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ASSESSMENT OF WILLINGNESS – TO – PAY FOR HONEY AMONG FARMING HOUSEHOLDS IN ABAKALIKI LOCAL GOVERNMENT AREA OF EBONYI STATE, NIGERIA

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ABSTRACT

The willingness to pay for honey among farming households in Abakaliki Local Government Area of Ebonyi State was studied. The study adopted a combination of descriptive and inferential statistics to analyse the objectives of the study. The findings revealed that the mean age of the farming households was forty-six (46) years with 62.5% of the males engaged in farming. Meanwhile, the mean household size of the farmers was eight (8) and cultivate an average of five (5) hectares and earn an annual farming income of one hundred and forty thousand (₦140, 000.00) naira. Using Kaiser's rule of thumb, the study identified the active nutrients content of honey (0.843), low sugar content of honey (0.572) and medicinal value (0.652) as factors influencing the consumption of honey. Consequent upon the importance of honey, it was observed that that 76.7% of the farmers are willing to pay for honey as interpreted as the Naira (₦) amount that the farming households were willing to pay to obtain honey at an average amount of seven hundred naira (₦700.00) for one litre bottle of honey which was equivalent of $4.46 per a litre. With the F-ration of 44.796 and coefficient of multiple determination (R^2) of 0.764, which implied that about 76% variation in the dependent variable was influenced by the independent variables included in the regression model; marital status (x_3), educational status (x_4), annual income (x_5), farm size (x_6), and household size (x_7) of the farmers were identified as having positive and significant effect on the willingness to pay for honey in Abakaliki L. G. A. of Ebonyi State, Nigeria. The study based on findings, recommended for public enlightenment campaign on the health advantage of honey consumption and utilisation should be intensified by government and non-governmental agencies, supports in form of grants and aids should be given to bee farmers to boost their production level so as to ensure adequate supply of honey.

Keywords: *willingness, to pay, honey, farming household, Abakaliki.*

INTRODUCTION

Willingness to pay for honey is the maximum price a consumer is willing to pay to consume the product. Honey is a sweet, thick viscid fluid of aromatic and agreeable taste produced by the honey bees through the assimilation of nectarines of flowers swallowed, regurgitated, stored and thoroughly opened in the cells of the combs. It is the end purpose for apiculture which serves as business to many people. Honey is primarily a high energy carbohydrate food and its distinct flavour cannot be found else where. Honey sugars are easily digestible and are similar to those in many fruits (USDA, 2007). Honey as the first sweetening agent known to man has been used in cooking as well as a food (Prescott, Harley, and Klein, 1999). It is equally used for creating appetite as well as in strengthening the stomach in the

ancient time (Maccarthy, 1995). These benefits and many others make honey a perfect meal as well as a medicine. Honey is a physiological sugar not a counterfeit and a natural gift to humanity. Although it contains sugar, its sugars are not harmful because they are natural and thus, it's a perfect replacement for refined sugar (Doner, 1977). Honey is a 100% natural food and is easily digested when eaten on its own or associated with other foods. It is the perfect antidote against the tiring stresses and strains of today's life styles. Honey contains tiny amounts of several compounds thought to function as antioxidants (Martos, Fereres and Tomas, 2000). Just like other nutritive sweeteners available, honey is mostly sugars and contains only trace amounts of vitamins and minerals (USDA, 2007). Honey has three amazing properties: hygroscopic, antimicrobial and antioxidant which makes honey a popular food as well as a medicine. Being hygroscopic in nature, it absorbs moisture when exposed to air. It is based on this property of honey that makes it very useful in treating open wounds. The hygroscopic nature of honey makes it an ideal ingredient in cosmetics as it keeps the skin hydrated and fresh as well as prevents drying (Root and Root, 2005). Right from the 11^{th} century the healing properties of honey have been documented by researchers and the development of resistance to antibiotics has led to a resurgence of interest into the healing properties of honey. The antimicrobial agent in honey prohibits the growth of certain bacteria. It contains an enzyme that produces hydrogen peroxide which is believed to be the main reason for the antimicrobial activity of honey (Lavin and Mariely, 2008). Honey also contains natural antioxidant properties that can biologically destroy some destructive chemical agents which have been linked to many diseases such as colitis as well as serving as an effective treatment for some throats and Cough (Ishikawa, 2008).

Honey, today no longer have the significance which it enjoyed previously, it has been forced into the background because of the intrusion of refined sugar in the middle of the eighteen century and the rate of sugar consumption among families is rather alarming because it has been on a continuous increase despite the fact that refined sugar has many negative effects (Yudkin, 1974). According to the United State Department of Agriculture (USDA), about a century ago the daily per capita industrial sugar consumption was about 45 calories but today per capita consumption of refined sugar is about 550 calories. A remarkable fact in modern literature is that honey is so sadly neglected. It is often treated in textbooks and magazines more from a technical view point than from a practical reality and that to a large extent contributes to its neglect (Molan, 2001). Despite the benefits of honey, most farmers are yet to imbibe the habit of honey consumption and that accounts for why there are only few hands engaged in beekeeping business. However, despite the fact that much has been done on the production, marketing, and medicinal properties of honey; there seems to be no empirical records on the farming the households willingness to pay for this natural food and resources. In order to provide solution to the problem, the study specifically, described the socio-economic characteristics of the farming households; determined the factors that influence farming households willingness to pay for honey; estimated farming households willingness to pay for honey; determined the effect of socio-economic characteristics of the farming households on willingness to pay for honey; and analysed the constraints to farmers' willingness to pay for honey in the area.

METHODOLOGY

The study area is Abakaliki Local Government Area of Ebonyi State. The LGA is made up of seven (7) communities namely: Amachi, Amaegu and Edda, Izzi Unuhu, Okpuitumo, Ndiagu Okpuitumo and Enyigba. Geographically, the area lies within longitude 8^0E and latitude 4^0N. The area is bounded by Ebonyi Local Government Area in the North, Ikwo Local Government Area in the south, Obubra Local Government Area of cross-river State in the East and Ezza South Local Government Area in the West. A multi-stage random sampling technique involving four stages was used in selecting respondents for the study. In the 1st stage, 4 communities were randomly selected out of the 7 communities of the study area. In the second stage 3 villages from the 4 communities were randomly selected making it 12 villages, 10 respondent were selected from each of the 12 villages to give a total of 120 respondents that was used as the sample size.

DATA COLLECTION

Data was collected primarily using structured questionnaires which were administered to the randomly selected farmers (respondents).

DATA ANALYSIS

Both descriptive and inferential statistics was employed in the analysis of the data that was collected. Descriptive statistics was used to describe the socio-economic characteristics of the farming households; factor analysis was employed to determine the factors that influenced the farming households' willingness to pay for honey; conjoint analysis was used to estimate the farming households' willingness to pay for honey; and multiple regression analysis was employed to determine the effect of socio-economic characteristics of the farming households on willingness to pay for honey.

Model Specification

i. Conjoint Analysis

Conjoint analysis was adopted for this study. This analysis has consistently been used in determining consumers' willingness-to-pay for products that represent particular characteristics or groups of characteristics (Hair, *et al.*, 2006). It was selected because of the ability to derive willingness to pay estimates for a bundle of attributes, rather than just a single attribute, also because it mimics the typical shopping experience, and has a low cost.
The conjoint analysis model used is calculated as the negative ratio of the coefficient for attributes *i* and the price premium coefficient. Hence, model is stated as:

$$\text{WTP} = \frac{-\beta_i}{\alpha}$$

Where,

WTP = willingness to pay
β_i = coefficient of attribute *i*
α = price premium coefficient.

ii. Multiple Regression Model

Y= (x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8) implicit function

$Y = \alpha_0 + \alpha_1x_1 + \alpha_2x_2 + \alpha_3x_3 + \alpha_4x_4 + \alpha_5x_5 + \alpha_6x_6 + \alpha_7x_7 + \alpha_8x_8 + \varepsilon t$ .... Explicit stochastic

Where:

Y = amount willing to pay (Naira, ₦)
α_0 = constant
α_1- α_8 = coefficients of regression
x_1 = Age
x_2 = Gender
x_3 = Marital status
x_4 = Educational status
x_5 = Farm annual income
x_6 = Farm size (Hectare)
x_7 = Household size
x_8 = Occupation
εt = stochastic disturbance

iii. Model for Likert Scale

$$X_s = \frac{\sum f\mathrm{n}}{nr}$$

Where;

Xs = Mean score
∑ = Summation
f = Frequency of respondents
n = likert value
nr = Number of respondents

Decision Rule: A weighted mean of 2.5 and above was used as an acceptable value of a factor.

RESULTS AND DISCUSSION

Socio-Economic Characteristics

The socio-economic characteristics of the farming households as shown in Table 1 revealed a mean age of forty-six (46) years. This represents the active age of a farmer and it has a strong influence in determining the level of willingness to pay for a commodity. The result agrees with the submission of Forelt and Fovat (2004) that the age of the farmer determines his maturity and decision making ability. The result equally shows that more males (62.5%) are engaged in farming in the area. Thus contradicting van der Ban and Hawkings (1999)

who posited that farming is left for the aged and uneducated people especially women owing to rural-urban migration. The educational status of the farming household indicated that most of the farmers completed a secondary education. Thus, disagreeing with Obibuaku (1983) who opined, that the population of the rural people has a higher rate of illiteracy than the urban population. Meanwhile, the mean household size of the farmers was eight (8) which was a strong indication of having a large family labour that will be actively employed in farming activities. Consequent upon the large household size, the farmers are classified as medium scale who cultivate an average of five (5) hectares and earn an annual farming income of one hundred and forty thousand (₦140, 000.00) naira. This finding is corroborated the finding of Ezike (2011) who reported an average annual income of N185, 987.00 of the Ebonyi State Fadama III users.

Factors Influencing Farming Household's Consumption of Honey

Using Kaiser's rule thumb, Table 2 identified that the consumption of honey among farming households were influenced by two major factors; nutritional factor, and economic factor. The nutritional factors identified were the active nutrients content of honey (0.843), its low sugar content (0.572) and medicinal value (0.652). The economic factor identified was the high cost of honey when compared with other sugars. Hence, it justified Rainer (1996) who posited that the high cost of honey has negatively influenced its consumption especially in the rural areas.

Willingness to Pay for Honey

In view of the fact that not all the farmers can be willing to pay for honey in Abakaliki Local Government Area of Ebonyi State, the study seeks to determine the number of farmers that are willing and the amount willing to pay. From the analysis, it was observed that that 76.7% of the farmers are willing to pay for honey. The willingness-to-pay for honey in this study was interpreted as the Naira (₦) amount that the farming households were willing to pay to obtain honey. From the 76.7% of the respondents as presented in Table 3, it was observed that on average, the farming households are willing to pay seven hundred naira (₦700.00) for one litre bottle of honey. However, the consumers were willing to pay the sum of one thousand two hundred naira (₦1,200.00) if the honey is confirmed to have been harvested from the natural forest and also were willing to pay the sum of one thousand naira (₦1,000.00) if the honey is confirmed to have been harvested from farm.

Effect of the Socio-Economic Characteristics of the Farmers on Willingness to Pay for Honey

The result of the analysis as shown in Table 4 indicates that the coefficient of multiple determination (R^2) was 0.764 which implies that about 76% variation in the dependent variable was influenced by the independent variables included in the regression model. The over all effects of the independent variables on the dependent variable was shown by F-ratio (44.796) which was significant at 1% level of significance. The low value of Durbin-Watson constant indicates absence of autocorrelation in the regression model and implies that the result was of good fit, statistically reliable and can be used to make predictions. It also shows

that the forecasting power of the explanatory variables were very high since relevant variables were not omitted in the regression model. Specifically, the explanatory variables show that the coefficient of gender (x_2) was negative and statistically significant at 1% level. This implies that there is gender bias on the willingness to pay for honey. It could be that male farmers are more willing to pay for honey than their female counterparts or vice-versa. The coefficient of marital status (x_3) of the farmers was positively related to their willingness to pay for honey. This implies that married farmers are more willing to pay for honey the unmarried ones. This could be because of the need to ensure a healthy family living, thus, the consumption of healthy and safe food is imperative. The coefficient of educational status (x_4) of the farmers was positive and statistically significant at 5%. This implies that higher the educational attainment of an individual, the higher his propensity to demand for quality food and products. This was inline with *a priori* expectation that the willingness to pay for honey increases with an increase in the level of education. The coefficient of annual income (x_5) showed a positive relationship with the farmers' willingness to pay for honey in the area. It conformed with the *a prior* expectation that increased annual income that has a resultant effect on the disposable income will lead to increased willingness to pay. It was statistically significant at 1% level of significance. Farm size (x_6) also bore a positive coefficient. This implies that the larger the farm size the greater their level of willingness to pay. This is so because increased farm land will bring about increased annual income and also increased disposable income. The result was significant at 1% level of significance. Household size (x_7) of the farmers was also significant at 1% level of significance and had a positive coefficient. This means that the higher their family size, the higher their willingness to pay for honey as against the expectation that increased family size will lead to a decrease in level of willingness to pay for sugar. It was significant at 1% level of significance.

CONCLUSION

From the finding of the study, it was observed that farming households in Abakaliki L.G. A. of Ebonyi State Nigeria were not very willing to pay for honey. Consequently, the socio-economic characteristics of the farmers have overall effect on the willingness to pay for honey.

RECOMMENDATION

Based on the findings, the following recommendations were made.

i. Public enlightenment campaign on the health advantage of honey consumption and utilisation should be intensified by government and non-governmental agencies.
ii. Supports in form of grants and aids should be given to bee farmers to boost their production level so as to ensure adequate supply of honey.

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Table 1: Percentage Distribution of Socio-Economic Characteristics of Farmers

Variable	Frequency (N=120)	Percentage	Mean
Age			
< 30	5	4.2	
31-40	25	20.8	46

41-50	70	58.3	
>50	20	16.7	
Gender			
Male	75	62.5	
Female	45	37.5	
Marital status			
Single	25	20.8	
Married	80	66.7	
Divorced	5	4.2	
Widowed	10	8.3	
Separated	0	0.0	
Educational level			
No formal education	20	16.7	
Primary school	30	25.0	
SSC/GCE	56	46.7	
TC II	1	0.8	
NCE/OND	11	9.2	
Degree/HND	2	1.7	
Household size			
1-5	42	35.0	
6-10	59	49.2	8
>10	19	15.8	
Farm size (Hectare)			
1-3	38	31.7	
4-6	61	50.8	5
>6	21	17.5	
Annual farm income			
< 100,000	36	30.0	
>500,000	26	48.3	140,000
Farming experience			
1-5	19	15.8	
6-10	40	33.3	10
>10	61	50.8	
Occupation			
Civil service	27	22.5	
Trading	52	43.3	
Artisan	41	34.2	

Source: Field survey, 2012

Table 2: Varimax Result of Factors Influencing Honey Consumption among Farming Households in the Study Area.

Factors	Component 1 nutritional	Component II economic
Low sugar content	0.572	-1.265
Rich in active nutrients	0.843	2.410
Am a bee farmer	-0.077	-0.329
It is cheap	-0.818	0.492
It is medicinal	0.652	0.072

Source: computed from field survey, 2012

Table 3: Percentage Distribution of Farmers based on Willingness to Pay for Honey

Willing	Frequency (N= 120)	Percentage	Amount willing to pay	Amount (₦)
Yes	92	76.7	Average amount willing to pay Farm harvested honey Forest harvested honey	₦700.00 ₦1,000.00 ₦1,200.0
No	28	23.3		

Source: Field survey, 2012.

Table 13: Result of Linear Multiple Regression Analysis

Variables	Variables names	Coefficient of regression	Standard error	t-value	Sig.
Y	Willingness to pay				
β_o	Constant	2.896	.547	5.293	.000
X_1	Age	-.064	.176	-.362	.718
X_2	Gender	-1.251	.250	-5.007	.000*
X_3	Marital status	.608	.181	3.362	.001*
X_4	Educational level	.087	.184	-.476	.635**
X_5	Annual income	.645	.331	1.949	-.054*
X_6	Farm size	.135	.137	-.980	.009*
X_7	Household size	.355	.288	-1.233	.000*
X_8	Occupation	-.502	.385	-1.303	.195 ns

Source: Data Analysis, 2012

* = Significant at 1% level of significance

** = significant at 10% level of significant

R^2 = .764

F-ratio = 44.796

Durbin-Watson = 1.591

Standard error of the estimate = .56475

Regression model is $Y = 2.896 - 0.64\ x_1 - 1.251\ x_2 + 0.608x_3 - 0.87x_4 + 0.645x_5 + 0.135x_6 + 0.355x_7 - 0.502x_8$

(0.547) (0.176) (0.250) (0.181) (0.184) (0.331) (0.137) (0.288) (0.385)

The values in bracket represent the standard error of the estimates.