Consumers' Perception on Ofada Rice in Ibadan North Local Government Area of Oyo State, Nigeria

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Abstract
The study examined the consumers' perception on Ofada rice in Ibadan North local Government Area of Oyo state. Respondents were identified using a multi-stage sampling technique. Probit analysis was employed to achieve the objective of the study. The study revealed that 74.6% of the respondents preferred Ofada rice to other rice. Among the respondents that have preference for Ofada rice, 35.2% cannot afford it at the present price. Presence of foreign material, long time of cook and high price of Ofada rice are the reasons that some respondents preferred other rice. The study affirmed that the quality of Ofada rice influences consumer's preference (p<0.01). Household size and monthly income and the number of wife in male headed households significantly influence consumer's preference for Ofada rice in the study area. The need for increased productivity of farmers through improved technology which will help to make it affordable like other rice is recommended.
Keywords: Consumer preference, Ofada rice, Agricultural Transformation Agenda, probit.
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Introduction

Rice is an important staple food worldwide. According to Jones (1995), rice is the second most important cereal in the world after wheat in terms of production. Nigeria is the largest net importer of rice in Africa and the second largest importer in the world; while Nigeria is ranked the highest producer and consumer of rice in the West Africa sub region. Akande and Akpokodje (2003) opined that, since the mid-1970s, rice consumption in Nigeria has risen tremendously, at about 10% per annum due to changing preferences while domestic production has never been able to meet the demand leading to considerable imports which today stands at about 1,000,000 metric tons yearly. According to Daramola (2005), the annual domestic output of rice in Nigeria still hovers around 3.0 million metric tons, leaving the huge gap of about 2.2 million metric tons annually, a situation, which has continued to encourage dependence on importation (Daramola 2005; FMA&RD 2012).

The dependency of the country's economy on crude oil as major source of revenue encourages importation of food at the detriment of local food production. Nwajiuba (2012) stated that Nigeria faces a looming food security crisis with a growing population that is increasingly dependent on imported foods. This is so, bearing in mind the volatility in the crude oil market – the major source of revenue for food import. According to the Federal Ministry of Agriculture and Rural Development (2012), US $2billion is being spent annually on rice importation which translates to US$6million daily; this is an attendant to the fact that its continual importation is not sustainable fiscally, economically and politically. Rice importation is seen as a waste of foreign exchange based on the comparative advantage of the country in rice production. USAID/MARKET (nd) submitted that Nigeria's arable land and agro-climatic conditions provide a robust natural resource base for rice production, which could well exceed local demand. Excessive imports put high pressure on the naira and hurting the economy and the Nigerian farmers in particular by displacing local production and creating rising unemployment (FMA&RD 2012). The cost of these rice imports represents a significant amount of lost earnings for the country in terms of jobs and income (Bamba et al., 2010).

The high demand for imported rice in the country purportedly stems from the average Nigerian consumer's desire for white polished rice unlike most African countries like Ghana where there is a preference for brown rice which is cheaper in cost than polished rice and richer in nutrients (Aondoakaa 2013). According to Rutsaert et al. (2013) and USAID (2009b), the switch of urban consumption from local coarse local rice to imported rice can be explained by consumers' perception that local rice is of inferior quality. Owing to a large percentage of foreign matter and low levels of postharvest grading and sorting, local rice fails to meet expectations concerning reduced workload and time spent on sorting and cooking rice, and hence falls short relative to imported rice in this convenience dimension. Several consumer-preference surveys in Benin, Burkina Faso, Côte d'Ivoire, Nigeria and Senegal confirm this (Lançon et al. 2001, 2003; Konkobo et al. 2002; Lançon and Benz 2007; Fall and Diagne 2008; Demont et al. 2012, 2013a, b). This critically explains why imported rice is preferred in many countries to local rice, with Mali, Gambia and Guinea as exceptions (USAID 2009b).

The drain on the foreign reserve led the government to come up with various strategies in order to make Nigeria self-sufficient in rice production. Among these strategies are (i) the Nigerian National Rice Development Strategy (NRDS) set up in 2009 aimed at making the country self-sufficient in rice by raising production of

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paddy rice from 3.4 million tonnes in 2007 to 12.8 million tonnes in 2018, (ii) The Presidential Initiative on rice implemented from 2001 to 2007 was centred on developing rice production, processing and exports, and aimed to achieve self-sufficiency and increase rice exports by 2007. None of these strategies achieved its aims as the importation of rice continued unabated. Imolehin and Wada (2000) reasoned that inconsistent government policy on rice imports has seriously affected local production. The current government effort aimed at encouraging local production of rice is contained in Agricultural Transformation Agenda (ATA). The policy (ATA) is not only aimed at making Nigeria self-sufficient in rice production by 2017, it also aimed at treating agriculture as a business rather than a development project. This means that farmers are being encouraged to produce at commercial quantity. Also, import tariffs are introduced to make domestic rice more competitive on price alone. However, Rutsaert et al. (2013) posited that price policies did not work due to the low responsiveness of rice consumers to price changes, especially in countries where rice is the main staple crop. More recent consumer-preference studies of Fall and Diagne (2008) and Lançon et al. (2004) confirm this conclusion. Establishment of rice mills by private individuals and public-private partners are being encouraged to handle the processing of large quantity of pappy rice expected as a result of ATA implementation.

Daramola (2012) identified three major production systems for local and improved domestic rice in Nigeria, namely upland rain-fed, lowland rain-fed and irrigated production. He claimed that these systems account for 97% of rice production in Nigeria. The major rice varieties grown in Nigeria are the local rice namely Gboko, Abakaliki, Mokwa and Ofada; while improved domestic varieties are Faro series, Nerica 8 and ITA series. Among these local rice varieties, Ofada rice is peculiar to southwest, Nigeria. Ofada rice is a generic name used to describe all rice produced and processed in the rice producing clusters of south west Nigeria. The short grain robust rice, believed to be OS6 and ITA 150 varieties, is named after Ofada, a small rural community in Obafemi-Owode Local Government Area of Ogun State. It is an unpolished short grain with red kernels which is not related to any other rice. Ofada rice has recently gained prominence internationally attention (IITA, 2007). It presents a strong consumer disposition and it is perceived to be more nourishing due to its natural state. According to Osaretin et al. (2007), Ofada rice variety contains higher protein, fibre and lower water content than the commonly consumed foreign rice (aroso). A lot of potentials exist in its cultivation, processing and export (http://21stplacelive.com/Ofadarice.htm). Consumer-preference studies show that taste is an important attribute that tends to favour local rice, but it is not the most decisive attribute in many cases (Lançon et al. 2001, 2003; Konkobo et al. 2002; Lançon and Benz 2007; Fall and Diagne 2008; Moseley et al. 2010; Demont et al. 2012). PrOpCom (2007) and Omonona et al. (2011) affirmed that Ofada rice is liked by consumers of all income classes for its distinct taste and aroma. Obsolete and inefficient processing technologies are identified as the problems of Ofada rice production (Omonona et al. 2011).

Bearing in mind the expected increase in production of local rice; most especially Ofada rice as a result of current intervention by government, the need for sustainable production hinges on increase in demand for local rice (Ofada rice) by consumers whose preference for rice imported from India, Thailand, China and USA is very high. The need for demand-focused research arises in order to determine anticipated demand for local rice (Ofada rice) by estimating the proportion of consumers that have preference for Ofada rice as well as identifying the reasons that some consumers prefer foreign rice to Ofada rice and incorporate such reasons at the appropriate point along its value chain in order to raise consumers' preference. According to USAID/Market (nd), consumer preference for higher quality product and limited domestic processing capacity creates demand for imports. The factors influencing consumers' preference as well as the probability that a household will prefer Ofada rice are determined by the study.

Theoretical framework
Theory of consumer preferences
The study is based on theory of consumer preferences. Consumer preferences are defined as the subjective (individual) tastes, as measured by utility, of various bundles of goods. They permit the consumer to rank these bundles of goods according to the levels of utility they give the consumer. Note that preferences are independent of income and prices. Ability to purchase goods does not determine a consumer's likes or dislikes. One can have a preference for Ofada rice over foreign rice but only have the financial means to buy foreign rice (Note that foreign rice is cheaper than the Ofada rice).

The goal of the theory of preferences is for the consumer to be able to rank these commodity bundles according to the amount of utility obtained from them. In other words, the consumer has different preferences over the different combinations of goods defined by the set of commodity bundles. There are four assumptions on consumer consumer's preferences. The first is decisiveness. Here, given any two commodity bundles in commodity space, the consumer must be able to rank them. Suppose two commodity bundles, for example, Ofada rice and foreign rice are randomly chosen. This assumption means that the consumer must be able to say that they prefer Ofada rice over foreign rice, or foreign rice over Ofada rice, or that Ofada rice and foreign rice provide the same level of utility. The second assumption is consistency. The consumer must be consistent in

preference and rankings. Suppose Abakaliki rice is now included in the bundle. Let the consumer prefer Ofada rice over foreign rice, and also foreign rice over Abakaliki rice. Then by this assumption the consumer must prefer Ofada rice over Abakaliki rice. The following two assumptions are not required to develop the theory of the consumer, but simplify matters significantly.

The third assumption is non-satiation. In other words, more is always better than less. More formally, any commodity bundle with at least as much of one good and more of the other must be preferred. The last of the assumptions is convexity, which is the most difficult to explain. It is based on the notion that as a consumer consumes more and more of a particular good, the additional utility obtained decreases. Convexity says that marginal utility declines as consumption increases. Note that the total utility continues to increase if marginal utility is positive (which it must be for non-satiation to hold), but total utility increases at a decreasing rate if marginal utility is declining (business.usi.edu/cashel/241/text%20files/consumer.pdf).

Methodology

The study was carried out in is Ibadan North Local Government area. The choice of the local government is based on its cosmopolitan nature and the location of many markets that deals with agricultural and non-agricultural item. The city of Ibadan is located approximately on longitude $3^0 5^1$ east of the Greenwich Meridian and latitude $7^0 23^1$ north of the Equator at a distance of about 145kilometres north east of Lagos. Economic activities undertaken by people in the local government area include trading, public service and agriculture. Ibadan North Local Government has the largest land area among the urban local governments' areas in Nigeria with 145.58km^2 and a population of 306,795 people (NPC, 2006). It is bounded in the West by Ido and Ibadan North West Local Government, bounded in the East by Lagelu, Egbeda and Ibadan South East Local Government respectively and it is bounded in the North by Akinyele Local Government.

Structured questionnaire was used to collect data from households in the study area. A multi-stage sampling technique was used to select the respondents. In the first stage purposive sampling was used to select only households which excluded students. In the second stage simple random sampling technique was used to select respondents that cut across different professions (civil service, trading and artisan). Data on socioeconomic characteristics, preferred rice (Ofada, foreign rice, Abakaliki rice among others), reasons that some respondent's prefer other rice to Ofada rice, how to improve consumers' preference for Ofada and monthly income, choice place of eating Ofada, frequency of Ofada consumption/week among the respondents that have preference for it, ranking of consumer preferences among other questions. One hundred and fifty questionnaires were administered while 130 were returned to time. Descriptive, chi-square and probit analyses were employed to achieve the objective of the study.

Chi-square is a statistical test commonly used to compare an observed data with data we would expect to obtain according to a specific hypothesis. It is used in this study to investigate whether consumers' preference for Ofada rice is influenced by quality or not. Quality of Ofada rice is based on colour and size of grain, aroma, and taste, presence/absence of foreign particles and ease of cooking. Data for the analysis were obtained using Likert scale. Likert-type or frequency scales use fixed choice response formats and are designed to measure attitudes or opinions (Bowling 1997, Burns & Grove 1997). These ordinal scales measure levels of agreement/disagreement. A Likert-type scale assumes that the strength/intensity of experience is linear, that is, on a continuum from strongly agree to strongly disagree, and makes the assumption that attitudes can be measured. Likert scale is a five (or seven) point scale which is used to allow the individual to express how much they agree or disagree with a particular statement.

Moreover, the study also utilized probit analysis to determine factors influencing consumers' preference for Ofada rice and the probability that a person chosen at random in the study area will prefer Ofada rice. According to Spearman (2008) probit is based on a latent model.

$$P(y_i = 1 \mid x) = P(y_i^* > 0 \mid x)$$

$$= P(x_i' \beta + \varepsilon_i > 0 \mid x)$$

Latent variable: U~ ~~~~~~~~~~~~~ take all values in $(-\infty, +\infty)$.

Generally, y_1 is the $= P(\varepsilon_i > -x_i' \beta \mid x)$

β represents the co ~~~~~~~~~~~ ble

y = 1 represents co $= 1 - F(-x_i' \beta)$ Ofada rice

y = 0 represents consumers that do not have preference for Ofada rice

gder represents gender of respondents

inc represents monthly income (₦)

hhs represents household size

maritstat represents marital status (married including widows and widowers=1, single and divorced =0)

nofwve represents number of wives in male headed households

Results and discussion

The result shows that majority of households in the study area is male headed (88%) while most of the females headed households are single parents and widows. The result reveals that 61.5% of the respondents are married. This result confirms the patrilineal nature of the Nigerian society. Furthermore, most of the respondents fall within the age bracket of 28 - 37years while the average age is 43years (see figure 1). The result revealed high literacy level in the study area (96.9%, that is; respondents with education above primary school). The average household size for the respondents that prefer Ofada rice and other rice are 4.38 and 5.88 respectively (Appendix 1). This means that preference for Ofada rice is common among families with small household size. The average monthly income of respondents in the study area is N81,838:28. However, the monthly income of respondents that have preference for Ofada rice is greater than (N89,773.96) those that prefer other rice (N58,031.25). From the foregoing, it means that preference for Ofada rice is common among the high income earners and family with small household size. This may be attributed to high price of Ofada rice per 'kongo' (local unit of measurement) compared to other rice.

Figure 1: Age distribution of respondents
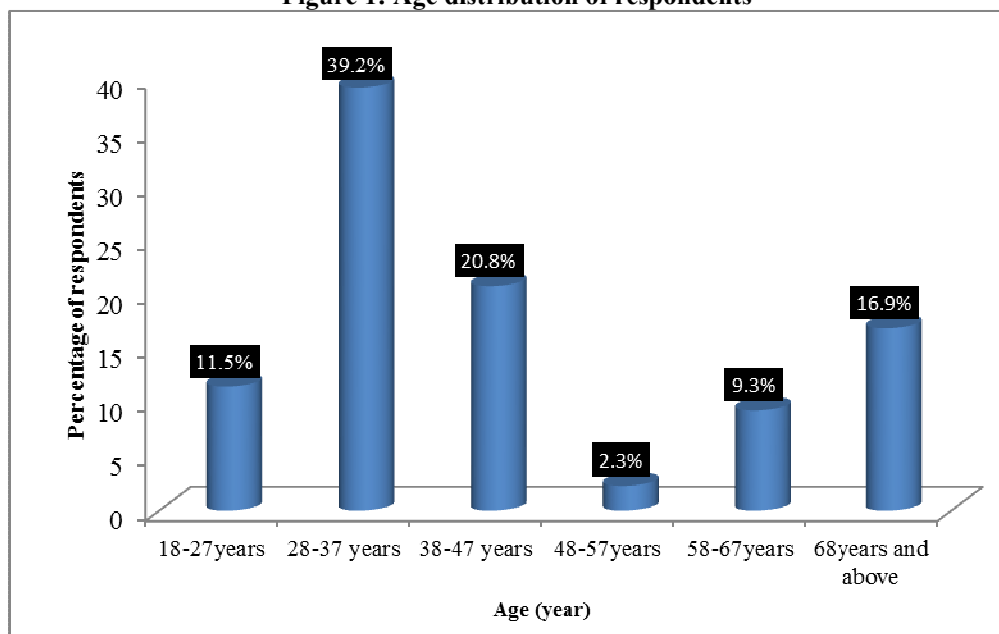
Specifically, the price of Ofada rice per Kongo ranges between N1000 and N1200 while the price of foreign rice ranges between N280 and N300. This means that a consumer with N1000 can buy more than three 'kongos' of foreign rice. Despite the high price of Ofada rice per kongo, the study revealed that 74.6% of the respondents prefer Ofada rice to other rice. This is in agreement with theory of consumer preference that preferences are independent of income and prices. Reasons given by respondents for preferring other rice include presence of foreign material, longer time to cook and high price of Ofada rice per kongo. Also, among the respondents that have preference for Ofada rice, 35.2% cannot afford it at the present price. This finding is corroborated by the fact that 67.5% of the respondents eat Ofada rice at parties where it is served free. Only 27.3% of respondents eat Ofada rice at home. The low percentage may be attributed to high cost of Ofada rice in the market due to low productivity. According to USAID/Market (nd), raising productivity per hectare, and improving efficiency throughout the value chain are major challenges in the domestic rice sector in Nigeria. Despite high preference for Ofada rice among the respondents, majority still ranked imported rice first (63.1%) while 41.8% of the respondents ranked Ofada rice first based on market price per 'kongo', presence of foreign material and ease of cooking.

However, the study affirmed that the quality of Ofada rice influences consumer preference (p<0.01). This finding is supported from the response during data collection. Majority of the respondents (89.6%) that prefer other rice attributed their preference to presence of foreign material on the relatively cheap Ofada rice compared to the packaged ones. They claimed that appreciable time is required to remove the foreign materials before cooking; hence, the cooking time is prolonged.

Moreover, the study showed that monthly income of respondents, household size and the number of wife in male headed households significantly influenced consumers' preference for Ofada rice. The coefficient of monthly income is significant (p<0.01) and it revealed that for any marginal increase in monthly income, the

probability that consumer will have preference for Ofada rice increase by 0.00056%. This means that preference and consumption of Ofada rice is common among households with high monthly income. Also a marginal increase in the household size reduces the probability of consumers' preference for Ofada rice by 3.96%. The high cost of Ofada rice may be the reason for the positive relationship between Ofada preference and household size. Since the price for a kongo of Ofada rice can buy more than three kongos of foreign rice, a large household size will prefer other rice to Ofada rice coupled with the ease of cooking. Furthermore, the study shows that the probability that a person chosen randomly from the study area would prefer Ofada rice is 0.82. This means that chosen 100 respondents from the study area, 82 will prefer Ofada rice.

Probit analysis result for consumers' preference for Ofada rice

	Coefficient	Std. error	z	p-value	Marginal effect
Constant	-1.14976	0.906114	-1.27	0.2045	
Gder	-0.1557	0.347896	-0.45	0.6544	-0.0397658
Ag	-0.00205	0.01087	-0.19	0.8502	-0.000537595
Inc	2.15×10^{-05}	5.053×10^{-06}	4.27	1.98×10^{-05}***	5.648×10^{-06}
Hhs	-0.151	0.067	-2.25	0.025**	-0.0395760
maritstat	0.271	0.329	0.82	0.412	0.0727889
Nofwve	-0.912	0.511	-1.78	0.075*	0.238946

Note: *** means 1% level of significance, ** means 5% level of significance, * means 5% level of significance

Mean Dependent var	0.751938	S. D. dependent var	0.261930
McFadden R-squared	0.271485	Adjusted R-squared	0.174619
Log-likelihood	-52.64637	Akaike criterion	119.2927
Schwarz criterion	139.3114	Hannan-QUINN	127.4267

Conclusion and recommendation

The study examined consumers' perception on Ofada rice in Ibadan North Local Government Area of Oyo State, Nigeria. The study reveal that there is high preference for Ofada rice in the study area and that among those that prefer Ofada rice, substantial percentage of these respondents cannot afford Ofada rice because of its high price compared to other rice. Presence of foreign material, high price and longer cooking time are reasons given by respondents that refer other rice to Ofada rice. The study also affirmed that preference for Ofada rice by consumer is influenced by the quality (grain size, aroma, taste, ease of cook and extent of foreign particles). Moreover, the study also showed that respondents' monthly income, household size and number of wife by male headed households influence consumers' preference for Ofada rice.

The foregoing showed that there is high preference for Ofada rice which is necessary for the sustainability of the government efforts towards encouraging local production of rice through Agricultural Transformation Agenda. However, for this preference to transform to effective demand there is the need for increased productivity of farmers through improved technology which will help to make it affordable like other rice. It is also imperative that the technology involved in the processing of rice (removal of foreign material in particular) should be made affordable to local farmers so that they can benefit more in the value chain of Ofada rice. This implies that the present government effort to boost local rice production through Growth Enhancement Scheme as enshrined in ATA has not made a tangible impact on Ofada rice production.

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Appendices

Appendix 1: Descriptive statistics for all the respondents

Parameter	Age (years)	Income(₦)	Household size
Mean	43.42	81,838.28	4.76
Standard error	1.46	2775.44	0.23
Median	32.5	86,550	5
Mode	32.5	105,550	8
Standard deviation	16.68	31,400.51	2.62
Sample variance	278.21	985,992,263.16	6.86
Kurtosis	-0.87	-0.66	-0.94
Skewness	0.72	-0.47	-0.4
Range	50	124,500	9
Minimum	22.5	0	0
Maximum	72.5	124,500	9
Sum	5645	10,475,300	614
Count	130	128	129

Source: Field Survey 2014

Appendix 2: Descriptive analysis for those that prefer and those that do not prefer Ofada rice

Parameter	Preference for other rice (age in years)	Preference for Ofada rice (age in years)	Preference for other rice (monthly income in Naira)	Preference for Ofada rice (monthly income in Naira)	Preference for other rice (household size)	Preference for Ofada rice (household size)
Mean	38.56	45.08	58,031.25	89,773.96	5.88	4.38
Standard error	2.22	1.78	3,724.90	3,093.48	0.46	0.26
Median	32.5	42.5	48,550	105,550	7	4
Mode	32.5	32.5	48,550	105,550	8	4
Standard deviation	12.73	17.58	21,071.23	30,309.76	2.62	2.52
Sample variance	162.12	308.91	443,996,572.58	918,681,419.96	6.86	6.34
Kurtosis	1.59	-1.25	3.07	0.71	-0.34	-0.88
Skewness	1.20	0.55	1.27	-1.11	-0.98	-0.31
Range	50	50	114,500	124,500	8	9
Minimum	22.5	22.5	10,000	0	0	0
Maximum	72.5	72.5	124,500	124,500	8	9
Sum	1272.5	4,372.5	1,857,000	8,618,300	194	420
Count	33	97	32	96	33	96

Source: Field Survey (2014)

Appendix 3a: Respondents opinion on the quality of Ofada rice

Parameter		A	SD	I	SA	SD	Total
A_1	Count	23	0	17	90	0	130
	Expected Count	36.9	13.6	18.5	48.1	12.8	130.0
A_2	Count	35	0	17	77	0	130
	Expected Count	36.9	13.6	18.5	48.1	12.8	130.0
A_3	Count	20	40	20	12	36	130
	Expected Count	36.9	13.6	18.5	48.1	12.8	130.0
A_4	Count	80	0	10	38	0	128
	Expected Count	36.3	13.4	18.2	47.4	12.6	128.0
A_5	Count	25	28	26	23	28	130
	Expected Count	36.9	13.6	18.5	48.1	12.8	130.0
Total	Count	184	68	92	240	64	648
	Expected Count	184.0	68.0	92.0	240.0	64.0	648.0

Source: Field Survey 2014

Appendix 3b: Chi-square test result

	Value	Degree of Freedom	Asymp. Sig (2-sided)
Pearson Chi-Square	377.526[a]	16	.000
Likelihood ratio	411.655	16	.000
Number of valid cases	648		

Where:

     A_1 represents Ofada rice has a pleasant aroma.

     A_2 represents Ofada rice tastes better than other locally produced rice

     A_3 represents there are no/little foreign particles in Ofada rice available in the market

     A_4 represents aroma makes Ofada rice my choice of rice

     A_5 represents unlike other rice, Ofada is easier to cook

     A represents Agreed

     D represents Disagreed

     I represent Indifferent

     SA represents Strongly Agreed

     SD represents Strongly Disagreed

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