

Effect of graded level of Fermented poultry litter on the Performance of Broiler starters

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INTRODUCTION

The competition for conventional feedstuffs, its high prices and scarcity which have been identified to limit the production of livestock and poultry has necessitated the need for research into non-conventional feedstuffs not competed for by humans such as wheat bran, maize offal, dried poultry waste, rice bran, poultry litter and many others for cheaper and increased production of animal protein.

Ogundipe (1991) reported that feed cost constitute about 60-70% of the total cost of poultry production depending on the operation. Great potentials exist for increased poultry production and self-sufficiency in poultry products at reduced cost by the re-cycling of the poultry by-products, which include poultry litter and dried poultry waste.

The usage of poultry manure or litter in ration formulation is justified by its ready availability in the poultry industry, cheapness and ability to provide part of the protein and energy values needed in diet formulation.

The present study is therefore designed to examine the effect of inclusion of fermented poultry litter at graded levels on broiler performance during the starter phase of the growing period.

MATERIALS AND METHODS

Poultry Litter, Inoculum and fermentation

Poultry litter of about two years old layers were collected. And it consists of wood shavings, poultry droppings, feathers, wasted feed and other contaminants in the poultry deep litter house.

Rumen content was collected freshly from Bovine and Caprine rumen just after slaughter at the Bauchi Abattoir. This was then mixed with water and filtered. The filtrate was used as the inoculum.

Fermentation was carried out for 10 days as recommended by Odufa (1987) who reported that flavouring, preservation, enhancement of nutritive values and detoxification can be achieved within this fermentation period.

About 250kg poultry litter was weighed out and properly mixed with 25kg ground maize to serve as energy source in the fermentation process, done under anaerobic condition, using rumen liquor, water and ground maize in a thorough mixture put into a properly covered shallow concrete wells.

Samples of the fermented and unfermented poultry litter were taken and analysed for proximate chemical composition (Table 1).

Feed formulation and feeding trials

In compounding the broiler starter ration the sun-dried fermented poultry litter was ground and substituted for a part of the 23% crude protein broiler starter ration compounded at graded levels. There were three experimental diets, a basal control diet, 15% and 30% level of substitution of the basal diet.

Feeding trials: One hundred and eighty day old Ross broilers obtained from ECWA poultry farm, Jos were raised on the basal diet for two weeks weighed and divided into nine groups of similar average weight.

Three groups of birds were randomly assigned to each experimental diet with each treatment having three replications. 20 birds per replicate and 60 birds per treatment. The birds were fed *ad libitum* with the experimental diet (Table 2 and 3) and water for four weeks.

The parameters measured were feed intake, body weight gain, mortality, and efficiency of feed utilization.

Analytical procedure: At the termination of the experiment, data collected were subjected to Analysis of

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variance. Least significant difference (LSD) procedure as described by Steel and Torrie (1981) was used to separate the means.

RESULTS AND DISCUSSION

Summaries of the performance of broiler chicks fed graded levels of fermented poultry litter (FPL).

Fermented poultry litter (FPL): A decrease in percent crude protein was observed after fermentation which may have been due to loss of nitrogen from the breakdown of the uric acid (Non-protein nitrogen) and other nitrogenous components of the litter by rumen microbes into ammonia which was evident by its characteristics pungent odour. Wet anaerobic fermentation has been reported to lead to loss of nitrogen (Muller, 1980).

FPL was found to be high in crude fibre and in nitrogen-free-extract (NFE) which represent the soluble carbohydrates. Therefore FPL is low in energy value and expectedly diluted the energy density of the compound ration.

Feeding Trials: Body weight gain, feed intake and feed conversion. The results showed no significant effect ($P \geq 0.05$) on weight gain, in the three treatments, however there were numerical increases in some with less of the FPL inclusion in the diet.

Both the feed intake and feed conversion efficiency indicated significant differences ($P \geq 0.05$) during the course of the experiment. Though mortalities were recorded, they were not significantly different for the three treatments.

Feed cost decreased linearly with increased inclusion of FPL in the basal diet. Results evaluated based on the prevailing market price of commercial broiler starter ration during the experimental period gave a savings of ₦570 in feed cost per tonne basis with 15% level of inclusion of FPL in the basal diet.

CONCLUSION

It was concluded that FPL could be accepted as a feed ingredient for poultry particularly broilers and can be included up to 15% level in broiler starter ration without any adverse effect on production traits such as feed intake, weight gain, feed conversion efficiency and mortality.

Further work is necessary using FPL for feeding chicks from day old as this work was started at two weeks of age as a precautionary measure.

Table 1: Proximate composition on dry matter basis of unfermented and fermented poultry litter

Proximate composition	Fermented	Unfermented
% Crude protein	13.00	13.54
% Ether extract	2.39	0.96
% Crude fibre	21.65	15.59
% Ash	21.54	26.29
% Nitrogen free extract	34.72	37.22

Table 2: Percent composition of the broiler starter ration with 23% crude protein

Ingredients	Percentage composition (%)
Ground white maize	52.86
Soyabean mesh	41.94
Bone meal	4.00
Oyster shell	0.50
Methionine	0.20
Vitamin premix	0.25
Salt	0.25
Total	100.00

Calculated Analysis

% Crude protein -	23	
ME, Kcal/kg	-	2,800
% Calcium	-	1.3
% Total Phosphorus	-	0.74

Table 3: Composition of diets with graded level of fermented poultry litter (FPL)

Ingredients	Control 1	15% FPL 2	30% FPL 3
Compounded broiler Starter ration	100	85	70
Fermented poultry litter	0	15	30
Total	100%	100%	100%

Calculated Analysis

% Crude protein	23	21.5	20
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