

Effect of Enzyme Supplemented Cassava Peelmeal (CPM) on Carcass Characteristics of Broiler Chickens

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Abstract: Eight weeks feeding trial was conducted to assess the effect of graded levels of enzyme supplemented cassava peel meal on carcass characteristics and its cost benefit. Five experimental diets were formulated in which enzyme supplemented cassava peel meal replaced maize at 0, 25, 50, 75 and 100% in both starter and finisher phases. One hundred and twenty Anak broilers chicks were randomly allotted to five dietary treatments in a completely randomized design with three replicates containing eight birds per replicate. The result of carcass characteristics showed significant difference ($P < 0.05$), the result also revealed that internal organs decreased with increasing levels of enzyme supplemented cassava peel meal. In conclusion, cassava peel meal has a good potential as feed ingredients for broilers and 50% level of inclusion recorded better carcass quality.

Key words: Broilers % Cassava peel % Carcass

INTRODUCTION

Researches on the use of unconventional feed stuffs are on the increase. These researches encouraged incorporation of agro-industrial by-products in poultry feed which reduce cost of production and maximize profit from poultry farming. Cassava peels has been used as alternative unconventional feedstuffs. The utilization of cassava peel in poultry ration is limited mainly due to its low energy, protein and high fibre content and more over the presence of toxic hydrocyanide is a limiting factor in its use as feed ingredients for poultry. With the advent of biotechnology, there are opportunities for economic utilization of agro-industrial residues such as cassava peel meal waste [1].

It has been reported that enzyme supplementation does improve the productive value of fibre feed stuffs [2]. Enzyme supplementation may be useful in reducing the depressing effect of cassava peel meal since it is known to counteract these adverse effects [3]. This has positive effect on the overall performance of broilers.

Enzymes allow the use of wide range of ingredients without compromising bird's performance and hence provide great flexibility in least cost

formulation [4]. Information on the effect of graded level of enzyme supplemented cassava peel meal is scanty and there is need to establish a definite inclusion level of enzyme supplemented cassava peel meal in poultry diets.

This research aimed to determine the effect of graded levels of enzyme supplemented CPM.

MATERIALS AND METHODS

Study area; the research was conducted at the Federal University of Technology Teaching and Research Farm located in Yola Adamawa state Nigeria. It lies within the latitude $9^{\circ} 11'$ north and longitude 12.28° east. It has annual rainfall of about 750-1050mm and an average minimum temperature of 15°C and a maximum of 32°C [5].

Experimental Diets and Treatment: Five experimental diets were formulated according to treatments (T). Diet 1 (T1) was corn-based diet without enzyme and served as the control. Diet 2-5 (T2-T5) contains graded levels of enzyme supplemented cassava peel meal to replace maize at 25, 50, 75 and 100%. Tables 1 and 2 present the composition of the experimental diet.

Table 1: Composition of starter diets (kg/100kg)

Ingredients	T1 0% CPM	T2 25% CPM	T350% CPM	T4 75% CPM	T5 100%
Cassava peel	00.00	12.00	24.00	36.00	48.00
Maize	48.00	36.00	24.00	12.00	00.00
Groundnuts cake	31.70	31.70	32.70	32.70	32.70
Wheat offal	13.00	12.00	11.00	9.00	8.00
Fish meal	3.00	4.00	5.00	6.00	7.00
Borne meal	2.50	2.50	2.50	2.50	2.50
Limestone	1.00	1.00	1.00	1.00	1.00
Salt	0.25	0.25	0.25	0.25	0.25
Premix ⁺	0.25	0.25	0.25	0.25	0.25
Lysine	0.10	0.10	0.10	0.10	0.10
Methionine	0.20	0.20	0.20	0.20	0.20
Enzyme	00.00	++	++	++	++
Total	100.00	100.00	100.00	100.00	100.00
Cal. Analysis					
Crude protein%	23.23	23.01	23.24	22.85	22.64
M/E (kcal/kg)	2814.01	2657.66	2526.68	2351.20	2194.42
Crude fibre	5.99	7.99	10.44	11.78	13.17

+ Supreme vitamin-mineral premix contains per 2.5kg the following: Vitamin A, 15,000,000 i.u; vitamin D3, 3,000,000 i.u, vitamin E,30,000 i.u, vitamin K, 2,500 mgr; Thiamine, B1, 2,000 mgr; Riboflavin, B2, 6,000 mgr; Pyridoxine B6, 4,000 mg; Niacin, 40,000 mgr; vitamin B12, 20mgr; Pantothenic Acid, 10,000 mgr; Folic Acid, 1,000mgr; Biotin, 80mgr; Choline Chloride 500mgr; Antioxidant, 125gr; Manganese 96gr; Zinc, 60gr; Iron, 24gr; Copper, 6gr, Iodine, 1.4gr; Selenium, 240mgr and Cobalt, 120gr

++ Maxigrain enzyme at 100g per one tone of feed

Table 2: Composition of finisher diet (kg/100kg)

Ingredients	T1 0% CPM	T2 25% CPM	T350% CPM	T4 75% CPM	T5 100%CPM
Cassava peel	00.00	13.50	27.00	40.50	54.00
Maize	54.00	40.50	27.00	13.50	00.00
Groundnuts cake	24.00	24.60	25.00	26.00	26.00
Wheat offal	15.60	14.00	12.60	10.60	9.00
Fish meal	2.00	3.00	4.00	5.00	6.60
Borne meal	2.50	2.50	2.50	2.50	2.50
Limestone	1.00	1.00	1.00	1.00	1.00
Salt	0.25	0.25	0.25	0.25	0.25
Premix ⁺	0.25	0.25	0.25	0.25	0.25
Lysine	0.10	0.10	0.10	0.10	0.10
Methionine	0.20	0.20	0.20	0.20	0.20
Enzyme	00.00	++	++	++	++
Total	100.00	100.00	100.00	100.00	100.00
Cal. Analysis					
Crude protein%	20.15	20.20	20.27	19.80	19.78
M/E (kcal/kg)	2836.88	2663.63	2489.16	2319.30	2147.47
Crude fibre	5.41	7.60	9.78	11.99	14.70

+ Supreme vitamin-mineral premix contains per 2.5kg the following: Vitamin A, 15,000,000 i.u; vitamin D3, 3,000,000 i.u, vitamin E,30,000 i.u, vitamin K, 2,500 mgr; Thiamine, B1, 2,000 mgr; Riboflavin, B2, 6,000 mgr; Pyridoxine B6, 4,000 mg; Niacin, 40,000 mgr; vitamin B12, 20mgr; Pantothenic Acid, 10,000 mgr; Folic Acid, 1,000mgr; Biotin, 80mgr; Choline Chloride 500mgr; Antioxidant, 125gr; Manganese 96gr; Zinc, 60gr; Iron, 24gr; Copper, 6gr, Iodine, 1.4gr; Selenium, 240mgr and Cobalt, 120gr

++ Maxigrain enzyme at 100g per one tone of feed

Experimental Design and Management: One hundred and twenty (120) Anak 2000 day-old broiler chicks were randomly allotted to five dietary treatments in a completely randomized design with three replication containing eight (8) birds each. The birds were well brooded and managed and proper vaccination schedule was observed.

Chemical Analysis: Proximate analysis of cassava peel and the experimental diets were carried out using the procedure described by A.O.A.C [6].

Statistical Analysis: Data obtained were subjected to analysis of variance (ANOVA) as described by Steel and Torrie, [7]. While treatment means were separated using Duncan multiple range test.

Table 3: Proximate Composition of Cassava peel meal

Nutrients (%)	Cassava Peel
Dry matter	82.55
Crude protein	5.46
Crude fibre	18.81
Ether extract	1.75
N.E.E	70.67
Ash	5.68

Table 4: Proximate Composition of Experimental Starter Diet

Nutrients	1	2	3	4	5
Lipid (fats)	7.05	6.45	5.98	6.57	7.20
Crude Protein	21.62	22.36	23.14	21.57	21.01
Crude fibre	14.92	0.24	8.48	11.01	13.24
Total Ash	9.34	8.37	7.97	10.42	12.50
M.E (Kcal/kg)	2864.81	2910.48	2863.45	2812.73	2784.95
Calcium	1.88	1.64	1.75	1.52	1.50
Phosphorus	0.46	0.52	0.49	0.50	0.47

Table 5: Proximate composition of Experimental Finisher Diets

Nutrients	1	2	3	4	5
Lipid (fats)	6.85	6.35	5.88	6.45	6.55
Crude Protein	19.62	20.57	21.96	20.30	19.77
Crude fibre	15.53	12.07	10.94	12.11	13.94
Total Ash	8.64	8.07	7.26	9.12	11.05
M.E (Kcal/kg)	2894.57	2994.84	2945.43	2875.61	2863.21
Calcium	1.54	1.33	1.50	1.31	1.30
Phosphorus	0.41	0.45	0.46	0.45	0.41

RESULTS AND DISCUSSION

The result of the proximate composition of cassava peel and the experimental diets are presented in Tables 3, 4 and 5. The result however, revealed that the dietary treatment had a significant effect ($P < 0.05$) on all the parameters recorded except for carcass weight which showed non significant difference. It is obvious that internal organs decreased with increasing level of enzyme supplemented CPM. This may be related to report of Marquardt [8] who pointed out that decrease in the size of the intestine following enzyme addition is presumably related to a more efficient and rapid digestion of nutrients hence reducing the need for an enlarged intestine and other organs. Apata and Ojo [9] also suggested that the decrease effect of enzyme on gut size may be due to the changes arising from the breakdown of high dietary fibre.

In conclusion, findings from this study revealed that dietary treatment had a significant effect ($P < 0.05$) on

internal organ characteristics. The result showed that internal organs decreased with increasing levels of enzyme supplemented cassava peel meal. It can be concluded that cassava peel has a good potential as feed ingredients for broilers.

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