



## **DETERMINANTS OF VEGETABLE CONSUMPTION AMONG HOUSEHOLDS IN ONITSHA METROPOLIS OF ANAMBRA STATE, NIGERIA**

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### **ABSTRACT**

The study examined determinants of vegetable consumption among households in Onitsha metropolis of Anambra State, Nigeria. Data for the study were collected using structured questionnaire administered to 80 respondents drawn from four (4) zones in the municipality of Onitsha. Data were analyzed using frequency, percentages, mean and multiple regression analysis. Result showed that the age of the respondents, marital status, home distance to market and total monthly income had a positive significant ( $P \leq 0.05$ ) influence on the level of vegetable consumption. The perishable nature of vegetable, seasonality of the product, high cost of vegetable and taste were factors that militate against vegetable consumption. These constraints notwithstanding, vegetable is consumed both on-season and off-season but with less consumption during off-season due its high price. It was recommended that vegetable farmers should organize themselves in cooperative groups in order to provide machines that can process vegetables into forms that can be stored to reduce post-harvest losses as well as making vegetables almost available in all seasons.

**Keywords:** Consumption, Determinants, Households, Patterns, Vegetable.

### **INTRODUCTION**

Vegetables are edible parts of plants that are consumed whole or in parts, raw or cooked as part of main dish (Uzuegbu & Eke, 2000; Okaka *et al.*, 2010; and Schippers, 2000). The tropical and sub-tropical countries of the world are blessed with varieties of vegetables some of which are domesticated, while others grow wild and their prices are relatively affordable when compared with other food items in the areas (Uzuegbu & Eke, 2000; Okaka *et al.*, 2010; and Schippers, 2000). Vegetable consumption is crucial to the availability of micronutrients to the body. This is because these food items are a rich source of vitamins and minerals which are required for the normal functioning of the human body (Ruel *et al.*, 2004). Although required in small proportions, vitamins and minerals are a needed part of the daily diet as the human body is not able to synthesize them in sufficient amounts to meet the nutritionally recommended allowances (Park, 2005). Apart from providing micronutrients, vegetables are known to provide dietary fibers (soluble and insoluble) which are vital for the optimal functioning of the gastro-intestinal tract. They also enable the body to use other nutrients required for its normal functioning (nutrients such as the energy from fats and carbohydrates) (Park, 2005). According to the World Health Organization (WHO, 2002), adequate vegetable intake entails a consumption of at least 400g of vegetables per day, per capita which is an equivalent of 146 kg per year per capita (Ruel *et al.*, 2004). The low consumption of vegetable globally (below the above requirement) is said to be responsible for the increased incidence of cardiovascular diseases as well as some cancers; the two leading causes of death worldwide (Ruel *et al.*, 2004). The WHO (2002) estimated that low vegetable consumptions contribute to approximately 2.7 million deaths per year from chronic diseases, 11% of cardiovascular accidents (CVA) and 31% of Ischemic Heart Diseases (IHD), worldwide (Ruel *et al.*, 2004). Low consumption of vegetables has also been ranked the sixth major risk factor for mortality



in the world (Ruel *et al.*, 2004). Research on patterns of vegetable consumption has shown that vegetable consumption is low in Nigeria (27 to 114 kg/capita/year) which is below the WHO/FAO recommendation of 146 kg/capita/year because Nigerians consume vegetable in low quantity (WHO, 2005). It is believed to be mainly due to the high cost of production of vegetable needed for good health and growth (IFAD, 2009). Nigerians frequently experience agricultural price volatility; previously the fluctuation was mostly associated with the gap between planting and harvesting seasons and a poorly developed infrastructure among other reasons (IFAD, 2009). Poly-Mbah *et al.* (2010) listed the rise in transportation costs caused by bad roads and expensive fuel, farm gate price, and the lack of proper storage among reasons for high cost of food products in Nigeria. The rise in transportation cost in Nigeria significantly affects the production of maize, yam and vegetables (Akande, 2003).

According to Akande (2003), despite the importance of vegetables as a component of a healthy diet, most urban households in Nigeria are unable to afford the required quantity of vegetables per day since they are regarded as poor people with low per capita income and since the commodities attract high prices. According to FAO (2003), increased vegetable consumption has been established as a global priority. Low consumption of these food items have resulted in heavy carbohydrate intake which can only supply the body with energy while other essential elements are lacking. In spite of the numerous vegetable sources, there is still a short fall in consumption/intake in the country and such shortfall have resulted in pronounced malnutrition, infant mortality and some chronic diseases such as diabetes mellitus, cancer, cardiovascular diseases and obesity. The paper therefore, evaluated the determinants of vegetable consumption among households in Onitsha metropolis. The specific objectives of the paper were to:

- i. identify the socio-economic characteristics of vegetable farmers;
- ii. identify of the common types of vegetables and pattern of consumption by the households;
- iii. ascertain the constraints to vegetable consumption; and
- iv. determine of the factors that influenced the level of vegetable consumption.

## **MATERIALS AND METHODS**

### **The Study Area**

The study was conducted in Onitsha in Anambra State, Nigeria with a population 1,003,000 million people (UN Habitat, 2009). The majority of people in Onitsha is Igbo and speaks the Igbo language; however, significant communities from Northern and Western Nigeria live in the city (Okanga & Nwolisa, 2003). Onitsha is located on latitude 6.1°N and longitude 6.8°E in the Anambra North Senatorial Zone of Anambra State (ASLGS, 2007). It occupies the eastern bank of the Niger River, covering some 50 square kilometres. The city is split into two (2) local government areas (LGAs) namely; Onitsha South and Onitsha North. Both areas are bound by Ogbaru Local Government Area (LGA) to the south, Idemili to the North and Oyi to the east, and Anambra East to the west (ASLGS, 2007). The study area is inhabited by civil servants and traders but the majority of the inhabitants are traders. The major economic activities include trading, tailoring, welding, carpentry, hair making and printing.

### **Sampling Procedure and Sample Size**

Multi-stage sampling technique was employed for the study. First, four (4) zones (Fegge, Inland town, Awada, Housing Estate) out of the eight (8) zones in the area were purposively selected. The eight (8) zones were Okpoko, Fegge, Housing Estate, Odakpu, Omogba, Inland town, Awada and Government Reserve Area (GRA). The reason for the purposive sampling technique was due to the high population and number of households in



those zones. In the second stage, 20 households were selected randomly from each zone, giving a total of 80 respondents (Table 1) for the study.

**Table 1:** Sampling Frame and Size Selection Plan of the Study

Agricultural Zone	Layouts	Sample Frame	Sample Size
<b>Onitsha Metropolis</b>	<b>Fegge</b>	<b>40</b>	<b>20</b>
	<b>Inland Town</b>	<b>43</b>	<b>20</b>
	<b>Awada</b>	<b>42</b>	<b>20</b>
	<b>GRA</b>	<b>45</b>	<b>20</b>

**Method of Data Collection**

Data were obtained mainly from primary sources using pre-tested well-structured questionnaire and interview schedule. The data administration focused on: socio-economic characteristics, most common types of vegetable, consumption patterns, determinants and constraints to vegetable consumption. The data were used to identify the most common vegetable and pattern of consumption, the factors that influence the level of vegetable consumption and ascertain the constraints militating against vegetable consumption.

**Analytical Techniques**

Descriptive statistics such as mean, percentages, frequency distribution and Likert scale rating and inferential statistics (multiple regressions) were used. Objective i, ii and iii were achieved using descriptive statistics while objective iv was achieved using multiple regression. Model specification for the linear regression is stated thus:

$$C = f (X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10} \dots X_n, e) \dots(1)$$

$$C = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + e \dots(2)$$

where;

C = level of consumption on vegetables (N);

X<sub>1</sub> = Sex of the respondent (male=1, female=0)

X<sub>2</sub> = Age of the respondent (years)

X<sub>3</sub> = Marital status (dummy variable married 1 otherwise 0)

X<sub>4</sub> = level of education (years)

X<sub>5</sub> = Household size (numbers)

X<sub>6</sub> = Household income (N)

X<sub>7</sub> = Distance from home to market (Km)

X<sub>8</sub> = self-cultivation (yes=1 otherwise 0)

X<sub>9</sub> = farming experience (years)

X<sub>10</sub> = farm size (hectares)

e = error term

In addition, a four (4) point Likert scale rating of “strongly agree (4), agree (3), strongly disagree (2) and disagree (1)” was used to ascertain the constraints militating against vegetable consumption in the study area. The mean and the interval scale used were 2.5 and 0.05, respectively. Mean score above 2.55 was considered a constraint while mean score below 2.55 was considered as not a constraint.



**RESULTS AND DISCUSSION**

**Socio-economic Characteristics of the Respondents**

Table 2 shows the summary of the socio-economic characteristics respondents. From the result, it was shown that majority of the respondents were female (51.2%). This supports the findings of Banwat *et al.* (2012) which stated that female headed households consume more vegetables than male headed households. The result in Table 2 also shows that majority of the respondents are within active age 20-40 (66.2%) and the mean age is approximately 37 years and more than half are married. This implies that vegetable consumption is more with the married who ensure nutritional availability for family members and concern for health issues which is similar to the findings of Menon and Ruel (2003) who opined that the married have larger households than the singles or unmarried.

**Table 2:** Socio-economic Characteristics of the Respondents

Variable	Frequency	Percentage
<b>Sex:</b>		
Female	41	51.2
Male	39	48.8
<b>Age:</b>		
20-30	37	46.2
31-40	16	20
41-50	15	18.8
51-60	6	12.5
61-100	2	2.5
Mean		36.99
<b>Marital Status:</b>		
Married	42	52.2
Single	33	41.2
Widowed	3	3.8
Divorced	2	2.5
<b>Educational level:</b>		
Primary	10	12.5
Secondary	23	28.8
Teachers training	17	21.2
Tertiary	30	37.5
<b>Major occupation:</b>		
Trading	36	45
Civil servant	35	43.8
Other occupations	9	11.2

Source: Field survey, 2016

From the results of Table 2, greater percentage of the respondents attained tertiary institutions, this implies that the majority of the consumers are educated and there is high probability of them having knowledge of the nutritive value of vegetable and its benefits making the household to consume vegetable in large quantity; majority of the respondents were traders, and majority (53%) had household size of 5 to 8 persons. This implies that the majority of vegetable consumers in the study area have a high household size, which is an attribute to the findings that, the larger the size of a family, the more their demand for vegetables will increase. The work done by Aromolaran (2004) also noted that the relationship between household size and the level of vegetable consumption are positive. Majority of the respondents



earned 30,000 to 60,000 naira; had the distance of 3 km to 5 km to cover from home to market, did not cultivate vegetable they consumed (63.8%), had no farming experience (58.8%). This implies that majority of the respondents do not know how to cultivate vegetable and they buy their vegetable from the market.

**Table 2: Socio-economic Characteristics of the Respondents Cont'd.**

Variable	Frequency	Percentage
<b>Household size:</b>		
1-4	26	32.5
5-8	50	52.5
9-12	3	3.8
13-20	1	1.2
<b>Monthly income (₦):</b>		
1000- 30,000		
30001-60000	6	7.5
60,001-100000	39	48.6
100001-1000000	32	40.1
Mean		61,475
<b>Self-cultivation:</b>		
No	3	3.8
Yes	61	63.8
<b>Farming experience</b>		
None	29	36.2
1-20	47	58.8
21-100	29	36.2
	4	5

Source: Field survey, 2016

**Types of Vegetable Consumed and Patterns of Consumption by the Households**

Table 3 shows the types of vegetable and the patterns of consumption. The mostly consumed vegetables in the study area according to their frequency and percentage are *Telfairia occidentalis* (Ugu leave) (100%), *Vernonia amygdalina* (bitter leave) (100%), *Abelmoschus esculentus* (Okra) (96.3%), scent leaves (88.8%), *Pterocarpus soyauxii* (Oha) (83.8%), *Amaranthus* species (Green Amalant) (82.5%), and waterleaf (73.8%). These vegetables have their consumption rate between 71-100% of the respondents in the study area. The other vegetables that are consumed in the area at moderate rate are *Piper guineense* (Uzuza) (66.3%), curry leaves (60%), and *Solanum melongena* (Anara leave) (56.3%). These vegetables have their consumption rate between 50-70% of the respondents while *Gnetum africanum* (Ukazi) is consumed sparingly at rate of 37.5%.

Table 3 also shows the frequency of purchases, most respondents indicated that their purchases are done daily on the mostly consumed vegetable especially *Telfairia occidentalis* (Ugu leave), and also purchase the moderately consumed 3-4 times a week while *Gnetum africanum* (Ukazi) which is the sparingly consumed was purchased weekly. There was no respondent who purchased vegetables either in every 2 weeks or monthly. This implies that respondents are aware of the benefits of vegetables. Considering the average amount spent by the respondents on vegetable monthly, the consumer spent on the daily consumed vegetables a minimum average amount (₦180.75) on waterleaf while the consumer spent a maximum amount (₦724.38) on *Telfairia occidentalis* (Ugu leaves). The consumer spent on the moderately consumed vegetables, a minimum amount (₦80.25) on curry leaves and a maximum amount (₦125.13) spent on *Solanum melongena* (Anara leaves) while the average



amount consumers spent monthly on the sparingly consumed vegetable which is *Gnetum africanum* (*Ukazi*) was ₦64. The reason for this disparity may depend highly on their preferences and taste, others which can be monthly income, disposable income, family size and the frequency of purchase, which is similar to the findings of (Adeoye *et al.* (2013) who noted that the increase in monthly income, disposable income, and family size will also increase vegetable consumption. The results also shows that the cost of vegetables was low between April and September which corresponds to the rainy season making the majority of the respondent (93.8%) to consume more during on-season and the cost of vegetables was high between October and March which corresponds to the dry season making few respondents to consume during off season. This compares favorably with the findings of Idowu-Agida *et al.* (2010) and Banwat *et al.* (2012) who reported that that level of consumption and season have a positive relationship.

**Table 3:** Types of vegetable consumed and patterns of vegetable consumption

Vegetable	*Frequency	Percentage	Monthly ₦ spent	Average ₦ spent	Rank
<i>Telfairia occidentalis</i> ( <i>Ugu</i> )	80	100	57,950	724.38	1
<i>Amaranthus hybridus</i> (Green)	66	82.5	23,870	298.38	6
<i>Vernonia amygdalina</i> (bitter leaf)	80	100	30,870	385.88	2
Waterleaf	59	73.8	14,460	180.75	7
<i>Pterocarpus soyauxii</i> ( <i>oha</i> )	67	83.8	29,500	368.75	5
<i>Piper guineense</i> ( <i>Uzuza</i> )	53	66.3	9,100	113.75	8
Scent leaves	71	88.8	15,790	197.38	4
<i>Gnetum africanum</i> ( <i>Ukazi</i> )	30	37.5	5,120	64	11
Curry leaves	48	60	6,420	80.25	9
<i>Solanum melongena</i> ( <i>Anara</i> leaves)	45	56.3	10,010	125.13	10
<i>Abelmoschus esculentus</i> ( <i>Okra</i> )	77	96.3	32,600	407.50	3

\*Multiple responses were recorded

Source: Field survey, 2016

**Constraints to Vegetable Consumption among Household**

Table 4 shows the constraints that militate against the level of vegetable consumption among households using four (4) point Likert scale rating. The constraints was perishable nature of vegetable with a mean value of 3.19, seasonality of vegetable with a mean value of 2.93, high cost of vegetable with a mean value of 2.78, and taste of vegetable with a mean value of 2.69. These were considered as constraints because their mean values was greater than 2.5 while others such as poor knowledge of the nutritive values, lack of interest of household in the product, and irritates when not properly cooked were considered as not constraints because their mean values was lower than 2.5. The perishable nature of vegetable was ranked the most prevailing constraint that militates against the consumption of vegetable in the study area. This was because 88.8% of the respondents with a mean of 3.19 indicated that it was one of their problems in purchasing vegetable in large quantity as vegetable cannot be preserved for long period of time as compared with other food stuffs, making the respondents to consume vegetable in low quantity because they only buy the quantity they can finish. Adeoye *et al.* (2013) had a similar observation on perishability being one of the factors that reduce the consumption rate of vegetable. The results further shows that the seasonality of vegetable with a mean (2.93) was one of the prevailing constraint to vegetable consumption which 85% of the respondents indicated as a result of vegetable production being seasonal in nature, during the on-season (rainy season); there is high production of vegetable which cause the price to be



affordable to households than during the off-season (dry season) when production was low and of high price. High cost of vegetable with a mean (2.78) also accounted for the low vegetable consumption as 75% of the respondents indicated it as a constraint to their household consumption; this was as a result of high cost of production cause by the current inflation experienced in the country, thereby pushing the household budget away from vegetable consumption. This finding is in line with the study done by Poly-Mbah *et al.* (2010) which stated that the price of the products plays a major role in producer’s decision to supply and consumer’s choices to demand. The tastes of some vegetables with a mean (2.69) are indicated by only 65% of the respondent as constraints to vegetable consumption as the consumers said that the taste of some of the vegetable such as *uzuza* and *okazi* are not to their taste and as such they don’t consume the vegetable. This finding agrees with the study done by Cavallo *et al.* (2019) who opined that consumers choice of vegetables are affected by the physical taste of the vegetable to that particular consumer and that consumers always avoid bitter-tasting food.

**Table 4:** Constraints to Vegetable Consumption among Households

Constraints	Frequency				Total	SA	Percentage			Total (%)	Mean	Rank
	S	A	S	D			A	SD	D			
	A	D										
High cost of vegetable	20	40	2	18	80	25.0	50.0	2.5	22.5	100	2.78	3
Taste	18	34	13	15	80	22.5	42.5	18.8	18.8	100	2.69	4
Poor knowledge of the nutritive value	9	5	47	19	80	11.3	6.3	58.8	23.8	100	2.05	NC
Seasonality of the product	20	48	4	8	80	25.0	60.0	5.0	10.0	100	2.93	2
Lack of interest of household in the product	10	13	34	23	80	12.4	16.3	42.5	28.8	100	1.98	NC
Irritates when not properly cooked	7	29	27	15	80	1.3	21.3	38.8	38.8	100	2.30	NC
Perishability of the product	27	44	6	3	80	33.8	55.0	7.5	3.8	100	3.19	1
It is not preferred by household members	1	17	31	31	80	1.3	21.3	38.8	38.8	100	1.85	NC
Based on prescription by health adviser	3	17	46	14	80	3.7	21.3	57.5	17.5	100	2.06	NC

Note: Likert scale rating decision rule (mean > or = 2.5 accept but mean < 2.5 reject); NC = Not Constraint  
 Source: Field Survey, 2016

**Factors that Influenced Household’s Level of Vegetable Consumption**

According to Table 5, R<sup>2</sup> value was 0.719, implying that 71.9% of the variability was explained in the model that is, the explanatory variables explained 71.9% variation of the dependent variable. The adjusted R<sup>2</sup> was 0.664 which means that 66.4% of the dependent variable was based on the predictors of the independent variables. The F- ratio was 13.021 and is significant at 1% level, signifying the overall significance of the model. Estimates of the determinants of vegetable consumption among households in the urban areas of Onitsha metropolis indicated that total monthly income, age of the respondent, marital status and distance from home to market were significant at one percent (1%) and five percent (5%) levels



of probability. Total monthly income was significant at five percent (5%) level of probability with a positive coefficient. By implication, the coefficient of 0.013 indicated that any 0.013 percent increase in monthly income will lead to a one percent increase in the amount spent on vegetable monthly among households in the study area. This result is in line with (International Agency for Research on Cancer [IARC], 2003).

Table 5: Result of a Multiple Regression Analysis

Variables	Coefficient	Std. error	t-values	Sig.
Constant	-1335.871	616.491	-2.167*	.034
Sex	-38.454	253.881	-.151	.880
Age	49.308	13.151	3.749**	.000
Marital status	562.979	254.345	2.213*	.030
Level of education	-383.320	318.539	-1.203	.233
Household size	6.161	52.132	.118	.906
Monthly income	.013	.005	2.447*	.017
Market distance	144.796	63.505	2.280*	.026
Self-cultivation	-251.727	387.102	-.650	.518
Farming experience	-7.015	17.234	-.407	.685
Farm size	692.481	918.886	.754	.454
R <sup>2</sup>	0.719			
R <sup>2</sup> Adjusted	0.664			
F-statistic	13.021			
Prob.>F	0.000			

\*significant at 5% probability level; \*\*significant at 1% probability level

Source: Field Survey, 2016

Also in Table 5, age of the respondents was significant at one percent level with a positive Sign of coefficient. This implied that with increasing age of the respondents, there is also an increase in the amount spent on vegetable. This result is in line with Correaleita *et al.* (2003), which said that with increasing risk of chronic diseases especially cardiovascular diseases at older ages, older people find additional incentive to consume vegetable for their health benefits. However, this finding contradicts that of Rasmussen *et al.* (2006).

Home distance to market had a positive relationship and statistically significant at 5% probability level. Most consumers travel to a short distance market to obtain vegetable which is attributed to the market sited at strategic points in the study area. This implies that the nearer the market the more the amount the consumer spent on vegetable because their level of consumption will increase because of the availability of vegetable in their locality which they can access easily.

Table 5 further reported that marital status has a positive relationship and statistically significant at 5% probability level. The implication of having married as the status with the highest percentage is that the purchase vegetables will be influenced positively since married couples tend to have a larger number of persons in the same household, thus, an increase in the amount spend on vegetable even with household number not being significant which can be as a result of household budget on other foods. This result compares favorably with the findings of Menon and Ruel (2003) who opined that vegetable consumption is more with the married who ensure nutritional availability for family members and concern for health issues.





## CONCLUSION AND RECOMMENDATIONS

Conclusively, total monthly income, age of the respondent, marital status and home distance to market were the major determinants of vegetable consumption among households in Onitsha Metropolis. All the variables all had positive and significant influence on the level of consumption of vegetable. The respondents consume more vegetables during the on-season than during the off-season; and also, the high or low price of some vegetables made them to be least or most frequently consumed. Factors that deter the consumption of vegetables in the study area includes; high cost, taste, and perishable and seasonality nature of the product. Based on the findings of the study, it was recommended that:

1. The farmers should organize themselves in cooperative groups in order to find methods by which vegetable can be processed into forms that can be stored. This will reduce post-harvest losses as well as making vegetables almost available all seasons and affordable.
2. Both urban and rural households should be encouraged by extension agents to cultivate vegetables. This will make vegetables readily available to all the consumers.

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