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EFFECT OF DIETARY ENZYME AND SUN DRIED CASSAVA PEELS MEAL AS REPLACEMENT FOR WHEAT BRAN ON PERFORMANCE CHARACTERISTICS OF BROILER STARTER

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Abstract

The study was examined performance characteristics of broiler starter fed varying levels of sundried cassava peels meal with enzyme supplementation. One hundred and fifty (150) day old broiler chicks were allocated to five (5) dietary treatments replicated five (5) times of ten (10) birds per replicate in a completely randomized designed (CRD) in a feeding trial that lasted for 28 days. There were significant ($p<0.05$) differences on all parameters examined except initial weight that was not differed significantly ($P>0.05$). Initial weight had 39.00g across dietary treatments. T1 had highest final weight (668.63g) gain while least (463.43g) was observed on T5. Weight gain showed highest (629.63g) on T1 while least (424.43g) value was recorded on T5. Highest (983.49g) feed intake was observed on T5 while T2 had least (872.88g). Highest (2.33g) feed conversion ratio was obtained on T5 while least (1.29) was recorded on T1. Zero mortality was recorded throughout experimental study.

The comparable growth performance of birds fed sun dried cassava peels meal with enzyme supplementation and those fed control diet is quite interesting in such a way that sun dried and enzyme supplementation in the diets helped to improve its texture, palatability and nutritive value by destroying or inactivating heat labile toxic compounds and anti-nutritional factors. Conclusion, it is proved from this study that cassava peels meal with enzyme supplementation can be included in the diet of broiler starter up to 40% without adverse effects on the growth performance.

Key words: Broiler starter, enzyme, sun dried cassava peels meal, feed mill and performance

INTRODUCTION

The use of lesser known and unconventional feed ingredients may represent a low-cost route to reduce the cost of production. Hence, partial or full replacement of wheat bran with farm wastes, biological products, industrial products and by-products from agricultural processing facilities is one of the identified ways of reducing total poultry production cost. However, most of the available alternative sources to wheat bran are fibrous and are generally low in nutrients Sethy., (2015). crops that are adapted to tropical climate are known to have higher lignin and cellulose contents with lower digestibility which and invariably affect animals' performance in different ways as compared to same crop variety in the temperate climate (Adeola, and Cowieson, 2011). Enzymes are chemicals or biological catalysts which speed up biochemical reactions and do not get used up in the process. The enzymes added to animal's feed to produce a desirable effect are referred to as exogenous while those secreted by the animal are called endogenous (Cowieson., 2006).These exogenous enzymes are produced industrially for commercial purposes among which is the

inclusion in animal feed as additive (Zou., 2013). Therefore, this study is directed toward evaluation of cassava peels meal with enzyme supplementation on performance characteristics of broiler starter.

Materials and methods

Location of the study

The experiment was carried out at the poultry unit, Oyo State College of Agriculture and Technology Teaching and Research Farm, , Igboora, Oyo State Nigeria, latitude 7°15`N and longitude 3°30`E with average annual rainfall of 1278mm and average temperature of 27°C (Sanusi, 2011).

Experimental diets

Sundried cassava peel was procured from garri processing factory at Oyo State College of Agriculture and Technology, Igbo-ora while enzyme was obtained at a commercial feed mill in Ibadan, Oyo State, Nigeria. Sun-dried cassava peels and other ingredients were milled separately at the feed mill unit of Training and Research Farm, Oyo State College of Agriculture and Technology, Igbo-ora. Thereafter, they were mixed together as designed (T1, T2, T3, T4 and T5). Five experimental diets were formulated having percentage crude protein ranged between 21.75% - 21.51% with energy ranged between 2934.54ME kcal/kg – 2968.57ME kcal/kg at starting phase. Wheat bran was fibre source while T2, T3, T4 and T5 were partially replaced with varying levels (10%, 20%, 30% and 40%) of sundried cassava peels meal (SDCPM)with enzyme supplementation respectively. Enzyme was included at the rate of 150g/1000 kg of the feed as shown on table 1.

Table 1: Experimental diets for broiler starter (0-4 weeks)

Ingredients (kg)	T1 (0%)	T2 (10%)	T3 (20%)	T4 (30%)	T5 (40%)
Maize	56.00	56.00	56.00	56.00	56.00
S.B.M	34.00	34.00	34.00	34.00	34.00
Wheat offal	5.00	4.50	4.00	3.50	3.00
C.P.M	0.00	0.50	1.00	1.50	2.00
Limestone	2.00	2.00	2.00	2.00	2.00
Bone meal	2.00	2.00	2.00	2.00	2.00
Lysine	0.25	0.25	0.25	0.25	0.25
Methionine	0.25	0.25	0.25	0.25	0.25
Salt	0.25	0.25	0.25	0.25	0.25
Premix (B)	0.25	0.25	0.25	0.25	0.25
Enzyme (g)	0.15	0.15	0.15	0.15	0.15
Total (kg)	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
Calculated analysis					
Energy(ME kcal/kg)	2934.54	2943.05	2951.55	2960.06	2968.57
Crude Protein (%)	21.75	21.69	21.63	21.57	21.51
Ether Extract (%)	3.61	3.62	3.63	3.64	3.65
Crude Fibre (%)	1.67	1.67	1.67	1.66	1.66
Calcium (%)	54.16	54.14	54.13	54.13	54.14
Phosphorus (%)	9.25	9.25	9.24	9.24	9.24
Ash (%)	0.35	0.35	0.35	0.34	0.34
Lysine (%)	0.01	0.01	0.01	0.01	0.01

Methionine (%)	2.31	2.31	2.31	2.31	2.31

S.B.M (Soya Bean meal) and C.P.M (Cassava peels meal)

Experimental birds, design and management:

A total of 150 day old broiler chicks (Arbor acres) were obtained from a reputable farm. Birds were divided into five treatments group, each treatment had thirty (30) birds and replicated thrice with ten (10) birds per replicate in a completely randomized design (CRD). Birds were brooded for 2 weeks on floor pens littered with wood shavings, using coal pot as the heat source. Feed and water were supplied *ad-libitum*. Observation of sick birds, mortalities and record keeping were carried out throughout the experimental periods (4 weeks).A given quantity of feed was measured and fed to the birds on a daily basis while daily feed intake was measured. The birds were weighed by using a weighing balance at one week‟ interval during the experimental period. Initial and final body weights of the birds were measured at the beginning and end of the experiment respectively. Average daily weight gain and feed conversion ratio were determined. Mortality was recorded.

Results and discussion

Performance characteristics of broiler starter fed experimental diets were shown on table1.There were significant ($p<0.05$) differences on all parameters examined except initial weight that did not differed significantly ($p>0.05$)this shows that all the broilers have similar weight. Initial weight had 39.00g across dietary treatments. T1 had highest final weight (668.63g) gain while least (463.43g) was observed on T5. Highest weight gain (629.63g) was observed on T1 while least (424.43g) value was recorded on T5. Highest (983.49g) feed intake was observed on T5 while T2 had least (872.88g). Highest (2.33g) feed conversion ratio was obtained on T5 while least (1.49) was recorded on T1. Zero mortality was recorded throughout the experimental study. Birds fed control (0%) diet had higher average final body weight and final weight gain. The positive effect of dietary fibre cannot be undermined. Dietary fibre had been found to activate the intestine, enhance peristaltic movement and ensure more enzyme production, thereby resulting in efficient digestion of nutrients (Esonu *et al.,* 1997). The comparable growth performance of birds fed sun dried cassava peels meal with enzyme supplementation and those fed control diet is quite interesting in such a way that sun dried and enzyme supplementation in the diets helped to improve its texture, palatability and nutritive value by destroying or inactivating heat labile toxic compounds and anti-nutritional factors. Feed conversion ratio decreased significantly ($p<0.05$) with increased sun dried cassava peels meal with enzyme supplementation above 20% level in the diets. Increased average weight gain as a result of enzyme supplementation has been reported by Omogbenigun *et al*. (2004). Birds on T5, consumed 983.49g more feed compare to those on T1, with feed consumption of 937.27g. This might be because of enzyme supplementation that makes the feed more palatable. Feed conversion ratio (FCR) is the ratio of feed intake to weight gain. FCR of birds on T1 was significantly ($p<0.05$) similar with those birds fed on T2 and T3.

Table 2: Performance characteristics of the experimental broiler starter (2-4 weeks)

Parameters	T (0%)	T2 (10%)	T3 (20%)	T4 (30%)	T 5(40%)	SEM
Initial weight	39.00	39.00	39.00	39.00	39.00	0.00
Final weight	668.63^{a}	531.63^{b}	553.97^{b}	512.50^{bc}	463.43^{c}	19.82
Weight gain	629.63^{a}	492.63^{bc}	528.30^{b}	473.37^{bc}	424.43^{c}	20.50
Feed intake	937.27^{ab}	872.88^{c}	935.21^{ab}	911.05^{bc}	983.49^{a}	11.20

Feed conversion ratio	1.49^{c}	1.77^{bc}	1.79^{bc}	1.93^{b}	2.33^{a}	0.08
Mortality (%)	0.00	0.00	0.00	0.00	0.00	0.00

Conclusion

It is proved from this study that cassava peels meal with enzyme supplementation can be included in the diet of broiler starter up to 40% without adverse effects on the growth performance.

Recommendation

Based on FCR in this study, 20% cassava peels meal with enzyme supplementation is recommeneded.

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