

REPLACEMENT VALUE OF GARRI SIEVATE FOR MAIZE IN RABBIT RATIONS

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ABSTRACT

Graded levels of Garri Sievate (GS) were used to replace equivalent levels of maize at 0, 20, 40% levels in three isonitrogenous rabbit diets to determine the affect on growth performance. Comparison of all three treatments for growing rabbits response showed significant ($P < 0.05$) differences in final body weight (1300.33g at 0%, 1496.18g at 20% and 1217.13g at 40%); weight gain (961.10g at 0%, 1154.96g at 20% and 877.02g at 40%) and total feed intake (4298.45g at 10%, 4734.16g at 20% and 4223.14g at 40%). All these results were in favour of a maize-GS combination of 30% - 20% respectively. There were however, no significant ($P < 0.05$) differences in the feed conversion ratios between treatments. There were cost savings in favour of the maize -GS combinations. The unit cost of feed/weight gain of the rabbits was least in treatment III (N0.01) and highest in treatment I (N0.02). It is concluded from this study that GS can be safely and gainfully included in rabbit diets at levels not exceeding 20%.

Key words: Garri sievate, Maize, rabbit, body weight, feed intake.

INTRODUCTION

One of the ultimate objectives of any livestock industry is the conversion into animal products of feeds which are either edible by man or surplus to his immediate requirements (Payne, 1990). In Nigeria where the ever-increasing human population exercises continual and probably mounting pressure on available feed resources, it is inevitable that conventional animal feeds should become increasingly more expensive. A number of researchers have investigated the possibility of inclusions (at various levels) of different agro-industrial by-products and wastes in livestock rations (Babatunde *et al*; 1975).

The availability of grains is widely recognised as the most precarious problem facing livestock feed industry in Nigeria (Obioha, 1975). This factor has forced the major feed manufacturers to market premixed concentrates which can be attenuated by feeders into the desired feed types for their various stock. Unfortunately, this practice has been abused by manufacturing agents who, in the absence of a statutory feed standard organisation, produce feeds for less than the minimum quality of existing feed

standards specified by the National Research Council (NCR, 1971).

Garri Sievate (GS) is a residue obtained when grated cassava (*Manihot esculenta*) is fermented, dried and sieved for "garri" production. Studies with garri or its analogue have indicated large replacements of grains in a variety of poultry diets without decrease in performance (Nwokolo *et al*; 1981). The toxic effect of the Hydrogen cyanide content of the cassava peels is further minimized by the process of drying and milling (Fomunyam and Meff eja. 1987).

This study was designed to ascertain to what extent the inclusion of Garri Sievate, a readily available source of carbohydrate will affect the performance parameters of growing rabbits. Secondly, to achieve a substantial replacement of maize in rabbit rations with Garri Sievate and thereby reduce production costs.

MATERIALS AND METHODS

Thirty, 5 weeks old New Zealand white rabbits (weaned at 4 weeks of age and acclimatized for one week) were marked, weighed and randomly assigned to three isonitrogenous dietary treatments. Each

treatment contained ten rabbits and was replicated to contain five rabbits per replicate.

Graded levels of Garri Sievate (GS) (0%, 20% and 40%) were incorporated into a formulated rabbit ration. Treatment I constituted the maize-based control diet (no replacement at all), while treatments II and III had step-wise replacement of maize by GS as shown in Table 1. chemical analysis was done according to the procedures of ADAC (1975).

The rabbits were housed in individual hutches and fed on the experimental diet for ten weeks after an equilibration period of one week. Feeding and water supply were *ad libitum*.

Feed intake was recorded daily. The animals were weighed weekly and the average daily weight gain computed.

Data analyses were done by analysis of variance, procedure of Steel and Torrie (1980) and the difference between the means determined by the Duncan (1955) Multiple range test.

RESULTS

The composition, by chemical analysis of maize and GS and the means of the performance parameters of the rabbits are summarised in Table 2 and 3 respectively. The rabbits used in this experiment were of a uniform weight range at the onset of the experiment. However, there were significant ($P < 0.05$) difference in the final weight and gains in weight.

The consumption of feeds varied significantly ($P < 0.05$) between the treatments. The highest consumption was in treatment II, followed by treatment I (maize-based diet) and treatment III, where maize was replaced by 40% GS. In spite of varying feed conversion ratios, there were no significant ($P > 0.05$) differences between treatments.

The results of cost evaluation of the diets (formulated in June, 1992; Exchange rate N10.00 = 1 US dollar) in relation to performance of the animals are presented in Table 4. It cost N4.75, N3.99 and N3.77 to produce 1kg of diets 0%, 20% and 40% GS replacement respectively. It cost more to produce 1kg of maize-based diet (0% level) as compared to diets II and III (20% and 40% GS). This same trend was observed

for cost/g feed. The cost of daily feed intake were highest for animals in treatment I followed by treatments II and III respectively.

DISCUSSION

The decrease in feed intake recorded in the animals fed diet III (40% GS replacement) could be as a result of the high fibre level of the diet. This is in accordance with the findings of researchers who reported that high levels of fibre and oxalates (Crowther and Chedda, 1982), low crude protein content (Smith 1962) and the physical structures - dried and ground - (Siotrus *et al* 1982; Harris *et al* 1983) are among factors responsible for low palatability and depressed feed intake in rabbits. Davidson and Spreadbury (1975) fed growing rabbits with diets containing 11%, 13%, 19% 23% and 27% crude fibre and observed a decrease in feed intake with high levels of fibre (23% and 27%). Although, these results do not necessarily suggest that rabbits eat predominantly with respect to crude fibre and protein rather than energy, high fibre content is associated with decreased dry matter intake (Lebas, 1975).

The observed superiority of treatment II in feed intake and weight gain ($P < 0.05$) would suggest that the combination of 30% and 20% for maize and GS respectively, was the most ideal. This could be as a result of increased palatability and availability of nutrients resulting from this combination.

The decrease in body weight gain in treatment III and the calculated feed Conversion Ratio (FCR) are inversely related to the level of replacement of maize with GS in the diet. This further justifies the reported difficulties associated with the ingestion of diets very high in fibre by rabbits and the subsequent effects on feed intake and weight gain. (Hoover and Heitman, 1972).

Cost computations (Table 4) show that the unit cost of feed/weight gain of the rabbits was least in treatments II and III. It cost least to produce 1kg liveweight with 20% and 40% GS replacement, followed by the maize-based diet.

CONCLUSION

The results of this study show that the partial replacement of maize with GS in conventional rabbit rations enhances feed intake and weight gain parameters. However, the level of replacement of maize with GS should not exceed 20%. The cost implications of this observation are important in grain-scarce situations where low-cost and readily available diet ingredients are desired.

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Table 1. Composition of formulated rabbit ration (%).

Ingredients	Diets		
	I	II	III
Maize (yellow)	50.00	30.00	10.00
Garri Sievate	-	20.00	40.00
Palm Kernel Cake	5.00	10.00	10.00
Soya Bean Meal	21.95	18.95	20.95
Rice Bran	20.00	18.00	16.00
Bone Meal		2.50	2.50
Salt	0.30	0.30	0.30
*Vitamin/Mineral Premix	0.25	0.25	0.25
Analysed Crude Protein (%)		15.31	15.27
Analysed Crude Fibre (%)		16.98	20.17
Analysed Ether Extract (%)		2.86	2.01
Calculated Metabolizable Energy (Kj/Kg)		10699.79	10511.59
			10456.27

*Mineral/Vitamin premix supplied the following per Kg. of Diet:
Vit A 10 million I.U., Vit D3 1 million I.U., Vit E 2000 I.U., Vit K 2mg,
Riboflavin 5mg, Pantothenic acid 11mg, Niacin 25mg, Chlorine

Chloride 300mg, Vit B12 10mg, Mn 80mg, Zn 50mg, Iodine 1.2mg,
Co 200mg, Cu 2mg, Fe 25mg.

Table 2: Chemical analysis of test ingredients.

Constituents % of DM	Maize	Garri Sievate
Dry Matter	89.48	93.01
Crude Protein	10.10	1.99
Ether Extract	4.36	0.20
Crude Fibre	2.01	2.30
Ash	3.43	2.23
Nitrogen Free Extract (NFE)	81.32	93.21

Table 3: Growth performance, Feed Intake and Feed Conversion ratio of rabbits fed GS meal.

Parameters	Diets			SEM (\pm)
	I	II	III	
Average Initial Liveweight (g)	339.23	341.23	340.11	0.18
Average Final Liveweight (g)	1300.33 ^{ab}	1496.18 ^b	1217.13 ^a	0.12
Actual Weight gain (g)	961.10 ^{ab}	1154.95 ^b	877.02 ^a	0.31
Average Daily weight gain (g)	13.73 ^a	16.50 ^b	12.53 ^a	0.21
Total Feed Intake (g)	4298.45 ^a	4743.16 ^b	4223.14 ^a	0.23
Daily Feed intake (g)	61.41 ^a	67.76 ^b	60.33 ^a	0.12
Feed Conversion ratio	4.47 ^a	4.11 ^a	4.81 ^a	0.03

a,b, means with different subscripts in the same row are significantly different (P < 0.05) for any parameter measured.

Table 4: Cost analysis of experimental diets

	Diets		
	I	II	III
Cost of feed/Kg (N)	4.75	3.99	3.77
Daily feed intake (g)	61.41	67.76	60.33
Cost of daily feed intake (N)	0.29	0.26	0.22
Daily weight gain (g)	13.73	16.50	12.53
Cost of Feed/Weight gain (N)	0.02	0.01	0.01

N10.00 = 1 US Dollar