Assessment of Rural Household Propensity to Consumer Value-added Yam and Cassava Flour in Rivers State, Nigeria

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DOI: 10.56201/ijaes.vol.11.no8.2025.pg173.179

Abstract
Assessment of rural households' propensity to consumer value-added yam and cassava flour in Rivers State, Nigeria. The sample size comprised 337 households, selected through multistage sampling procedure. Structured questionnaire was used to collect data for the study. Data analyses were done through the use of descriptive (frequency, percentages and mean). All (100%) were aware of one yam and cassava value-added flours, almost all (99.1%) were aware of both pre-gelatinized and fermented cassava flours, 97.9% were aware of High Quality Cassava Flour (for baking and cooking), 97.3% Fortified Cassava or Yam Flour (with vitamins and minerals), 96.7% Composite flour (cassava or yam mixed with other grains) and 88.1% Dried Yam Flour (Amala). The various ways in which rural households' consumers utilize yam and cassava value-added flour were based for fufu ($\bar{X}$= 3.8), for baking bread, cake and pastries ($\bar{X}$=3.6) and snacks (eg chin-chin, biscuits, etc) making ($\bar{X}$=3.4). The order of preference for yam and cassava value-added flour were High quality cassava flour (for baking, cooking, etc.) ranked first (96.7%), followed by fermented cassava flour (95.3%), pre-gelatinized cassava flour and pounded yam flour (87.3%), dried yam flour (Amala) (83.7%) and composite flour (cassava or yam mixed with other grains) (80.7%).The study recommended that rural households should be encouraged by agricultural extension experts, community leaders and other relevant bodies to consume yam and cassava value added product.

Key Words: *Rural, Household propensity, Consumer, value-added flour and cassava*

INTRODUCTION

The agricultural sector is the bedrock of Nigerian economy; it is a complex engagement that is deeply linked with the nation's cultural, social and economic aspects. Agriculture not only provides a significant portion of the food consumed by the population but also serves as a primary source of employment, especially in rural areas where approximately 70% of the country's population resides, with majority depending and deriving their livelihood from the sector (Adio et al, 2016; Adesakin & Oluwatosin, 2017).

Agricultural production in Nigeria has witnessed the cultivation of several food and cash crops which have contributed significantly to sustaining the lives of the nation's population and its economy. There are various crops which are cultivated in Nigeria. Yam (*Dioscorea* spp.) and cassava (*Manihot esculenta*) stand out as two of the most important staples (Oke et al, 2022). These crops are largely expressed in the Nigerian diets, giving rise to numerous traditional dishes and serving as vital sources of carbohydrates for the majority of the population. Yam and cassava are

grown extensively across different agro-ecological zones in Nigeria, from the humid rainforests of the south to the drier savannas of the north, indicating their adaptability and resilience in varying climatic conditions (Onyediako & Adiele, 2022).

In particular, cassava is among the staple food crop that is widely cultivated by rural peri-urban and urban dwellers in Africa (Banmeke et al, 2021; Jacob et al, 2023;). According to Bentley et al (2017), as a regional asset, cassava serves as one of the most vital basic food sources for over 200 million people living in Sub-Sahara African. In West African sub-region, cassava is the mostly grown food crop due to its value in the sub-regional economy, and as noted by Mondo *et al* (2019) and Acheampong et al (2018), cassava is considered as the number one food crop with high economic transforming value in the region. In Nigeria, cassava is recognized as essential commodity that has the potential to create the needed economic transformation, address the twin problems of food insecurity and mal-nutrition, reduce poverty and generates foreign exchange (Ojeleye, 2018; Acheampong, Onwusu & Nurah, 2018).

Essentially, cassava production in Nigeria does not only serve as source of calories but an outstanding income generating enterprise for rural households (Ojeleye, 2018). Cassava like other agricultural product generates both food and income to about 65-70% of the people living in Nigeria. Udoh et al (2005) asserted cassava to be a popular energy food in tropical regions with prolific yield and production, noting that the crop has successfully replaced cocoyam and other carbohydrates rich crops. The authors further stated that cassava provides up to 40% of all the calories consumed in most African households, and apart from being a major and important staple, cassava is seen as main deriver of starch for both industrial and food purposes. Cassava which can be processed into pellets or chips is fast becoming important in world trade and economy as cheap supplier of energy for livestock such as goats, sheep, pigs, poultry and other livestock. The leaf is consumed as vegetables in some African countries. Interestingly, cassava can be processed into different products such as fufu, starch, flour, garri, chips, biofuel, cassava flakes, medicinal products, ethanol and livestock feed products to boast rural farmers' livelihood (Aluko, Shaib-Rahim & Ogunwale, 2019). Cassava production is critical to Nigeria economy because over 70% of people living in the country especially in rural areas depend largely on cassava for food, income, employment generation, foreign exchange, and raw materials for other industrial and pharmaceutical products (Banmeke et al, 2022). Yam, on the other hand, often referred to as the "king of crops," which belongs to the Dioscoreaceae family, is the second most important staple food in West Africa after cereals (Odunze, 2019; Kulasinghe & Nanaweera, 2019). Traditional yam-based foods in Nigeria include amala, pounded yam and chips, with pounded yam being the most popular across Nigeria's major ethnic groups. Pounded yam also holds cultural significance, being a key dish during yam festivals to celebrate the arrival of new yams. However, the process of pounding yam is labor-intensive and time-consuming. To alleviate this challenge, food scientists developed instant pounded yam, which involves a simple process of peeling, washing, dicing, sulphiting, blanching, drying, and milling yam tubers. The resulting product is yam flour that can be easily stirred into boiling water to make pounded yam.

These products, with their extended shelf life, ease of use, safer transportation and potential for higher economic output, provide a good platform for confronting some of the major problems facing the agricultural sector in Nigeria, while at the same time placing the country as a vital player in the global agricultural landscape. However, success and continued existence of these value-added products in rural areas depends largely on consumers' willingness /disposition to pay for the products (Ayatonye, 2021). Specifically, the study:

i. ascertained the rural households' awareness of yam and cassava value-added flour;

ii. described the various forms rural household consumers utilize cassava and yam flour products;
iii. ascertained rural household consumers' levels of utilization of yam and cassava value-added flours; and
iv. assessed the most preferred yam and cassava value-added flour in the study area.

Methodology

The study was conducted in Rivers State. Rivers State is one of the thirty- six (36) states of the Federal Republic of Nigeria. The state is the treasure base of the nation and blessed with oil and gas resources and it is the heart of the hydro-carbon industry responsible for a huge amount of the nation's foreign exchange earnings generated from the heart of Niger/Delta (Rivers State Diary, 2014). Rivers State is located between latitudes 4º 15'N and 5º 45'N and longitudes 6º 22'E and 7º 35'E.

The sample size of 400 household representatives obtained using the formula suggested by Taro Yamane at 95% confidence level was used for the study. To draw this sample for the study, a multistage sampling procedure was employed. In the first stage, the state was clustered into three (3) agricultural zones. In the second stage, three (3) Local Government Areas (LGAs) were purposively selected from each of the State's agricultural zones and this was based on the rurality of the area. In the third stage, sampling procedure was used to select twenty-eight (28) communities. In the fourth and final stage, simple random procedure was used to select the 400 respondents from the 9 LGAs selected. Primary source was the main source of data for the study. The instruments that were used to collect data from the rural households were structured questionnaire and interview schedule. Data generated from the field were analyzed using descriptive and inferential statistics. Descriptive statistics such as mean, frequency count and percentage were used to present data while inferential statistics such as.

Results And Discussion

According to table 1a, all the respondents (100.0%) were aware of the various value-added flours of yam and cassava origin. This result implies that there may be widespread knowledge and potential market acceptance of yam and cassava value-added flours. This high awareness suggests that information both cassava and yam value added flours have been effectively disseminated through marketing, word-of-mouth, social media or other channels in the study area. This finding contradicts the stance of Aina and Adewumi (2024), who reported that there was low knowledge of value-added cassava flour (Pupuru) in Akoko North-East Local Government Area of Ondo State, Nigeria. It may also indicate familiarity due to cultural relevance or prior exposure. However, awareness does not necessarily translate into willingness to pay for the products.

Table 1a: Respondents' Distribution According to their Awareness of Yam and Cassava Value Added Flours

Variable	Category	Frequency (n=337)		Percentage (%)	
Awareness	Aware	Yam 337	Cassava 337	Yam 100.0	Cassava 100.0
	Not aware	-	-	-	-

Source: Field survey data, 2025;

The table 1b revealed that among the respondents, almost all (99.1%) were aware of both pre-gelatinized and fermented cassava flours, 97.9% were aware of High Quality Cassava Flour (for

baking and cooking), 97.3% Fortified Cassava or Yam Flour (with vitamins and minerals), 96.7% Composite flour (cassava or yam mixed with other grains) and 88.1% Dried Yam Flour (Amala). This result indicates that majority of the rural households in the study area were familiar with the various value- added flours of yam and cassava origin, more respondents were aware of cassava flours than those of yam. This increased awareness may be because of increased promotion of the agricultural value chain within the Nigeria society. Aina and Adewumi (2024) reported that agricultural value chains in Nigeria are expanding rapidly to ensure national food security and reduce or totally eliminate malnutrition.

Table 1b: Awareness of each Yam and Cassava Value-Added Flours

Value-added products	Frequency (n=337)	Percentage (%)
Cassava Flours		
High Quality Cassava Flour (for baking and cooking)	330	97.9
Fortified cassava or yam flour (with vitamins and minerals)	328	97.3
Pre-gelatinized cassava flour	334	99.1
Fermented cassava flour	334	99.1
Yam Flours		
Composite flour (yam mixed with other grains)	326	96.7
Pounded yam flour	295	87.5
Dried yam flour (Amala)	297	88.1

Source: Field survey data, 2025; Multiple responses

The various ways in which rural households' consumers utilize yam and cassava value-added flours according to the respondents are presented in table 4.4. The table revealed the respondents agreed that they utilize yam and cassava value-added flours in the following ways: as base for fufu ($\bar{X}$= 3.8), for baking bread, cake and pastries ($\bar{X}$=3.6), snacks (eg chin-chin, biscuits, etc) making ($\bar{X}$=3.4), making pounded yam ($\bar{X}$=2.7) and as a base for Amala ($\bar{X}$=2.6). On the other hand, the respondents disagreed that they use yam and cassava value-added flours as portage ($\bar{X}$=1.9), soup/stew thickening ($\bar{X}$=2.2), tablet, beer and other alcohol production ($\bar{X}$=1.6) and for infant food manufacturing. The high mean scores for these uses suggest strong consumer preference and potential demand in these segments. The reported consumption patterns indicate that rural household consumers primarily use yam and cassava value-added flours for traditional staple foods such as fufu, baking, and snacks, reflecting their adaptability to existing dietary habits. Yam and cassava value-added flours have a neutral flavor and light texture, making them versatile in a variety of processed goods. This is why Kaur et al (2021) stated that in bread making for instance, cassava flour has successfully replaced part of the wheat flour without significantly changing the product texture and taste. Thus, this may mean that these products have gained wider acceptance in most rural communities in Nigeria.

Table 2: Ways of Rural Household consumers' Utilization of yam and Cassava Value-added Flours

Ways of Yam and Cassava Value-added Flours utilization	SA	A	D	SD	Sum	Mean	Standard deviation (std dev)	Remark
Cassava value-added flour								
For baking bread, cake and pastries	244	70	6	17	1215	3.61	0.76	Agree
As base for fufu	307	7	2	21	1274	3.83	0.75	Agree
For soup/stew thickening	33	87	133	84	743	2.20	0.92	Disagree
Snacks (eg chin-chin, biscuits, etc) making	189	126	6	16	1162	3.43	0.75	Agree
For beer and other alcohol production	8	9	171	149	550	1.61	0.65	Disagree
For tablets production	7	16	147	167	537	1.60	0.68	Disagree
For infant food manufacturing	8	13	148	168	535	1.54	0.68	Disagree
Yam value-added flour								
For making pounded yam	39	208	62	28	933	2.71	0.77	Agree
As a base for Amala	48	150	98	41	879	2.60	0.88	Agree
For portage or other meal	17	71	125	123	654	1.91	0.88	Disagree
Grand Mean						**2.50**		

Source: Field survey data, 2025; Means ≥ 2.50 = Agree, < 2.50 = Disagree

Most Preferred Yam and Cassava Value-added flour

Table 3 revealed that in order of preference, High quality cassava flour (for baking, cooking, etc.) ranked first (96.7%), followed by fermented cassava flour (95.3%), pre-gelatinized cassava flour and pounded yam flour (87.3%), dried yam flour (Amala) (83.7%), composite flour (cassava or yam mixed with other grains) (80.7%) and fortified cassava or yam flour (with vitamins and minerals) (73.6%), which ranked 1st, 2nd, 3rd, 4th, 5th, 6th, and 7th positive, respectively. The overwhelming preference for high-quality cassava flour, fermented cassava flours and pre-gelatinized cassava flour as the result indicates cassava flours versatility in cooking and baking, making it a staple choice for many rural households. Rural household consumers likely link flours of cassava origin with better texture, taste and performance in food making especially as a suitable replacement for wheat flour in baking. This preference is in line with the growing interest in homegrown alternatives to wheat, driven by cost considerations and food security policies of many nations including Nigeria, promoting cassava flour use in bread and other baked goods. Also, the high ranking of fermented cassava flour suggests that traditional food preferences still play a significant role in consumption choices. Fermented flour, specially used for making fufu, is widely

accepted in most rural households due to its characteristic taste, ease of preparation and digestion and long shelf life. This preference suggests the importance of cultural and dietary lifestyle in shaping rural household consumers' choices. Additionally, pre-gelatinized cassava flour (often used in instant food applications) is gaining wider acceptance in rural communities and among rural households, possibly due to the growing need for convenience in meal preparation. Pounded yam flour is also highly ranked, indicating that consumers value convenience in preparing a traditional easy -to- make food without the labour-intensive pounding process. Additionally, the strong preference for dried yam flour (Amala) points the importance of regional and ethnic eating lifestyle particularly in Southern Nigeria, where Amala is fast gaining popularity. From the result, its slightly lower ranking compared to flours of cassava origin suggests that yam flour may have a more particular market relative to cassava flour, which has broader applications. The lower rank of composite flour may indicate that while rural consumers recognize and accept the benefits of diversification (e.g., improved nutrition, texture), they may still prefer the pure forms of cassava and yam flours for traditional foods.

Table 3: Respondents' Most Preferred Yam and Cassava Value-added flour

Yam and Cassava Value-added Flours	Frequency (n=337)	Percentage (%)	Rank
High quality cassava flour (for baking and cooking)	326	96.7	1st
Fortified cassava or yam flour (with vitamins and minerals)	248	73.6	7th
Pre-gelatinized cassava flour	294	87.2	3rd
Fermented cassava flour	321	95.3	2nd
Composite flour (cassava or yam mixed with other grains)	272	80.7	6th
Pounded yam flour	294	87.2	3rd
Dried yam flour (Amala)	282	83.7	5th

Source: Field survey data, 2025;

Conclusion and Recommendation

Rural household consumers were aware of the various yam and cassava value-added flours studied. However, the awareness was more on cassava products than those of yam and they used them for variety of end products (including as base for fufu, for baking bread, cake and pastries, snacks making, making pounded yam and as a base for Amala) for home consumption at a high level. Most rural household consumers prefer High quality cassava flour (for baking, cooking, etc.). It was recommended that rural households should be encouraged by agricultural extension experts, community leaders and other relevant bodies to consume yam and cassava value added product.

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