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Utilization of Cassava Peel Meal as Energy Source for Growing Pigs

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Abstract: An investigation was carried out into the use of cassava peel meal as energy source for growing pigs. Four experimental diets were formulated using graded levels 0, 10, 20 and 30% cassava peel meal as replacement for maize on a weight for weight basis. The diets were neither iso-nitrogenous nor iso-caloric. Sixteen growing pigs of an average range 12.0 to 12.5 kg were randomly allocated to 4 dietary treatments in a completely randomized fashion with each treatment replicated twice. The diet containing 0% cassava peel meal (control diet) was tagged diet I and fed to pigs in treatment I while diets containing 10, 20 and 30% cassava peel meal, tagged diets 2, 3 and 4, respectively were fed to pigs in treatments 2, 3 and 4, respectively. The pigs were fed on an *ad-libitum* basis and data were collected on them for a period of 8 weeks. Results show that the inclusion of cassava peel meal up to a level of 30% in the diets of growing pigs did not have any significant ($p>0.05$) effects on their performance. The cassava peel meal diets gave similar daily weight gains and feel conversion ratios as the control diet while there were slight differences in feed intake. However, feed cost per kilogramme weight gain was significantly ($p<0.05$) reduced with the inclusion of cassava peel meal in the diets. Cassava peel meal could therefore be included in the diets of growing pigs up to level of 30% to reduce feed cost without any detrimental effect on performance.

Key words: Cassava peels meal, energy source, growing pigs

INTRODUCTION

Globally, the level of animal production has increased over the years due to improvement in genetics, sanitation and hygiene and nutrition. In spite of this increase the human requirement of animal protein has not been met particularly in developing countries. Adebambo[1] gave the per caput animal protein intake in West and Central Africa as 5-6 g compared to the nutritionist target of 25-30 g. This situation is as a resultant effect of the astronomical increase in human population without a proportionate increase in animal production.

The livestock sector in Nigeria has been characterized with a deficit in meat, milk and other Livestock products compared to developed countries.

This according to Fetuga[2] is largely due to high cost of feed arising from fluctuation in feed supplies, rising prices of ingredients, poor quality feeds and inefficiency in production and distribution in the feed industry. Therefore the success of the livestock industry depends to a large extent upon the availability of good quality and cheap compound feeds particularly for the intensive livestock enterprises (pigs and poultry), whose performance depend on the use of concentrate balanced compound rations.

In response to the problems of rising prices of livestock feed and scarcity of conventional protein and energy concentrates, nutritionists have continually been searching for alternative cheaper and readily available protein and energy sources. Several researchers for example Iyayi and Tewe *et al.*,[3-5] have confirmed the suitability of cassava meal as good substitute for maize for all classes of pigs. However, cassava meal is also becoming expensive and not readily available in sufficient quantity for livestock feeding. Also the recent campaign on the use of cassava in the production of industrial starch and chips and in the confectionary industry will further reduce the availability and affordability of cassava meal for livestock feeding.

Cassava peels, which constitute about 10-13% of tuber weight, is of no use to the human populace and often constitute waste disposal problems could be of great potential in livestock feeding. Also the recent campaign to increase the production of cassava for industrial use will increase the availability of cassava peel for livestock feeding.

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MATERIALS AND METHODS

Preparation of test ingredient and diets: Cassava peels were obtained from local gari and fufu processors in Odeda local government area of Ogun State. The peels were sun dried to obtain the Cassava Peels Meal (CPM). Which was then used to compound four (4) experimental diets such that diet 1(control diet) had 0% cassava peel meal, while diets 2, 3 and 4 contained 10, 20 and 30% cassava peels meal as substitutes for maize on a weight for weight basis. Table 1 shows the percent composition of the experimental diets.

Experimental design, animals and management: Sixteen growing pigs of average weight range 12.0 to 12.5 kg were allocated to four treatments in a completely randomized design with two replicates per treatment and two animals per replicate. The pigs were treated against Endo- and Ecto-parasites with Ivomec injection before the onset of the trials. The pigs in treatment 1 were fed the control diet while those in treatments 2, 3 and 4 received diets 2, 3 and 4, respectively. Feed and water were given *ad libitum* throughout an experimental period of eight weeks.

Data collection: Data were collected on feed intake and weekly weights and calculations were made for weight gains and feed conversion ratio. The cost per kilogramme of each diet was calculated using the current prices of feed ingredients at the time of the experiment. These values were used to calculate the cost of feed per kilogramme weight gain for each treatment.

Chemical analysis: The proximate composition of the test ingredients and diets were analysed using the AOAC[6] procedure.

Table 1: Percent composition of diets for growing for growing pigs using graded levels of cassava peels meal to replace maize

	Diets			
Ingrediants (%)	1	2	3	4
Maize	40.00	30.00	20.00	10.00
Cassava peels meal	0.00	10.00	20.00	30.00
Palm kernel cake	10.00	10.00	10.00	10.00
Soyabean cake	10.00	10.00	10.00	10.00
Groundnut cake	15.00	15.00	15.00	15.00
Fish meal	1.00	1.00	1.00	1.00
Wheat bran	10.00	10.00	10.00	10.00
Oyster shell	1.00	1.00	1.00	1.00
Bone meal	1.50	1.50	1.50	1.50
Vitamin–mineral premi	x0.25	0.25	0.25	0.25
Salt	0.50	0.50	0.50	0.50
Total	100.00	100.00	100.00	1000
Proximate composition%				
Dry matter	88.30	94.01	94.55	95.45
Crude protein	18.35	1823	17.99	17.83
Crude fibre	4.89	5.47	6.01	7.02
Ether extract	4.88	3.87	3.64	3.51
Ash content	5.11	5.72	6.11	6.55
NFE	66.77	66.71	66.61	65.00

Statistical analysis: Data generated were analysed using the Minitab[7] statistical package installed on a computer system. The differences between treatment means were separated using the Duncan's Multiple Range Test[8].

RESULTS AND DISCUSSION

The cassava peels meal used was found to contain 93.00, 3.06, 7.89, 4.00, 6.50 and 78.55 Dry Matter (DM), Crude Protein (CP), Crude Fibre (CF), Ether Extract (EE), ash and Nitrogen Free Extract (NFE), respectively. The proximate composition of the diets is presented in Table 1. The DM ranges from 88.30 to 95.45%. The CP of the different diets were somewhat similar with a range of 17.83 to18.35%.The CF of the diets varied from 4.89 to 7.02%, increasing with the inclusion of CPM.

However, EE slightly declined with the inclusion of CPM with a range of3.51 to 4.88%. The ash content increased slightly with the inclusion of CPM ranging between 5.11 and 6.55%. The NFE Values (65.00 to 66.77%) were also similar.

The results of performance and cost effect of replacing maize with CPM in the diets of growing pigs are shown in Table 2. The average daily feed intake was not significantly ($p<0.05$) affected by the inclusion of CPM with values ranging from 993.66 to 1037.51 g/day. decreasing, although insignificantly ($p>0.05$) with increase in cassava peels meal in the diets. The higher intake value for diet 1 could be due to the lower fibre content and higher palatability of the diet.

The daily weight gain values ranging from 216.52 to 223.22 g/day, were similar ($p>0.05$) showing that the cassava peel meal diets were able to support as much growth as the maize based diet. The feed conversion ratio values for the different treatments (4.59 to 4.65) were similar, so also were the final body weight values (24.63 to 24.75 kg). These findings are in line with the reports of Iyayi and Tewe[3]. The cost per kilogramme of diet varied from 22.46 to #36.56 but the values were not significantly ($p>0.05$) different. However the cost per kilogramme weight gain significantly ($p<0.05$) reduced by the inclusion of CPM in the diets. This is in agreement with the findings of Tewe and Oke[9] and could be explained by the exponential effect of reduced feed intake

Table 2: Performance characteristics and cost effect of replacing maize with cassava peels meal in the diet of growing pigs

	Diet				
Variable	1	2	3	4	SEM
IBW (Kg)	12.25	12.00	12.00	12.50	0.132
ADFI (g/day)	1037.51	1010.09	992.06	993.66	9.30
ADWG (g/day)	223.22	218.75	218.75	216.52	3.31
FBW (kg)	24.75	24.25	24.25	24.63	0.252
FCR	4.65	4.62	4.55	4.59	0.050
CKD (#/kg)	6.56	31.85	27.18	22.46	0.00
CKWG (#/kg)	169.91^{a}	147.15^{b}	123.69^{c}	103.09^{c}	9.57

and cost per kilogramme of diet and the fact that the lower feed quantities were able to give about the same weight gain as the control diet.

CONCLUSION

The inclusion of cassava peel meal in the diets of growing pigs up to a level of 30% gave satisfactory performance and lowered feed costs per gain. It is therefore, more profitable to use cassava peel meal as energy source for growing pigs than maize.

REFERENCES

1. Adebambo, O.A., 2003. Animal Breeds: A Nations Heritage. UNAAB Inaugural Lecture Series, pp: 1-102.
2. Fetuga, B.L., 1977. Animal production in Nigeria and feed supplies. Nig. J. Anim. Prod., 4: 19-41.
3. Iyayi, E.A. and O.O. Tewe, 1994. Cassava feeding in small-holder livestock units. International Workshop on cassava safety, Ibadan, Nigeria. Acta-Horticulture, 375: 261-269.
4. Job, T.A., 1975. Utilization of protein supplementation of cassava for animal feeding and effects of sulphur sources on cyanide detoxification. Ph. D. Thesis, University of Ibadan, Ibadan, Nigeria, pp: 540.
5. Tewe, O.O., 1994. Indices of cassava safety for livestock feeding. International workshop on cassava safety, Ibadan, Nigeria. Acta-Horticulture, 375: 241-249.
6. A.O.A.C., 1990. Official method of Analysis. Association of Official Analytical Chemists. 15th Edn Washington, DC.
7. Minitab, 2002. Minitab Statistical Package Version, pp: 13.
8. Duncan, B.D., 1955. Multiple range and multiple F. test, Biometrics, 11: 1-42.
9. Tewe, O.O. and O.L. Oke, 1983. Performance, Carcass characteristics and Economy of growing pigs on varying cassava peel level.Nutrition Report Intl., 29: 235-243.