APPT 009

CARCASS CHARACTERISTICS AND ORGAN WEIGHTSOF BROILER CHICKENSFED VARYING INCLUSION LEVELS OF CASSAVA *(MANIHOTESCULENTA*CRANTZ) PEEL BASED DIETS

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ABSTRACT
The effect of four cassava peel products on carcass characteristics of broiler chickens were investigated with 10-day old Ross 308 broiler chickens(n=455) randomly divided into thirteen treatments of 35 birds each. Each treatment was in five replicate of 7 birds per replicate in a completely randomised design. The experimental diet had sundried cassava peel meal (SCPM), coarse cassava peel mash (CCPM), whole cassava peel mash (WCPM) and fine cassava peel mash (FCPM) each at three (20,40 and 60%)levels of replacement of maize and thelast diet was a maize-based control diet.Resultsshowed that there was no significant effect of replacement of maize with all test samples on the offal yield except for eviscerated weight, breast meat, wings and heart. Broiler chickens on control had the highest eviscerated yield of 80.86% and breast meat yield of24.90%, while those on 20% SCPM (73.33%) and 20% FCPM (21.27%) had lower eviscerated and breast yields, respectively. The highest wing yield was obtained from chickens on 60% SCPM (8.89%) andleast in those on 60%FCPM (7.55%). Broiler on 60% CCPM had the higher heart yield (0.61%) than those on 20% WCPM (0.36%). In conclusion,replacement of up to 60% of maize with cassava peel products did not have adverse effect onthe broiler meat yield and organ weights except for breast, wings, eviscerated weight and heart.
Keywords: Cassava peel, Internal offal, External offal, Primal cuts, High-Quality Cassava Peel Mash
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INTRODUCTION
The demand for livestock products is increasing due to growing human population (1). Poultry product particularly broiler meat has a great potential to meet this demand due to the relatively lower feed conversion ratio (FCR) and short rearing period of broiler chickens.
Maize remains an integral part of broiler chickens' feed and its inclusion in diet could be as high as 60% (5). The availability of maize all year round for poultry feed has reduced and this could be attributed to competition for maize by humans and animals, irregular rainfall pattern and high cost of maize (5,8).These have resulted tosearch for alternatives especially when maize is scarce.

An alternative feed resource that could be used in place of dietary maize is cassava (*Manihotesculenta*Crantz) peels since it is less competed for by humans. Cassava peel is obtained from generous peeling of cassava tuber account for 10-13 percent of the tuber weight and when dried, couldbe used to replace maize in broiler diets (6).

Cassava peel could not be used wet and needed to be processed into dried form. Researchers has adopted different method of processing of cassava peel formonogastric diet with success(1,2,6,7) with sun-drying commonly adopted. Findings of (8) also noted that it is practically impossible to sun-dry fresh cassava peel during the wet season as it requires 2-3 days to reduce the moisture content of cassava peel to 20% or less for marketing.It was thereforesuggested that a new processing method similar to garri but without fermentation would be required which would facilitate sundryingin less than 6 hours.

These methods involve combination of different physical methods such as grating, dewatering, pulverizing and sun-drying. There is therefore the need to documentinformation on the effect of these different cassava peel products on carcass characteristics and organ weights of broiler chickens fed varying dietary level of cassava peel products which wereinvestigated in this study.

MATERIALS AND METHODS

TEST MATERIAL

Fresh cassava peel from white varieties of cassava was obtained from cassava processing plant in Ajegunle, Oyo, Oyo State. The cassava peel was then transported to International Livestock Research Institute for processing into products. One part was sorted for stump or foreign materials, sundriedfor 2-3 hours andmilled to becomeSundried Cassava Peel Meal (SCPM). Other products: Whole Cassava Peel Mash (WCPM), Fine Cassava Peel Mash (FCPM) and Coarse Cassava Peel Mash (CCPM) were obtained using the processing method of (8).

EXPERIMENTAL ANIMAL

A total 10-day old Ross 308 broiler chickens (n=455) were randomly distributed into 13treatment groups of 35 birds. Each group was in five replicates of 7 birds per replicate.

EXPERIMENTAL DIETARY LAYOUT

The experiment was a(4x3)+1 augmentedfactorial arrangement in a complete randomized design. There were four cassava peel products sundried cassava peel meal (SCPM), coarse cassava peel mash (CCPM), whole cassava peel mash (WCPM) and fine cassava peel mash (FCPM) and three levels (%)of replacement of maize 20,40 and 60% and augmented with a maize-based diet (control). The experimental diet was formulated for growing (days 10- 24) and finishing (days 24-46) phases.

Table 2: Gross composition (g/100g DM) of the experimental control grower and finisher diet

Ingredients	Grower	Finisher
Soya oil	2.70	1.50
Maize	50.00	52.00
Wheat bran	7.68	8.91
Soycake (45%)	30.30	13.80
Full fat soya	5.00	20.00
$CaCO_3$ (35%)	1.00	0.80
Di-Calcium Phosphate	2.00	1.90
Salt	0.35	0.37

CARCASS ANALYSIS

At day 46 of the experiment, two birds

with body weight closest to the group average weight were selected per replicate and were properly tagged. All the selected birds were starved of feed over-night. The birds were sacrificed, to bleed, defeathered and properly dissected into various parts and weights recorded. The different parts were calculated and reported in relative percentage of the live weight of birds

Lysine	0.42	0.19
DL-methionine	0.20	0.18
*Premix	0.25	0.25
Toxin binder	0.10	0.10
Total	**100.00**	**100.00**
Calculated Nutrients		
Crude Protein (%)	20.90	19.51
Metabolizable energy (Kcal/Kg)	3050.50	3103.90
Crude Fibre	3.20	3.40
Methionine (%)	0.51	0.48
Calcium (%)	0.99	0.85
AvailablePhosphorus (%)	0.51	0.49
Lysine (%)	1.40	1.16

RESULTS AND DISCUSSION

The effect of graded dietary levels of cassava peel products based diet on carcass characteristics and organ weights are shown in Tables 2 and Table 3. Results showed no significant effectof replacement of maize with all test cassava peel products on the offal yield except for eviscerated weight, breast meat,wings and heart. Birds on control diet had the highest eviscerated yield (80.86%) while the least yield was recorded by chickens on 20% SCPM (73.33%).

Table 2: The effect of graded level of cassava peel based diets on carcass primal cuts of broiler chickens %

Cassava Peel Product	Inclusion level	Eviscerated	Carcass	Shank	Head	Neck	Thigh	Drum Stick	Breast	Back	Wings
Control	0	80.86^{a}	74.02	4.02	2.71	4.49	10.98	10.76	24.90^{a}	14.06	8.14^{abc}
	20	73.33^{b}	70.63	4.31	2.96	4.57	11.85	10.95	23.05^{ab}	12.15	8.18^{abc}
Sundried	40	80.22^{a}	72.39	3.65	3.28	4.73	12.85	10.64	22.77^{ab}	12.09	8.36^{abc}
	60	80.22^{a}	72.26	4.68	3.25	4.17	10.91	10.81	22.83^{ab}	14.00	8.89^{a}
	20	79.67^{a}	72.39	4.30	2.85	3.96	11.26	10.81	23.53^{ab}	14.14	8.14^{abc}
Coarse	40	80.23^{a}	72.76	4.50	2.99	4.60	11.52	10.69	22.48^{ab}	14.51	8.33^{abc}
	60	76.62^{ab}	69.48	4.34	2.80	4.25	11.28	10.68	22.90^{ab}	11.71	8.24^{abc}
	20	79.03^{ab}	72.06	3.90	3.14	4.47	11.63	10.16	24.02^{ab}	12.27	8.27^{abc}
Whole	40	78.85^{ab}	71.68	4.51	2.79	4.25	11.18	9.45	23.01^{ab}	13.97	8.18^{abc}
	60	79.68^{a}	71.81	4.87	2.92	4.36	11.78	1051	22.15^{ab}	12.35	8.01^{bc}
	20	77.57^{ab}	69.63	4.64	3.32	4.34	11.37	10.43	21.77^{b}	13.06	8.36^{abc}
Fine	40	78.75^{ab}	71.68	4.23	2.86	4.37	11.55	10.80	23.21^{ab}	13.70	8.40^{ab}
	60	79.30^{ab}	72.27	4.12	2.93	4.40	11.06	10.67	23.39^{ab}	14.20	7.55^{c}
	SEM	0.51	0.44	0.097	0.07	0.10	0.17	0.14	0.23	0.25	0.07

[abc]Means with the same superscripts in the same column are not significantly different (P>0.05) SEM= Standard error of mean; All values are in % of live weight.

Table 3: The effect of graded level of cassava peel based diets on relative organ of broiler chickens (%).

Cassava Product	Inclusion level	FG	EG	Liver	Heart	Kidney	Spleen	IL (cm)	IntWt	AFAT
Control	0	2.88	1.88	2.16	0.50[abc]	0.00	0.11	236.67	4.95	0.25
	20	3.41	2.35	1.85	0.52[abc]	0.01	0.08	216	5.77	0.00
Sundried	40	3.05	2.03	2.02	0.56[ab]	0.02	0.11	224.00	5.68	0.84
	60	3.25	2.26	1.96	0.49[abc]	0.01	0.10	217.67	6.66	0.17
	20	3.13	2.29	1.82	0.61[a]	0.01	0.09	209.67	5.23	0.00
Coarse	40	3.44	2.05	1.62	0.40[bc]	0.01	0.09	213.67	5.42	0.31
	60	3.06	2.00	1.80	0.48[abc]	0.01	0.10	240.67	5.65	0.20
	20	2.71	1.94	2.24	0.36[c]	0.01	0.07	22.67	5.74	0.72
Whole	40	3.12	2.06	2.02	0.44[abc]	0.02	0.09	214.00	5.37	0.00
	60	2.72	1.95	2.05	0.46[abc]	0.01	0.07	138.33	6.04	0.28
	20	3.35	2.22	1.97	0.46[abc]	0.01	0.11	202.67	5.73	0.45
Fine	40	2.97	1.96	1.61	0.51[abc]	0.02	0.12	221.00	6.19	0.00
	60	2.72	1.85	1.61	0.51[abc]	0.00	0.1	218.33	5.89	0.15
	SEM	0.07	0.04	0.07	0.02	0.00	0.004	6.13	0.16	0.07

[abc]Means with the same superscripts in the same column are not significantly different (P>0.05). All values were calculated from percentage of live weight. SEM= Standard error of mean; FG=Full gizzard, EG=Empty gizzard, IL= Intestinal length, AFAT= Abdominal fat, Intwt= %Intestinal weight in live weight.

Breast yield was highest with chickens on Control (24.90%) while the least yield was reported on chickens of 20% FCPM (21.77). Wing yield was highest in chickens on 60% SCPM (8.89%) while the lowest was recorded with chickens on 60% FCPM (7.55%). The highest heart yield was recorded withchickens of 20% CCPM (0.61%) and the least was recorded with WCPM (0.36%). The significant difference observed for both wings and heart yield negate the findings of (3) who observe no significant difference when chickens were fed lower inclusion of cassava peel based diets; the difference could be due to lower inclusion employed. The breast yield was similar to those reported by (5) which ranged from 23.04-24.73% for broiler chickens fed beta carotene bio-fortified cassava grit based diets. The variations observed were not consistent with the cassava peel products or inclusion level used; this could be adduced tothe iso-caloric and iso-nitrogenous diets used in this study.

CONCLUSION AND APPLICATION

Replacement of up to 60% maize in broiler dietswith cassava peel products did not have adverse effecton the broiler meat yield and organ weights except for breast, wings, eviscerated weight and heart.

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