FOOD SECURITY ASSESSMENT AND CONSUMPTION PATTERN IN RURAL HOUSEHOLDS IN OGUN STATE, NIGERIA

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Abstract: *The problem of nutrition security is getting worse in Africa, due to increasing population growth and poor progress in efforts directed at reducing food insecurity in many countries in the continent. The paper undertook an assessment of the food security situation and food consumption pattern in rural households in Ogun state, Nigeria. A multistage sampling technique was used to select 260 rural households from whom data were collected through structured questionnaire. The tools of analysis were descriptive statistics and food security index. The former described the consumption pattern, and households' sources of food availability, while the latter was used to analyse the food security situation. The result of the rural households' consumption pattern reveals that the rural households derived more of their energy from carbohydrates at the expense of other classes of food items. The result also shows that majority (75.5%) obtained their food through their own production and supplemented same with food purchased from the market to meet up with their family needs. Based on the recommended daily calorie intake (R) of 2,470 kcal, 59.6% of the rural households were food insecure while 40.4% were food secure. The calculated head count ratio (H) for the food insecure households was 0.6, confirming that almost 60% of households in the study area were food insecure. For secure households, the head count ratio (H) was 0.4, further confirming that only about 40% of households in the study area were food secure. The shortfall index and surplus index were 0.2787 and 0.3498 respectively, meaning that the energy requirement was less by about 27 percent and in excess of 34 percent for the food insecure and food secure households. The paper recommends that while enhancing production of arable crops - roots, tubers and cereals, a sensible balance of tilting towards meeting the requirements in the consumption of animal protein/legume, fats/oils, fruits and vegetables must be maintained to ensure food security. This policy thrust could be enhanced through mass education.*

Keywords: *Food security, consumption pattern, rural households, food security index.* (JEL code: *R20*)

INTRODUCTION

Food security and insecurity are terms used to describe whether or not households have access to sufficient quality and quantity of food. The definition adopted by World Food Summit (1996) assert that food security is achieved when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO, 2004). Food availability is necessary but not sufficient in itself to ensure food security. At the households' level, food availability is through own production, market purchases, and gifts. According to (Ajani, 2005), food insecurity is generally associated with fluctuation in household own production and food prices. These fluctuations, in turn, lead directly to variation in real income, which affects economic access of households to food. Access refers to the ability of individuals and households to purchase sufficient quantities and quality of food. Economic and physical access to food is not in itself sufficient for food utilization. Food utilisation implies that the nutritionally adequate diet be biologically utilized and should translate to an active and healthy life for every individual. Therefore, food security involves not only increasing the available supply of food and ensuring that people have access to the supplies but also and very importantly food utilisation that ensures good nutritional outcome.

Food security is currently both a fundamental objective and an expected outcome of development policies in Nigeria, as the country currently faces a challenge in meeting the basic food needs of its population. Majority of Nigerians depend largely on subsistence agriculture, which is hardly sufficient to meet the food needs of the population. Despite the many policies, programs, and investments by various local and international agencies operating in the country, food security and the nutrition situation are worsening (FEWSNET, 2007). While the nutrition insecurity is generally being reduced

worldwide, the problem is getting worse in Africa. This is due to increasing population growth and poor progress in efforts directed at reducing food insecurity in many countries in the continent. Carbohydrates, fat and protein comprise the three principal sources of energy in the human diet. Individual foods contain different proportions of the three principal macronutrients. Animal products (meat and dairy) are rich sources of protein and fat, while cereals, fruits and vegetables contain a large proportion of carbohydrate. The quantity and quality of each component is particularly important when analyzing nutritional adequacy (Kennedy, 2001). The nutrition status of individuals is to a large extent determined by the level of food consumption. The consumption pattern of Nigerians differs across the nation but cereals are important staple foods in Nigeria and are widely consumed across the regions of the country. In the savannah eco- zones of Nigeria, Etkin and Ross (1994) documented about 119 food plants which are predominantly found in the forest. According to Okafor et al. (1994), these forest foods form the major intake of protein, vitamins, minerals, fats, and carbohydrates among the majority of rural communities in the country. A study reported by the (National Bureau of Statistics, 2007) showed that the South West household members consumed more of "Eko/Agidi", bread, yam flour, yam tuber, and garri. However, beef, rice, yam tuber, cassava, and bread constituted the main food items consumed in the south-eastern part of Nigeria. Rice, maize, beans, beef, guinea corn, millet, tomatoes, and yam tuber were the food items consumed by household members in the North West zone, while the North East zone consumption pattern was dominated by rice, dried fish, beef, palm oil, groundnut, beans, maize grain, yam , millet, and guinea corn. Food items consumed in the South-South geo-political zone included beef, garri, fresh fish, rice, yam tuber, and beans. In a similar manner, yam tuber, beef, fufu, rice, beans, and garri were the major food items consumed by household members in the North Central zone. In view of the above, it can be seen that the consumption pattern revealed in the south-west geo-political zone was the poorest, because all the food items reported belong only to the class of carbohydrate. A critical review of this situation is therefore necessary with due attention to rural households in Ogun state in South western, Nigeria. This is why this paper finds it imperative to investigate the link between consumption pattern and food security in the study area in order to formulate a policy framework for food security enhancement intervention.

It is in this line, this paper sets as the major objective to determine food consumption pattern and assess the food security situation in the rural households in Ogun state. The specific objectives however are to:

– Determine the rural households' food consumption and consumption pattern.
– Identify the sources of food availability in the study area.
– Assess the food security status of the rural households in the study area.

RESEARCH METHODOLOGY
Study Area

The study was undertaken in Ogun State in Southwestern, Nigeria. Ogun state was created on February 3rd, 1976 from the old western region. It lies within latitude 60N and 8 0N and longitude 2 0E and 15 0E. It is bounded on the west by the Republic of Benin, on the east by Ondo State, on the North by Oyo State and on the south by Lagos state. The state is approximately 1.9 percent (16,762 km) of Nigeria's 923,219 km land area. It is located in the moderately hot, humid tropical climate zone of Southwest, Nigeria. It is made up of 20 Local Government Areas spread across the four main provincial zones namely Egba, Ijebu, Remo, and Yewa. The population of the state stands at 3.728,098 million with its growth rate placed at 2.83percent per annum and about 60% of its population are rural (National Population Commission, 2006).

There are two main distinct seasons in the state namely, the rainy season and the dry season. The average annual rainfall in the state ranges from 1,250mm and 1,800mm with a bimodal distribution which peaks in June and October, while the dry season stretches from mid November to mid March. Temperature ranges from 270C to 320C and the average relative humidity is about 80% to 90%. The climatic condition favours the production of timber, arable and tree crops. Arable crops such as cassava, maize, cocoyam, yam, melon, tomatoes and local rice (ofada) are produced in the study area.

Sampling technique and Sample size

Multistage sampling technique was employed to select 260 households from the 4 Ogun State Agricultural Development Programme zones of Abeokuta, Ijebu-Ode, Ilaro and Ikenne. The first stage of selection involved a random sample of 50% of blocks per agricultural zone based on probability proportionate to size (PPS). This resulted into the selection of two blocks each in Ilaro and Ikenne zones (the zones are made up of four blocks each), and the selection of three blocks each in the Abeokuta and Ijebu-ode zones (the zones are made up of six blocks each) making up a total selection of 10 blocks. The second stage adopted the same procedure of sampling based on PPS but this time with 20% of cells selection per block. This resulted in 26 cells. The third stage involved a purposive selection of one rural village per cell resulting into 26 villages, while the final selection was equally a purposive selection of 10 households from each of the 26 villages resulting in 260 households. The procedure aimed at ensuring equal representation across all cells.

Data Sources and Collection

The use of primary data was employed for this study. The primary data were obtained through the use of a structured questionnaire. The questionnaire elicited information on household consumption of various food items within seven days. This included information on the different types, food

classes and their corresponding quantities. Nevertheless, data on various sources of household food availability through own production, market purchase, and gift were collected. The secondary information was sourced from relevant journals, internet, books e.t.c.

Analytical Technique

This study employed the use of descriptive statistics and the food security index. The descriptive statistics involved the use of frequency tables, percentages and means, for summarizing their food consumption and sources of food availability, while the pie-chart was used in summarizing the consumption pattern. The Food Security Index (FSI) was used to assess the food security status of the rural households. A food security line was determined and used to classify households into either being food secure or food insecure depending on which side of the line they fell. The food security line used in this study is the recommended daily per capita calorie intake of 2,470kcal as used by (Olayide, 1982 and Ajani, 2005). The household caloric acquisition method according to Hodinnott (2000) is the number of calories or nutrients available for consumption by household members over a defined period of time. The household calorie intake was obtained from the household consumption within 7 days. The quantity of every food item consumed by the household in 7 days was converted into its calorie content. This was achieved by multiplying all respective food items (weight in kilograms) by the corresponding food energy content. This was further converted into per capita calorie by dividing the estimated total household calorie intake by the adjusted household size in adult equivalent. Furthermore, the per capita calorie intake was converted into daily per capita intake by dividing by 7. A household whose daily per capita calorie intake was up to the recommended was regarded as food secure and if below as food insecure. In a similar way, as used by Ibrahim *et al. (*2009), the food security index was calculated as follows:

$$Z = \frac{daily\ per\ capita\ calorie\ intake}{recommended\ daily\ per\ capita\ calorie\ intake\ (2,470kcal)}\quad (1)$$

Where the Z value (food security value) was less than 1, household was regarded as food insecure but where it was greater than or equal to 1, the household was regarded as food secure.

The shortfall/surplus index was calculated for the households based on the food security index Z. The shortfall/surplus index (P) measures the extent to which households are below or above the food security line. It is expressed as:

$$P = \frac{1}{M}\sum_{j=1}^{m} G_j.\quad (2)$$

Where:

$$G_j = \left(\frac{Y_j - R}{R}\right)\quad (3)$$

G_j = Deficiency or surplus faced by households

Y_j = Daily per capita calorie intake of the *j*th household

R = Recommended daily per capita calorie intake

The head count index is calculated as follows:

$$\text{Head count index (H)} = \frac{M}{N}\quad (4)$$

Where:

M = Number of the food secure or insecure households

N= No of households in the sample

RESULT AND DISCUSSION
Food Consumption in the Rural Households in Ogun State

Food constitutes a larger proportion in the expenditure pattern of most rural households due to its importance to the nutritional wellbeing of individuals. Food consumption level and corresponding energy content of rural households in Ogun State, Nigeria is as presented in Table 1. Food items which were not often consumed but only by few households of the rural households in Ogun State were categorized as others. These food items classified as others were Semovita, wheat, spaghetti, groundnut, cheese, margarine, apple and beverage. Consumption of cocoyam, fufu and garri which belong to the carbohydrate class were the highest in terms of quantities. They were 9.75kg, 5.24kg and 4.90kg in that order and they contributed the largest proportion to the household energy intake. The consumption of milk and egg contributed about the lowest to the household food intake. The total weekly food consumption was 56.09kg.

*Table 3: Distribution of food consumption
in the rural households in Ogun State*

Food items	Quantity(Kg) consumed/week	Kcal	% Calorie
Rice	3.67	12830	7.17
Maize	2.86	8095.2	4.52
Gari	4.90	17211	9.61
Fufu	5.24	21836	12.20
Cocoyam	9.75	37322	20.85
Yam	3.89	13018	7.27
Lafun	2.66	10281	5.74
Elubo	1.99	6189.2	3.46
Cowpea	1.93	6608	3.69

Food items	Quantity(Kg) consumed/week	Kcal	% Calorie
Meat	0.90	2272.5	1.27
Fish	1.40	1535.4	0.86
Egg	0.52	729.14	0.41
Milk	0.33	169.68	0.09
Palm oil	0.79	6874.6	3.84
Veg oil	0.44	3896.8	2.18
Orange	1.21	531.3	0.30
Plantain	2.28	3071.8	1.72
Okra	0.41	1850	1.03
Tomatoes	1.17	262.49	0.15
Onion	0.59	134.74	0.08
Vegetable	0.65	3063	1.71
Melon	0.25	1529.4	0.85
Pepper	0.42	175.62	0.10
Bread	1.03	2401.3	1.34
Others	6.81	17075.3	9.54
Total	56.09	178963.5	100

Source: Computed from Field Survey Data, 2013.

Food Consumption Pattern in the Rural Households in Ogun State.

The household consumption pattern indicates that the rural households derived more of their energy from carbohydrates at the expense of other classes of food items, as they consumed mostly from carbohydrate and consumed less food from fruits, vegetables and protein sources (fig. 1). This could have serious implications on their health and wellbeing. Carbohydrate sources are mostly from cereals (rice, maize, wheat e.t.c.) and root and tuber products (garri, fufu, lafun, e.t.c.) and these accounted for 83.42% of the households' weekly calorie intake. This was followed by 7.17% protein, 6.02% fats and oils and 3.37% fruit and vegetables. The proportion of protein intake from legumes was 4.54% and was found to be greater than that from animal product that was only 2.63%. This is expected, since pulse and legumes are the cheapest sources of protein. This low proportion has huge implications in the abilities of the households to meet the protein needs of the members. It can be seen that the rural households in the study area did not comply with dietary recommendation which specifies the minimum requirements for the supply of energy from carbohydrates, legumes, animal proteins and fats/oils.
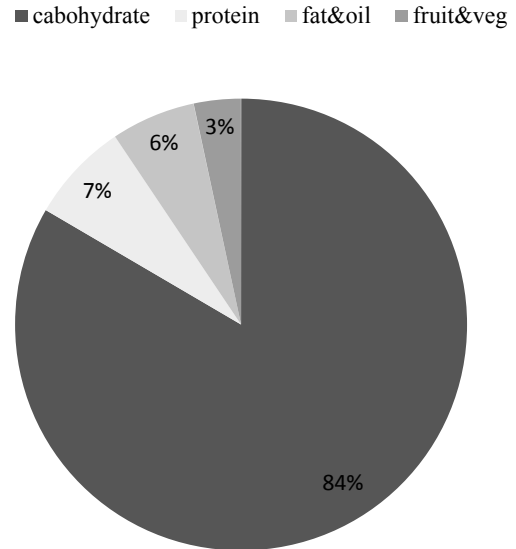
Figure 1: Pie-chart showing the rural households' food classes' consumption pattern

Distribution of Households by Major Food Sources

The analysis of the food consumed revealed that rural households in the study area have access to food from three different major sources, namely own farm production, food purchased from the market and food obtained as gift from friends and relatives. It is revealed that all the rural households relied on purchasing some proportion of their food from the market as they could not be sole producers of all their food resources. Majority of them (75.5%) obtained their food through their own production, usually home grown food and supplemented same with food purchased from the market to meet up with their family needs (Table 2). The proportion of 23% obtained their food from their own production, purchase from the market, and as gifts from other people. The percentage distribution of 1.2% solely purchased their food items from the market, while 0.8% obtained some of their food from the market and the remaining part of their food as gift. As evidenced here, all the respondents had to purchase some of their food resource in other to meet their overall food need.

Table 2: Distribution of households by major food sources

Major source	Frequency	Percent
Own and purchase	195	75.0
Own ,purchase, gift	60	23.0
Purchase only	3	1.2
Purchase and gift	2	0.8
Total	260	100.0

Source: Computed from Field Survey Data, 2013.

Food Security Status of the Rural Households in Ogun State.

The summary of the statistics of the food security situation is as presented in Table 3. The recommended daily calorie intake (R) defines the food security line and consumption below the minimum level of calorie requirement indicates food insecurity. Based on the recommended daily calorie intake (R) of 2,470 kcal, 59.6% of the rural households were food insecure while 40.4% of them were food secure. Thus more than half of the households were consuming less than the daily per capita calorie requirement. This implies that out of the 260 rural households in the study area, 155 households were food insecure while 105 were not. The result further shows that the household size (adult equivalent) and the dependency ratio (ratio of dependants to household members) of the food insecure households were higher than that of the food secure households. This is an indication that the food insecure households have more adult members to feed than the food secure households and also that there are more dependants (non-working) members in the food insecure households than that of the food secure households. Also the per capita daily calorie available for the food insecure households was 1,781.42 and that of the food secure was 3,334.11kcal. This brings the mean for the two households to 2,408.47kcal.

Based on the food security index - Z, other food security measures were calculated. On this basis, the Head count ratio (H) for the food insecure households was 0.6, indicating that about 60% of households in the study area were food insecure. For secure households, the head count ratio (H) was 0.4, indicating that about 40% of households in the study area were food secure. The absolute value of the shortfall index (P_{sf}) was 0.2787 while the surplus index (P_{sp}) was 0.3498. The shortfall index of 0.2787 implies that the food insecure households fell short of their daily per caput requirement by 28 percent. This translates to 691.6 kcal needed to get out of food insecurity. The surplus index which is 0.3498 implies that the food secure households were in excess of their daily requirement by 35 percent which is equivalent to 864.5 kcal.

Table 3: Summary statistics and food security index of or rural households in Ogun state

Food security indices	Food insecure	Food secure	Total
No of Households	155	105	260
Percentage of households	59.6	40.4	100
Household size(adult equivalent)	5.85	5.70	5.79
Dependency ratio	68.02	67.06	67.63
Per capita daily calorie available	1,781.42	3,334.11	2,408.47
Head count ratio	.60	.40	-
Shortfall/ surplus	-.2787	.3498	-

Source: Computed from Field Survey Data, 2013

CONCLUSION AND RECOMMENDATION

The major findings in this paper have shown that rural households in the study area rely mostly on consumption of carbohydrate at the expense of other classes of food, while the bulk of their consumption is through own production. Result also indicates clearly that there is food insecurity in the study area. The food insecure households fell short of their daily per caput requirement by 28 percent that translates to 691.6kcal needed to get out of food insecurity. The food secure households surplus index of 0.3498 showed respondents being in excess of their daily requirement by 35 percent which is equivalent to 864.5kcal.

Based on the findings in this paper, it is recommended that urgent mobilization of efforts at ensuring farm expansion should be given urgent attention, since majority of the rural households obtained their food from own production. The government and other stakeholders therefore need to assist farming households through provision of adequate access to land, modern farming inputs and equipments required for increase production to ensure regular food supply for the rural populace.

The food consumption level and the food consumption pattern among the rural households at present calls for the enhanced production of arable crops especially roots, tubers and cereals to alleviate the incidence of food insecurity. This requires sensible balancing towards enhanced production of protein sources also to be able to meet the recommended consumption requirements in animal product and legumes. This policy thrust should also be made to imbibe meeting the requirements also in fats/oil, fruits and vegetables. Appropriate policies for mass education in this direction to meeting consumption diversity in the study area will go a long way to meeting the set standards for keeping a healthy and productive population necessary for national development process.

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