Consumers' Willingness to Pay for Organic Leafy Vegetables in Oyo State, Nigeria

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Abstract: This study investigated consumers' willingness to pay for organic leafy vegetables in Oyo state, Nigeria. Multistage sampling technique was employed in the selection of one hundred and twenty respondents through structured questionnaire. Data were analyzed using the contingent valuation method, descriptive statistics and logit model. Majority (80.83%) had prior knowledge of organic leafy vegetables with *Cochorus olitorius* as the most preferred. The mean willingness to pay is ₦23.00. Freshness is the major attribute mostly considered by consumers. Age, years of education, awareness of health and environmental benefits positively influenced willingness to pay for organic leafy vegetables while marital status and household size had a negative effect. Hence, efforts should be intensified on improving the educational status of citizens and policy measures oriented towards nutrition security and food safety should include birth-control.

[Omonona Bola. T, Obisesan Adekemi A and Ogunlana Gabriel O. **Consumers' Willingness to Pay for Organic Leafy Vegetables in Oyo State, Nigeria.** *Academ Arena* 2014;6(11):40-45]. (ISSN 1553-992X). http://www.sciencepub.net/academia. 7

Keywords: Consumers' Willingness, Organic Leafy Vegetables, Oyo State, Nigeria

Introduction

Organic agriculture is a production system that sustains the health of the soil, ecosystem and people. Its production system is based on specific and precise standards of production which are based on the goal of achieving optimal agro-systems which are socially, ecologically and economically sustainable to our existence. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships as well as a good quality of life for all involved (IFOAM, 2008). According to the united States Department of Agriculture, organic production is a farming system which avoids or largely excludes the use of synthetically compounded fertilizers, pesticides, growth regulators and livestock feed additives to the maximum extent feasible or farming systems that rely on crop rotation, residues, animal manure, legumes, green manure, off-farm organic waste and the aspects of biological pest control measures, soil productivity and tilt to supply plant nutrients and to control insects, weeds and other pests (Alvares *et al*, 1999).

The role of organic agriculture in providing safe food and income is now gaining wider recognition (Van Elzakker et al, 2007). It is one of the most promising options in meeting the challenge of alleviating poverty, increasing incomes and enhancing trade while at the same time protecting the environment. It is therefore, a powerful tool for achieving the Millennium Development Goals (MDGs) particularly those related to poverty reduction and the environment. It can contribute to meaningful socioeconomic and ecologically sustainable development.

A large number of small scale farmers in Nigeria practice organic agriculture in default of the prohibitive costs of chemicals fertilizers and other agrochemicals (Adeoye, 2011). To attain a higher level of market share, more farmers have to be encouraged to turn to organic farming. However, the future of organic agriculture to a large extent will depend on the consumer demand and their motive for paying extra price for organically grown food. Recently, consumers' awareness of food safety information is being emphasized as a significant policy tool in food demand analysis (Henson, 2005). Food safety is affected by the decisions of producers, processors, distributors, food service operators and government regulations as well as consumers (Caswell, 2003). Thus, a consumer oriented approach to understanding the market for organic products is important for pursuing better management of organic farming (Aryal, 2008). Consumer beliefs, attitudes, responses to originally grown products and the willingness to pay a premium price determine production and marketing strategies.

According to Krissoff (1998), consumers purchase organic products because of the perception that such products are safer, healthier and more environmentally friendly than the conventionally produced alternatives. Hence, awareness and knowledge about organically produced foods are critical in the consumer purchase decisions. Also, willingness to pay for organic foods creates a challenge to sustain organic consumption since prices of these foods are generally higher than those conventional products as a result of increased cost of production.

Vegetables are edible plants or parts of a plant, but usually excludes seeds. Leafy vegetables are plant leaves eaten as vegetables sometimes accompanied by tender petioles and shoots. They require little processing before they are eaten. Vegetable plays a significant role in the socio-economic development of West Africa. It contributes to ensuring food security, provides raw materials for local industries, generates foreign exchange and provides employment for most of the population (Theodore *et al*, 2002). They give high yield per unit area of land, hence, generating high income for the farmers. Leafy vegetables are typically low in calories, low in fats, high in protein per calorie, high in dietary fibre, iron, calcium, vitamin A, vitamin B6 and very high in phytochemicals such as Vitamin C, carotenoids, lutein, foliate as well as vitamin K (Gruda, 2005). They have high content of water and abundance of cellulose. The cellulose though not digested serves a useful purpose in the intestine as roughage, thus promoting normal elimination of waste products (Stanlake and Grant, 1999). The consumption of vegetables in Nigeria has been steadily increasing in the past decades and it is presently estimated to be about 22-47.58kg/person/year (Hart *et al*, 2005). Organic vegetables mostly grown include *celosia argentia* (soko), *cochorus olitorius* (ewedu) and *amaranthus cruentus* (tete) among others.

Considering the benefits of vegetable and in particular organic leafy vegetables, there is a need to analyze the consumers' willingness to pay for organic leafy vegetables in Nigeria. Willingness to pay for a commodity is the amount of money a consumer will be willing to pay for a higher level of quality. It is a measure of the value individuals attached to improvement in food safety (Spencer, 1996). This study therefore contributes to the scanty literature on consumers' awareness and willingness to pay for organic vegetables such as: Dipeolu and Akinbode (2005); Dipeolu et al., (2009); Obayelu et al.,(2014) by filling the huge knowledge gap of estimating the mean willingness to pay for organic leafy vegetables as well as the influencing factors. This study applies the dichotomous choice contingent Valuation Method (CVM) to evaluate consumers' willingness to pay for organic leafy vegetables. The CVM technique is superior to other valuation methods because it is able to capture use and non-use values. Other valuation methods like Hedonic Pricing and Travel Cost method tend to underestimate satisfaction derived from services rendered since they measure use values only. As Freeman (1993) noted non-use values could be larger in some cases, and, as such, the use of measurement techniques that capture only use values underestimates the total derived values. The other reason for using CVM is its ease of data collection and requirement compared to other valuation method.

Specifically, this study examines consumers' awareness of organic leafy vegetables, determine the mean willingness to pay for a kg of organic leafy vegetables and identify the factors that influence willingness to pay for organic leafy vegetables in the study area.

Materials and Methods

The study was carried out in Ibadan, Oyo state. Primary data employed in this study were obtained through the aid of well-structured questionnaire administered to individuals in the study area. Multistage sampling technique was employed in the selection of respondents. The first stage was the purposeful selection of Ido Local Government Area. Premise on the fact that this local government area comprises of rural-urban settlements. The second stage involved the random selection of three wards from the LGA while the final stage involved the random selection of one hundred and twenty respondents proportionate to the population sizes of the wards. Data were collected on their: general socio-economic characteristics, consumers' awareness of organic leafy vegetables and their willingness to pay for organic leafy vegetables.

The analytical techniques employed in this study include descriptive statistics and Logit regression model. Descriptive statistics such as frequency distribution, percentages and mean were employed to assess extent of consumers' awareness of organic leafy vegetables while the logit model was used to analyze the factors influencing consumers' willingness to pay for organic leafy vegetables. The consumers' response to willingness to pay for organic vegetables was characterized as a dichotomous response (yes or no). The cumulative logistic distribution function as derived by Hanemaan (1989) and used by Adepoju and Omonona (2009), in their study on determinants of willingness to pay for improved water supply in Osogbo Metropolis, Osun state Nigeria is given as:

$P_i = E(Y= 1/X_i) = 1 / (1 + e^{-Z})$ …….. (1)

Where, *Y* is dependent variable

P_i is a probability that Y_i =1, its values range from 0 to 1, and it is assumed to be non-linearly related to Z.

$Z = \beta_0 + \beta_i X_i$ …….. (2)

X_i is a set of independent variables

$ß_0$ is the intercept which is a constant

$ß_i$ is the coefficient of the identified variables influencing consumers' willingness to pay for organic foods.

The explanatory variables are as follows:

X_1 = Gender (Male = 1,0 otherwise)

X_2 = Age (Years)
X_3 = Marital Status (1, if married, 0 otherwise)
X_4 = Years of Formal Education (years)
X_5 = Household Size (Number)
X_6 = Household-head Income (Naira)
X_8 = Prevailing Market Price of Vegetable (Naira)
X_9 = Awareness of Health Benefits (yes=1, 0 otherwise)
X_{10} = Awareness of Environmental Benefits (yes=1, 0 otherwise)
X_{11} = Awareness of Source (yes=1, 0 otherwise)
X_{12} = Taste (good=1, 0 otherwise)

Results and Discussion

Socio-economic Characteristics of Respondents

Table 1 shows the distribution of the respondents by socio-economic characteristics. The male respondents constitute the larger percentage (63.33%) of the respondents while 36.67% were female. The average household size was 5. The majority of the respondents (68.33) have their household sizes falling within the range of 1 to 5 persons, with the average age of the respondents being 45. This indicates that most of the respondents are in their economic active age. From the table, 81.66% of the respondents are married, 14.17% are single while the remaining 4.17% of the respondents are either divorced or widowed. Table 1 also reveals that 52.50% of the respondents had between 7 and 14 years of formal education, 45.83% between 15 and 21 years while 1.67% had above 22 years of formal education. A higher proportion of the respondents (82.16%) have an income level of ≤₦100,000 while the remaining 17.84% have income level of above ₦100,000.

Table 1: Distribution of Respondents by Socio-economic Characteristics

Characteristics	Frequency (n=120)	Percentage
Gender Male	76	63.33
Female	44	36.67
Age 20-39	48	40.00
40-59	49	40.83
>60	23	19.17
Marital Status Married	98	81.66
Single	17	14.17
Divorced/ widowed	5	4.17
Years of formal education		
7-14	63	52.50
15-21	55	45.83
22 & above	2	1.67
Household size 1-5	82	68.33
6-10	35	29.17
11 & above	3	2.50
Household income ≤ 100,000	99	82.16
Above 100,000	21	17.84

Major Attributes Considered by Consumers When Purchasing Leafy Vegetables

The major attributes consumers take into consideration when purchasing leafy vegetables is as shown in Table 2. From the table, majority (76.67%) of the respondents take into consideration the freshness of the vegetables while 5.83%, 9.17% and 7.50% consider price, taste and source (point of sale) respectively before purchasing their vegetables.

Table 2: Major Attributes Considered by Consumers When Purchasing Leafy Vegetables

Attributes	Frequency (n=120)	Percentage (%)
Price	7	5.83
Taste	11	9.17
Freshness	92	76.67
Source	9	7.50
Others	1	0.83

Awareness of Organic Leafy Vegetables

Table 3 reveals the respondents' awareness of organic leafy vegetables. The table shows that 80.83% of the respondents are aware of organic leafy vegetables while 19.17% are not aware of the fact that there are leafy vegetables grown without agrochemicals.

Table 3: Awareness of organic leafy vegetables

Awareness	Frequency (n=120)	Percentage (%)
No	23	19.17
Yes	97	80.83

Mean Willingness to Pay for a Kilogramme Organic Leafy Vegetables

Having the knowledge that a bunch of inorganic leafy vegetables cost ₦50, extra amount that consumers will be willing to pay for a similar bunch of different types organic leafy vegetable is as shown in Table 4. The mean willingness to pay for the organic vegetables is ₦23. Majority (66.67%) of the respondents are willing to pay extra amount for a bunch of organic *Celosia argentia* while 33.33% are not willing to pay. Among those willing to pay extra amount, 36.67% are willing to pay between ₦10 and ₦30, 28.33% are willing to pay between ₦40 and ₦60 while 1.67% are willing to pay ₦60 and above. Table 4 also shows that 73.33% of the respondents are willing to pay extra amount for a bunch of organic *Cochorus olitorius* (ewedu) while 26.67% are not willing to pay. From the table, 48.33% are willing to pay between ₦10 and ₦30, 24.17% are willing to pay between ₦40 and ₦60 while 0.83% are willing to pay ₦60 and above. Furthermore, the table reveals that 70% of the respondents are willing to pay extra amount for a bunch of organic *Amaranthus cruentus* (tete) while 30% are not willing to pay. From the table, 39.17% are willing to pay between ₦10 and ₦30, 29.17% are willing to pay between ₦40 and ₦60 while 1.67% are willing to pay ₦60 and above.

Table 4: Willingness to Pay (WTP) for Organic Leafy Vegetables

Willingness to pay (WTP) for organic leafy vegetable	Frequency	Percentage
Celosia argenta (soko)		
WTP Yes	80	66.67
No	40	33.33
Extra amount (₦)		
10-30	44	36.67
40-60	34	28.33
Above 60	2	1.67
Cochorus olitorius (ewedu)		
WTP Yes	88	73.33
No	32	26.67
Extra amount (₦)		
10-30	58	48.33
40-60	29	24.17
Above 60	1	0.83
Amaranthus cruentus (tete)		
WTP Yes	84	70.00
No	36	30.00
Extra amount (₦)		
10-30	47	39.17
40-60	32	29.17
Above 60	5	1.67

Factors Influencing Consumers' Willingness to Pay (WTP) for Organic Leafy Vegetables.

The result of the factors influencing the consumers' willingness to pay for organic leafy vegetables is shown in Table 5. The result of the logit model shows that the log likelihood is -45.9863 and is significant at 1%. From the result, six variables significantly influenced consumers' willingness to pay for organic leafy vegetables in the study area. Age, years of formal education, awareness of health benefits and environmental benefits have positive influence while marital status and household size negatively influenced willingness to pay.

Age has a positive and significant ($p<0.01$) effect on WTP for organic leafy vegetables. This implies that the older proportion of the population will be willing to pay than the younger ones. A unit increase in age will increase the probability of WTP by 1.3%. This might be due to the health related issues and food safety concerns. Marital status significantly ($p<0.1$) reduce willingness to pay by 0.116. Years of formal education has a positive and significant ($P<0.01$) influence on WTP for organic leafy vegetables. From the result, a unit increase in years of formal education will increase WTP by 4.8%. This is as a result of the fact that the educated are knowledgeable about the benefits of organically produced vegetables.

Furthermore, household size significantly ($p<0.05$) reduced WTP by 0.051. Awareness of health benefits has a positive and significant ($p<0.05$) effect on WTP for organically produced leafy vegetables. Awareness of health benefits increases the likelihood of WTP by 0.265. Awareness of the environmental benefit increased the probability of WTP by 0.40 significantly at 1%.

Table 5: Estimates of the Logit Regression for the Determinants of Willingness to Pay for Organic Leafy Vegetables

Variables	Marginal effect	Standard Error	P(Z)
Gender	0.071	0.092	0.440
Age	0.013***	0.005	0.008
Marital status	-0.116*	0.066	0.085
Years of formal education	0.048***	0.015	0.001
Household size	-0.051**	0.022	0.023
Household income	1.830	0.001	0.821
Working experience	-0.002	0.005	0.617
Prevailing market price	0.003	0.102	0.844
Awareness of health benefits	0.265**	0.111	0.026
Awareness of environmental benefit	0.400***	0.034	0.000
Awareness of source	0.064	0.132	0.046
Taste	0.204	0.221	0.357

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*,**,*** are significant levels at 10%, 5% and 1% respectively

Log Likelihood -45.98

Prob.> Chi^2 0.0000

LR Chi^2 23.03

Pseudo R^2 0.3237

Conclusion and Recommendation

The awareness level of the respondents about organic leafy vegetable is high; however, consumers' knowledge on the benefits especially the environmental benefits should be enhanced by awareness campaigns through media, workshop and public lectures. Years of formal education, household size, awareness of health and environmental benefits among others significantly influenced willingness to pay for organic leafy vegetables. Hence, efforts should be intensified on improving the educational status of citizens and policy measures oriented towards nutrition security and food safety should include birth-control.

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11/16/2014