



ANALYSIS OF CONSUMER PREFERENCE FOR SWEET POTATO ATTRIBUTES IN KANO STATE, NIGERIA

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ABSTRACT

The study was undertaken to examine the consumer preference for sweet potato attributes in Kano State. Descriptive statistics and Garret's ranking were used to analyze the data collected from 251 sweet potato consumers who were systematically selected using structured questionnaire. The results showed that sweet potato consumers had a mean age, household size and monthly income of 34 years, 4 persons and ₦49, 724 respectively. Majority (93% and 77.29%) of the consumers were male and married respectively. The results further indicated variety (mean score = 77.5, ranked 1st), colour (mean score = 72.6, ranked 2nd), dry matter content (mean score = 62.0, ranked 3rd), fibre content (mean score = 53.1, ranked 4th) and sweetness (mean score = 46.0, ranked 5th) were the most attributes considered by the consumers while purchasing sweet potato. It is concluded that majority of the sweet potato consumers were more sensitive to variety, colour and dry matter content in their decision to purchase sweet potato and therefore, recommended that the breeders should take into cognizance these attributes while developing new sweet potato variety to make it more acceptable and marketable commodity to consumers.

Keywords: Analysis, Attributes, Consumers, Kano, Sweet potato.

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INTRODUCTION

Sweet potato (*Ipomoea batatas* (L) Lam) is of increasing importance for food and nutrition security in Sub-Saharan Africa (Reuben *et al.*, 2020). The crop is grown in almost all West African countries (Food and Agriculture Organization Statistics (FAOSTAT), 2018), given its ability to adapt to different environments. Similarly, Nigeria is one of the largest producers of sweet potato in Sub-Saharan Africa with annual production estimated at 4.03 million tonnes per year (Food and Agriculture Organization Statistics, FAOSTAT, 2020). The crop is an important root crop in the country, and because of its broad agro ecological adaptability it can be grown in all of Nigerian 36 states. The concentration of the crop production was in the subhumid zones of Kwara, Plateau, Niger and Benue states but has shifted since 1971 from

these zones to northern semi-arid agro ecological zones, of Kano, Kaduna and Bauchi states (Karya and Otsanjugu, 2019).

Consumer preference for a particular product is the greater liking for one alternative over another. Consumer preference toward a particular crop variety is often influenced by quality attributes such as appearance, smell, texture, and taste, amongst others (Moyo *et al.*, 2022). However, preferences for sweet potato depend on a complex set of attributes. Attributes such as variety, taste, appearance, color, price, texture, and flavor, skin color, flesh color, size, place of origin and shape are some of the indicators that influence the consumer preference of sweet potato (Kivuva *et al.*, 2014).

Thus consumer preferences for sweet potato can determine the success of a newly released variety. The high variability in quality attributes and textural properties of fresh and stored sweet potato roots, coupled with an increasing range of value-added food products from the crop requires that greater attention be paid to understanding the quality characteristics desired by different consumers (Mwanga *et al.*, 2020). Therefore, this study intended to investigate the set of attributes preferred by sweet potato consumers using Garret's ranking technique in Kano State with a view to recommend the breeders to develop the variety that may encompasses such attributes set.

METHODOLOGY Study Area

Kano State is situated in the Sudan Savannah Agro Ecological Zone of Nigeria, ranging between latitudes 9° 30' and 10° 33' North and longitudes 7° 34' to 9° 25' East with a total land area of 42,582.8 km² of which agricultural land is 30,684.8 km², and forest and grazing land is 11,898 km² (Kano State Government (KNSG) (2019). The National Bureau of Statistics (NBS), 2022 estimated the population of Kano State to be 15, 462, 200. More than half of the state's residents are farmers, cultivating legumes, grains, and vegetables. Maize, millet, sorghum and rice are the major food crops produced for local consumption. Other food crops include sweet potato, cassava and cowpea.

The climate of the study area is tropical dry, with a monomial rainfall distribution averaging 600mm per annum, with most rains occurring between May and September. Air humidity is high during the wet season and extremely low during the dry season. The average temperature is 29°C, with a minimum temperature of 15°C occurring from November to February and a maximum temperature of 39°C occurring from March to May (KNSG, 2019). The soils are light, freely graining, and loamy, making them highly adaptable to intensive cultivation. The State is currently made up of 44 LGAs (Kano State Agricultural Development, KNARDA, 2019).

Sampling procedure

A multistage sampling technique was used for data collection in the study area. The first stage involved purposive selection of one Local Government Area from each agricultural zone based on relative abundance of sweet potato marketing and consumption. On that basis Kibiya Local Government was chosen from zone I, Rimi Gado Local Government from zone II and Wudil Local Government from zone III. The second stage, involved purposive selection of one market from each of the selected Local Government Areas based on the size, high involvement in sweet potato marketing as well as for easy access to consumers. On that basis, Kibiya market

was selected from zone I, Rimin Gado markets was selected from zone II and Wudil market was selected from zone III from the selected L.G.As.

After a reconnaissance survey with some of the sweet potato marketers in the markets, the following sweet potato consumers were estimated by the retailers (as there was no sweet potato Marketing record). There were 118, 103 and 97 buyers from Wudil, Rimin Gado and Kibiya Markets respectively, making a total of 318 buyers. A Raosoft online sample size calculator was used to determine the sample size at 95% confidence level and 5% margin of error. A total of 251 was found as a sample size for this study. See Table 1

Table 1: Sample Frame, Sample Size and Sample Location of Market Selected.

Agricultural Zones	LGA	Market Location	Sample Frame	Calculated Sample size
I	Kibiya	Kibiya	97	78
II	Rimin Gado	Rimin Gado	103	82
III	Wudil	Wudil	118	91
Total			318	251

Source:-Field Survey, 2022

Data Collection Procedure

Data were collected using structured questionnaire. The information elicited include socio economic characteristics of the respondents such as sex, age, employment, income, number of children and consumer preferred sweet potato attributes.

Analytical Techniques

Descriptive and inferential statistics and garret’s ranking techniques were employed to analyze the data collected for this study.

Descriptive statistics: Descriptive statistics such as frequency, percentage, mean, minimum and maximum was used to describe the socioeconomic characteristics of the sweet potato consumers in the study area.

Garret’s Ranking Technique: Garrett’s ranking technique was employed to ascertain the consumer preference for sweet potato attributes. In this techniques, consumers were asked to rank the attributes identified for the purpose of this research using numbers 1 to 10 in order of their preference with “1” as the sweet potato attribute preferred most, “2” the second most preferred attribute and “10” as the sweet potato attribute preferred least. These ranks were used to calculate the percentage position using Garrett’s formula as given:

$$\text{Percentage position} = \frac{100 * (R_{ij} - 0.5)}{N_j} \dots\dots\dots i$$

Where:

R_{ij} = rank given for the ith sweet potato attribute by jth consumer; N_j

= number of sweet potato attributes ranked by jth consumer.

The percentage position of each rank was converted into scores referring to the table given by Garrett and Woodworth (1969). For each product ranked, the scores of individual consumers were added and divided by the number of consumers for whom scores were assigned. Therefore, sweet potato attributes were ranked based on the mean scores.

The percentage position and their corresponding Garrett's score is presented in Table 2.

Table 2: Percentage Position and their Corresponding Garrett's Table Value

Rank	Percentage Position	Garrett's Table
1	$100(1 - 0.5)/10$	5
2	$100(2 - 0.5)/10$	15
3	$100(3 - 0.5)/10$	25
4	$100(4 - 0.5)/10$	35
5	$100(5 - 0.5)/10$	45
6	$100(6 - 0.5)/10$	55
7	$100(7 - 0.5)/10$	65
8	$100(8 - 0.5)/10$	75
9	$100(9 - 0.5)/10$	85
10	$100(10 - 0.5)/10$	95

Source: Author's own computation

RESULTS AND DISCUSSION Socio Economic Characteristics of Consumers

The socio-economic characteristics considered in the study are both quantitative (age, household size and income) and qualitative (sex and marital status).

Table 3: Distribution of Quantitative Socioeconomic Characteristics of Sweet Potato Consumers (n=251).

Variable	Frequency	Percentage	Minimum	Maximum
Age (years)				
20 – 27	35	13.94	20	34
28 – 35	125	49.80		
36 – 43	80	31.87		
44 – 51	8	3.20		
52 – 60	3	1.19		
Household Size				
1 – 4	107	42.62	1	4
5 – 8	84	33.46		
9 – 12	35	13.95		
13 – 16	19	7.56		
17 – 20	6	2.40		
Income(naira/monthly)				

₦ 7000 – ₦ 25600	20	7.80	₦ 7000	₦ 100,000	₦49,724
₦ 25700 – ₦ 44300	120	47.80			4
₦ 44400 – ₦ 63000	28	11.15			
₦ 63100 – ₦ 81700	57	22.70			
₦ 81800 – ₦ 100400	26	10.35			

Source: Field Survey, 2022

The results presented in Table 3 revealed that the minimum age group was 20 years, maximum age group was 59 years and mean age was 34 years. This implies that majority of the respondents were at their middle age. And with the increase in consuming food like sweet potato among the middle age households means consuming diet high in fiber low in fat and other component that will result in good health and in turn result in increase in sufficient amount of energy and better physical function. The study also showed that mean household size was 4 which is less than the national average of 5. This implies that sweet potato consumers had a relatively small household size. Therefore, small household size allows for reliable access to sufficient quantity of affordable, nutritious food like sweet potato (Olutope *et al.*, 2020). On the other hand, large household size is associated with increased household consumption expenditure, since almost all members depend on the family. The results further indicated that the mean households monthly income was ₦49,724. The findings proved that most of the respondents are low income earners, and this could negatively affect the consumption pattern of sweet potato. Muhammad *et al.*, (2017), reported that the high variability of household income implies a wider variation in purchasing power of households and subsequently, the households demand for food and household income influences food consumption. **Sex of Sweet Potato Consumers**

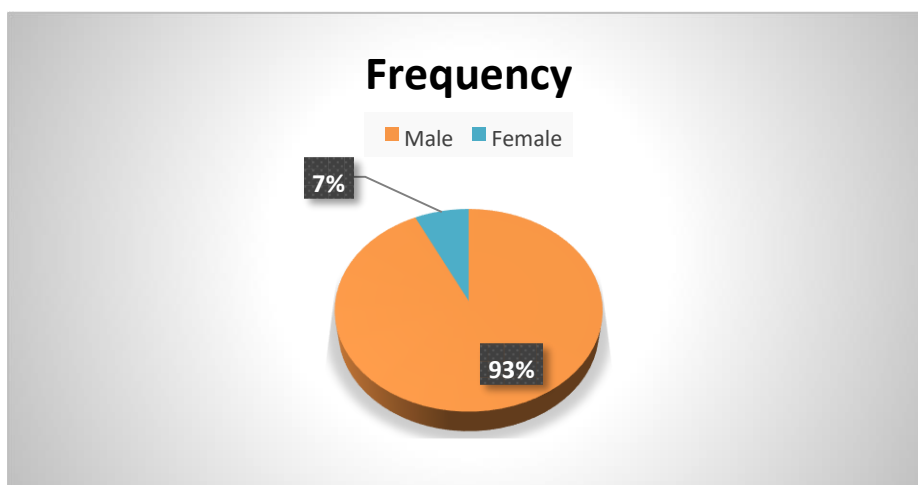


Figure 1: Sex of Sweet Potato Consumers

Source: Field Survey, 2022

As shown in figure 1, the study revealed that, there were more male than females with 93% and 7% respectively. This may be due to religious inclination of the study area whereas; males are to provide for the family while the female are to take care of the domestic activities.

Marital Status of Sweet Potato Consumers

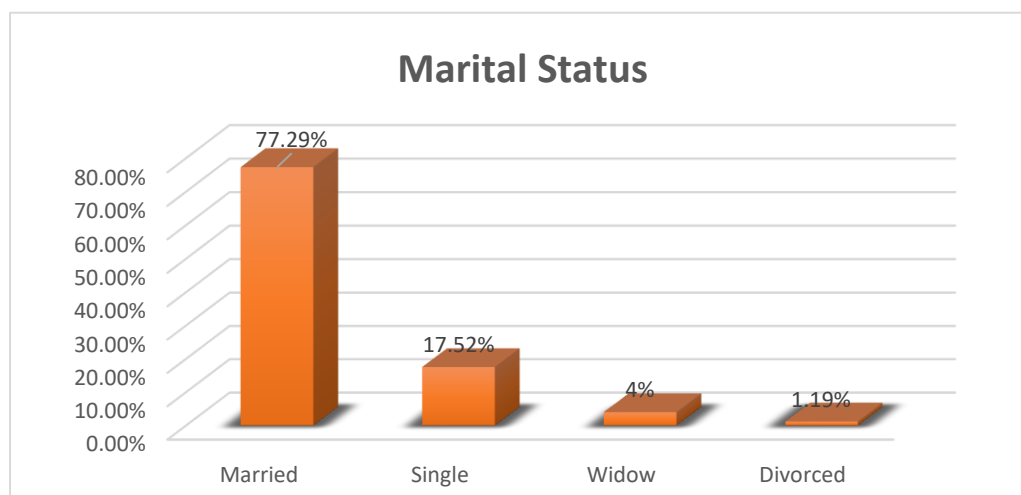


Figure 2: Marital Status of Sweet Potato Consumers:
Source: Field Survey, 2022

The result in figure 2 revealed that majority of the respondents (77.29 %) were married, implying that the respondents were dominated by married men who invariably contributed to increase in household size as well as increase in consumption. The result corroborates with Ejechi *et al.*, (2020) who reported that increase in potato consumption was more among the married class in the various households than the single, divorced and widowed class in Ebonyi State, Nigeria.

Attributes Preferred by the Consumers While Purchasing Sweet Potato Table 4: Garrett's Ranking Results for Consumer Preference for Sweet Potato Attributes (N = 250)

S/N	1 Sweet potato attributes Variety	Garrett's Score	Rank
1		77.5	1 st
2	Colour	72.6	2 nd
3	Dry matter content	62.0	3 rd
4	Fibre content	53.1	4 th
5	Sweetness	46.0	5 th
6	Size	43.5	6 th
7	Price	42.0	7 th
8	Texture	40.9	8 th
9	Shape	38.3	9 th
10	Origin	22.2	10 th

Source: Field survey, 2022.

Table 4 shows Garret's ranking of sweet potato consumer preferences on variety, colour, size, sweetness dry matter content, fiber content, price, shape and origin. The result indicates that

variety, colour, dry matter content and fibre content have the highest ranking positions of 1st, 2nd, 3rd and 4th respectively. This implies that consumer ranking preference of sweet potato is biased towards its variety, colour, dry matter content and fibre content. The findings may be attached to high production of a particular variety in the study area. This finding is in line with Reuben *et al.* (2020) who found out that the most cultivated and preferred variety in Kano State was the local landrace white-fleshed because of its high yield, short maturity period and better market price. Likewise, consumers have high preference for dry matter content roots and fiber content. This may be because moisture content can have a significant impact on sweet potato attributes such as tastes, texture appearance and storage life. This finding corroborates with that of Baafi *et al.* (2015) who revealed that consumers in Ghana desired high dry matter with low fiber content sweet potato variety.

CONCLUSION AND RECOMMENDATION

Based on the finding of this study it can be concluded in the study area that sweet potato consumers were young, married with relatively small household size. Variety, colour, dry matter content, fiber content and sweetness were the attributes preferred most by the consumers when buying sweet potato. Therefore, Breeders and scientists should lay emphasis towards producing sweet potato varieties with regards to the consumers preferred attributes.

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