20	532.33	16.35	0.67
AFI (g/bird)	913.57^{b}	1022.60^{a}	950.70^{ab}	1007.90^{a}	977.57^{ab}	13.93	0.05
FCR	01.90	02.00	01.94	01.88	01.87	00.06	0.91
MRT (%)	06.67	03.33	00.00	03.33	03.33	01.26	0.65

a,b,c,; means in the same row with different superscript are significantly different (p<0.05), SEM= standard error of mean.

CONCLUSION AND APPLICATION

It can be concluded from the results obtained that the inclusion of fermented poultry droppings in the diet of starter broiler birds up to the level of 5 % can be tolerated by the birds and does not pose any negative effect on the birds in terms of their performance. This was established from the results obtained for the final body weight, weight gain and feed conversion ratio. Thus, fermented poultry droppings up to 5 % inclusion levels for substitution can be incorporated into the diet of starter broiler birds as a good and rich alternative to convention protein feed ingredients in broilers diet.

REFERENCES

A.O.A.C, (2000) Association of official Analytical Chemists. Official methods of Analysis. (17th Ed). A Publication of the Association of official Analytical chemists, Washington, D.C. Pp 52-157.

Abbas, T. E. (2013). The use of Moringa oleifera in poultry diets. Turkish *Journal of Veterinary and Animal Science*; 37:492-496.

Couch, J. R. (2007). Evaluation of poultry manure as feed ingredient. *Worlds Poultry Science Journals* vol.30 ;(4).279-289

Dieye, P. N., Missohou, N. A., Faye, A. and L'aviculture F. (2010). Un levier pouraméliorer les revenus des éleveurspauvres au Sud du Sénégal. In: Faye B, Duteurtre, G., editors. L'élevage, richesse des pauvres. Paris: Editions Quae; 191-201.

FMSN, (2015). Federal Metrological Station, Minna International Airport Weather Report. (Unpublished)

Mohapatra, S. K., Pradhan, K. P., Sahu, P. K. & Kumar, M. R. (2014). The performance measure of GS-DG MOSFET: an impact of metal gate work function. Advances in natural sciences: *Nanoscience and Nanotechnology*, 5 (2), 025002.

Muazzez, C., Yilmaz, G., Figen, K., Hakan, B. and Selim, M. (2016). Comparison of carcass characteristics, meat quality and blood parameters of slow and fast grown female broiler chickens raised in organic or conventional production system. *Australas Journal of Animal Science,29(7),987-997*

Oluyemi, J. A. and Robert (2002) Performance and Economic production of Broiler chickens fed different dietary energy sources.volume 9 PP 41-49 *Asian Journals of Poultry Science*

Sofowora, A. (1993) Phytochemical Screening of medicinal Plants and traditional Medicine in Africa Edition.Spectrum Books Ltd,Nigeria. 150-156

Srivastava, B.,Niwas, R.,Singh, D. P. and Benson (2013).Impact of herbal based diets on production efficiency of broiler. *An international Quarterly Journal of Life Science. The Biological scan,8 (1), 119-122.*

Sundu, B. (2009). Gastrointestinal response and passage time of pelleted diets in the digestive tract of broilers. *International journal of poultry science* 7: 511-515

Yahaya, S. K. (2014). Performance and Blood Biochemical profile of wild indigenous Guinean Fowl(Numidia meleagritis galecta) fed differently processed Negro coffee(seama occidentalis) seed meal under intensive production, Phd thesis to the postgraduate school, federal university of technology Minna.

Zhan, G., Zhang, F., Ru, W. and Han, J, (2010) Solid-state fermentation of corn meal with the Ascomycetes marchella esculenta for degrading starch and upgrading nutritional value, *World Journal of Microbiology and Biotechnology*, 26,15-20.