Growth Performance and Cost Benefits of Two Strains of Broiler Chickens Fed Cassava Grits Based Diets

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RATIONALE

- Broiler chicken has emerged as outstanding animal protein source for meeting the growing demand for animal protein globally.

- Broiler chickens are marketed under different trade names (strains) however, production has been challenged by high cost of cereals, high feeding cost thus the need for cheaper alternative such as cassava.

- Efforts aimed at reducing high cost of broiler production and enhancing economic viability without sacrificing technical efficiency would be a welcome development.

INTRODUCTION

- Current economic realities in Africa occasioned by high import bills, climate change, competition on cereals for other human use and high cost of maize are daunting challenges on animal feeds in general and poultry in particular.

- This therefore has necessitated the need to explore further, other viable and profitable energy feedstuff such as cassava in poultry production.

- Cassava has long been used as a component of balanced diets for animal feed (Yimala *et al.,* 2008, Chayunarong et al. 2009) but daunt of information on economic viability thus this study

Objectives

To determine:

- growth performance of two strains of broiler chickens fed cassava grits as replacement for maize at the finisher phase

- cost benefits of two strains of broiler chickens fed experimental diets

MATERIALS AND METHODS

- **EXPERIMENTAL SITE AND LOCATION**
- **TEST INGREDIENT**
- **EXPERIMENTAL DIETS (Table 1)**
- **EXPERIMENTAL BIRDS AND MANAGEMENT**
- **DATA COLLECTION**

  GROWTH PERFORMANCE (Weight gain, Feed Conversion ratio, Mortality)

  COST ANALYSIS (Cost of feed, Cost of feed consumed, Cost per kilogram weight gain)
- **STATISTICAL ANALYSIS**

TABLE 1: BROILER FINISHER DIETS CONTAINING VARYING LEVELS OF CASSAVA GRITS AS REPLACEMENT FOR MAIZE

Ingredients (kg)	Cassava replacement levels for maize			
	0%	**20%**	**40%**	**60%**
Maize	550	440	330	220
Groundnut cake	200	200	200	200
Soybean meal	88	88	88	88
Cassava grits	0	110	220	330
Palm kernel cake	67	67	67	67
Wheat offal	38	38	38	38
Bone meal	25	25	25	25
Oyster shell	25	25	25	25
Lysine	1	1	1	1
Methionine	1	1	1	1
Premix	2.5	2.5	2.5	2.5
Salt	2.5	2.5	2.5	2.5
Total	**1000**	**1000**	**1000**	**1000**
Determined values				
Metabolizable Energy (kcal/kg)	3035	2991	2901	2877
Crude protein (%)	19.90	19.10	18.90	19.00
Calcium (%)	1.60	1.62	1.62	1.64
Phosphorus (%)	0.51	0.51	0.51	0.49
Lysine (%)	1.04	1.08	1.08	1.16
Methionine (%)	0.45	0.46	0.47	0.49

RESULTS

TABLE 2: MAIN EFFECT OF VARYING LEVELS OF CASSAVA GRITS ON GROWTH PERFORMANCE AND COST BENEFIT OF FINISHER BROILER CHICKENS

Parameters	Cassava grits replacement levels (%)			
	0	20	40	60
Initial Weight (g/b)	739.67	734.00	692.00	671.83
Final Weight (g/b)	2188.83^{a}	2190.83^{a}	1923.33^{b}	1698.17^{c}
Total Weight Gain (g/b)	1449.17^{a}	1456.83^{a}	1231.33^{b}	1026.33^{c}
Daily Weight Gain (g/b/d)	51.76^{a}	52.03^{a}	43.98^{b}	36.66^{c}
Total Feed Intake (g/b)	3922.60	3924.00	3743.60	3925.90
Daily Feed Intake (g/b/d)	140.09	140.14	133.70	140.21
Feed Conversion Ratio	2.73^{b}	2.70^{b}	3.07^{b}	3.92^{a}
Mortality (%)	2.89^{b}	2.84^{b}	3.23^{b}	4.09^{a}
Cost per kg of feed (₦/kg)	130.50	124.80	119.20	114.70
Cost of feed consumed (₦b)	512.34^{a}	489.72^{a}	446.23^{b}	450.30^{c}
Cost of feed per kg weight gain (₦/kg)	357.18^{b}	336.98^{b}	366..05^{b}	449.19^{a}

TABLE 3: MAIN EFFECTS OF BROILER STRAINS ON GROWTH PERFORMANCE AND COST BENEFITS OF FINISHER BROILER CHICKENS FED DIETS CONTAINING CASSAVA GRITS

Parameters	Broiler strain		SEM
	Arbor Acre	Marshal	
Initial Weight (g/b)	728.50	690.25	9.20
Final Weight (g/b)	1984.08	2016.50	52.01
Total Weight Gain (g/b)	1255.58	1326.25	48.01
Daily Weight Gain (g/b/d)	44.84	47.37	1.71
Total Feed Intake (g/b)	3848.98	3909.08	40.64
Daily Feed Intake (g/b/d)	137.46	139.61	1.45
Feed Conversion Ratio	3.19	3.02	0.31
Mortality (%)	3.41	3.12	0.13
Cost per kg of feed (₦/kg)	122.29	122.29	1.24
Cost of feed consumed (₦b)	470.69	478.04	7.02
Cost of feed per kg weight gain (₦/kg)	386.75	367.95	12.40

Table 4: Interaction effect of varying levels of cassava grits and broiler strains on growth performance and cost benefit of finisher broiler chickens

Parameters	Arbor Acre				Marshal				SEM
	Cassava grits replacement levels (%)								
	0	20	40	60	0	20	40	60	
Initial Weight (g/b)	744.33^{a}	731.33^{a}	726.00^{a}	712.33^{a}	735.00^{a}	736.67^{a}	658.00^{b}	631.33^{b}	9.20
Final Weight (g/b)	2361.00^{a}	2128.30^{ab}	1915.70^{bc}	1624.70^{d}	2110.00^{ab}	2253.30^{a}	1931.00^{bc}	1771.70^{cd}	52.01
Total Weight Gain (g/b)	1626.00^{a}	1397.00^{ab}	1189.70^{b}	912.30^{c}	1375.00^{ab}	1516.70^{a}	1273.00^{ab}	1140.30^{bc}	48.01
Daily Weight Gain (g/b/d)	58.07^{a}	49.89^{abc}	42.49^{bcd}	32.58^{d}	49.11^{abc}	54.17^{ab}	45.46^{bc}	40.73^{cd}	1.71
Total Feed Intake (g/b)	3829.00	3857.00	3775.90	3815.10	3897.30	3991.00	3711.30	4036.70	40.64
Daily Feed Intake (g/b/d)	136.75	137.75	134.85	136.26	139.19	142.53	132.55	144.16	1.45
Feed Conversion Ratio	2.35^{d}	2.76^{cd}	3.20^{bc}	4.20^{a}	2.87^{bcd}	2.64^{cd}	2.94^{bcd}	3.63^{ab}	0.31
Mortality	2.68^{c}	2.98^{bc}	3.39^{bc}	4.43^{a}	2.96^{bc}	2.71^{c}	3.07^{bc}	3.75^{ab}	0.13
Cost Per Kg of Feed (₦/kg)	130.50	124.80	119.20	114.70	130.50	124.80	119.20	114.70	1.24
Cost of Feed Consumed (₦/b)	499.68^{a}	481.35^{ab}	450.08^{cd}	437.59^{e}	508.59^{ab}	498.08^{a}	442.39^{bcd}	463.01^{de}	7.02
Cost of Feed Per Kg Weight Gain (₦/kg)	339.31^{bc}	344.44^{bc}	381.63^{bc}	481.63^{a}	375.04^{bc}	329.51^{c}	350.47^{bc}	416.76^{ab}	12.40

SUMMARY & CONCLUSION

- From the results of this study, broiler strains fed finishing diet containing cassava grits at 20% replacement for maize had similar results with control diet in terms of:

  final weight,

  daily weight gain,

  feed conversion ratio,

  mortality &

  lower cost per kilogram weight gain.

- Study concluded that 20% cassava grits can be used as replacement for maize in finisher broiler production for optimum growth performance and better cost benefits.

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