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UTILIZATION OF GRADED LEVELS OF COWPEA WASTE MEAL IN BROILER FINISHER RATION

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Target Audience: Broiler producers, animal nutritionists

ABSTRACT

A feeding trial was conducted to evaluate the performance of broiler finisher fed varying levels of cowpea waste (CWM) as a replacement for groundnut cake (GNC). Five isonitrogenous and iso-caloric diets were formulated using groundnut cake as the reference protein source in the control diet A. In diets B, C,D, and E;20 , 40,60,and 80 percent of the (GNC) in the control diets A were replaced with cowpea waste meal respectively. The result showed that feed intake. growth and efficiency of feed utilization values were significantly (P<0.05) improved at the 60 percent (diet D) level of GNC replacement. Cost analysis showed that cowpea waste meal substituted diets were profitable as regard total cost of feed per kilogram of live weight gain.

Key word: Cowpea waste meal (CWM), feed intake growth rate, Broiler finishers..

DESCRIPTION OF PROBLEM

Over the years, Nigerian have been finding it increasingly difficult to meet their demand for animal protein foods. This has resulted in increased importation of meat and milk products in recent years. While the per capital protein requirement is established at 85.9g per day (1) of which 34,0g should be of animal origin (2), the average Nigerian consumes between 6.5- 8.6g of animal protein per day, compared with U.S.A 64g;Inadequate 49g. This shows that the average animal protein consumption by Nigeian is grossly inadequate protein intake can lead to various nutritional diseases and morbidity problems manifesting as Kwashiorkor and marasmus in children, (1). Scientists, particularly Nutritions, have to play a major role in reversing the situation. The rising cost of beef, mutton and goat meat, and scarcity of bush meat, all tend to hasten our efforts towards continued rapid development of the poultry industries. Animal Nutritionists have generally agreed that development of the poultry industry is the fastest means of bridging the prevailing protein deficiency gap (3). In Livestock production, feed alone accounts for about 80% of recurrent costs. In many parts of the world, especially in the developing countries, feed is fast becoming the most limiting factor in livestock enterprises. Many livestock producers in Nigeria for instance, have been forced to fold up their businesses because of high cost of feeds. For example, groundnut,

maize soyabeans and other feed ingredients which are important ingredients of animal feed are also staple foods for human beings. hence they are in short supply owing to competition between man and animal and they have to be imported even to the detriment of the currency balance (4. 5). The rising cost of feedstuff. apart from the fact that it is fast becoming prohibitive for feed manufacturers will ultimately lead to high cost of animal products. In fact the entire poultry industry is being threatened with imminent collapse unless urgent step is taken to rescue the industry and improve the situation. It therefore becomes necessary to exploit all possible avenues for partial or total replacement of conventional feed grains with unconventional ingredients into livestock feeds with a view to bringing down feed costs without sacrificing production efficiency.

Among such unconventional feed source are waste products of abattoirs. bran and offals of grain. waste and many others.

Cowpea waste meal contains adequate proportion of vitamins like thiamin and Riboflavin. It also contains adequate quantity of minerals. which include calcium. phosphorus and iron which makes it a valuable feed item for animals.

This study was therefore carried out to evaluate the nutritional potential and feeding value of cowpea waste meal (CWM) as a replacment for GNC in rations.

MATERIALS AND METHODS

The experiment was conducted with 70 white Ross broiler finishers (5 weeks old) purchased from a local hatchery. At the commencement of the experiment. the birds were randomly distributed into five dietary treatments with each treatment containing fourteen (14) birds. One group of birds was fed each of the five diets formulated to contain 0. 20. 40. 60 and 80% of cowpea waste meal. The cowpea waste meal was substituted at the expense of groundnut cake.

The experimental birds were raised on concrete-floored pens. which were properly cleaned. disinfected and littered with wood shavings. Birds were weighed indiviSdually at the beginning of the experiment and subsequently at weekly intervals. The birds were fed the respective experimental rations add libitum and fresh. water was available at all times. A record of daily feed intake was kept. All vaccinations and preventive were administered as at when due. and the experiment was terminated when the birds were 10 weeks old.

The ingredient composition of the experimental diets is shown in (Table 1). while the proximate composition (6) is presented in Table 2 . The date collected were subjected to analysis of variance and significant differences treatment means were determined using he multiple range test (7).

Table 1. Ingredient Composition of Experimental Diets (%)

Ingredients	Rations A	B	C	D	E
Maize	59	53	47	41	35
Groundnut Cake	24	19.2	14.4	9.6	4.8
Cowpea waste meal	--	10	21.6	32.4	43.2
Fish meal	3.0	3.0	3.0	3.0	3.0
Brewers Dried grains	10.0	10.0	10.0	10.0	10.0
Bone meal	2.0	2.0	2.0	2.0	2.0
Oyster Shell	1.0	1.0	1.0	1.0	1.0
Vitamin-mineral mix*	0.5	0.5	0.5	0.5	0.5
Salt	0.5	0.5	0.5	0.5	0.5
Total	100	100	100	100	100
Calculated CP(%)	20.26	19.73	19.20	18.67	18.14
ME(Kcal\Kg)	2930	2940	2950	2960	2960
Feed cost (N\Kg)**	8.17	7.47	6.78	6.09	5.40

*Vitamin-mineral mix supplied per kg ration: Mg0.25mg :Mn.120mg; Fe. 48mg; Cuo. 4mg; I_2 1,100mg: Se 100mg; Vit A 10.000 IU.Vit D_3 1,000IU: Vit E 10mg. Vit.B_1 1.6mg; Vit B_2 3.2mg;Vit B_6 2.4mg Vit B_{12} 8mg Folic acid 0.6mg;panthothenic acid 14.4mg; Choline chloride 80mg.

** Based on prices of ingredients during the period of experiment.

RESULTS AND DISCUSSION

The chemical composition of the experimental rations are shown in (Table 2). The crude fibre, ether extract and ash contents of the ration increased slightly (P>0.05) while the crude protein and Nitrogen free extract decreased(p>0.05) as the level of cowpea waste meal increased. The performance characteristic data of the birds on the different are presented in Table 3. The highest average daily feed intake was 104.35g on ration D in which 60% of the groundnut cake (GNC) was replaced with cowpea waste meal (CWM) while the lowest feed intake value of 87.09g was obtained on rations e. the differences in the average daily feed intake values among the rations were significant(P>0.05) The highest average daily live weight gain of 22.41g was observed in birds on ration E. While birds on rations A. Band C made average daily weight gain of 26.85.28.94 and 25.75g respectively. There were no significant differences (P>0.05) among the values. The final live weight of the birds followed the pattern of the average live weight gains. The feed conversion ration value showed slight variation. which were not significantly (P>0.05) different from one another. The feed cost per kilogram of control ration (A) was the highest at N28.35\kg. There was a progressive decrease in the feed cost as the significant differences (P>0.05) observed among the dietary treatment as regards total feed cost per kilogram live weight gain.

Table 2 Proximate Composition of experimental rations

Parameter	A	B	C	D	F
Dry matter (%)	91	90	90.5	90	89
Other components (DM basis)					
Crude protein(%)	20.75	20.73	20.56	20.40	20.36
Crude Fibre (%)	9.50	10.00	10.51	10.98	11.76
Ether extract	0.80	1.00	1.00	1.00	0.90
Ash(%)	5.08	5.09	5.20	5.22	5.32
NFE(%)	54.87	53.18	53.23	52.40	50.66

The crude protein content of the rations vary from 20.36 to 20.75% These levels are within the ange recommended by various workers (8, 9 and 10).There was a progressive but non significant (P>0.05) decrease in the crude protein and nitrogen free extract of the diets and an increase in the crude fibre, ether extract and ash contents as the level of cowpea waste meal (CWM) increased. Generally, the results of the study have indicated that cowpea waste meal (CWM) can totally replace groundnut cake (GNC) without any deleterious effects. No mortality was recorded at all levels of replacement of groundnut cake (GNC) with weight gain was generally in favour of the cowpea waste meal (CWM) substituted diets. From the result of this study, it may be concluded that cowpea waste meal (CWM) may be substituted for groundnut cake (GNC) at 60% level in the diets of broiler finishers as a means of reducing the cost of production.

Table 3 Effect of replacing maize with cowpea waste meal on performance of broiler finishers

Parameters	Rations				
	A	B	C	D	E
Average initial live wt.(g)	486	543	564	557	486
Avg. final live wt.	1483	1577	1387	1632	1270
Avg .feed intake (g\day)	99.02 ^{bc}	95.08 ^{b}	102.18 ^{c}	104.35 ^{c}	87.09 ^{a}
Avg.wt. gain (g\day)	26.85	28.94	25.75	30.70	22.41
Feed conversion ration	2.69	3.29	3.40	3.97	3.89
Total feed\bird(kg)	3.47	3.33	3.65	3.58	3.05
Cost of feed(N\Kg)	28.35	24.87	24.75	21.80	16.47
Weight gain\bird(Kg)	0.94	1.01	0.90	1.07	0.78
Feed Cost\Kg gain (N)	30.16	24.62	23.13	24.22	21.12
Mortality	0	0	0	0	0
NO. of birds	14	14	14	14	14
Experimental period(days)	35	35	35	35	35

Means on the same line with different superscripts are significantly (P<0.05) different.

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