

Consumer Preference for Watermelon Varieties in Urban Environment of Ibadan Metropolis, Oyo State, Nigeria

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ABSTRACT

Watermelon (*Citrullus lanatus* (Thunb.) Matsum and Nakai)) is becoming very popular among residents in Nigerian cities due its taste, flavor and attractive color. One of its constituent, lycopene, an antioxidant, is known to prevent degenerative diseases such as cancer. Horticultural marketing in Nigeria is becoming sophisticated. Thus, it is therefore important to produce and market varieties of preference. The study examined consumer preference for three watermelon varieties ('Sugar baby', 'Kaolack' and 'Charlton gray') in an urban environment of Ibadan, Oyo state. Primary data was collected from respondents from three randomly selected local government areas in Ibadan Metropolis, Oyo State. Data were collected from 101 randomly selected consumers of watermelon using a multistage sampling technique. The data were analyzed using descriptive and Probit regression techniques. The results revealed that 63.4% of the respondents were females and that the majority was less than 30 years of age (34.65%). Most respondents had a tertiary level of education (80.85%) and were married (69.15%). Although the result of the analysis indicated that there was little difference in the preference scores of 'Kaolack' and 'Sugar Baby', 'Kaolack' has a slight higher percentage of 49%, 'Sugar baby' had 48% while 'Charlton gray' was preferred by only 3% of the respondents. The result also revealed that most of the respondents preferred whole (81.3%), medium-sized (65.9%) watermelon to sliced fruits. 29.4% of respondents purchase watermelon once a week. The result of factors influencing consumer preference for watermelon showed that age, household size and number of children in the household ($P < 0.05$) were important determinants of respondents' preference for watermelon. Research efforts should be concentrated on the development of medium-sized fruits of 'Kaolack' and 'Sugar baby'.

Keywords: 'Charlton gray', 'Kaolack', socioeconomic factors, 'Sugar baby', watermelon

INTRODUCTION

Watermelon is one of the most widely cultivated crops in the world (Huh *et al.* 2008). Watermelon (*Citrullus lanatus*) is a vine-like flowering plant originally from southern Africa (Wiki 2011). Watermelon is an excellent source of Vitamin C and a very good source of Vitamin A notably through its concentration of β -carotene. Watermelon is also a source of the potent carotenoid antioxidant (WHF food 2011). Watermelon is a rich natural source of lycopene, a carotenoid of great interest because of its antioxidant capacity and potential health benefits (Bohm *et al.* 2000). Watermelon is one fruit that is highly recommended especially for people looking at losing weight the healthy way (Health Mango 2010). This wonder-fruit is also effective in treating a number of other medical conditions like diabetes, colon cancer, asthma and arthritis. It has abundant nutrients that are suitable in keeping the weight under control (Health Mango 2010).

There are more than 1,200 varieties of watermelon ranging in size from less than half kilogram to more than 90 kg with flesh that is red, orange, yellow or white (Wiki 2011). China was reported to be leading country in production of watermelon followed by Turkey, United States, Iran and Republic of Korea (Wehner and Maynard 2003; Huh *et al.* 2008).

In Nigeria, the crop has a wide distribution as a garden crop, while as a commercial vegetable production; its cultivation is confined to the drier savanna region of the Nigeria (Anon. 2006). There is an increase in demand for watermelon in Nigeria (Akintoye *et al.* 2009). The largest production of the crop comes from the Northern part of Nigeria

where the suitable agro ecology is found; nevertheless, a good crop could also be achieved in other agro ecologies with intensive management and is still economically feasible. The potentials of watermelon as a cash producing crop is enormous for farmers especially those residing near the urban areas (Watermelon Production guide). According to Adeoye *et al.* (2007) and Oguntola (2006), watermelon is the most preferred among five other exotic vegetables examined in Ibadan Metropolis of Oyo State, Nigeria.

Consumer preference should be considered as an important factor in commercial watermelon production. Consumer preference information is essential to targeting research (Langyintuo *et al.* 2002). Preferences could be conceived of as an individual's attitude towards a set of objects, typically reflected in an explicit decision-making process (Lichtenstein and Slovic 2006). Preference can be notably modified by decision-making processes, such as choices (Sharot *et al.* 2009). Therefore, knowledge of consumer's preferences characteristics can help plant breeders and post-harvest technologists target attributes which are economically viable in their breeding improvement research and postharvest technology development respectively. It is therefore necessary to determine watermelon variety preferred by the consumers. Some basic questions include: Who consumes watermelon and variety preferred? What are the factors influencing consumers preference for watermelon in the study area? The objective of this study therefore was to evaluate and determine consumer preference for watermelon varieties and analyze factors influencing consumer preference for watermelon.

MATERIALS AND METHODS

Study area

The study was carried out in Ibadan, Oyo State, Nigeria between March to June, 2011. There are eleven local government areas (LGAs) in Ibadan: Egbeda, Ibadan North, Ibadan North West, Ibadan North-East, Ibadan South-West, Ibadan South-East, Ido, Lagelu and Oluyole.

Method of sampling and data collection

This study employed a two-stage random sampling procedure to obtain relevant information from consumers of water melon in Ibadan Metropolis. The first stage was the selection of 4 LGAs (Ibadan North, Ibadan North West, Ibadan South West and Iddo) from the Ibadan metropolis. In the second stage, 35 consumers of watermelon were randomly selected from each of the selected LGAs. In all, a total of 102 watermelon consumers were interviewed. However, only 101 had meaningful information for analysis. The data were collected with the aid of a structured questionnaire to capture the socioeconomic characteristics of the consumers and their preference for the watermelon varieties.

Analytical technique

This study employed a number of analytical tools based on the objectives of the study. The tools were: Descriptive statistics such as frequency, mean, standard deviation and percentages for socioeconomic variables; Probit model is used for determinants of consumer preference for water melon. Probit is an econometric model (Wiki, 2011) in which the dependent variable y_i can be only one or zero, and the continuous independent variable x_i are estimated in:

$$\Pr(y_i=1) = F(x_i'b)$$

where b is a parameter to be estimated, and F is the normal cdf. The logit model is the same but with a different cdf for F . A probit model is a popular specification for an ordinal or a binary response model that employs a probit link function. This model is most often estimated using standard maximum likelihood procedure, such an estimation being called a probit regression. Suppose response variable Y is *binary*, that is it can have only two possible outcomes which we will denote as 1 and 0. A vector of regressors X_i are assumed to influence the outcome Y . Specifically, we assume that the model takes form

$$\Pr(Y = 1 | X) = \Phi(X'\beta),$$

where \Pr denotes probability, and Φ is the Cumulative Distribution Function (CDF) of the standard normal distribution. The parameter β is typically estimated by maximum likelihood. The following are a host of explanatory variables (X) which are expected to explain the variation for consumer preference for watermelon in the study area:

X_1 = gender (male = 1 and 0 = female); X_2 = age (years); X_3 = household size (number); X_4 = educational level (year); X_5 = level of income (Naira); X_6 = number of children in household (number).

RESULTS AND DISCUSSION

Socio economic characteristics of respondents

The socio-economic characteristics of respondents are shown in **Table 1**. Most of the respondents were females (63.4%) while remaining are male. This is attributed to the fact that female purchase most of the items that are being required in various homes. About 35% of the respondents were less than 30 years while less than 5% of the respondents are over 60 years. Majority of the consumers are young, active and have easy access to source of cheap supply than the aged who might find it difficult to get. Also, 70.7% of the respondents were educated to the tertiary level. The implication is that educated individual is better aware of importance of vegetables in diet for healthy living and a trend of generational taste. About 66.3% of the respondents

Table 1 Socioeconomic characteristics of water melon consumers.

Variable	Frequency	Percentage
Gender		
Male	37	36.6
Female	64	63.4
Total	101	100
Marital status		
Single	34	33.7
Married	67	66.3
Total	101	100
Age		
< 30	35	34.7
31-40	33	32.6
41-50	21	20.8
51-60	8	7.9
>60	4	4.0
Total	101	100
Occupational level		
Civil servant	42	38.4
Researchers	14	14.1
Students	14	14.1
Traders	19	10.1
Teachers	11	6.1
Farmers	1	1.2
Total	101	100
Educational level		
No formal	4	4.0
Primary	7	7.1
Secondary	18	18.2
Tertiary	72	70.7
Income level (Naira)		
10,000 – 30,000	32	32.3
40,000 – 60,000	18	14.1
70,000 – 90,000	15	15.2
100,000 – 120,000	17	17.2
130,000 – 150,000	5	5.1
Above 160,000	14	14.1
Total	101	100

Table 2 Consumption pattern and preference for the vegetables.

Variable	Frequency	Percentage
Preference for the varieties		
Kaolack	50	49.0
Sugar baby	48	48.0
Charlton	3	3.0
Total	101	100.0
Reasons for purchasing watermelon		
Health benefit	66	65.0
Flavour/taste	26	26.0
Family likes it	8	8.0
Price	1	1.0
Total	101	100.0
Preference for size of watermelon		
Large size	30	29.4
Medium size	58	56.9
Small size	14	13.7
Total	101	100.0
Frequency of purchase		
Daily	3	2.9
Once a week	30	29.4
Twice a week	10	13.8
Thrice a week	14	13.7
Fortnightly	26	25.5
Once a month	15	14.7

were married and most of the respondents were in the income range of 10,000 – 30,000 Naira per month (32.3%). The implication is that in the urban areas of Nigeria water melon is generally seen a source of cheap vitamins among the households.

Table 3 Factors affecting consumer preference.

Variables	CV	SE	z	p>z	(95% conf. interval
Sex	0.1081216	0.627246	.017	0.683	0.1.337501 1.121258
Age	0.0421719	0.0250812	1.68	0.093	-0.0069863 0.0913301
Hhsize	0.270408	0.1363728	1.98	0.047	0.0031223 0.5376938
Edu	0.6415285	0.7364078	0.87	0.384	-0.8018043 2.084861
Income	5.14e-06	8.41e-06	0.61	0.541	-0.0000113 0.0000216
Children	-0.7126058	0.2439532	-2.92	0.003	-1.19075 -0.2344664
constant	-0.8805625	1.182527	0.74	0.456	-3.198274 1.437149
LR Chi ² (6)	40.26				
Prob>Ch ²	0.0000				
Pseudo R ²	0.545				
Log likelihood	-16.8061				

Household's source of watermelon

Result revealed that 46% of the respondents purchased their watermelon from the hawkers while 27% and 20% purchased their watermelon from grocery and retail market respectively. However, only 7% of the respondents patronized Farmers fruits markets for their household need. The result also revealed that most of the respondents preferred whole watermelon (81.3%) to sliced fruits (18.7%). The reasons for preferring whole watermelon was attributed to the hygienic component of whole water melon and the prevention of contaminations and diseases that might result from using unclean knife in cutting the watermelon. Those consumers preferring sliced fruits attributed this to the cheapness, product will not be wasted and in order for them to determine the ripeness of the product as their reasons for purchasing sliced watermelon.

Consumption pattern and preference for the vegetables

The result of the analysis indicated that 49% of the respondents preferred 'Kaolack' of watermelon, 48% preferred 'Sugar baby' watermelon while only 3 percent preferred 'Charlton gray' watermelon in the study area. This implies that 'Kaolack' and 'Sugar baby' watermelon are preferred by the respondents in the study area. The little difference between 'Kaolack' and 'sugar baby' preference scores may be due to the price difference. 'Kaolack' is cheaper than 'Sugar baby'.

The most important reasons for purchasing watermelon in the study area in order of importance are health benefit (65%), flavor/taste (26%), family choice (8%) and price (1%). This did not conform to the findings of Evans (2008) in his study of consumer preference for watermelon in which majority of respondents indicated that flavor/taste is an important reason for consumption of watermelon. Evans (2008) studied different attributes of watermelon such as flesh colour, seed content, lycopene content and price in order to identify the influence of consumer preference on watermelon purchasing behavior.

The result from this study also revealed that most of the respondents preferred medium-sized watermelon (65.9%), large (29.4%) and small (13.7%). The consumers believed that the family will be able to finish the medium sized watermelon at once and that the price will be affordable compared to the large melon.

Frequency of respondent purchase of watermelon is presented in **Table 2**. Most of the respondents purchase watermelon once a week (29.4%). The reason is that water melon is easily perishable and would not stay for long once it is cut. As a result, households tend to buy the quantities they could keep for few days. This was followed by fortnightly (25.5%), twice a week (13.8%), three times a week (13.7%), once a month (14.7%) while only 2.9% purchased watermelon daily.

Factors affecting consumer preference

In order to determine the factors influencing consumer preference for watermelon, probit model was employed. **Table 3** shows that age, household size and numbers of children in the households are important variables affecting consumer preference at levels of significance. The coefficient of age has a positive and significant relationship with preference to a particular variety of watermelon. An additional year to the age of household head would increase the preference of respondent by 0.04%. Household size may be important factors since this will facilitate the consumption of watermelon because of the nutrition values. The results also showed that as household size increases by 1%, water melon consumers' preference increased by 27.0%. In other hand, as the number of children in the household increases, consumers' preference decreased by 71.3%. The reason might be that younger people are fascinated by the colour of the vegetables. In a similar study, Adenegan and Adeoye (2011) examined fruit consumption among University of Ibadan Students, Nigeria. Their findings revealed that students' income and taste were significant determinants of the amount spent on fresh fruits by students. Also, Riediger and Moghadasian (2008) in their study of patterns of fruits and vegetable consumption among Canadian elderly found that total household income was significantly and positively associated with fruit and vegetable intake. A significant positive association between highest education in the household and fruit and vegetable intake was observed among Canadian elderly. They also found that women were significantly and consistently more likely in every age group to be consuming the recommended amount of fruit and vegetable than men. Begum *et al.* (2010), in their study of influence of socio economic factors on food consumption pattern in district Nowshera, found that Monthly total income had a positive influence on all food items i.e. wheat flour, milk, vegetable, meat, tea, fruit and eggs except rice, pulses, sugar and edible fats. Whereas, household size influenced wheat flour, milk, rice, pulses, fruit, vegetables, tea and eggs positively but meat, vegetables and edible fats were consumed independently of household strength.

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