CASSAVA HOUSEHOLD EXPENDITURE AND ANTHROPOMETRIC INDICES OF PRESCHOOL CHILDREN IN RURAL AREAS OF IMO STATE

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ABSTRACT

In an attempt to verify the myth associated with cassava, that high consumption causes malnutrition, anthropometric measurements of 445 preschool children aged 0 - 5 years in 90 randomly selected farm households of cassava growing areas of Imo State were undertaken. Growth deviations (Z – scores) were calculated and assessed from National Centre for Health Statistics (NCHS). Expenditure on cassava and other staple foods was determined for each household of the preschool children and classified into two groups and the average determined. Significance of difference between the mean Z – scores of the children for above and below average expenditure households was determined by Student t – test. The growth deviations were less among preschool children from high than among those from cassava, yam and millet food expenditure households in all the anthropometric indices except in maize expenditure households, but the deviations were significantly less for total food expenditure households. High cassava food expenditure households had higher cash incomes through processed cassava products and hence better nutritional status. In order to maintain good

nutritional status total expenditure on all foods rather than expenditure on individual food items as well as more processed cassava products production should be encouraged.

INTRODUCTION

Cassava (*Manihot esculenta*) is an extensively grown food crop in Nigeria. It is grown over a wide range of climate, soil and other ecological factors in all states of the country. In the Southern States, a cassava based farming system is widely identifiable. Cassava is a basic food staple of most people in Nigeria. Depending on variety and cyanogens content, it can be eaten raw, boiled, pounded into fufu or as processed garri, lafun etc. Its role in supplementing household income is not in doubt (Nweke, 1996). In some areas, it accounts for as much as 50 percent of household income. It is a security crop as it can be left to establish ownership of a piece of land in some cases, and it ensures food supply when all other crops have failed. In all considerations, its importance in the rural farm economy and food security is well established.

Cassava has for long and enormously been considered to be an inferior commodity. There is a perceived inverse relationship between cassava consumption and standard of living. For instance, high cassava consumption is often presumed to associate with malnutrition (Ekpere et al, 1986). This myth associated with cassava in the past, in some parts of Nigeria, made

the crop appear inferior to yam. It is believed that kwashiorkor due to protein deficiency is more common in young children weaned onto cassava rather than millet or maize (Tylleskar and Tylleskar, 1988).

This paper examines whether differences exist in the nutritional status (anthropometric indices) of preschool children from categories of cassava household and other staple foods expenditure in cassava growing areas of Nigeria.

METHODOLOGY

The study was carried out in two cassava growing villages in Imo State, namely; Ngor Okpala Eziala and Obinikpaezihe. In each village a list of farm households was compiled and grouped into large, medium and small farm holder households with the assistance of key village informants. Farm households which cultivated 10 ha or more of all crop were excluded as unrepresentative of small holder farm households. The farm households were selected from each of the classified groups. The total number selected in each village was 30. A total number of 90 farm households were selected from which 445 preschool children aged 0 – 5 years were obtained.

The anthropometric measurements were taken by direct measurement of the standard procedures established by UN (1986). The age of child was obtained from their birth certificates or from carefully questioning the mother with the and of local events calendar to assist them in their recall.

National Center for Health Statistics (NCHS) reference population (WHO, 1983) was used to convert anthropometric measurements into indicators of height for age, weight for height and weight for age for assessment of nutritional status of the preschool children. Z-score (Standard deviation) of a nutritional indicator for an individual was calculated. The formular is as follows

$$\text{S.D. Score} = \frac{X - Y}{Z}$$

Where, x = Actual Child's Measure
Y = Median value of reference population
Z = Standard deviation value of reference population

To determine the relationship between cassava consumption and the nutritional status of the preschool children, the nutritional status indicators of the preschool children were compared at two levels of household expenditure on cassava food products as well as on other food staples, namely, maize, millet and yam. Household expenditure on each of the four staples and household total expenditure on all the staple food items were reduced to per person basis and average for the 90 households determined.

For each of the staples the households as well as the preschool children were grouped according to whether they were from high expenditure households if they were from households with above the average

expenditure per person for the particular staple or from low expenditure households if they were from households with average or less expenditure per person. The children's Z-score for weight for age, height for age and weight for height were calculate for each sub-group of the household food expenditure.

Student T-test was carried out to determine the levels of significance of the difference in the mean anthropometrics indices between the various sub-groups of the household food expenditure.

RESULTS

Household food expenditure and anthropometric indices

Household total food expenditure

Average expenditure on all the staple foods per person per week was ₦104. 38, the range was ₦100.68 to ₦835.18 (table 1). There significant differences between the growth deviations of the preschool children in the above average and average (or less) household total food expenditure by all three anthropometric indices ($p < 0.05$). The Z-score values were higher among preschool children from above average total food expenditure households than among preschool children from average (or less) total food expenditure households by all three indices (table 2).

Household cassava and other staple foods expenditure

Average expenditure per week was ₦17.74 on cassava food, ₦14.61 on yam, ₦8.35 on maize, ₦7.30 on millet/sorghum, and ₦56.34 on all other food items (table 1).

The growth deviations did not differ significantly between categories of households' expenditure on cassava food or on any of the other staples for any of the indices except for weight for height index of the preschool children in the millet or sorghum expenditure households. However, the Z-score values for weight for age and height for age indices were higher for preschool children

from high cassava food expenditure households while the Z-score value for weight for height was higher for preschool children from low cassava food expenditure households (table 2). In case of maize the Z-score values for weight for age and weight for height were lower for preschool children from above average expenditure households. In case of yam or millet/sorghum the Z-score values were higher for children from above average expenditure households for all indices.

DISCUSSION

The low level of statistical relationship between each of the nutritional status indices and household expenditure on cassava food and/or on any other staple is evidence that the nutritional status of children might not depend on the level of household consumption of any individual food item. In contrast, the high level of statistical relationship of all the nutritional status indicators with household total food expenditure suggests that the nutritional status of the children depended on the level of household consumption of all food items combined. In other words, level of total food consumption rather than level of consumption of any individual food item determined the nutritional status of the children. This is logical, nutritional problems may be caused not by what is eaten but by what is not eaten.

In the particular case of cassava, the nutritional status of the children was higher among children from high cassava food expenditure households than among

children from low cassava food expenditure households for weight for age and height for age indices though not for weight for height index. It has been pointed out that height for age is usually the single best anthropometric indicator because it is associated closely with household diet. (WHO, 1983). Moreso, high cassava food expenditure households had significantly higher cash income per household (table 3) than low cassava food expenditure households.

Nweke (1994) reported that cassava is processed into a wide range of food products the most common ones being chips/flour, granules and pastes. The various cassava processed food products can be grouped into two with respect to convenience of preparation into a meal. The first group consists of products which enter the marketing system in ready (or near ready) to serve forms; garri, cassava toasted granules, is an example of the products in this group. Garri is made by advanced methods of processing, it is attractive to working class urban consumers because it is easily converted into food or it can be eaten directly without any further preparation; hence it competes effectively with grains in the market. The second group consists of products which need further processing or elaborate cooking at home; chips/flour is an example of the products in this group. Chips/flour is made by a wide range of methods some of which are quite rudimentary involving only peeling and drying of the fresh roots; the product is not as attractive to working class urban consumers and therefore does not

have as much market opportunities as products in the first group.

Table 4 shows that proportionately more high cassava food expenditure households processed cassava into garri and hence had higher sales income earning opportunities than low cassava food expenditure households. With their higher sales income the high cassava food expenditure households had higher total food expenditure and hence had children with higher height for age (higher stature) indicator than low cassava food expenditure households.

CONCLUSION

Children from high cassava expenditure households had higher Z-score values for height for age, the single best anthropometric indicator, because such households had higher cash income and hence higher total food expenditure than low cassava food expenditure households. However, households' total food expenditure to a large extent rather than household expenditure on individual food items determined the nutritional status of the preschool children. Better nutrition is mainly achieved by higher level of consumption of all the households food items.

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Table 1:Mean values of household expenditure on food items in cassava producing areas (Naira per person per household per fortnight)

Household food expenditure		Mean	Min.	Max.	SD	n
Cassava	17.74	0	0.79	0.14	90	
Maize		8.35	0	0.62	0.08	90
Yam		14.61	0	0.77	0.15	90
Millet/Sorghum		7.30	0	0.51	0.10	90
All other food items		56.34	0	0.79	0.19	90
Total (all food)		104.34	100.68	835.18	104.53	90

n = number of households

Table 2: Mean Z-score of anthropometric indices of preschoolers by major staple household food expenditure

	Weight for age			*Height for age*			*Weight for height*		
Household food expen-diture	*Z*	*SD*	*n*	*Z*	*SD*	*n*	*Z*	*SD*	*n*
Cassava food expenditure									
> aver	-1.12	1.88	144[a]	-1.10	2.98	145[a]	-0.53	1.29	143[a]
Avg/<	-1.77	1.66	194	-1.49	2.45	299	-0.41	0.94	294
	(-0.2965)			(1.3707)			(1.0070)		
Maize food expenditure									
> aver	-1.21	1.63	147[a]	-1.35	2.38	148[a]	-0.47	1.03	146[a]
Avg/<	-1.13	1.79	291	-1.36	2.76	296	-0.44	1.09	291
	(0.4531)				(0.0467)			(0.4730)	
Yam food expenditure									
> aver	-0.94	1.78	141[a]	-1.17	2.69	142[a]	-0.36	1.02	140[a]
Avg/<	-1.26	1.71	197	-1.45	2.61	302	-0.49	1.09	297
		(1.7755)			(-1.0581)			(-1.2264)	

Millet food expenditure

> avg	-0.93	1.78	140[a]	-0.98	2.73	143[a]	-0.42	1.12	140[b]
Avg/<	-1.26	1.71	298	-1.54	2.57	302	-0.46	1.04	297
	(1.8515)			(-0.3399)			(-2.0857)		

All food expenditure

> avg	-0.58	1.77	143[c]	0.54	2.57	143[c]	-0.29	1.13	142[b]
Avg/<	-1.44	1.65	295	-1.75	2.58	301	-0.52	1.03	295
	(-4.9479)			(-4.6019)			(-2.1253)		

Figures in parenthesis are t-ratio: a. $P > 0.05$ b. $P < 0.05$ c. $P < 0.005$

Table 3: **Household cash income (Naira/household) expended on staple foods by household category**

Staple food	High expenditure households		Low expenditure households	
	No. of households	Naira	No. of households	Naira
Cassava	37	41,753	53	29,909
Maize	43	28,920	47	37,309
Yam	34	35,395	56	33,214
Millet/Sorghum	32	39,235	58	30,520

Table 4: **Percentage distribution of surveyed households by the type of cassava products made.**

Cassava Product	High cassava food Expenditure households	Low cassava food expenditure households
	43*	47*
	Percentage	
Chips/flour	57	79
Granules	36	14
Pastes	7	7
Total	100	100

* No. of households