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Consumers' Willingness-to-pay for Lettuce in Supermarkets and Specialty Shops in Ilorin Metropolis, Nigeria

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Abstract

This study examines willingness to pay (WTP) for lettuce in supermarkets and specialty stores in Ilorin, Nigeria. A two-stage sampling technique was used to select 250 respondents from two supermarkets and two specialty stores in the study area. Data were collected with structured questionnaire and analyzed with descriptive statistics and Tobit regression. Results showed that 79.2% of the shoppers were willing to pay for lettuce in such shops. The mean WTP for a bundle (averaging 0.5kg) of lettuce by the respondents was ₦640.50, in constrast to the current price of ₦1000.00 per bundle in the study area. The significant variables that positively influenced the consumers' WTP were age ($p < 0.01$), access to food safety information ($p < 0.05$), number of teenagers in the household ($p < 0.05$), household composition above 60 years ($p < 0.01$) and nutritional knowledge of food planner ($p < 0.01$) while importance attached to price negatively affected it ($p < 0.01$). Therefore any food security policy involving sales of lettuce in supermarkets and specialty stores should be made in a way that the price should not be greater than ₦640.50 per bundle. Also, policies aimed at improving access to food safety and nutritional knowledge of household's food planner should be put in place by the government and other food security agencies.

Keywords: Food security, lettuce, policies, shoppers, willingness to pay

Introduction

Vegetables are leafy plants with edible succulent stem portions, petioles and leaves (Okunlola, 2009). Vegetables are rich in vitamins and minerals, which are needed for maintaining good health and prevention of diseases (Hanif *et al.*, 2006; Nwalieji, 2006). Vegetables can also help in the alleviation of several micro nutrient deficiency burdens, especially in the less developed countries which suffer hunger and malnutrition. Low vegetable intake has been identified as a major contributor to mortality and adequate consumption could help prevent major chronic non-communicable diseases. Based on epidemiological findings, diets rich in vegetables have been found to significantly reduce the risk of ischemic heart disease, stroke and type-two diabetes (Bazzano *et al*., 2003). The World Health Organization (WHO)/Food and Agricultural Organization (FAO) (2004) recommends that a minimum of 400g/day of vegetable/fruit is required by an individual. However, the consumption (27-114kg/capita/year) is still very low in sub-Saharan Africa and far below the WHO/FAO recommended level of 146kg/capita/year (WHO/FAO, 2004).

Traditionally, households in Nigeria are used to vegetables sourced from wet or conventional markets. Such vegetables have been identified as less safe (less hygenic) than those obtained from supermarkets and specialty stores (Okello *et al.*, 2010). An important approach to achieve food safety and minimise the health hazards associated with vegetable consumption is the promotion of consumption of quality vegetables in the country. This in turn requires reliable information on consumers' willingness-to-pay a premium for such vegetables and their determinants.

Previous studies on vegetable buying behaviour have shown that the value consumers put on food depends not only on their income but several other influencing intrinsic and extrinsic attributes such as taste, nutritional value, size, colour, weight, among others. The extrinsic attributes are used by consumers to perceive a product quality and as such are described to have influence on consumers' purchasing motive. A study conducted in Ghana by Oboubie *et al*. (2006) revealed that characteristics such as freshness, colour and spotless leaves were considered by consumers' when buying vegetables. Kovacic *et al*. (2002) reports that in Croatia, vegetable buyers consider freshness as the most important characteristic when

buying vegetables. Sensory intric attaributes, such as tastes, also influence consumers' buying behavoiur. Combris *et al*. (2007) in trying to find answers to whether taste beats food safety, found that food safety instantly influenced consumers' willingness-to-pay while taste was preferred to the guarantee of food safety in driving buying behaviour. Other similar factors include healthfulness and environmental friendliness of where the food is produced (Byrne *et al*., 1992; Vander Mey, 2004).

Lettuce is one of the vegetables of importance globally. In Nigeria, the vegetable is now sold in supermarkets and specialty stores with the view to guaranteeing its quality, compared to that which is sold in the wet/spot markets. In order to formulate relevant policies on consumers' preference for vegetables that are sold in supermarkets and specialty stores, there is need to assess consumers' willingness-to-pay for such vegetables. The aim of this study therefore was to examine consumers' willingness-to-pay for lettuce in specialty shops and supermarkets in Ilorin metropolis. The specific objectives are to: describe the socio-economic characteristics of shoppers of supermarkets and specialty shops; investigate the importance attached to quality attributes of lettuce sold in supermarkets and specialty shops; estimate the mean willingness-to-pay for lettuce in such shops and determine factors affecting willingness-to-pay for lettuce in supermarkets and specialty shops by consumers.

Methodology

The Study Area

The study was conducted in Ilorin metropolis. Ilorin is a city, a traditional emirate and capital of Kwara state, Nigeria. It is a major trade centre between the Hausa/Fulani of the north and the Yoruba of the south. It is a major market for locally raised crops (such as tubers, grains and vegetables) and livestock/products (cattle, poultry, dairy and hides).

There are supermarkets and specialty stores that are involved in the marketing of agricultural produce in the city. Such supermarkets and special stores serve as a brand of choice for many consumers across the metropolis. They are said to offer the widest range of products and the highest standards of freshness and quality whilst maintaining the lowest prices.

Sampling and Data Collection Techniques

The target population of interest for this study was made up of shoppers of supermarkets and specialty stores in Ilorin metropolis. A two-stage sampling technique was adopted for the study. First, four stores comprising two supermarkets and two specialty stores were purposively selected. The purposive selection was based on their being renowned for marketing of lettuce. The selected shops were: Shoprite and Martrite (supermarkets) and Temitope Fruits and vegetable Store and Olaitan Store (specialty stores). These form the two strata used for this study. Probability proportion to size sampling technique was used to determine the number of respondents to interview in each of the strata. Systematic random sampling was used to pick respondents in each stratum at purchase points. Every third lettuce buyer was sampled and interviewed until the quota for the target store was attained. Substitution method was used in case of rejection by any potential respondent. In all, two hundred and fifty (250) respondents were sampled and used for the study.

Both primary and secondary data were used for the study. Primary data were sourced from the lettuce buyers through personal interviews using structured questionnaires. Data collected include: socio-economic profile of the respondent, perception and ranking of quality attributes of lettuce sold in supermarkets and specialty stores, willingness-to-pay for such lettuce, etc. Supporting secondary data were also obtained from the internet and published literature.

Method of Data Analysis

Data collected were analyzed with descriptive statistics and Tobit regression. Descriptive statistics like frequency distribution, percentage, ranking techniques and bar chart were used to analyze the socio-economic characteristics of the respondents and also to determine the average amount that the respondents were willing to pay. The mean willingness-to-pay (MWTP) is expressed as:

$$MWTP = \frac{I}{n}\sum_{i=1}^{n} y_i$$

Where n = total number of respondents willing to pay, y_i = WTP for

consumer *i*.

The Tobit model proposed by James Tobin (1958) was used to determine the factors influencing willingness to pay for lettuce by the shoppers. The model is used to describe the relationship between a non-negative dependent variable y_i and an independent variable (vector) x_i (Wikipedia, 2014). This variable linearly depends on the independent variable via a parameter which determines the relationship between the independent variable and the latent variable. In addition, the model has a normally distributed error term to capture random influences on the relationship. The observable variable is defined to be equal to the latent variable whenever the latent variable is above zero and zero otherwise. This model was used because some of the responses on WTP for lettuce were zeros. Hence, its WTP was censored at zero.
The model is expressed as:

$$Y_i = \beta X_i + e_i$$

$$Y = Y^* \text{ if } Y^* \geq 0$$

$$Y = 0 \text{ if } Y^* \leq 0$$

Where

Y_i = Dependent variable i.e. mean WTP

β = Parameter vector

X_i = Independent variables

The explicit form of the model (used) is as follows:

$$Y_i == \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + e_i$$

Where:

Y_i = Dependent variable i.e. mean WTP

$\boldsymbol{\beta}$ = Parameter vector

X_i = Independent variables

X_1 = Gender of the buyer (female = 1, male = 0)

X_2 =Age in (years)

X_3 = Average monthly income (₦)

X_4 = Membership of social organization (member = 1, not a member = 0)

X_5 = Access to food safety information (Have access = 1, No access = 0)
X_6 = Educational attainment (years of successful schooling)
X_7 = Number of active/productive members of the household (household composition between 18 – 60 years)
X_8 = Number of teenagers in the household (household members between 0 – 17 years)
X_9 = Number of aged members of the household (household composition above 60 years)
X_{10} = Importance attached to price (Not important = 4, Less important = 3, Fairly important = 2, Very important, 1)
X_{11} = Nutritional knowledge of food planner of household
e_i = Error term

Results and Discussion

Table 1 shows socio-economic characteristics of the respondents. About 60% of the respondents were females while only 40% were males. This likely suggests that more female shop in supermarkets and specialty stores for lettuce than males. The age of the respondents ranges from 15 – 59 years. The mean age of the respondents was 33 years. This likely suggests that majority of the shoppers were still young. About 48.0% of the respondents were married, while 46.4% were single. The majority (97.6%) of the shoppers had formal education. The household size of about most (93.6%) of the shoppers ranged from one to six persons while the mean household size was about three persons. The shoppers were mainly students and civil servants and they accounted for about 32% and 34% respectively. Seventy-two percent of the shoppers were members of social organisations and the majority of them had knowledge about food safety.

Distribution of the respondents according to their monthly income shows that the majority of the shoppers earned more than ₦18,000, which is the Minimum Wage in the Nigerian civil service.

Table 1. Socio-economic Characteristics of the Respondents

Variables	Category	Frequency	Percentage
Gender	Male	101	40.4
	Female	149	59.6
Age (years)	≤20	35	14.0
	21 – 30	93	37.2
	31 - 40	62	24.8
	41 – 50	46	18.4
	Above 50	14	5.6
Marital status	Single	116	46.4
	Married	120	48.0
	Divorced	6	2.4
	Widowed	4	1.2
	Separated	1	1.6
Educational level	No education	6	2.4
	Primary	28	11.2
	Seconda Y	46	18.4
	Tertiary	170	68.0
Household size	1 – 3	108	43.2
	4 – 6	126	50.4
	7 – 9	11	4.4
	10 – 12	2	0.8
	Above 12	2	0.8
Occupation	None	5	2.0
	Studentship	81	32.4
	Artisans	36	14.4
	Trading	43	17.2
	Civil servant	85	34.0
Employment status	Unemployed	8	3.2
	Student	35	14
	Retired	27	10.8
	Self employed	57	22.8
	Part-time employed	48	19.2
	Full-time employed	35	14
Social organisation	Yes	180	72.0

	No	70	28.0
Food safety information	Yes	183	73.8
	No	67	26.8
Monthly income (₦)	< 18,000	47	18.8
	18,000 – 37,999	53	21.2
	38,000 – 57,999	33	13.2
	58,000 – 77,999	56	22.4
	78,000 – 97,999	20	8. 0
	98,000 – 117,999	10	4.0
	118,000 – 137,999	10	4.0
	138,000 – 157,999	10	4.0
	Above 157,999	11	4.4

Source: Field Survey, 2014

Importance of Quality Attributes to the Lettuce Shoppers

Figure 1 shows the ranking of the importance attached to quality lettuce from supermarkets and specialty stores by the shoppers. From Figure 1, it can be deduced that the safety, nutritional value, sensory quality, hygiene and environmental friendliness are highly ranked when buying in supermarkets and specialty shops compared to convenience, price and ethics. Investigations during the survey revealed that the majority of consumers used different kinds of signals of food safety during the purchase. Consumers who purchase lettuce in supermarkets and specialty stores indicated that they do so because they treat lettuce sold in such stores as being safer than those in the wet and conventional markets. Other lettuce consumers use organic-labels on the produce as signal that the lettuce is safe. This finding is in consonance with Okello *et al.* (2010) who reported that consumers of leafy vegetables in Nairobi used different kinds of signals of food safety during purchase.

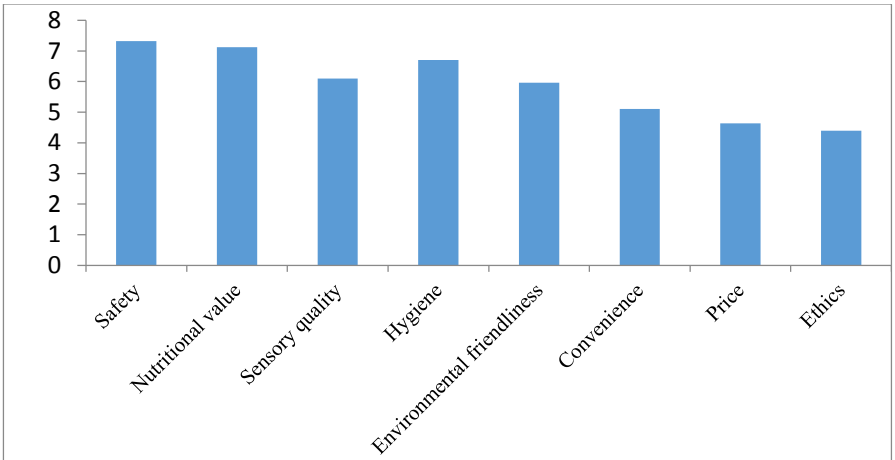

Fig. 1: Ranking of Importance of Quality Attributes of Lettuce by Respondents

Willingness-to-pay for Lettuce by the Respondents

This section examines the level of willingness to pay for quality lettuce by the shoppers. It is worthy of note that the lettuce sold in the supermarkets and specialty stores in the study area vary in weight and size. In most of the shops, a bundle averaging 0.5Kg sells at about ₦1,000.00.

Table 2 shows the consumers' willingness to pay and the amount they were willing to pay. The majority (79.2%) of the shoppers were willing to pay for lettuce from such shops. However, only 8.1% of the willing shoppers (representing 6.4% of all the shoppers) were willing to pay at least ₦1000, which was the least price of a bundle (averaging 0.5kg) of lettuce in the supermarkets and specialty shops in the study area. This suggests that all things being equal not more than 8.1% of the willing shoppers in the study area usually purchased lettuce from such shops, given the average price a bundle (₦1000) . Further analysis of the results revealed that the mean WTP for lettuce by the shoppers was ₦640.50. The analysis also revealed that 55.3% of the willing shoppers (representing 43.6% of all the respondents) could pay more than the mean WTP. This implies that if the price of 0.5kg bundle of lettuce is reduced (from the current ₦1000) to at least ₦640.50, the percentage of willing shoppers will increase (from the current 8.1%) to, at least, 55.3%.

Table 2: Consumers'Willingness and Amount Willing to Pay

Variables	Category	Frequency	Percentage
Willingness-to-pay	Yes	198	79.2
	No	52	20.8
***Amount willing-to-pay pay (₦)**	100 – 399	70	35.6
	400 – 699	61	30.8
	700 – 999	51	25.8
	= 1000	16	8.1

***** Number of willing respondents =198
Source: Field survey 2014

Table 3 shows the results of the investigations made to know why some (20.8%) of the shoppers were not willing to pay for lettuce in the supermarkets and specialty stores. The major constraint limiting the unwilling shoppers from buying lettuce in supermarkets and specialty stores in the study area was high price. This was reported by about 81% of the unwilling respondents, representing 16.8% of all the shoppers interviewed. Other reasons were that 5.8% of unwilling shoppers didn't consume the vegetable, 5.8% were not interested, 3.8% complained of long distance to purchase points while 3.8% complained about the packaging.

Table 3: Major Constraints to WTP for Lettuce by the Unwilling Respondents (n = 52)

Variables	Category	Frequency	Percentage
Factors	High price	42	80.8
	I don't eat it	3	5.8
	Long distance to purchase point	2	3.8
	No interest	3	5.8
	Packaging	2	3.8
	Total	52	100

Source: Field Survey, 2014

Table 4 shows the results of the Tobit regression model used to determine factors affecting WTP for lettuce by the shoppers. The chi-square of 222.01 obtained in this study showed that the variables included in the model were significant. The likelihood function of the model was also significant (Wald = -1403.5629, with $p < 0.0000$). The results in the Table show that five of the independent variables influenced the probability of paying for lettuce by the respondents. The independent variables that positively affected the shoppers' WTP for lettuce were age, access to food safety information, household composition kids 0 – 17 years, household composition above 60 years and nutritional knowledge of food planner while importance attached to price negatively affected it.

Table 4: Determinants of Willingness-to-pay for lettuce by the Respondents

Independent variables	Coefficient	Std error	t-test	p-value
Gender	15.21737	25.13259	0.61	0.545
Age	7.118932	1.117372	6.37***	0.000
Average monthly income	1.11e-06	.0001715	0.01	0.995
Membership of social organization	45.1692	27.48924	1.64	0.102
Access to food safety information	61.35578	27.82076	2.21**	0.028
Educational attainment	4.480772	4.953585	0.90	0.367
Household composition 18 – 60 years	-5.94089	5.66696	-1.05	0.296
Household composition kids 0 – 17 years	41.14723	19.99514	2.06**	0.041
Household composition above 60 years	35.0286	7.107164	4.93***	0.000
Importance attached to price	-22.70517	5.221609	-4.35***	0.000
Nutritional knowledge of food planner	45.17901	6.051014	7.47***	0.000
Constant	182.3061	9.109347	164.3613	200.251
$chi^2(11)$ = 222.01				
Prob > chi2 = 0.0000				
Log likelihood = -1403.5629				
Pseudo R^2 = 0.6803				
Number of observation = 250				

Note: *** and ** = Figures significant at 1% and 5% significant levels respectively.
Source: Field Survey, 2014

The coefficient of respondents' age is positive and significant at 1%. This means that the older ones are more likely to pay for lettuce. This is logical, as older people are always cautious of what they eat or buy for health reasons (Falola, 2014). Also, access to food safety information had a positively significant ($p < 0.05$) relationship with WTP. Also, number of teenagers in the household had a positive relationship with WTP. This could result from the fact that consumers with very young children are very cautious of what they give their children. Number of household members above 60 years was also positively and significantly ($p < 0.01$) related to the shoppers' WTP. This means that people with more old people in the households are likely to be more interested in paying for lettuce from specialty stores and supermarkets.

Importance attached to price was negatively significant at 1%. This implies that if a consumer attaches less importance to price of lettuce in his/her food plan, the consumer will be willing to pay for quality lettuce. On the other hand, if price is very important in one's decision, then willingness-to-pay for lettuce in supermarkets and specialty stores tends to decrease.

Nutritional knowledge of the food planner of a household also significantly ($p < 0.01$) influenced WTP for lettuce in supermarkets and specialty stores. The results reveal that households whose food planners have high level of nutritional knowledge tend to buy lettuce from supermarkets and specialty stores that those whose food planners have low nutritional knowledge.

Conclusion

Given the findings of this study, it can be inferred that a large proportion of the people in the study area are willing to pay for lettuce in supermarkets and specialty stores. However, the mean WTP (₦640.50) in the study area is below the current average price of lettuce (₦1000.00) in such shops. This implies that at present, the actual number of shoppers of lettuce in supermarkets and specialty stores in the study area is less than the potential. Therefore, there is the need for management of supermarkets and specialty stores in the study area to device strategies that will encourage more consumers of lettuce to acquire the vegetable from them. Such strategies may involve devising means of reducing the price of the

vegetable. This may be by sourcing the vegetable from farm gate if possible, increasing scale of purchase of lettuce from the producers (farmers), using methods that will involve reduced transportation cost, reduced packaging cost, and so on. This will reduce the cost incurred per bundle of the vegetable. As such, the specialty stores and supermarkets will be able to sell to willing consumers at reduced price (at most the mean WTP). This will increase the volume of sales of such shops.

This study further revealed that access to food safety information and nutritional knowledge of food planner had positive effects on consumers' WTP for lettuce in supermarkets and specialty stores. Based on these findings therefore, it is recommended that policies aimed at improving households' access to food safety information and nutritional knowledge of household's food planner should be put in place by the government and other relevant food security agencies. This may involve training people on food safety through enlightment programmes. In the same vein, universities and other training institutes could also include food safety nutrition security in their programmes.

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