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ANALYSIS OF CONSUMPTION PATTERN AND FOOD SECURITY STATUS OF CASSAVA BASED FARMERS IN IMO STATE, NIGERIA.

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ABSTRACT

This study analyzed the food consumption patterns and food security status of cassava farmers in Imo State. Structured questionnaires were administered to 100 cassava farmers. The findings revealed that the cassava farmers mean age, farming experience, and farm sizes were 41 years, 22 years, and 0.66 hectares respectively. The food consumption pattern among the farming households showed that carbohydrate, ranked highest in the list of food items consumed daily (garri (31.18%), fufu (18.33%), plantain, and yam (13.07%). Only 35% of farming households were food secure, using the estimated Food Security Index of 0.003. The study recommends the implementation of pro-poor policies to boost farmers productivity and enhance balanced dietary food consumption among farmers. Farm families will be better able to make food decisions if they are informed about the importance of a healthy diet.

Keywords: Food Consumption, Food Security, Cassava Farmers, Nigeria

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INTRODUCTION

In the world today, developing countries are far from achieving the Sustainable Development Goals SDG, 2030 which are clear mandates of the United Nations. Most developing countries, Nigeria included are challenged with food insecurity, poverty, malnutrition, unsustainable food consumption and production leading to low calorie consumption and stunted growth among the populace of Nigeria Chiaka et al,2022. Food security ensures the availability, affordability, and stability of basic foodstuff to the people. Therefore, a household needs to have access to enough food to meet its nutritional needs, either produced or acquired in quantity and quality, to be food secure (Otu, et al., 2014).The Food and Agriculture Organization FAO (2010) states that the most severe stage that results from food intake is that it is insufficient to meet daily dietary energy requirements known as "hunger," and that the number of undernourished persons on a worldwide scale has risen to an all-time high of 9.9% in 2020 (Nugroho et.al 2022). Most nations' strategic plans against hunger, malnutrition and under-development is commonly achieved through food security (Davies, 2009). About 19.4 million Nigerians were affected by food and nutrition insecurity, food crises, and extreme hunger (FAO, 2022) due to insurgency in the North, Armed banditry and Inflation,

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localized shortfall in cereal, root, and tuber production, worsening conflicts, high food prices, spike in fuel prices, impact of covid-19 and the war in Ukraine.

In 2021, the global food security index (GFSI) as released by the Economist Impact and Corteva Agriscience which measures the cost, ease of access, stability, and quality of food ranks Nigeria 97th out of 113 countries, the ranking reflects the frequency, severity of environmental hazards and reputational loses to Nigeria food industry. Although, a couple of initiatives have been created in Nigeria to fix the problem of food insecurity by improving income and calorie consumption in both availability and value. Farming households in rural communities, particularly smallholder farmers, are most at risk of food insecurity. In line with the World Bank (2001) report poverty, inadequate income, limited ownership of assets, joblessness and instability are multiple hurdles to self-sufficiency which face these farmers and position them at greater risk of food insecurity, family weaknesses and difficulty.

Agriculture is a cornerstone of the Nigerian economy (which accounts for between 10% and 70% of GDP according to the National Bureau of Statistics NBS (2021). However, because most of the nation's agriculture is rain-fed, it is susceptible to catastrophic events. Nigeria is the leading cultivator of most arable crops in the world of which cassava leads with 9.17 million tons in 1971 to 60 million tons in 2020 (Oladoyin et al,2022). It is among the exporter of cassava with 77% of the world export volume of 22,174,000 metric tons of production, if enhanced, has the capacity of providing the nation's minimum food security of 2400 calories per person per day maintaining the daily recommended calorie of 2260kcal (Fakayode et al 2008). According to Githunguri et al., (2017), cassava supplies 38.6 percent of Africa's caloric requirements of which 200 million individuals rely mostly on it to meet their daily calorie needs (Dada 2016). It provides nutrients for more than 700 million families in sub-Saharan Africa. Cassava's demand has grown due to population pressure, income level, urbanization, and changes in family structure, Oladoyin et, al (2022).

Cassava has remained a significant contributor to Nigeria's food security because of its adaptability and tolerance to disease and drought, FAO (2018). In fact, it is one of the crops that are relatively resistant to climate exigences and maintains all year availability Jarvis 2012, Ani & Agbugba, 2017. The cassava plant produces more carbohydrates than any other crop species, possibly even more than sugarcane (Match Maker Associates (MMA), 2007). It is rich in vitamins B, C, Calcium, thiamine, riboflavin, and niacin. Its nutrient properties vary with the age of the crop, soil conditions, climate, and other environmental factors.

A household's pattern of food consumption indicates the quantity and quality of food consumed by the household. The food consumed is categorized based on their respective classes. Carbohydrates are the major source of food nutrient consumed at about 94.5% of total daily per capita calorie intake (Akinyele,2009).

Most middle to low- income countries like Nigeria consume higher quantities of staple food like rice, maize and cassava Chiaka et al 2022. According to Okoye (2021), most carbohydrates

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consumed in Nigeria are cassava-based foods that are ingested regularly, probably several times a day. Wirfat, et al. 2013 states that meals rich in plant food like vegetable oil and low-fat dairy products are usually preferable and beneficial since it has been known to have lower risk of chronic diseases. The globally known diet patterns are Diets to stop hypertension (DASH), Mediterranean diet, prudent pattern high-quality diet, Nordic diet pattern, and Western dietary pattern, which is dominated by processed beef, junk foods, refined cereals, confectionaries, sweets, sugar and ultra-processed food which has a higher risk of chronic health issues like cancer. The rural people of Nigeria are known to consume prudent pattern high-quality diet due to country-specific, culture and availability of plant diets such as cassava which ranks highest in their food table in different forms of *garri* and *fufu*. Despite these obvious benefits, little development and investigation have been made to study the consumption pattern and food security of Cassava Crop farmers in Imo State.

MATERIALS AND METHODS

The study was conducted in Imo State, Nigeria. The state is located in the Southeastern part of Nigeria and lies within latitudes 5°45'N and 6°35'N, and longitude 6°35'E and 7°28'E with an area of 5,067 km3 Anyiam et. al.2019. The population of the State is 3,934,899 persons and mainly subsistence farming households (Imo State Agricultural Development Program ADP 2014). The state has 27 Local Government Area (LGA) and is divided into three agricultural zones, namely; the Okigwe, Owerri and Orlu Agricultural zones respectively.

With an average yearly temperature of above 20°C (68°F), annual rainfall ranging from 1,500mm to 2,200mm, and relative humidity of 75% year-round, the rainy season lasts from April through October. The State fell within the tropical rainforest zone of Nigeria which makes its vegetation habitable for livestock and man.

This study utilised multistage sampling technique that includes the purposive and simple random sampling techniques for sample size selection. In the first stage, purposive sampling technique was employed in choosing the following LGAs; Ihitte Uboma, Okigwe, Ohaji- Egbema, Ngor-Okpala, and Orlu as the sample frame for the study. The selection criteria were based on the five LGAs' with the highest cassava production activity in the area. In the second stage, a simple random sampling technique was used to select one community from each of the five (5) selected LGAs within the state. The third stage involved the random selection of two (2) villages per community to give a total of 10 villages in all. The fourth and final stage involves the random selection of ten (10) cassava farmers from each selected village, thus giving a total of 100 cassava farmers.

Method of Data Collection

A structured questionnaire was utilized to obtain the primary data for this study. Through in-person interviews, the questionnaires were administered to selected group of farmers in the study

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areas. The questionnaire was sub-divided into two main categories, the first category examined the socio-demography of each respondent such as age, marital status, farming experience, farm size, membership of cooperative organization etc. The second category is centered on the dietary pattern of respondents like class of food eaten, no of times food is eaten, presence of any other supplement like snacks, drinks etc. The number of times looked at whether morning meal (breakfast) afternoon meal (lunch) and evening meal (dinner) was eaten or skipped.

Econometric Model Specification: Food Security Index (FSI)

The FSI model was adopted from Omotesho *et. al.* (2006) and Ojeleye (2015) to analyze the food security index to determine the food security status of cassava farming households. To measure the cassava farming household food security status, a food security index was constructed.

$$\text{Food security index FSI (Zi)} = \frac{\text{Household's daily per capita calorie availability}}{\text{Household's daily per capita calorie requirement}}$$

Decision: A household is considered food secure when the food security index (*Zi*) is greater than or equal to 1 ($Zi \geq 1$). But the household is considered food insecure if the food security index (*Zi*) is less than 1 ($Zi < 1$).

RESULTS AND DISCUSSION

Socio-economic Characteristics of the Cassava Farming Households in the Study Area

The socioeconomic characteristics of the farmers are presented in Table 1. The result showed that the farmers were mainly married men with a mean age of approximately 41 years, indicating that the farmers are within the economically productive age. As suggested by Adeola (2010) and Osuji et., al,(2017) people of this age are more resilient to stress and devote more time to agricultural operations, which can lead to increased output. The table shows further that most of the cassava farmers had secondary education. Education increases your awareness and adoption of prudent dietary pattern which involves the classes of food in a balanced manner, Education is an important determinant of food demand and consumption (Onyemauwa,2010).

The mean years of farming experience is approximately 22 years, which suggests that most Cassava farmers have been active in the industry for a considerable length of time. With such extensive experience in cassava farming, these farmers should be able to make sound decisions that will influence their level of productivity and, as a result, ensure their food security. The findings are consistent with those of Dhital & Joshi (2016), who discovered that farming experience was positively associated with the adoption of new recommended agricultural practices but differ from those of Ekepu & Tirivanhu (2016).

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The farmers' average farm size of 0.66 hectares aligns with the findings of Olarinde et al., (2020) who found that cassava cultivation in Nigeria was largely done by smallholder farmers with less than 5 hectares of farmland. Most cassava farmers are members of one or more cooperative societies. Cooperative membership helps farming households obtain credit, information, and input through collective bargaining.

Food Consumption Pattern of Cassava farming household

Table 2 shows the food consumption pattern of cassava farming households in the study area. The table revealed that garri, rice, beef, fish, egg, and sachet milk were some of the major staple foods consumed by farmers in the area. The table also showed the percentage daily per capita calorie consumption of the farmers; Carbohydrates ranked highest with *garri* (31.18%), *fufu* (18.33%), plantain, and yam (13.07%), with rice accounting for the seventh most consumed carbohydrate in their weekly food consumption menu. The high consumption of *garri* (a cassava derivative) in the study area supports Echebiri & Edaba's (2008) assertion that cassava has the potential to provide increased calories for struggling families because it can be processed into a variety of products.

Foods high in protein, especially animal products like beef (1.55%) and fish (0.81%) were also consumed. However, protein products such as egg and milk were consumed less frequently and were not frequently consumed daily. While vegetables like teleferia occidentalis were the most consumed vitamins by the households. Most of the Cassava farming household included red palm oil in their families' diets nearly every day. The nutritional quality of the cassava farming household is greatly improved by the addition of protein, vitamins, fats, and minerals.

The dietary patterns and practices of any group of people are based on the foods that are typically farmed, cultivated, or gathered in the area where they live. These discoveries are especially relevant when considering the intricate food/nutrition systems of the communities that depend on cassava in southeast Nigeria.

Food Security Status of the Cassava farming households

Table 3 shows the findings of the food security status of the households cultivating cassava in the study area. The result shows the classification of cassava farming households based on their food security status using the Food Security Indices (FSI) as an indicator. About 65% of the cassava farming households were food insecure while the remaining 35% of the cassava farming households were food secure. This implies that more than half (65%) of the Cassava farming households within the study area do not have access to sufficient food. This result agrees with Idrisa et al. (2008) that over half of the farming households in Sub-Saharan Africa lack food security. The results here are also similar in terms of food security status to those of Ahungwa et al., (2013), Osuji, (2019), and Oyetunde-Usman & Olagunju (2019), where the proportions of households experiencing food insecurity are larger than those that are food secure.

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According to Abass et al. (2016), this trend in cassava farming households' food security is the reason for the much slower pace of cassava commercialization in the southeast.

The performance or success of development projects as well as the commercialization of the agricultural sector, particularly the cassava subsector, depend on the food security of farming households. The FAO recommended a minimum of 2,250kcal daily calorie intake and the national recommended average is 2,700 kcal. However, the severity index of household food insecurity was 0.003, which was less than the average food security threshold. This meant that the majority of Cassava farming households are not food secure. The cassava farming households' average daily calorie intake index of 1492.25 was significantly lower than both the FAO and national average daily recommended calorie intake. The food-insecure cassava farming households fell 34% short of their daily calorie needs, according to the food insecurity gap indicator, which gauges the extent of divergence from the food security line.

CONCLUSION

Two-thirds of the cassava farmers were not food secure with a daily calorie intake of 1492.25Kcal less 767.746cal of the recommended daily per capita of 2260Kcal. The determinants of food security are alternative income, age, gender, farming experience, membership of cooperatives, and access to credit, government assistance, and productivity index. Farmers should increase their food security by tapping into the social capital provided by cooperative membership and access to credit which can help boost alternative income, dietary patterns, and ultimately food security.

RECOMMENDATION

Cassava farmers are encouraged to produce and consume cassava and its products with vegetables, protein, fats, and oil to improve their food consumption and food security status and increase disease resistance.

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APPENDICES

Table1. Socioeconomic Characteristics of Cassava Farmers

Variable	Mean		
Age	53.54 Years	Farming Experience	22 Years
Farm Size	0, 66 hectares		
Gender			
Male	55.0		
Female	45.0		
Marital Status			
Married	83.3		
Single	16.4		
Level of Education			
Primary	16.3		
Secondary	57.5		
Tertiary	26.3		
Household size			
1 – 3	6.3		
4 – 5	62.5		
7 – 9	31.3		
Cooperative Membership			
Yes	55		
No	45		
Total	100		

Source: Field Survey, data, 2022

Table 2. Food consumption pattern of farmers in the study area

Food Items in grams	Weekly Consumption	KG Equivalent	Calorie Equivalent	Daily Per Cap Cal	Total Daily Per Cap	Rank
Carbohydrate						
Rice	7.663	0.667	2333.231	60.969	2.84	7th
Garri	1.675	7.37	25058	669.076	31.18	1st
Fufu	1.025	4.51	15334	393.219	18.33	2nd
Yam tubers	1.888	9.438	10381.25	280.347	13.07	4th
Cocoyam	0.938	4.125	4537.5	115.729	5.39	6th
Bread	1.125	0.563	1490.625	41.218	1.92	8th
Plantain	1.125	9	10980	280.476	13.07	3rd
Pap	1.788	89.375	44.688	1.156	0.05	

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Potato	0.975	9.75	7507.5	185.669	8.65	5th
Protein						
Cowpea	1.794	0.156	181.025	4.642	0.22	14th
Beef	766.75	0.499	1246.667	33.237	1.55	10th
Fish	680.813	0.34	701.237	17.458	0.81	12th
Eggs	4.64	263.102	40.781	1.113	0.05	16th
Milk	2.7	48.6	20.412	0.579	0.03	17th
Minerals						
Tea	1.425	25.65	102.087	2.864	0.13	15th
Vitamins						
Tomatoes (1.5kg)	1.313	1.969	354.375	9.216	0.43	13th
Vegetables	1.138	1.644	1068.438	28.328	1.32	9th
Fats and Oil						
Palm oil	0.097	88.16	779.331	20.229	0.94	11th
Total per capita daily				2145.525	100	
Adult equivalent				5.863		

Source: Computed from the field data, 2022.

Table 3. Food security indices of Cassava farmers' households in the study area

Statistical Estimates	**Food insecure households**	**Food secure households**
Frequency	65 (65%)	35 (35%)
Average daily calorie intake	1492.254	3358.742
Maximum daily calorie intake	2255.564	5516.807
Minimum daily calorie intake	556.194	2373.335
Standard deviation	484.981	812.301
Food insecurity	0.66	
Food Insecurity Gap	0.34	
TFIG	0.007	
Severity	0.003	