PERFORMANCE OF BROILER FED DIETS CONTAINING GRADED LEVEL OF CASSAVA (Manihot esculentus) FLOUR MEAL AT STARTER PHASE

ABSTRACT

The experiment was conducted in the Federal University of Agriculture Zuru, Kebbi State in the Department of Animal Science to determine the performance of broiler starter fed diets contain graded level of cassava (Manihot esculentus) flour meal (CFM 0%, 20% and 30%), diet tagged T1, T2 and T3 were compounded respectively. Using one hundred and fifty (150) Ross 308 day old chicks, each treatment replicated five times with 10 chicks per treatment group. Feed intake and body weight gain of the birds were determine and compared. Result of final body weight, feed intake, body weight gain and feed conversion ratio were significantly different ($P<0.05$) for all the treatment while the result of mortality showed that there was no significant difference ($P>0.05$). It is concluded that feeding broiler with 20% cassava flour meal performed better in the study area.

Key words:- Performance, Broiler starter, Diets, Cassava,

INTRODUCTION

A serious competition exists between the feed industry and other channels in the food chain (especially man) over convention feed ingredients such as maize and soybeans. This has resulted in the high cost and scarcity of these conventional feedstuffs. Poultry feed producers are thus facing the task of finding alternatives feed stuff that will not compromise quality. The search for such alternatives has exercised Animal Nutritionists in Nigeria for over a decade (Oke *et al.*, 2002).

Cassava has been used as an alternative energy source and its inclusion in diet for poultry has been extensively studied (Tewe and Egbunike, 2000 and Adegbola, 2001). Nigerian cassava

production is by far the largest in the word, a third more than production in Brazil and almost double the production in Indonesia and Thailand. The food and agriculture organization of the United Nations estimated 2002 that the cassava production in Nigeria to be approximately 34 million tones (FAO, 2004). The trade of cassava production reported by the Central Bank of Nigeria put the highness estimate of production at 37 million tons in 2000 by the Federal Ministry of Agriculture and Natural Resources (FMARD, 1997). The third series provided by (PCU, 2003) had the most conservative estimate of production at 28 million tons in 2002 Nigeria's production was targeted at 40 million tonne by 2005 and 60 million tonne by 2020., International Trade Administration (ITA, 2002) Nigeria; being the words largest producer of cassava should be able to utilize its vast potential to provide enough of the tuber, not only for human consumption, but also for animal feed, it can be used as flour after being peeled or chipped with the peels and ground before use studies have shown that levels as high as 40% could be used in broiler diet (Erurbetine and Afolami, 1992).

The greatest limitation to the use of cassava for livestock feed is its content of Cyanogenic-glucosides, linamarin and lotaustralin. Toxicity of cassava is cause by hydrocyanic acid (HCN) which is liberated when glucoside is hydrolysed by the action of linamerase enzyme. The degree of toxicity depends upon the variety, ecological condition for growth of the plant. The form of the product being fed and its processing technology (Coursey, 1999). The normal range of hydrocyanic acid in fresh cassava root is 15-400 pm. It has long been established that the peel contains 5-10 times prussic acid of the content of the pulp. Where the hydrocyanic acid is below 100 ppm, as in cassava flour or chips cassava can be safely incorporated into rations as is allowed in the EEC (Delange and Ahuwalia, 2002).

The aim of this is to determine the performance of broiler fed diets containing cassava as energy supplement

MATERIALS AND METHODS

Study Area

This research work was conducted in the Department of Animal Science, Federal University of Agriculture Zuru, the area is geographically located in the guinea savanna on the latitude 11^0 405N and longitude $5^0$2.39E of the equator (Baba *et al.,* 2013).

Experimental Birds

The bird used for this experiment was sources from Zarm Farm in Oyo State in Nigeria. The strains used were Ross 308 broiler and was purchased at day old. One hundred and fifty (150) day old broiler chicks were used for this research.

Experimental Diets

The experimental diets used for the research was formulated using the available feed ingredients such as maize, cassava flour meal, soybean, groundnut cake, bone meal, vitamin-mineral premix, methionine, lysine and salt. The diet was fed to the birds throughout the experiment the gross and chemical compositions of the diets are shown in table 1 below.

Table 1: Gross and chemical composition of the experimental diets.

Ingredients (%)	$T_{1\ (0\%)}$	$T_{2\ (20\%)}$	$T_{3\ (30\%)}$
Maize	60.00	40.00	30.00
Cassava Flour Meal	-	20.00	30.00
Palm Oil	-	0.30	0.40
Soybeans Meal	2.70	5.00	3.30
Groundnut Cake	25.50	26.00	27.50
Wheat Offal	3.60	0.50	0.20

Fish Meal	0.20	0.40	0.50
Blood Meal	4.00	4.10	5.00
Bone Meal	2.00	1.7	1.70
Limestone	1.00	1.00	0.50
Lysine	0.25	0.25	0.25
Methionine	0.25	0.25	0.25
Premix	0.25	0.25	0.25
Common Salt	0.25	0.25	0.25
Total	100.00	100.00	100.00
Calculated chemical composition of the experimental diet `			
Energy ME(kcal/kg)	2993.00	2993.00	2993.00
Crude Protein (%)	22.60	22.60	22.60
Lysine (%)	1.00	1.00	1.00
Methionine (%)	0.50	0.50	0.50
Calcium Ca (%)	1.00	1.10	1.00
Phosphorus (%)	0.5	0.50	0.50

Experimental Design

One hundred and fifty (150) day old broiler chicks were used for the experiment. They were randomly divided into three treatment groups of 50 chicks each. Each treatment was further being divided into 5 replicates, with ten chicks per replicate. In a completely randomize design. Each treatment was fed one of the experimental diets for four weeks.

Data Collection

Feed intake was recorded daily by subtracting the amount offered from the left over of the previous day. Body weight was monitored weekly and mortality was recorded as it occurs.

Statistical Analysis

The data collected was subjected to analysis of variance (ANOVA) using the Stat View Statistical Package (SAS, 2003).

RESULTS AND DISCUSSION

At the end of the experiment, broiler chicks fed diets with the highest level of cassava flour meal supplement (T_3) consumed less feed (273.81g/b) compared to those on the other treatment (400.00 and 317.4g/b) for T_1 and T_2 respectively ($P>0.05$) (Table 2). Similarly, birds on the highest level of cassava flour meal (T_3) recorded the lowest body weight gain (175.5g/b) compared to the value recorded for T_1 and T_2 (232.21 and 229.5 g/b) respectively. The final body weight (g/b) differ significantly between the treatment ($P<0.05$) even though the highest value was recorded for T1 (290.71) as against 288.00 (g/b) and 234.00 (g/b) for T2 and T3 respectively. Feed conversion ratio (FCR) differ significantly between the treatment ($P<0.05$) even though the best value was recorded for T2 (1.38) as against 1.72 and 1.56 for T1 and T3 respectively. Incidence of mortality did not vary between the treatment ($P>0.05$) even though the highest value was recorded for T1 (3.00) as against 1.60 and 2.60 for T2 and T3 respectively (Table 2).

Table 2: Performance of broiler fed diets containing cassava flour meal at starter phase

Parameter	T1	T2	T3	SEM
Initial body weight	58.50	58.50	58.50	1.48

Final body weight (g/b)	290.71[c]	288.00[b]	234.00[a]	13.27
Feed intake (g/b)	400	317.04	273.81	546.67
Feed intake (g/b/d)	14.28[b]	11.32[a]	9.77[a]	0.67
Body weight gain (g/b)	232.21[b]	229.5[b]	175.5[a]	10.78
Body weight gain g/b/d)	9.79[b]	8.19[b]	6.26[a]	0.40
Mortality (%)	3.00	1.60	2.60	1.21
Feed conversion ratio	1.72[b]	1.38[a]	1.56[b]	0.54

[abc] Means in the same row followed by different superscripts are significant difference ($P < 0.05$)

From table 2.0 Results on body weight gain for chick on the control group was significantly ($P < 0.05$) better compared to chicks on others treatment diets. However, feed intake for chick on all treatment diets differed significantly ($P<0.05$) during the starter phase. This is in tandem with Eruvbetine and Afolani (2001) that showed a progressive decline in body weight gain of birds increasing concentration of cassava meal. It also agreed with earlier report of Akinfala (20 00), who recommended inclusion level of up to 25% cassava root in poultry rations. Stevenson and Jackson (1983) reported that level rate of up to 30 percent of cassava in the diet improved growth performance of poultry, whereas (Erurbetine and Afolami, 1992) observed decrease in the weight of poultry with increase in the quantity of cassava included in the diets. This research showed that birds on 0% CFM inclusion level had the highest body weight gain than the rest of the treatments. This supports the findings of (Adegbola, 2001) who reported a significant difference in weight gain of starter broilers fed cassava meal.

The non-significant effect ($P>0.05$) of cassava flour meal levels in feed intake of chicks conformed to the work of (Erurbetine and Afolami, 1992) who reported similar non-significant

effects of this parameter. Stevenson and Jackson (2003), reported similar findings when they fed up to 30% cassava flour meal without any significant effect on the consumption index of broilers. However, (Tewe and Egbunike, 2000) reported that feed consumption was affected when cassava level of 30% was fed to young chicks.

The mortality rate was within the accepted range of 0-5% for good management practices and safety of diets as advocated by ISA (1996).

The result of the feed conversion ratio of chicks is significantly affected ($P<0.05$). This is similar with the report of (Erurbetine and Afolami, 1992). who reported significant effect on feed conversion ratio among birds, fed dietary cassava meal. (Tewe and Egbunike, 2000 and Adegbola, 2001) reported that the feed conversion ratio of broilers fed sundry cassava flour meal was poor when compared to those on maize meal. It is also similar with the finding of (Adegbola, 2001) who reported a significant difference on feed conversion efficiency when cassava meal was added to the diets of starter broilers at graded levels.

CONCLUSION AND RECOMMENDATIONS

It is concluded that broilers fed 20% cassava flour meal performed better in most parameters

It is also recommended that further investigation should be carried but to determine the hematological parameters and proximate analysis of cassava flour meal. Feeding trials should be repeated to ascertain the passive impact of CFM on performance characteristics. Lower levels of CFM should be tried.

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