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Utilization of Low-Grade Cassava Meal (Gari) in the Diets of Egg Type Chicks (0-8 Weeks)

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Abstract: An experiment was conducted to evaluate the utilization of low-grade cassava meal (gari) in the diets of egg type chicks (0-8 weeks). The proximate analysis of gari showed that it has 2.5% crude protein, 0.3% ether extract and 3.5% crude fibre. One hundred and ninety two days old egg type chicks having equal weight were randomly allocated to six dietary treatments with two replicates and 16 birds per each replicate. The six dietary treatments composed of rations in which graded levels of gari replaced maize up to 100% in treatment six. The results showed a significant decrease ($p<0.05$) in feed consumption as the level of gari increased in the diets, while weight of birds and weight gain were significantly lower ($p<0.05$) for those with higher levels of gari. The feed to gain ratio and percent mortality did not show any significant difference ($p>0.05$). There was a decrease in cost (N)* Kg gain in weight as the level of gari increased in the diet with a savings of N65.44 k for the last treatment. It is therefore economical to use gari as a substitute for maize in the diet of egg type chicks.

Key words: Gari, egg type chicks, cost (N)* kg gain

Introduction

Maize play a key role as a major source of energy in a conventional poultry diets. It is however, used as human food and for various industrial raw materials. This brings about high competition for maize between man and many monogastric animals. The demand for maize is therefore always higher than its supply which results in high cost of the grain and made it uneconomical to use as a sole energy source in poultry diets (Udedibie and Asoluka, 2008). The current trend in Nigeria is the use of by-products which are industrial or of local base in the diets of poultry and other monogatric animals. For example Vantsawa *et al.* (2008), fed locally processed maize offal (dusa) to growers chicken and its effect on their subsequent early egg production and observed that it could replace all the maize in their diets without any detrimental effect. Atteh *et al.* (1993), reported that Maize Mill Waste (MMW) could replace all the maize in the diets of pullets. Dafwang and Shwarmen (1996) showed that rice offal can be incorporated up to 10% in broiler rations. All these are attempts to cut down cost of production by farmers.

One of the energy sources that has a great potential as animal feed in Nigeria is cassava. Its production is increasing and so far Nigeria is the largest producer of cassava in the world. It was estimated that in 2004 cassava production in Nigeria was about 38-179 million metric tons (FAO, 2005). This figure must have doubled by now because of federal Government support for cassava farming (Udedibie and Asoluka, 2008). The only limiting factor of cassava is its low amino acid profile but can be supplemented to have a balance diets for animals.

Many of the cassava by-products have been used by many researchers in poultry and other monogastric rations. For example Sekoni (1997) fed cassava peel meal to layers and did not have detrimental effect on performance. Omoikhoje *et al.* (2008) fed unpeel cassava root meal up to 30% in rabbits diets with guaranted performance.

Cassava meal popularly known as gari is obtained by the fermentation of peeled cassava tuber and is a stable human food. It is fairly expensive to feed gari to animal because of cost since it is an acceptable human food. But substantial amount of it becomes sub-standard for human consumption while processing. Such sub-standard gari are usually sold to animal farmers at a cheaper rate. Since, the product is available all year round, it is important to ascertain its utilization as a substitute for maize in the diets of egg type chicks (0-8 weeks).

Materials and Methods

One hundred and ninety two days old egg type chicks obtained from Simtu farm, Shika, Zaria having equal weight were randomly allocated to six dietary treatments with two replicates of 16 birds each into pens of equal dimension. The six dietary treatments composed of rations in which graded levels of gari replaced maize up to 100% in treatment six. The birds were brooded in an open-sided deep litter house screened with wire mesh. The open sides of the house were covered with Zink Sheets to conserve heat. Kerosene stoves and electric bulbs were used to provide additional heat. The brooding lasted for four weeks.

Table 1: Experimental chick mash (18% CP)

	Treatment					
Ingredient	1	2	3	4	5	6
Gari	0.00	10.00	20.00	30.00	40.00	45.65
Maize	66.20	52.51	38.82	25.13	11.43	0.00
S/B	17.20	20.89	24.58	28.27	31.97	37.75
Dusa	10.00	10.00	10.00	10.00	10.00	10.00
Blood meal	2.80	2.80	2.80	2.80	2.80	2.80
Bone meal	3.00	3.00	3.00	3.00	3.00	3.00
Salt	0.35	0.35	0.35	0.35	0.35	0.35
Premix*	0.25	0.25	0.25	0.25	0.25	0.25
Methionine	0.10	0.10	0.10	0.10	0.10	0.10
Lysine	0.10	0.10	0.10	0.10	0.10	0.10
Total	100.00	100.00	100.00	100.00	100.00	100.00
Calculated AnalysisM.E (Kcal Kg^{-1})	2724.00	2707.00	2629.00	2612.00	2595.00	2581.00
Crude Protein (%)	18.00	18.00	18.00	18.00	18.00	18.00
Crude fibre (%)	3.25	3.85	4.45	5.05	5.65	6.07
Phosphorus (%)	0.87	0.86	0.85	0.84	0.83	0.83
Calcium (%)	1.19	1.22	1.24	1.26	1.28	1.30
Lysine (%)	0.79	0.86	0.92	0.98	1.05	1.17
Methionine + cystine	0.69	0.68	0.67	0.67	0.66	0.67
Cost (N)*Kg feed	41.20	38.94	36.68	34.43	32.17	28.63

*Biomix chicks premix supplied the following per Kg diet: Vit A, 10,000 iv; Vit D_3 2000 iv; Vit E 23 mg; Niacin 27.5mg, VitB_1, 1.8 mg; Vit B_2, 5 mg; Vit B_6, 3 mg; Vit B_{12}, 0.015 mg, Vit K, 2 mg; Pantothenic acid, 7.5 mg, Folic acid, 0.75 mg; Choline chloride, 300 mg; cobalt, 0.2 mg, copper, 3 mg; Iodine, 1 mg, Iron, 20 mg; Manganese, 40 mg: Selenium, 0.2 mg

Table 2: Utilization of low-grade cassava meal (gari) in the diets of egg type chicks (0-8 weeks)

	Treatments						
Parameters	1	2	3	4	5	6	SEM
Feed consumption (g)	1358.34^{a}	1145.43^{a}	1139.29^{a}	1100.65^{a}	834.30^{b}	762.87^{b}	99.96
Avg. wt (g)	371.30^{a}	330.91^{b}	324.58^{b}	321.91^{b}	257.77^{c}	244.41^{c}	13.57
Avg. wt gain (b)	333.77^{a}	292.63^{b}	287.08^{b}	284.41^{b}	220.27^{c}	206.91^{c}	13.76
Feed to gain ratio	4.08	4.04	4.01	3.93	3.83	3.50	0.43
% Mortality	20.00	20.00	16.67	13.34	6.67	3.34	8.17
Cost (N)* Kg gain	150.76^{a}	135.08^{ab}	124.09^{ab}	121.76^{ab}	110.02^{bc}	85.32^{c}	11.90

Means along the same row bearing the same superscript are not significantly different (p>0.05), SEM = Standard error of the means

Experimental chick mash and its calculated analysis for each treatment is as shown in Table 1.

Feed and water were provided ad-libitum. Vaccination and other routine medication were done according to local schedules. Feed consumption and weight gain were recorded each week. Mortality was recorded as it occurred. Cost (N)* Kg feed, cost (N)* Kg gain and cost (N)* Kg bird were computed. All the data collected were subjected to the analysis of variance using the general linear model procedure of statistical analysis (SAS, 1990). Differences in means were separated using Duncan Multiple Range Test (Steel and Torrie, 1980).

Results

The results of the utilization of low-grade cassava meal (gari) in the diets of egg type chicks (0-8 weeks) are as presented in Table 2. There was a significant decrease ($p<0.05$) in feed consumption from treatment four as the level of gari increased in the diets. The least consumption was observed in treatment six which contain 100% maize replacement by gari. However, average weight of birds and the average weight gain were significantly higher ($p<0.05$) for those treatments with lower percentage of gari in the diets. As the level of gari increased in the diet, the weight of birds and the average weight gain decreased. The feed to gain ratio and the percent mortality did not show any significant difference ($p>0.05$). The cost (N)* Kg gain in weight was significantly higher ($p<0.05$) for the control which had higher percentage of maize when compared with treatment six which had the highest percentage of gari. The difference in cost (N)* Kg gain between the control treatment and that of treatment six is about N65.44 k.

Discussion

The reason for the lower feed consumption observed in treatment six in which 100% of maize was replaced by gari may be due to delay in the digestion of gari in the crop of birds. When water is added to gari, it swells up which results in crop fill and give birds a form of satisfaction and eventually stop feeding. Also, because gari is high in energy and relatively low in other essential

nutrients, when the energy need of a bird is met, it stop feeding (Olomu and Offiong, 1983). Sunde (1984) observed that feed consumption decrease when the energy content of the diet is high. That is why there was decrease in feed consumption among birds on diets with high percentage of gari.

Since, the rate of digestion of gari is relatively slow when compared to maize, the rate of nutrient release is slow hence the absorption rate is also slow. This will not allow the birds to get the required essential nutrients for growth. That explains the significant difference in weight gain between treatment six and the control treatment.

The non-significant difference ($p>0.05$) observed in the feed to gain ratio for the treatments shows that though, gari is slow in digestion the effect did not show in the overall performance at the end of the eight weeks study. Also the non-significant difference at 5% level observed between treatments for percent mortality shows that gari has no detrimental effect on chicks. Sekoni (1997) also showed that cassava peel meal has no effect on chicks. The significant difference observed for the cost (N)* Kg gain in weight between treatments with higher percentage of maize than those with higher percentage of gari shows that it is economical to feed chicks with low-grade gari. The use of cheaper non-conventional human food in feeding chicks will boost the profit margin of farmers (Vantsawa *et al*., 2007). This makes the use of low-grade gari as a substitute for maize economical. The surplus maize that would have been used in feeding chicks can be channeled for other purposes (Dafwang, 2006). The savings of about N64.38* Kg gain observed in using low-grade gari was as a result of cost difference between maize and the gari. As at the time of the research maize was sold at the cost of N40.00* Kg while the low-grade gari was N20.00* Kg. It is concluded that despite the slow digestion of gari, it is economical to use it as a substitute for maize in the diet of egg type chicks (0-8 weeks).

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