CONSUMER PREFERENCE FOR FISH PRODUCT TYPES IN IWAJOWA LOCAL GOVERNMENT, IGANNA, OYO STATE, NIGERIA

Abolupe Oluyemi AYANBOYE[1*], Zaccheaus Olaniyi OLUWAFEMI[2], Adewale Isaac OLUTUMISE[3], Ahmed Olugbenga BUSARI[1], Oluwakemi Adeola OBAYELU[4*], Sunday Emmanuel OLUSOLA[5], Adebola Oluyinka AJIBOYE[4**]**

[1]Osun State University, *Faculty of Renewable Natural Resources, College of Agriculture, Department of Fisheries and Aquatic Resources Management, **Faculty of Agricultural Production and Management, College of Agriculture, Department of Agricultural Economics and Agribusiness Management, Ejigbo Campus, Osun State, Nigeria, Phones:+2348062075491; +2348052174096, E-mails: oluyemi.ayanboye@uniosun.edu.ng, hamed.busari@uniosun.edu.ng
[2]Oyo State College of Agriculture and Technology, Department of Agricultural Economics, Igboora, Oyo, Nigeria, E-mail: femi0677@gmail.com
[3]Adekunle Ajasin University, Department of Agricultural Economics, Akungba-Akoko, Ondo State, Nigeria, Phone: +2348060160118; E-mail: adewale.olutumise@aaua.edu.ng
[4]University of Ibadan, *Department of Agricultural Economics, **Department of Aquaculture and Fisheries Management, Ibadan, Oyo State, Nigeria, E-mails: jkemmyade@yahoo.co.uk, debron2005@yahoo.com
[5]Olusegun Agagu University of Science and Technology, Okitipupa, Nigeria, Department of Fisheries and Aquaculture Technology, School of Agriculture, Food and Natural Resources, Phone: +2348034110139; E-mail: se.olusola@oaustech.edu.ng; belloolus@yahoo.com

Corresponding author: oluyemi.ayanboye@uniosun.edu.ng

Abstract

This study examined the consumers' preference for fish products types in Iwajowa local Government, Iganna Oyo state, Nigeria. This study used data from a primary source and descriptive statistics such as frequency, mean and percentages were used to the analysed the data collected. It also utilized a Multinomial Logit regression (MNL) Model to determine the consumers' preference. The results showed that about 68% of the respondents were female and approximately 32% were male. The mean age and household size is 35.55±11.01 and 4 ±2 respectively. Result revealed that 57% of the respondents had formal education. About 29%, 31% and 38% of the sampled consumers preferred fresh, smoked and frozen fish respectively. There is no clear-cut distinction in preference for a particular fish product among the consumers and the respondents were not so concerned about the nutritional quality of the fish consumed. The mean income of the respondents was ₦28,883.72 (USD17.17) per month with a standard deviation of 34,219.02 (USD 20.31). The study revealed that ₦ 1,629.96 (USD 0.97) as the per day expended on fish on average while ₦1,467.73 (USD 0.87) was on close substitutes. The mean income and amount expended on close substitutes was relatively low among the respondents. Gender, household size, fish price per day, price of fish close substitute, health status and fish quality had significantly effect on the consumers' behaviour for consumers' preference for fish products consumption. It is recommended that there is need for quick intervention by the government to create awareness to consume fish of a good nutritional quality and a concerted effort to improve the standard of living of the respondents. Fish farming should be encouraged to boost production of fresh fish. This will go a long way to improve fresh fish protein consumption. Fish industries are also advised to incorporate all the identified factors affecting fish preference into their policy.

Key words: *preservation, processing nutritional quality, consumer behaviour, multinomial logit, Nigeria*

INTRODUCTION

Fish has been classified as an important source of food in supporting the growth and well-being of humans being. It provides an appreciable portion of the protein needed for healthy growth in humans. It supplies fats, and fat-soluble vitamins in the diets of people, and most especially in developing countries. It gives a valuable medicinal, feeding and

technical products. Fish is seen as relatively cheap source of animal protein. It has little or no religious rejection, unlike other sources of animal protein such as pork. Fish play a substantial role in livestock and fishery industries.

Furthermore, the lack connective tissue in fish make it easily digestible [8]. Besides other factors that are commonly identified with fish consumption, the health benefit is gaining prominence. The change in human dietary sources of protein to fish consumption, a white meat from the consumption of red meat is also of a great advantage. Recently, meta-analyses have revealed the relationship between a life-threatening colorectal cancer disease, [9]; [37], type II diabetes [3] stroke, coronary heart disease and heart failure [5], obesity [36] and all-cause mortality [24] and consumption of beef, lamb, pork, and other mammalian meat. Therefore, based on these discoveries, [29]; [21] reported that, organizations including the American Cancer Society recommend consumption of poultry, fish, or plant-based proteins [29]; [21] and limiting red meat consumption.

However, despite all the benefits from fish consumption mentioned, it spoils quickly. According to [15], fish gives certain signal which make it unsuitable for human consumption as a result of microbiological, chemical, enzymatic and physical action [19]. Therefore, when fish is removed from its original natural environment, it is highly prone to deterioration if not preserved or processed [27].

Spoilage in fish occurs straight away the fish succumb to death. In a minute, lot of physiological and microbial deteriorations begin and as a result degrading the quality of the fish which reduce post-harvest rate. Spoilage of fish is speedier than that of beef and pork due to the high load of bacteria in gills, skin and viscera part.

However, the good news is that there are some activities that could prevent spoilage in fish. In Nigeria, fish spoilage can be prevented through fish processing and preservation. The outcome of preventing fish spoilage is to make it more acceptable for consumers, this could either be through fish smoking, frozen and drying. These are the commonest in Nigeria.

Nigeria is a fish producing country, but during the last decade production declined, and imports are required to cover the consumers' needs [2, 7].

Fish is presented in various forms as a consumer's diet in Nigeria, this includes fresh fish, frozen fish, dry fish, fried fish and smoked fish. Other forms that are available but not popular in Nigeria are fish crackers, fish fingers and fish chinchin.

The forms of fish products that are presented to consumers in the market vary with the location of the source of fish relative to market distance, time, culture, size of fish, available processing and storage facilities, and consumer desired taste and preference. From these, the consumers as rational beings have freedom of choice that will give the highest level of satisfaction. The consumer choice among these forms of fish also could be influenced by numerous factors. [39] and [43] opined that consumer decision or choice could be determined due to patterns of food consumption, diversity of attitudinal dimensions, health status as well as socio and economics factors.

A review of available literature on the fish consumption behavior using the multinomial log model revealed scanty empirical studies in the study area. Available studies are [13] and [22]. Therefore, this research work adds value to the existing body of knowledge by providing scientific-based information on fish consumers' behaviour in the Ibadan metropolis. The following are the objectives; depicting the socio-economic of the fish consumers, fish products available and determining factors influencing fish consumers' behaviour in the choice of fish types they consume.

Theoretical / Conceptual Framework – Consumption Preference Theory

Consumers are rational in their choices to satisfy their needs at the least cost. The theory of consumer behaviour is paramount in the growth and development of any given market frontier. Studying consumer rationality is key because it indicates that producers and marketers can recognize what determines consumers' purchasing choices. By

understanding how customers make a choice on a product they can tailor their products to meet market demand as well as determine the items that are required to satisfy their goals. From the theory of consumer behaviour, each desires to derive the best satisfaction from a set of alternative bundles of options obtainable from the market [12]. The satisfaction or utility of a given bundle of goods varies with place, price, product, time or form. For instance, fish products could be consumed in fresh, fried, dried, smoked, or frozen forms, [8]. The choice made by a given consumer is determined by many intrinsic, social, psychological and economic factors [33].

[23] asserted that a consumer behaviour study seeks to disclose why, what, when and how the consumer purchases a product. Likewise, it establishes how people decide on what they purchase. [34] referred to this as the decision process. Decisions on the type of fish products and what quantity to consume are affected by socio-economic and geographic characteristics factors of consumers and fish attributes [32], [42], [18].

Consumer preference on the other hand describes how a consumer places likeness among a group of related goods. It gives an excellent association between actual purchase and consumption [17] and [28]. Consumers' choice has been viewed as a microeconomic theory that relates expenditure and preferences for consumption of goods and services together which culminate in consumer demand curves. The links between personal preferences consumption and the demand curve are one of the most closely studied relations in consumer economics. Choice theory is a way of analysing how consumers may achieve equilibrium preferences and expenditures by maximizing utilities as subject to consumer budget constraints. As reported by [26], preference has been viewed to be a major factor influencing general food consumption behaviour. According to [30], tradition and habit often affect fish consumption which could also be enhanced by nutritional awareness.

MATERIALS AND METHODS

Study Area

Iwajowa is a Local Government Area in Oyo State, Nigeria. Its headquarter is in the town of Iwere Ile. Iwajowa Local Government is bounded in the North by Itesiwaju Local Government, in the south by Ibarapa North Local Government, in the East by Kajola Local Government and in the West by Republic of Benin. It has an area of 2,529 km^2 and a population of 102,980 inhabitants at the 2006 census. Iwere-ile became the headquarters of Iwajowa Local Government Area on 4 December 1996 upon the creation of the new local government under the Gen Sanni Abacha's regime. Other town and settlements include Iganna, Ilaji-Ile, Idiko-Ile, Ayetoro Ile, Itasa, Idiko Ago, Elekookan, Ijio, Ayegun Wasimi and over 350 villages and farm settlements. The inhabitants of the area are predominantly Yoruba cohabiting peacefully with other tribes such as Fulani, Hausa, Tiv, Egede and others who engage in cattle rearing, large scale farming and hunting. Iwajowa local government was chosen for this study because it has a relatively number of freshwaters such as rivers which encourages fish farming. Frozen fish are available in the towns and there are markets where smoked fish is being sold.

The sampling technique involves a random sampling procedure. This technique was employed to select 172 respondents randomly from the towns and settlements. These towns (Iganna, Ilaji-Ile, Idiko-Ile, Ayetoro Ile, Itasa, Idiko Ago, Elekookan, Ijio, Ayegun Wasimi) were used because they have appreciable number of respondents who could be used for the purpose of this research work. Data collected were thoroughly cleaned and subjected to the required analysis to achieve the purpose of the objectives of this study.

Analysis of Data

The results derived from this survey were analysed using simple descriptive statistics and multinomial logit (MNL) regression. Descriptive statistics include frequency table, mean and standard deviation, these were used to describe the socio-economic characteristics of the respondents. While multinomial logit regression model was used to determine the factors influencing consumers' behaviour on their fish types option in the study area.

Literature Review on Multinomial Logistic Regression Model (MLM)

The application of the Multinomial Logistic Regression Model (MLM) has been used extensively to determine a consumer's choice. This includes [20]; [38]. The model springs from the theory of rational choice of consumers of a product within a probabilistic framework. The model applies the use of the utility maximization hypothesis which says that a decision maker's choice is the result of their preferences [25]. According to [14], the model based on four core concepts: (i) the customer has an unobservable (at least to the modeller) preference or utility for each of the choice alternatives, (ii) the utility of each choice alternative is made up of two additive terms namely, a deterministic component (the intrinsic value or attractiveness of the choice alternative), and a random component which varies randomly across choice alternatives, customers, and purchase occasions, (iii) the distribution of the random component can be specified, and (iv) on each choice occasion, the customer chooses the alternative that provides him the highest utility. Consequently, the decision-maker is assumed to select the alternative with the highest preference or utility.

Multinomial Logit Model (MLM) Specification:

Let πj denote the multinomial probability of an observation falling in the jth categories of fish forms option, to find the relationship between this probability and the p-explanatory variables, $X_1, X_2,........., X_p$, the multinomial logistic regression model is given thus:

$$\log\left[\frac{\pi_j(x_i)}{\pi_k(x_i)}\right] = a_{0i} + \beta_{1j}x_{1i} + \beta_{2j}x_{2i} + ... + \beta_{pj}x_{pi},$$

.... (1)

where:
j=1, 2, … (k-1), i = 1, 2, … p.
k = number of response or dependent categories (fish types option).
Note: one of the categories must be considered the base level and all the logits are constructed relative to it.
P = number of explanatory variables included in the model.

Since all the π add to unity, this reduces to

$$\log\pi_j(x_i)) = \frac{\exp(a_{0i} + \beta_{1j}x_{1i} + \beta_{2j}x_{2i} + ... + \beta_{pj}x_{pi})}{1 + \sum_{j=1}^{k-1}\exp(a_{0i} + \beta_{1j}x_{1i} + \beta_{2j}x_{2i} + ... + \beta_{pj}x_{pi})}$$

....(2)

For j = 1, 2, …..(k-1), the model parameters are estimated by the method of multinomial logit

$U_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + ei$

....(3)

where:
U_i, =Fish types (Fresh fish, Smoked fish and Frozen fish).
The independent variables are as follows
X_1 is gender (male = 0, female = 1)
X_2 is Age of respondents (in years)
X_3 is Marital Status (single = 0, married = 1)
X_4 is Level of education (Non-formal = 0, formal =1)
X_5 is Household size (numbers)
X_6 is Monthly income (naira)
X_7 is Price of fish (naira)
X_8 is Price of close substitute (naira)
X_9 is Fish taste (Yes = 1, No = 0)
X_{10} is Health factor (Yes = 1, No = 0)
X_{11} is Fish odour/aroma (Yes = 1, No = 0)
X_{12} is Fish appearance (Yes = 1, No = 0)
X_{13} is Nutritional quality (Yes = 1, No = 0)
e_i is Disturbance error

RESULTS AND DISCUSIONS

Table 1 showed the result of the analysis of socioeconomic characteristics of fish consumers in the study area. The results reveal that about 68% of the respondents were female and approximately 32% were male. It could be inferred that there is no gender discrimination against fish consumption in the locality. This is also in agreement with the findings of [41].
The probable justification for the higher percentage of females in the study area is that women are usually in charge of food preparation for most households. It was also observed that a larger proportion of males were bachelors. Generally, the positive behaviour of fish consumers is observed towards a well-

preserved fish product form because it could be kept for a long time when bought and easily accessible if other alternatives or substitutes are not affordable and reachable at the time of need.

Table 1 reveals that a typical fish consumer in the study area was young with an average of about 36 years and a standard deviation of about 11 years. The distribution shows that more than 74% of the respondents were within the age bracket of 40 years. This implies that many of the fish consumers in the study area are at a productive stage and they would require high-quality protein in their daily food consumption. According to [41], age was found to be significantly associated with determination to eat healthy food. [31] also discovered an association between age and knowledge of fish preference.

Furthermore, 57% of fish consumers have formal education. As gathered from this study, a large number of respondents have secondary school educational qualifications. Generally, the influence of education on human behaviour towards the consumption of healthy food could not be overemphasized. A typical educated person would prefer to choose a healthy and balanced diet that will not result in ill health such as cholesterol and other similar health challenges. [40] also emphasized that there is a positive association between consumption of fishery products and education. It is well known that red meat consumption is being discouraged for health reasons, while consumption of white meat, of which fish is one source, is being encouraged among educated societies [35]. This is evidence of the influence of education on human behaviour toward food consumption. [4] opined that education brings improvement in the standard of living and this also invariably affects their choice of fish products

A greater percentage of the fish consumers in the area of study were married. Being married imposes responsibilities on the household breadwinner and one of such responsibilities is the provision of a healthy and balanced diet for family members. Fish is common in household dietary food consumption due to many factors; it is relatively cheap, a source of vitamins, minerals, and protein with essential amino-

acid, easy to digest and less cholesterol [11]. For these reasons, most married households choose different forms of fish products for their satisfaction.

In the study area, 35%, 52% and 13% of the respondents have household sizes of 1-3, 4-6 and 7-9, respectively, while the average household of a typical family was about 4 persons with a standard deviation of 2.1. This result is in consonance with the findings of [41]. Also, as pointed out by [40], consumption of fish was discovered to be positively correlated with household size. However, [42] reported a contrary result. This study shows that residents in the study area keep moderate family sizes which could be attributed to the education among the sample population.

The mean income of ₦28,883.72 (USD17.17) with a standard deviation of 34,219.02 (USD 20.31) per month were obtained among the fish consumers in the study. As reveal in this study, the income received in a month by most of the respondents was relatively low. This could have a negative impact on their choice and consumption of their preferred fish products.

This agreed with the submission of [6] and [16] who opined that income levels might affect fish consumption. The average amount spent per day on fish consumption in the study area was ₦ 1,629.96 (USD 0.97) with a standard deviation of ₦741.79 (USD 0.44). Given the current rate of food inflation, this amount was low. The combined effects of low monthly income, household size and high food inflation would result in inadequate consumption of daily dietary protein that is obtainable from fish.

Furthermore, Table 1 reveals that the respondents spent ₦1,467.73 (USD 0.87) per day on close substitutes for fish with a standard deviation of ₦448.06 (USD 0.27). This value was also relatively low. It could be deduced that the price of fish and other sources of protein might be a major constraint and negatively influence fish consumption among the respondents.

Table 1. Description of socio-economic characteristics of the respondents (n =172)

Variable	Frequency	(%)	Mean ±S.D
Gender			
Male	55	31.98	
Female	117	68.02	
Age			
21-30	70	40.70	
31-40	58	33.72	35.55±11.01
41-50	30	17.44	
>50	14	8.14	
Educational Status			
Non Formal	74	43.02	
Formal	98	56.98	
Marital Status			
Single	52	30.23	
Married	120	69.77	
Household size			
1-3	61	35.47	
4-6	89	51.74	4 ±2.1
7-9	22	12.79	
Monthly Income (₦)			
<10,000	66	38.37	
10,000 – 50,000	94	54.65	₦28,883.72± 34,219.76
50,001 – 100,000	10	5.81	
>100,000	2	1.16	
Price of fish per day			
<500	12	6.98	
500-1,000	84	48.84	
1,001-1,500	36	20.93	₦1,629.96± 741.79
1,501-2,000	12	6.98	
>2,000	28	16.28	
Price of close substitute per day			
<500	2	1.16	
500-1,000	66	38.37	₦1,467.73± 488.06
1,001-1,500	14	8.14	
1,501-2,000	14	8.14	
>2,000	76	44.79	

Source: Field survey, 2023.
$1 is equivalent to ₦ 1,684.64 as of October 2024 [Central Bank of Nigeria] [10].

Fish Products Type and Quality of Parameters Considered by the Consumers
Generally, food preference and consumption inducement vary with individual cultural background, prevailing economic power, social class and strata, health status, age, occupation and employment status, education, gender, etc. Specifically, preference and choice of a given fish product by the individual consumer could also be influenced by its price, price of close substitutes, taste and fish species, health factor, appearance, taboo, odour, nutritional quality and household size. In the study area, the common forms of fish products identified by the respondents are fresh fish, smoked fish and frozen fish. While the attributes considered include taste, health factors, appearance, odour and nutritional quality.

The fish products available were almost evenly distributed among the consumers in the study area. No less than 32%, 29% and 39% of the sampled consumers preferred fresh, smoked and frozen fish. This implies there is no clear-cut high preference for a particular fish product among the consumers. The findings from this study may be attributed to low income.

Table 2. Type of fish products and quality of parameters considered by the consumers (n= 172)

Variable	Frequency	Percentage (%)
Type of fish		
Fresh fish	50	26.07
Smoked fish	54	31.39
Frozen fish	66	38.37
Taste		
No	24	13.95
Yes	148	86.05
Total	172	100
Health factors		
No	54	31.40
Yes	118	68.60
Appearance		
No	60	34.88
Yes	112	65.12
Odour		
No	36	20.93
Yes	136	79.07
Nutritional quality		
Yes	66	38.37
No	106	61.63

Source: Field Survey, 2023.

On the other hand, the taste of the fish product is of utmost concern to the people in the locality of this study. This is noticeable in the response of about 87% of the fish consumers who reported that fish taste positively influences their preference for their choice. Also, 68% considered health factors as their inducement for their fish consumption. The appearance of fish was of a great importance to about 65% of the consumers' behaviour

towards their choices. Since fish come with different odours, about 79% of fish consumers according to this study considered odour of the fish consumed. The result agreed with the findings of [18], who opined that food preferences are affected by several sensory (taste, smell, and texture) and non-sensory factors (behaviour, beliefs, personal characteristics, and risk perception). However, it was observed that the respondents were not so concerned about the nutritional quality of the fish consumed as indicated by 61%. In other words, many of the respondents are of the opinion that all the fish products are of the same nutritional quality. This may be a result of their low monthly income and rising food prices.

Multinomial Logit Regression Analysis Result

Table 3 reveals the outcome of multinomial logit regression analysis performed to determine the factors that influence the independent choices made on fish forms by the fish consumers in the study. Fresh fish was used as a base category for the analysis, therefore, the discussion will be with reference to fresh fish.

The results indicate that the factors which influenced the consumers' preference for smoked fish are age, gender, and marital status, and household size, price of fish per day and price of close substitutes. Statistically, age and household size were significant at 10%, price of close substitute was significant at 5% while gender, marital status and price of fish were statistically significant at 1%. In terms of direction, the coefficient of gender and marital status were negative, meaning that being a married woman would reduce the consumption of smoked fish and increase the consumption of fresh fish.

Table 3. Parameter estimates of multinomial logit regression for fresh fish product type

Fish product forms	Smoked fish			Frozen fish		
Variables	Coefficients	z	P>|z|	Coefficients	z	P>|z|
Age	0.0415365*	1.82	0.069	-0.0234962	-1.16	0.247
Gender	-1.056471***	-2.51	0.012	1.210067***	2.98	0.003
Marital status	-1.321026***	-3.21	0.001	0.1634163	0.44	0.662
Educational status	0.6706687	1.45	0.146	0 .2236792	0.50	0.617
Household size	0.207212*	1.73	0.084	-0.1986693*	-1.69	0.091
Monthly income	8.47e-06	1.31	0.189	3.38e-06	0.63	0.528
Price of fish	0.0006495***	3.25	0.001	-0.0003288*	-1.89	0.059
Price of close subt.	0.0004224**	2.28	0.023	-0.0004928***	-2.65	0.008
Fish taste	-16.05645	-0.02	0.985	17.14352	0.02	0.984
Health status	15.67552	0.01	0.989	1.032233*	1.67	0.095
Fish Odour	-1.375388	-0.00	0.999	0.4780953	0.00	1.00
Fish appearance	14.80692	0.02	0.983	-13.66837	-0.02	0.985
Fish quality	19.01946	0.02	0.986	-3.519471***	-4.43	0.000
Constant	-18.01946	-0.02	0.986	0 .2656968	0.23	0.819
Log likelihood	-254.42124					
Likelihood ratio	233.71					

Significant level: 1%, 5% and 10% ***, ** and *, respectively.
Source: Own results.

The preference for fresh fish could be because married women like to satisfy their husbands with freshly prepared meals. This agreed with the findings of [1], in Gorgan City, Iran and [22] in Ibadan, Nigeria, who discovered a clear preference for fresh fish in their studies. The factors that determine the consumers' preference regarding the consumption of frozen fish include gender, household size, fish price, fish close substitute price, heath status and fish quality.

Statistically, gender, price of close substitute and fish quality were significant at 1%, while household size, fish price and health status were significant at 10%.

The coefficient of household size, fish price, price of close substitute and fish quality were negatively related to frozen fish. Increasing the

price of frozen fish would lead to more consumption of fresh fish, increase in fish quality would reduce consumption of frozen fish, which would lead to fresh fish consumption in the study area.

The Marginal Effect of Fish Consumers' Behaviour on their Preference of Fish Product Type

The results of the marginal effects of determinants of fish consumers' preference on their choice of fish product forms are shown in Table 4.

Summarily, the results show that being a female would reduce the tendency to consumption of smoked fish by 12% and increase fresh fish by the same proportion. Being married would reduce consumption of smoked fish by 7% and frozen fish by roughly 13% with the tendency of increasing the consumption of fresh fish in the study area.

Table 4. Results of the marginal effect of determinants of fish consumers' preference on their choice of fish product type

Fish product forms	Smoked fish			Frozen fish		
Variables	$\partial y \partial x$	z	P>|z|	$\frac{\partial y}{\partial x}$	Z	P>|z|
Age	0.0033807*	1.66	0.102	0.0007762	0.25	0.778
Gender	-.1247539***	-3.29	0.001	0.0958679*	1.76	0.078
Marital status	-0.0705605*	-1.90	0.570	-0.1348971***	-2.56	0.010
Educational status	0.0164123	0.36	0.717	0.1263695**	2.13	0.033
Household size	0.022021*	1.83	0.067	-0.115039	-0.91	0.364
Monthly income	1.72e-07	0.32	0.749	1.70e-06*	1.84	0.066
Price of fish	0.0000504***	2.81	0.005	0.0000194	0.88	0.381
Price of close subt.	0.0000505***	2.80	0.005	-0.00004*	-1.69	0.092
Fish taste	-1.817079	-0.02	0.985	1.221568	0.02	0.982
Health status	0.6491966	0.01	0.990	2.161603	-0.02	0.987
Fish Odour	-0.0929575	-0.00	0.999	-0.0823169	-0.00	0.999
Fish appearance	1.540146	0.02	0.984	-0.7223536	-0.02	0.990
Fish quality	1.540146	0.02	0.983	-0.7223536	-0.02	0.990

Significant level: 1%, 5% and 10% ***, ** and * respectively
Source: Own results.

CONCLUSIONS

This paper had critically examined fish consumers' preference analysis in Iwajowa Local Government, Oyo State. There is no clear distinction in preference for a particular fish product among the consumers. The amount spent on fish consumption as well as amount spent on close substitutes for fish were found to be relatively low which could have adverse effect on fish product forms consumption. This issues of low income is adjudged for the respondents unconcerned attitude to the nutritional quality of the fish products consumed.

Generally, gender, household size, fish price per day, price of fish close substitute, health status and fish quality had significantly effect on the consumers' behaviour for consumers' preference for fish product types consumption. The study recommends a quick intervention and awareness to open the eyes of the respondents the nutritional quality of different fish products in the area so to improve fish preference. Moreover, a concerted effort is needed to improve the standard of living of the respondents as the income obtainable is found to be relatively low. This has greatly affected the household in their preference for fish products. Moreover, all the identified factors

affecting fish preference should be incorporated into the policy.

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