

Performance Evaluation of Partially Formulated/Substituted Cassava Chips-Based Broiler Finisher Feeds With Commercial Broiler Finisher Feeds in Broiler Production in Umunze, Anambra State

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Abstract

Cereal grains mainly corns are the conventional energy feed in poultry ration which constitute over 50% of the diet for the different classes of poultry. The rapid growth of human population has intensified the competition between man and livestock for cereals, resulting to high cost of the cereal grains and consequently high prices of poultry products leading to low levels of per capita poultry meat and egg consumption. Therefore, it is necessary to look for alternative and cheaper sources of feeds that can replace cereals to reduce cost of production and contribute to increased supply of animal protein at an affordable price. One such economical substitute feed for maize is cassava. This study was therefore centered to evaluate the performance of partially formulated/substituted cassava chips-based broiler finisher feed with commercial broiler finisher feed in poultry production in Umunze, Anambra State. Twenty (20) pieces of unsexed day-old chicks of sayed breed were procured and brooded for five (5) weeks in a controlled environment and later transferred to a rearing pen made of deep litter materials under intensive system of management. Twelve (12) birds that constituted the sample size of the study were randomly selected and divided into two (2) experimental dietary treatments T_1 and T_2 for each six (6) birds with four (4) replications R_1 , R_2 , R_3 and R_4 and five (5) birds per replicate in a completely randomized design (CRD) R_1T_2 , R_2T_1 , R_3T_2 and R_4T_1 . The birds were fed ad libitum throughout the research period of twelve (12) weeks and measurement of performance parameters of the sampled birds taken and recorded on weekly basis. The result of the study showed that there were no significant relationships or differences between partially formulated/substituted cassava chips-based broiler finisher feed (T_1) and commercial broiler finisher feed (T_2). The result also showed that the birds fed with partially formulated/substituted cassava chips-based broiler finisher feed had greater feed conversion efficiency and economically cheaper than the commercial broiler finisher feed. Based on the results of performance parameters of the birds in this study, formulated/substituted cassava chip-based broiler finisher feed can completely replace cereal grains in broiler diets on energy feed ingredient in poultry production.

Keywords: Broilers, Carcass, cassava root chips and intake

Introduction

Cereal grains mainly corns are the conventional energy feed in poultry ration which constitute over 50% of the diet for the different classes of poultry (Iyayi, 2009). The rapid growth of human population has intensified the competition between man and livestock for cereals, resulting to high cost of the cereal grains and consequently high prices of poultry products leading to low levels of per capita poultry meat and egg consumption. Therefore, it is necessary to look for alternative and cheaper sources of feeds that can replace cereals to reduce cost of production and contribute to increased supply of animal protein at an affordable price. One such economical substitute feed for maize is cassava (Anthony, 2009).

The world production of cassava was 262.6 million times in 2012 with a steady increase in production over previous years (FAO, 2012). Cassava chips and pellets are the key cassava products used in animal feeding which can replace some or all of the cereal grains in diets (Iji et al, 2011). The high metabolizable energy content of cassava root chips and its wide acceptability in the tropics makes it a possible alternative to cereals as feed for poultry (Stevenson et al, 2000).

However, the usage of cassava is generally plagued by its high content of hydrocyanic acid (HCN) which is a chemical known to affect digestion, growth rate and other performance characteristics (Ayanwale, 2003) and certain haematological indices in broilers (Stephen and Ayanwale, 2003). Therefore, properly dried whole cassava tuberous roots can replace maize in non-ruminant rations, if the HCN does not exceed 100ppm in finished feeds.

The surge to harness the potentials of cassava in poultry rations has brought about several investigations. Saentaweeksuk et al, (2000) studied effects of substitution of maize by cassava in broiler diets and found that cassava can be substituted for 50% of the maize without any adverse effect on performance. The authors also reported that broilers on cassava diets were stronger, required much less medication and had lower mortality rates and the meat on cassava diets had a better perception by consumers. Equally, Saentaweeksuk et al, (2000b) studied the substitution of maize by cassava in diets for layers (22-37 weeks) and found that laying hens on 100% cassava diet had similar production performances to those on 100% maize diets. Also, other researchers have reported variable responses of diets containing cassava products such as chips and pellets in broiler diets (Obikaonu and Udedibie, 2006).

From the foregoing, it is imperative that further research works be carried to position cassava roots as alternative source of energy in poultry diets. This position informed the main objective of this research work which

centered on performance evaluation of partially formulated/substituted cassava chips-based broiler finisher feed with that of commercial broiler finisher feed. The study mostly sought to ascertain the rate of feed intake, the body weight gain, feed conversion efficiency, cost of feed consumed, cost of feed per weight gain per bird, mortality rate and the carcass characteristics.

Materials and Methods

The materials used in the study included twenty (20) unsexed day-old chicks, partially formulated/substituted cassava chips-based broiler finisher feed and commercial broiler finisher feeds. The feed ingredients used in the formulation of different experimental rations were corn grain, cassava root chips, soyabean meal, vitamin premix, salt, limestone and dicalcium phosphate. To prepare the partially formulated/substituted cassava chips-based broiler finisher feed for the study, high quality whole fresh cassava tubers were procured, peeled, washed, cleaned and chipped into small slices and then spread on a concrete level floor under direct sunlight to dry for five (5) days. The chips were turned regularly to prevent uneven drying and possible decay. The dried cassava chips were hammer milled to 5mm sieve size and used in the formulation of the experimental ration.

The twenty (20) day-old unsexed chicks which constituted the population of the experimental birds were brooded for five (5) weeks in a controlled environment and later transferred to a rearing pen where they were randomly divided into two (2) dietary treatments (T_1) and (T_2) and four (4) replications R_1 , R_2 , R_3 and R_4 with five (5) birds per replicate in a completely randomized design (CRD) (R_1T_2 , R_2T_1 , R_3T_2 and R_4T_1) out of which twelve (12) birds constituted the sample size for the study. The birds were vaccinated against newcastle (HB1) at day nine (9) and lasota, a booster dose at day twenty one (21) and infections bursal disease (Gumboro) at day seven (7). The birds were managed under intensive system in a deep litter house covered with wood shavings and fed ad libitum with the two (2) dietary experimental treatments viz partially formulated/substituted cassava chips-based broiler finisher feed (T_1) and commercial broiler finisher feed (T_2).

The study lasted for twelve (12) weeks and the quantity of feed offered and refused per replicate was measured and recorded on weekly basis. Feed intake was determined as the difference between the feed offered and refused. The experimental birds were weighed on weekly basis in each replicate and the average weight calculated. The body weight (BW) gain or

change was calculated as the difference between the final and initial body weight. The average body weight gain (ABG) was calculated as the ratio of body weight to the number of experimental days. The dry matter or feed conversion efficiency was computed as the ratio of average daily body weight gain to daily feed consumption. The cost of feed consumed by the birds was calculated by recording and comparing the expenditure incurred in the purchase of broiler starter feed, commercial broiler finisher feed and partially formulated/substituted broiler finisher feed. The cost of feed per weight gain of the birds was calculated as the total cost of each experimental treatment divided by the total average weight gain of the birds after the research period. Mortality of the birds was registered as it occurred and general health status was monitored throughout the twelve (12) weeks study period. At the end of the study, one (1) bird was randomly sampled from each of the four (4) replicates for examination of carcass characteristics. The birds were starved for twelve (12) hours, weighed immediately before slaughtering and exsanguinated by severing the neck. After slaughtering, the birds were de-feathered by hand plucking and consequently eviscerated and carcass cuts and non-edible offal components were determined

Results:

1. The result showed that the minimum and maximum consumption or intake of feed by the birds during the Starter phase was 0.1083kg and 0.3392kg respectively.
2. The result equally showed that there were no significant relationships or differences between the two (2) dietary experimental treatments on body weight gain.
3. The result also showed that cassava chips-based formulated broiler finisher feed had greater feed conversion efficiency more than commercial broiler finisher feed.
4. Equally, the result further revealed that the cost of cassava chips-based formulated broiler finisher feed was relatively cheaper than the commercial broiler finisher feed.
5. The result equally showed that the cost of formulated cassava chips-based broiler finisher feed per kg per bird was relatively cheaper than that of commercial broiler finisher feed.
6. The result also revealed that no mortality of the sampled birds was recorded during the starter and finisher phases of the study.
7. The result further showed that there were no distinguishable differences in the carcass characteristics of the sampled birds fed with the two (2) dietary treatments.

Discussion

Cassava root chips appeared to be rich source of energy and low in fibre, protein, ash and other extract. The high metabolizable energy content of cassava root chips noted in this study is indicative of its potential as a substitute to energy rich cereals in the diet of broilers. The intake and performance results of this study on broiler performance parameters such as body weight gain and feed conversion efficiency etc suggest that partially formulated/substituted cassava chips can fully substitute cereal grains in poultry production. This is an agreement with different previous findings (Saentaweek et al, 2000a, Ojewola et al, 2006 and Ngandjou et al, 2011).

Conclusion

Based on feed intake and other growth performance parameters of broilers obtained in this study, partially formulated/substituted cassava root chips could completely replace cereal grains in broiler diets as energy feed ingredient in poultry production.

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