

ASSESSING CONSUMER PERCEPTION AND PREFERENCE FOR FRESH OR PROCESSED CITRUS FRUITS: IMPLICATIONS FOR THE SWEET ORANGE SUPPLY CHAIN IN OYO STATE NIGERIA

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Abstract

This study investigated the level of substitution of fresh fruit for processed fruit and what influences consumers' preference for purchase of fresh citrus or processed citrus in Oyo State. Well-structured questionnaires were used to collect information from 100 respondents using a two-stage sampling technique. Descriptive statistics and probit regression were used to analyze the relationship of socioeconomic factors and respondents' opinion with regards their preference for fresh or processed citrus fruits. From the result of the study, a good number of respondents prefer fresh to processed citrus fruits. The study also revealed that the opinion or perception of the respondents in relation to cost of purchase, nutritional content, negative or positive implication on health influences their preference for fresh citrus while convenience, cost of purchase and nutritional content influence preference for processed citrus fruits. Majority of the respondents indicated that processed citrus may have negative health implications.

Key words: consumer preference, fresh citrus fruits, impact, processed citrus fruits, supply chain, Oyo State

INTRODUCTION

The turn of events in pattern of food consumption globally has made the inclusion of staple fruits in daily dietary need very important. Fruits are vital to humans as many of the food we eat come from them. Many species of mammals, birds and insects rely on fruits for their livelihood. More importantly, fruits are known to have nutritional and commercial values. Indeed, many of the fruits we eat are not merely tasty or delicious but have the advantage of being low in calories and very high in nutrients. Fruits are also a good source of fibre, protein, vitamins and other nourishment which enhance human health and well-being. Again, many fruit trees are categorized as *medicinal plants*, that is, plants that are used for the intention of treating or preventing diseases or ailments in both humans and animals. Over 70 percent of fruits produced globally are citrus [38]. Citrus is a collective name for some allied shrubs or evergreen trees that belong to the rue family. Some common fruits they produce include

lemon, grapefruit, lime, orange and citron. Perhaps the most popular type of citrus fruit is the orange fruit, which comes in different varieties such as the sweet orange (*Citrus sinensis*), sour orange, and the mandarin orange, also known as tangerine. Oranges are of high economic value, constituting about three quarters of the global citrus production which is estimated at over 105 millions tons [9]. Citrus is believed to have appeared in Southeast Asia around 4000BC and later spread to Northern African through migrants. The first worldwide trades of citrus fruit did not appear until 1800s while the sales of orange juice started in the 1940s [10]. Citrus is highly nutritious as it contains some essential nutrients such as Ascorbic Acid, folic acid, potassium, calcium, foliate, thiamine, niacin, vitamin B6, phosphorus and magnesium. The flowers, leaves and rind of the fruit are rich in volatile oil and emit sharp fragrance. Citrus is rich in essential nutrients such as proteins, vitamins, minerals, and water. These nutrients or food substances play a crucial role in maintaining human health and

survival. Nutritionists and dietitians report that citrus fruits are helpful in the treatment of such ailment's toothache, diarrhea, nasal decongestion, vomiting, and weight loss to mention a few. Generally, most fruits are rich in vitamin, which is important for vision and skin care. Vitamin A is also helpful for bone growth and in supporting the immune system. Even though is native to Southeast Asia, the citrus plant has now become a common plant all over the world. And all though China and America are regarded as the two major growers of citrus fruits, many species are also cultivated in different societies of the world. Indeed, world production of citrus fruits is on the rise all over the world. In Tables 1 and 2, we find the various species or types of citrus fruits and the ranking of the

countries with regards to their cultivation or production.

Table 1. Major producing countries of the different types of citrus fruits

Oranges
Brazil, United States, Mexico, India, Spain, China, Iran, Italy, Egypt, Indonesia
Small citrus
Nigeria, China, Syria, Guinea, Japan, Saudi Arabia, India, Sierra Leone, Angola, Tunisia
Lemons and limes
Mexico, India, Iran, Spain, Argentina, Brazil, United States, China, Italy, Turkey
Grapefruit
United States, China, South Africa, Mexico, Israel, Cuba, Argentina, India, Turkey, Tunisia

Source: UNCTAD, 2005 [34].

Table 2. Top ten total Citrus fruits producers 2007 (Metric Tons)

Country	Grapefruit	Lemon and lime	Orange	Tangerine	Others	Total
Brazil	72,000	1,060,000	18,279,309	1,271,000	-	20,682,309
China	547,000	745,000	2,865,000	14,152,000	1,308,000	19,617,000
U.S.A.	1,580,000	722,000	2,865,000	14,152,000	1,308,000	19,617,000
Mexico	390,000	1,880,000	4,160,000	355,000	66,000	6,851,000
India	178,000	2,060,000	3,900,000	-	148,000	6,266,000
Spain	35,000	880,000	2,691,400	2,080,700	16,500	5,703,600
Iran	54,000	615,000	2,300,000	702,000	68,000	3,739,000
Italy	7,000	546,584	2,293,466	702,732	30,000	3,579,782
Nigeria	-	-	-	-	3,325,000	3,325,000
Turkey	181,923	706,652	1,472,454	738,786	2,559	3,102,414
WORLD	5,061,023	13,032,388	63,906,064	26,513,986	7,137,084	155,650,545

Source: FAO of United Nations Economic and Social Department: The Statistical Division 2007 [9].

Nigeria's potential to lead in citrus fruits production is high. It was introduced into Nigeria over 5 decades ago and grew to be one of the major cash crops in the country. Nigeria ranked among the top ten citrus producers in the world [39] (Table 2), with annual production of about 930,000 tons covering 30 million hectares estimated land area. Other major producers include the United States of America and China; these countries and South Africa dominate the grapefruit and Orange export market whereas Nigeria is yet to become a major player [9].

In South West Nigeria, citrus has been reported to be one of the most widely cultivated fruit crops [3]. Citrus production takes place in the rainforest and guinea savannah belt of Nigeria which includes the state of Oyo, Ogun, Ekiti, Osun, Ondo,

Kwara, Kogi, Edo, Delta, Taraba, and Benue. Orange, mandarin, grapefruit and pummelo constitute the four topmost citrus fruit varieties in international trade [36]. Orange is a common citrus fruit which is categorized into sour and sweet orange. Sour oranges are used purely for essential oil while sweet oranges are consumed fresh or juiced [37].

Citrus has gained wide acceptance in Nigeria as a nation as well as in Oyo state as it has become a part of staple food for all. Processed orange juice is one of the main drinks in homes, offices as well as celebrations. Studies show an increase in the consumption of fruit juice from 200 million litres in 2002 to about 320 million litres in 2007 [28]. Processed and packaged fruit juices are served at such occasions as burials, workshops, seminars, naming wedding ceremonies while fresh

citrus is majorly consumed at home either raw or in form of extracted fresh juice.

Citrus Supply Chain

The international citrus marketing chain is dominated by oranges and orange juice because they are the major outputs traded. In the orange chain, harvested fruit may be sold fresh or it may be processed for juice and other by-products. The chain is increasingly being driven by consumers as a result of restructuration and globalization. The fresh fruits sector is characterized by many medium-sized firms supplying the fruit, and the concentration of producers in response to buyers' consolidation. The presence of cooperative organizations in the chain keep it coordinated, enhance better prices and improve negotiating power of activities of growers [35].

There are two major markets for citrus in Oyo state; the fresh and the processed fruits - majorly orange juice (foramfera.com). The fresh citrus supply chain in Oyo state is characterized with so many challenges such as poor harvesting, inadequate and poor storage facilities, poor transportation, inadequate market infrastructure as well as unorganized supply chain among others [31]. Fresh fruits are made available without proper grading, packaging or quality control on the streets, local markets and roadside [24]. On the other hand, the juice processing firms have managed these challenges to some extent by integrating the sectors into the production cycle. They monitor the harvesting, build storage facilities and warehouses or enter into contracts with another company for warehousing and storage. Citrus fruits are processed and are well packaged in tetra packs, bottles or can using modern day equipment. Their marketing strategies involve provision of transportation for conveying the finished produce from the factory to the stores of the retailers where it is made available to the consumers.

Nigeria has a rapidly growing economy, which is gradually translating into improvement in the standard of living of her citizens, including the people of Oyo state. Change in the pattern of food consumption, westernization of our daily meal and desire

for convenience in terms of food preparation, gradually finding footings. Also, health awareness has been on the increase especially in respect to food consumption; the nutritional benefits of taking fruit especially citrus as part of daily dietary requirement and the danger that consuming most of this package food may pose to our health. The result of the above on consumers' preference for citrus fruit either processed or fresh therefore pose a challenge for our citrus industries about how best to take advantage of the growing demand for citrus produce in Nigeria. Other variables such as place of origin, educational status, sex, household disposable income, convenience, price, technological advancement and level of awareness of implication of consuming citrus produce, both fresh and processed, could determine consumers' preference. Therefore, the focus of this study will be to determine the socioeconomic characteristic of respondents, what consumer preference is with respect to fresh or processed citrus fruit and the influence of some of the variables on consumers' attitude. These factors will in turn promote understanding and influence the information reaching the consumer as it is related to purchase decision. It will also help breeders to develop a better variety and also help the juice processing industry [6, 17] in producing a better, well packaged and healthier juice. This could also be a good source of information for farmers willing to go into citrus processing as the result will intimate them with the factors that influence consumers' choices.

Theoretical Framework

The underline factor for consumer preference is the consumer behaviour or utility theory [32]. Individual consumer preferences are measured in terms of the level of satisfaction derived from consuming bundle of goods. But income, and price and other factors may serve as constraints to consumer choice of goods. Consumers make decisions by allocating their scarce resources (income) among available goods or supplies as way of deriving the greatest satisfaction possible. We then say that consumer maximize their utility subject to budget constraint. Utility determinant are

decided by a host of non-economic factors such as education, culture, individual taste and so on. Consumer's preferences are defined as the subjective (individual) taste, as measured by utility of various bundles of goods. They permit the consumer to rank these bundles of goods according to levels of utility they give the consumer. It studies how individuals, groups or organizations select, secure, use and dispose the product or services, to satisfy needs and the impacts they have on the consumer and the society [19]. Studies have shown that the consumers are the beginning of a value chain of agricultural products [21], their perceptions, taste and attitudes determines the success of food production [22], and their acceptance of local products develop domestic manufacturing sector of a free economy like Nigeria [27, 5]. Consumer preferences have been known to directly affect producer's decisions as goods with high demands are more likely to be produced [1]. Consumer production-marketing chain i.e. value chain studies is thus recommended to respond to consumers' changing taste that can respond to their changing tastes [11].

MATERIALS AND METHODS

Methodology

The study area was Ona Ara Local Government of Ibadan, the capital of Oyo State, located in southwestern Nigeria. Ibadan is an urban settlement and covers a total land area of 3,123 km with the main city covering 463.33 km. The 2006 National Population census estimated the population of Ibadan to be about 2,550,593, with an overall population density of about 586 persons per km. Ibadan city is the administrative and commercial headquarter of Oyo State. The city is a center of attraction for investors and potential investors. The same 2006 population census put the total population of Ona Ara at a little above 265,000, and a land area of 3,570 square kilometre. Apart from Akanran, which is the Local Government Headquarter, Ona Ara made up of other important towns and communities such as Gbedun, Olunloyo Amuloko, Olorunsogo and Araromi to mention a few. Ona Ara has a Traditional

Council and many other local chiefs who are charged with maintain peace and cohesion among the citizens and the various communities. While in the past Ona Ara lacked such social amenities as good roads, electricity and potable water, presently, some of these amenities have been provided by the State Government. In Ona Ara, while the main occupation of the men is farming, the women combine farming with petty trading. Ona-Ara is gradually becoming of mixed ethnicity due to migration. Though the people are predominantly of the Yoruba ethnic group, the last decade, has witnessed tremendous vertical movement, particularly from neighboring Benin Republic. The migration route is normally through Ogun state. The migrant workers are itinerant labourers that help in farm works. Similar, there are the Igedes from the Middle-belt of Nigeria, they are also majorly farmers, and motorcycle commercial drivers, with some of their females engaged as house maids.

Ona-Ara Local Government Area is divided into 11 wards. The wards, in order of number, are: Akaran, Araro, Badeku, Gbada, Idi-Ose, Idi-Osan, Olunloyo, Ajia/Odoku, Olorunsogo, Gbedun and Ore Meji. The five urban settlements among these wards are Idi-Ose, Idi-Osan, Olunloyo, Olorunsogo and Ore-Meji. Citrus is being produced in Ona Ara local government but not on a commercial scale. Farmers cultivate this crop on less than 15 acres of land. Citrus production in this area is characterized with high incidence of pest and diseases, decaying of fruits before maturity, water deficit in soil and climate change [2]. Fresh citrus is sold in the main market by the farmers and it is made available to the consumer by the retailers, who are majorly street hawkers. Processed citrus (juice) is sold in small retail shops or local markets. Ona Ara local government was selected for this study because of its mixed population. That is, the local government is made up of peri-urban as well has rural area which is a representation of the composition of Ibadan and Oyo state at large.

Data Type and Collection

Primary data was collected from respondents using two-stage sampling. Three different

wards within the local government was selected using simple random sampling. These wards are Akanran, Badeku, Gbedun. Collection of data from the respondents was done using purposive sampling method. Person-to-person interview was conducted using well-structured questionnaires administered to selected respondents to gather information on their socio-economic characteristics as well as the demographic variables. These include age, sex, educational qualification, monthly income, marital status. Data was also collected on health awareness, disposable income (especially expense on food items), and desire for convenience in preparation or consumption, location and status in the family.

Method of Data Analysis

Descriptive statistic was employed to analyze the socio-economic characteristics of respondents while frequency distribution was adopted to show the percentage of respondents who prefer fresh citrus and percentage of respondents who prefer processed citrus, based on their socioeconomic attributes. Frequency distributions are visual displays that organize and present frequency counts so that the information can be easily interpreted. It can show absolute frequencies or relative frequencies, such as proportions and percentages. Frequency tables can be shown in a table or a graph. Some common methods of showing frequency distributions include frequency tables, histogram or bar chart, pie chart and box distribution.

Regression analysis was done using a probit model to assess the relationship between the variables and consumer preference. A probit model, is used to model binary outcome variables by modelling the inverse standard normal distribution of the probability as a linear combination of the independent variables. The purpose is to estimate the probability that an observation with particular characteristics will fall into a specific binary category. Suppose Y is a response variable which is binary; that is, it has only two possible outcomes denoted as 1 and 0 [4, 7]. In this case Y represents preference for or against fresh orange juice. The outcome

variable Y is assumed to be influenced by a set of independent variables or vector of regressors, X. The model is expressed as:

$$\Pr(Y = 1 | X) = \Phi(X^T \beta) \quad \dots \quad (1)$$

where:

Pr = Probability

Φ = Cumulative Distribution Function of the standard normal distribution

β = Parameter to be estimated through the maximum likelihood method

The model may also be presented as a latent variable; given the expression:

$$Y^* = X^T \beta + \varepsilon \quad \dots \quad (2)$$

where:

Y^* = Auxiliary random variable or latent variable

$X^T \beta$ = As defined above

$\varepsilon \sim N(0,1)$

Y is an indicator for whether the latent variable is positive as expressed below [7]:

$$Y = \begin{cases} 1 & Y^* > 0 \\ 0 & \text{Otherwise} \end{cases} = \begin{cases} 1 & X^T \beta + \varepsilon > 0 \\ 0 & \text{Otherwise} \end{cases} \quad \dots \dots \dots \quad (3)$$

The explanatory variables are a range of perception scores based on likert scale analysis. The key perception points examined are: Health benefits, nutritional benefits, social status, cost implication, convenience and absence of negative effects on the body.

RESULTS AND DISCUSSIONS

Consumers' Socio-economic Characteristics

The socio-economic characteristics of respondents considered in the study are sex, age, marital status, educational qualification, family size and monthly incomes and so on. As shown in Table 3, the frequency distribution analysis of the respondent shows that 76 out of 93 respondents prefer fresh citrus fruits; this represents 81.7 percent of the respondents, while 18.3 percent, representing 17 respondents prefer fresh citrus. 44.31 percent of those who prefer fresh citrus are male and 34.41 percent are female. 7.53 percent of those who prefer processed citrus

are male while females constitute 10.75 percent. 32.4 percent of those who prefer fresh citrus are below 30 years of age, 58.8 percent are between the age of 30 and 59 years and 6.5 percent fall to the range of 60 years and above, while 53.1 percent of respondents who prefer processed citrus fruit fall below age 30 years, 47.2 within the age range 30 years and 59 years and none for 60 years and above. Also, 56.99 percent of respondents who prefer fresh citrus are married while 24.93 percent are single. Respondents who prefer processed citrus has 7.53 percent married and 10.75 percent single.

45.16 percent of those who prefer fresh citrus are in informal employment and 36.56 percent are in the informal sector. 11.83 percent of those who prefer processed citrus are in the formal sector while 6.45 percent who prefer fresh citrus are in the informal sector. 54.84 percent prefer fresh citrus, with a house size of 1 to 5 while 26.88 who prefer fresh citrus have a household size of between 6 to 10. Again, 13.98 percent prefer processed citrus and have a household size of between 1 and 5 while 4.30 have a household range size of 6 to 10.

Table 3. Socio-economic Characteristics Consumers

Variable	Category	Prefer Fresh Citrus		Prefer Processed Citrus	
		Frequency	Percentage	Frequency	Percentage
Age (years)	Below 30	30	32.40	9	53.10
	30-39	21	27.40	3	17.70
	40-49	14	18.30	3	17.70
	50-59	7	13.10	2	11.80
	60 and above	5	6.5	0	0
Education (Years)	0-6	21	22.59	2	2.16
	7-12	20	21.51	5	5.38
	13-18	25	26.89	9	9.68
Marital status	Married	53	56.99	7	7.53
	Single	23	24.73	10	10.75
Household	1-5	51	54.84	13	13.98
	6-10	25	26.88	4	4.30
Monthly income (₦,000)	1-20	30	32.26	4	4.30
	21-40	38	8.60	2	2.15
	41-60	4	4.30	4	4.30
	61-80	34	36.56	7	7.53
Smoking?	Yes	8	8.60	1	1.08
	No	68	73.12	16	17.20
Gender	Male	44	47.31	7	7.53
	Female	32	34.41	10	10.75
Frequent body exercise	Yes	55	59.14	12	12.90
	No	21	22.58	5	5.38
Alcohol consumption	Yes	18	62.37	1	1.08
	No	58	19.35	16	17.20

Source: Field Survey, 2014.

32.26 percent of respondent prefer fresh citrus and earn a monthly income within ₦1,000 - ₦20,999, 8.60 percent earn ₦21,000 – ₦40,999, 4.30 percent earn ₦41,000 – ₦60,999 and 36.56 percent of the respondents who prefer fresh citrus earn between ₦61,000 and above. Respondents who prefer processed citrus who earn between ₦1,000 – ₦20,999 are 4.30 percent, 2.15 percent earn between ₦21,000 and ₦40,000, 4.30 percent earn ₦41,000 and ₦60,999 and 7.53 of those who

prefer processed fruits earn ₦61,000 and above. About 54.1 percent of respondent who prefer processed citrus do not spend on fresh fruit, 18.9 percent spends between ₦100 and ₦599, 7.9 percent spend between ₦600 and ₦1,099, 10.5 percent spend between ₦1,100 and ₦1,500 and 7.8 percent spend above ₦1,500 on fresh fruits, while 11.8 percent of those who prefer processed citrus fruit spend nothing in buying processed citrus fruits, 17.7 percent spend between ₦100 and ₦599, 5.9

percent spend between ₦600 and ₦1,099, 35.2 percent spend between ₦1,100 and ₦1,500 and 29.4 percent spend above ₦1,500 on processed citrus. For respondent who prefer fresh citrus fruit, 10.5 percent do not spend on fresh citrus, 68.9 percent spend between ₦100 and ₦599, 11.8 percent spend between ₦600 and ₦1,099, 5.2 percent spend between ₦1,100 and ₦1,500 and 2.6 percent spend above ₦1,500. 11.8 percent of the respondents who prefer fresh citrus spent nothing on process citrus fruit, 58.9 percent spend between ₦100 and ₦599, 17.7 percent spend between ₦600 and ₦1,099, 5.9 percent spend between ₦1,100 and ₦1,500 and 5.9 percent of respondents who prefer fresh citrus spend above ₦1,500 on process fruits. About 8.6 percent of respondents who prefer fresh citrus engage in smoking habit, 73.12 percent do not smoke, while 1.08 percent of those who take processed citrus smoke 17.20 percent engage in smoking habit.

59.14 of respondents who indicated preference in fresh citrus engage in body exercise and 22.58 percent do not while 12.90 percent of respondent prefer processed citrus and engage in body exercise and 5.38 percent do not. 55.9% of the respondents consumed fresh citrus within the last seven days from the day which the questionnaire was administered to them while 44.1% consumed it within a week ago and above. While 29.0% of the respondents consumed processed citrus fruit within 7 days of administration and 71% consumed processed citrus fruit within a week ago and above. We can imply from above that more of the respondents consumed fresh citrus fruit more frequently than processed citrus fruit. 6.85 percent consumed grains, 7.37 percent consumed root and tuber, 7.18 percent consumed vegetables, 8.59 percent consumed fruits, 7.37 percent consumed various types of meat, 9.95 percent consumed eggs, 8.02 percent consumed fish and crayfish, 7.89 percent consumed pulses, 8.99 percent consumed milk and milk product, 9.18 percent consumed oil, 8.73 percent consumed sugar, 9.89 percent consumed condiments.

Consumers' Perceptions on Fresh Versus Processed Citrus Fruits

The following revealed in Table 4 are the distribution of degree of preference of the respondents. 76 respondents which represent 87.7% of the respondents prefer fresh citrus, while 17 respondents, representing 18.3% prefer processed citrus fruit. 20.4% of the respondents completely agree that fresh citrus is more nutritious, 60.2% agree, 5.4% are neutral 14% either disagree or completely disagree. 37.6% completely disagree, 49.6% disagree, 4.3 neutral and 8.5% either disagree or completely disagree with the no negative health implication question. 23.7% and 59.1% respondents also indicated completely agree and agree that fresh citrus is less expensive than processed citrus, 9.7% neutral and 4.3% and 3.2% disagree and completely disagree respective. Cumulative total of 76.4% of the respondents indicate disagree and completely disagree with their socioeconomic status affecting their choice of preference of fresh citrus, while cumulative total 23.6% are either neutral, agree or completely agree. 47.3% agree, 10.8% completely disagree, 16.1% are neutral, 20.4% disagree, and 5.4% completely disagree with convenience as a determinant of preference for fresh citrus fruit. 2.0% of the respondents completely agree that processed citrus is more nutritious, 16.1% agree, 15.1% are neutral 54.8% disagree and 11.8% completely disagree. 3.2% completely disagree, 3.3% disagree, 15.1% neutral and 20.4% either disagree and 51.0% completely disagree with the no negative health implication question. 1.1% and 3.2% respondents also indicated completely agree and agree that processed citrus is less expensive than fresh citrus, 12.9% neutral and 60.2% and 22.6% disagree and completely disagree respective. Cumulative total of 20.4% of the respondents indicate disagree and completely disagree with their socioeconomic status affecting their choice of preference of processed citrus, while 43.0% are either neutral, 23.7% agree or 12.9% completely agree. 8.6% agree, 53.8% completely disagree, 16.1% are neutral, 15.1% disagree, and 6.5% completely disagree with convenience as a determinant of preference for fresh citrus fruit.

Table 4. Descriptive Analysis of Consumers' Opinion

Variables	% CA	%A	%N	% DA	% CDA
-More nutritious	20.4	60.2	5.4	10.8	3.2
-No negative health implication	37.6	49.6	4.3	6.5	2.0
-Less expensive	23.7	59.1	9.7	4.3	3.2
-Socioeconomic status	1.0	3.2	19.4	32.3	44.1
-Convenience	10.0	47.3	16.1	20.4	5.4
-More nutritious	2.0	16.1	15.1	54.8	11.8
-Negative health implication	3.2	3.3	15.1	20.4	51.0
-Less expensive	1.1	3.2	12.9	60.2	22.6
-Socioeconomic status	3.2	17.2	43.0	23.7	12.9
-Convenience	8.6	53.8	16.1	15.1	6.5

Source: Field Survey, 2014.

Note: CA: Completely Agree; A: Agree; N: Neutral; DA: Disagree; CD: Completely Disagree.

Relationship Between Consumer Perceptions and Choice of Orange

Educational status of respondents affected their preference: the higher the educational attainment of respondents, the more their preference for fresh citrus fruit. This is consistent with the position of [15], that educational attainment may influence dietary knowledge and the motivation to have a healthy diet. Previous study also showed that women with high educational attainment consumed fresh fruit and vegetables more frequently and had a higher perceived ability to control their behavior [18]. Low nutritional knowledge can affect fruit preference and purchasing behaviour (Table 5). An association was also detected between low education attainment and low intake of orange in men [15]. Also, respondents do not consider processed citrus more nutritious than fresh citrus fruit, a fact which is consistent with previous findings or studies. Fresh fruits, in particular, are good for health because they are packed with vitamins and minerals essential nutrients such as Ascorbic Acid, folic acid, potassium, calcium, foliate, thiamine, niacin, vitamin B6, phosphorus, magnesium and copper as well as anti-oxidants which help to eliminate harmful free radicals called oxidants [23]. Free radicals are believed to contribute to a host of health problems, including heart disease, diabetics and cancers. Respondents believed consuming processed citrus fruits has negative health implication. This may belief may stem from the idea that processed foods contain

chemicals which are harmful to the health. According to [24] most of the commercially available fruit juices or drinks contain chemical preservatives and are more often avoided by health-conscious people.

Some of the respondents consider fresh citrus cheaper than processed citrus fruit. This cost of purchase influences their preference for fresh citrus. Whilst this is inconsistent with theory of consumer behavior, the pattern revealed is consistent with findings of [30], which showed that there were mismatches between consumer purchases and preferences. This position is consistent with findings in the literature on consumer attitude formation [16, 33]. However, respondents who prefer processed citrus will keep buying even though the price is more expensive than fresh citrus fruits. This is in agreement with theory of consumer behaviour- consumer is rational and will consume a good as long as it brings a maximum satisfaction/ utility, and supported by the result of the study on demand for fruit juice by [25]. He found out that demand for fruit juice is price inelastic; therefore, consumers are insensitive to changes in the price. Interestingly, convenience of purchase and preparation played a major role in the choice respondents who prefer either fresh or processed citrus. With improvement in the standard of living, desire for fast food (that is, western-type food) is expected. This finding agrees with the position of [39] and [29] to the effect that accessibility or handiness of food is fast becoming a major factor in consumers' preference for diet. However, consumers may

sometime discover that easily accessible food may be of inferior quality. [26] corroborate this viewpoint by highlighting the effect of street or hawked foods to the nutrient intake of Nigerian adolescents.

A review of Table 6 shows that educational status and number of dependents is significant at 1 percent level of significant while others are not significant at all. Educational status has a positive relationship with preference, which implies that as respondents attain higher educational status there will be increase in their preference for fresh citrus. This is in line with the position of [15] that educational attainment may influence dietary knowledge and the motivation to have a healthy diet. Previous studies also showed that

women with high educational attainment naturally choose a healthy lifestyle by eating healthy diet such as fresh fruit and vegetables. They also have a higher ability to control their behavior [19]. Low nutritional knowledge can affect fruit preference and purchasing behaviour [14]. An association was also detected between low education attainment and low intake of orange in men [15]. The number of dependents also has a positive relation with preference. This implies that members of the household influence the choice of preference of respondents. This is in line with [20], who reported that food preference may be influenced by other family members and this is reflected in family of low socioeconomic status [18].

Table 5. Relationship between Consumer Perception and Preference for Fresh or Processed Orange

Variable	Coeff.	Std. Error	Z	P Z value	95%
Nutrient	-1.42***	0.35	4.05	0.00	-2.10-0.73
Health	-.49*	.33	1.48	0.14	0.14-0.15
Cost	1.14**	0.49	2.35	0.01	0.19-2.08
Status	0.11	0.25	0.44	0.66	-.39-0.61
Convenience	.13	0.14	0.89	0.37	-.15-0.41
Constant	2.17*	1.25	1.74	0.08	-.28-4.62
LR Chi2 (6)					39.19
Prob.>chi2					0.0000
Log likelihood					24.636475
Pseudo R2					-0.4430

Source: Field Survey, 2014. Significance at 10%*, 5%** , 1%***

CONCLUSIONS

The study found out that a good number of respondents about 76 prefer fresh citrus to processed citrus, while 17 respondents prefer processed citrus to fresh citrus. This means that fresh citrus is consumed more in Ona Ara local government than processed citrus fruits. Majority of respondents who prefer processed citrus have either secondary or tertiary education. Also, from the result educational attainment and number of household dependents, influences consumer preference for fresh citrus fruit or processed citrus fruits. This agrees with [13, 15]. The study also revealed that respondents' opinion/ perception in relation to cost of purchase, nutritional content, negative or positive implication on health influences their preference for fresh citrus, while convenience, cost of purchase

and nutritional content influence preference for process citrus. Majority of the respondents in their opinion indicates that processed citrus may have negative health implications. This may suggest why they prefer fresh to processed citrus.

The increase in dietary awareness, which has brought consumption [8, 12] of fruits to the forefront of nutritional requirement, has encouraged demand for fresh or processed citrus. In order to take advantage of this the following recommendations should be considered:

-Fresh fruit producer should cultivate improved quality citrus which is aimed at satisfying the consumers taste as well as meeting the standard requirement for exportation. Also, fresh fruit should be harvested carefully and packaged attractively in other to maintain the present consumer

population. Farmers should process fresh citrus fruit during glut in order to reduce loss incurred through spoilage. Since there is increasing demand for processed fruits.

-Juice processing company should fortify their product with more nutrients in order to encourage the growing population of consumers. A good hygienic and attractive packaging may also influence consumers' preference for processed citrus fruits.

-Policies should be put in place by the government to reduce or stop totally importation of citrus concentrate, in order to encourage indigenous citrus processing company. This will also reduce waste due to spoilage.

Further research should be carried out on how consumer preference affects citrus supply chain in Nigeria and citrus contribution to microeconomic development in Nigeria.

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