CONSUMER PREFERENCE AND CONSUMPTION PATTERN FOR SECLECTED FORMS OF FISH IN OYO STATE, NIGERIA

Amao J.O.* and Ayantoye K.*
Department of Agricultural Economics
Ladoke Akintola University of Technology,
P.M.B 4000, Ogbomoso
Email: yojobamoo@yahoo.com

Abstract: This study was carried out to examine the effects of certain factors on preference and consumption pattern for some forms of fish in Oyo state, Nigeria. The data collected showed that households can be grouped, into low, middle and high income groups and the analysis revealed that majority of the households in the study area fell within the low income group and this group spent a higher percentage of their income on fish. The study revealed that household size, educational status of household head, taste of fish, availability of fish, ease of preparation of fish, income of household head had significant effects on the preference and consumption pattern of fish in the study area. The result revealed that majority of the households (about 50%) preferred frozen form of fish and this was followed by fresh water fish while a few made smoked fish their choice. It was found out that factors which were significant to frozen fish include availability of fish, household size, ease of preparation of fish, freshness of fish while those significant to fresh water include educational status, level of household head, taste of fish, cleanliness of fish and factors significant to smoked fish include availability of fish, ease of preparation of fish, household size and freshness of fish.
Keywords: Consumer preference, Consumption pattern, frozen fish, smoked fish, income groups.

1. INTRODUCTION

Fish is one of the most important sources of animal protein available all over the world for human consumption. Fish, among all other important protein foodstuffs (such as eggs, milk, meat and other animal product), constitute an excellent source of protein of high biological value. As food, fish is also known for its Recent surveys on nutritional problems revealed that one out of five persons in the developing World is chronically undernourished (FAO/WHO, 1993). FAO (2002) showed that despite fluctuations in supply and demand caused by the changing state of fisheries resources, the economic climate and environmental conditions, fisheries, including aquaculture, have traditionally been, and remain an important source of food, employment and revenue in many countries and communities. Kumar et al

(2005) showed that taste was the most important reason (54%) for purchasing catfish more often than other fish, easy to fry (15%) and availability (10%) were the other main reasons for preferring catfish to other fish.

Akpinar et al (2009) found out that variety, supply channel, price and production method were effective and significant in purchasing preference of the consumer. Adeniyi et al (2012) revealed that the total monthly expenditure on fish was positively affected by monthly expenditure on food and total monthly expenditure on animal protein. Mugaonkar et al (2011) revealed that majority of consumers (84.3%) have been found to be species specific while buying fish. Quality and convenience have been found to be the major factors responsible for shift from local markets.

Agriculture and Agri-food Canada (2010) discovered that on the average, households spent $7,440 on food in 2008, up to 1.8% from 2007. In the 1960s, food represented the largest proportion of household expenditure, accounting for 18.7% of total spending. However, this proportion has declined constantly to just over 10% of total spending. Seafood consumption varies a lot across Europe, not only in relation to frequency of consumption, but also in relation to types of fish products and types of species that are preferred in different countries. In order to understand what drives demand, it is argued that motive or value fulfillment in many situations is a major antecedent for decision-making and food choices (Brunso, 2009). Brunso (2003) revealed that European consumers eat fish 1.49 times a week on average, which is less than the recommended level of consuming fish twice a week. Furthermore, this figure includes both at-home consumption as well as out-of-home consumption, and thus the preparation of fish in the households will be even less that 1.49 times per week on average across the countries included.

 Brunso et al (2004) revealed that motive or value fulfillment in many situations is a major antecedent for decision making and food choices, e.g. the achievement of desired consequences such as a nice enjoyable meal or the expected health benefits achieved by eating some specific foods (Brunsø *et al*., 2004). Brunso et al (2002) revealed four major motives for choice of food which are health, taste, process characteristics and convenience. *Health* is a dimension that has become very important for many consumers, and consumers form preferences based on this dimension motivated by expectations of both a longer life and one of higher quality (Roininen *et al*., 2001; Vannoppen et al., 2002). *Taste* of food has always been of high importance to most consumers: food is a matter of pleasure, and few people eat things of which they do not like the taste (Grunert *et al*., 2000; Verbeke, 2006).

Thus taste and other aspects of food, like appearance and smell, are still an important issue for consumers and recently, consumers have attached increasing importance to the way food is produced, i.e. the *production process* has become a dimension of quality, even when it has no immediate bearing on the taste or healthiness of the product. Specifically the study sets out to determine the consumption pattern of households for various forms of fish and factors that affects consumption pattern of different forms of fish in the study area.

2. METHODOLOGY

The study was carried out in Ibadan metropolis. Ibadan, with a population of about 3.5 million people (National population commission,2006), is one of the largest indigenous urban center in Africa South of the Sahara it is located on 150km inland near the forest grassland boundary of South Western part of Nigeria. Ibadan is the capital of Oyo State. The city lies in the equatorial rain forest zone and has a land mass of between 445-455km^2. Ibadan metropolis comprises eleven local government areas out of the thirty three local government areas in Oyo State. It is bounded in the north by Akinyele LGA and in the east by Ona Ara LGA while it is bounded in the West by Iddo LGA that make up Oyo State. Primary and secondary data were used for this study. The information on primary data was obtained through the use of well-structured questionnaires which were administered to households. The household's income and expenditure data dominated the bulk of the data collected. Others include demographic characteristics of the household head, and socio-economic characteristics. The stratified random sampling technique was used by grouping households into homogenous classes or strata of low, middle and high income density areas. This was to ensure that each income group was adequately represented in the sample. The criteria used in identifying income groups in the city are income, educational attainment differences and other socio-economic characteristics of the households. Interviews of the household were directed mostly to the heads (women/men) within the households who often undertake food purchases and preparation whole some questionnaires were also directed to some bachelors and spinsters. A total of 140 households were therefore randomly sampled. Due to wrong and/or inappropriate completion or non-return of 20 of the questionnaires, a total of 120 consuming household were used for the study. The list of sampled areas/locations is shown in table1 below.

Table 1: List of Sampled locations

Income Group	Location Area
High Income	Bodija Estate, Oluyole extension, Jericho, Ring Road, Agodi, Challenge, Ikolaba and Bashorun
Middle Income	Felele, Ososami, Oke-Ado, Eleyele, Mokola, Agbowo, Oke Bola and Sango
Low Income	Beere, Oje, Orita Merin, Nalende, Ogunpa, Oke Padi, Oja Oba and Olorunsogo

Source: Field Survey, 2012

Various analytical techniques were used to analyse the data collected from fish consuming households in the study area. These include the descriptive and Tobit regression analysis. The techniques are described as follows: The descriptive statistics that were used for this study include tabular presentation, frequency distribution and percentages. They were used to illustrate and show the occurrence of sample characteristics grouped into classes and socio-economic variables of the respondents. The Tobit regression, a hybrid of the discrete and continuous dependent variable was used to determine the effect of the explanatory variables on the forms of fish consumed.

The model is expressed following Tobin (1958)

$$Y_i^* = X_i\beta + E_i$$

where Y_i^* is the income of the household head in naira. X_i is a vector of explanatory variables, β is a vector of unknown coefficients and the E_i's are independently, identically normally distributed random variables with mean zero and variance σ^2. The independent variable specified as determinants of fish consumption are defined as follow:

Y   =   Income of household head (=N=) , Age   =   Age of household head (years) , Edu   =   Educational level of household head (years), HH   =   Household size, Tst   =   Taste of fish, Eas   =   Ease of preparation of fish, Saf   =   Safeness to eat fish, Frh   =   Freshness of fish, Cln =   Cleanliness of fish, App   =   Appearance of fish, Odr = Odour (smell) of fish, Ava   =   Availability of fish in the open market, Exp =Expenditure on substitutes (naira), E=   Error term.

3. RESULTS AND DISCUSION

3.1 Distribution of respondents by socioeconomic characteristics

Sex of household head is an important factor that has significant influence on the preference and consumption pattern of fish by households. This is because it has been found out that women engage them, patronize market and select good quality varieties of protein rich food items like beef, fish, eggs and subsequently increase their consumption for them. The distribution of households by sex and forms of fish is presented in table1 which showed that for each form of fish, the number of female headed households outweighs that of the male and the overall percentage for female headed households was 60.83% while that of the male was 39.17%.   This showed that women headed households were more involved in the purchase and consumption of fish in the study area than their male counterparts. It could also be deduced that majority of female headed households preferred their form of fish frozen due to the availability of the form in every corner of the market, followed by fresh water fish while few of them voted for smoked fish.

The distribution of the household by marital status and form of fish is presented in table 2. Table1 showed that 76.70% of the households were married while 23.30% of them were singles. This showed that there is the tendency for more purchases of fish and increased consumption by households headed by married people than singles due to an expansion in family size and greater responsibilities in terms of expenditures on food items. It could be observed from table1 that unmarried people preferred to spend more on fresh water fish and frozen fish while none of them voted for smoked fish and this may be attributed to the protein and nutritional value of fresh and frozen forms of fish while the uncleanness and smell of smoked fish may put them off.

There is a tendency for the age of the household head to affect the preference and consumption pattern of a household because it can determine to an extent the type and quality of nutrition of the household. A large number of household heads fell within the age group of 31-41 years and represented about 36.67%. This was followed by respondents with age group 41-50 years, 21-30 years and 51 and above representing 25.83%, 25.0% and 12.50% respectively. This showed that young people in the age bracket 31-40 consumed more fish than those in other age groups. Table2 also revealed that young people preferred their forms of fish frozen or fresh average devoted their expenditure on frozen fish than other forms of fish which may be attributed to the availability of this form in the open market.

Education changes taste over time and usually affects consumption pattern, preference for food items and nutrition of a household. This is because consumers become aware of the nutritional value of protein rich food items like beef, eggs and fish and subsequently enhance their consumption. The distribution of household head by level of educational attainment and form of fish is presented in table 2. Table 2 showed that household heads with tertiary education had the highest percentage of 60.80%. This was followed by household heads with secondary education having about 21.70% and household heads with primary education having 10.80% while the lowest percentage of 6.70% was recorded for household heads with no formal education. It could be seen from the above that majority of the respondents who had tertiary education showed preference for fresh water fish and frozen fish while those with little or no formal education showed preference for smoke fish. This showed that level of educational attainment determines and plays an important role in the choice of fish and consumption pattern in the study area. In addition, table 2 revealed that on the average, most households still preferred frozen fish to other forms due to its cheapness and availability in all corners of the market.

Household size had a significant effect on the consumption patter of food items. As the family size increases, there is tendency for the household to consume more food and the percentage of income going to each member of the family decreases. Table2 gives the distribution of households according to their forms of fish. It can be observed that high percentage of the households had between 1-4 members accounting for 51.67% of households sampled. This is followed by household with 5-8 members representing 43.33% of sample households and 9-12 members representing 5% of the sampled households. This tendency towards small family size in the study area may be attributed to the level of education of the respondents and their corresponding awareness of family planning measures. Table 2 also showed that majority of the sampled households on the average voted for frozen fish and this may be due to the fact that as family size increases, more food items need to be purchased at an affordable price and so the need for cheap form of fish like frozen fish. The level of income of the household is a major determinant of nutritional status of the household. It determines the type, quality and quantity of food items consumed by household members.

Table 2 also gave the distribution of households by income group. Majority of the households in the study area were in the low income group accounting for about 48.33% of the total sample. It also showed in the table that a large number of households with high income group showed preference for fresh water fish while those in the low or middle income groups

showed preference for frozen and smoked fish. This could be attributed to the differences in price of various forms of fish as well as some quality differential attached to them. From the table, it could be observed that in general regardless of the level of income of household heads, majority of them still purchased more of frozen fish than other forms of fish due to its availability throughout the season.

Table 2: Distribution of Household by Sex Household head and forms of Fish

Sex	Fresh Water Fish	Smoked Fish	Frozen Fish	Total	Percentage
Male	19	3	25	47	39.17
Female	25	13	35	73	60.83
Total	44	16	60	120	100.00
Marital Status					
Single	14	-	14	28	23.30
Married	30	16	46	92	76.70
Total	44	16	60	120	100.00
Age (yrs)					
21 – 30	16	-	14	30	25.00
31 – 40	16	3	25	44	36.67
41 – 50	10	8	13	31	25.83
51 and above	2	5	8	15	12.50
Total	44	16	60	120	100.00
Level of Edu					
No Formal Education	-	7	1	8	6.70
Primary Education	1	3	9	13	10.80
Secondary Education	3	3	20	26	21.70
Tertiary Educ	40	3	30	73	60.80
Total	44	16	60	120	100.00

Income Group (₦)

Low < 15,000	11	14	33	58	48.33
Middle	14	2	21	37	30.84
15,000-30,000					
High >30,000	19	0	6	25	20.83
Total	44	16	60	120	100.00

Household

size

1 – 4	30	3	29	62	51.67
5 – 8	13	12	27	52	43.33
9 – 12	1	1	4	6	5.00
Total	44	66	60	120	100.00

Source: Field Survey, 2012

3.2 Distribution of respondents by Consumption Expenditure Analysis

Table 3 presented the household monthly expenditure on forms of fish by income group. Household expenditure is an important variable used in measuring household purchasing power. In most consumption studies, a large proportion of consumption expenditure is taken by food items among low income households and lower proportion among high income households. From the table, average monthly expenditures on various forms of fish by household increased with increase in income. This is an indication that at higher income, better foods such animal protein like fish would be consumed. The percentage of monthly income spent on various forms of fish by income groups, however declined with an increase in income. This can be seen from the table where the highest percentage of 13.97% was devoted to fish consumption by the low income group while the lowest percentage of 11.06% was spent on fish by high income group. This confirms Engel's law that as income increases, the percentage of income spent on food items like fish decreases. It could also be observed from the table that high income earners spent more on fresh water fish and little on smoked fish while low income earners spent more on smoked and frozen forms of fish. The low income earners spent moiré on smoked and frozen fish due to the relative cheapness of these forms of fish compared with fresh fish.

Table 3 showed that household size has an influence on monthly expenditure on forms of fish. It was observed that for various forms so fish, average monthly expenditure on them by household increases as the size of household expands. It can also be seen that 10.56%, 10.90% and 23.91% were spent on fish by household sizes 1-4, 5-8 and 9-12 respectively.

This could be attributable to the fact that as family size expands, more members of household will require more protein food items and so the expenditure on food items tends to increase.

The educational attainment of household head also determines the choice of food items and subsequently pattern and degree of consumption, by the household. This is presented in the table below. Table 3 showed that the average monthly expenditure on various forms of fish by household is influenced by the educational attainment of the households head. It was observed that household heads with tertiary education spent more on fresh water fish while those with little or no education spent more on smoked and frozen forms of fish. This was attributable to the fact that at high level of education there is tendency to earn more income and this creates awareness for more nutritious and proteinous food item. It could also be observed that the highest percentage of 16% was spent on fish by household head with no formal education while 10.52%, 11.60% and 11.83% were spent by household with primary, secondary and tertiary education respectively.

Table 3 showed the average monthly expenditure on forms of fish by age of household head. Age can determine preference, the type, quality and quantity of nutrition of households. The table revealed that a large monthly expenditure was devoted by household head with age group 21-30 on fresh water fish than other forms of fish while large amount were spent on smoked and frozen forms of fish by household with age above 30 years. This would be as a result of lesser responsibility of young people which enable them to spend more on form of fish that attracts high price while older people with greater responsibilities in terms of larger monthly expenditure was devoted by household head with age group 21-30 on fresh water fish than other forms of fish while large amount were spent on smoked and frozen forms of fish by household with age above 30 years. This could be as a result of lesser responsibility of young people which enable them to spend more on forms of fish that attracts high price while price while older people with greater responsibilities in terms of expenditures on food items committed their expenditure on forms of fish with low price. The percentage of monthly income spent on fish however, follows no definite patterns.

Table 3 showed the average monthly expenditure on forms of fish by sex of household head which also influences to an extent the choice and consumption of food items like fish. Table 3 revealed that the percentage of monthly income spent on fish by male headed household was 11.93% while 12.27% was spent by household headed by women. This showed that women who engaged in domestic activities like purchase and cooking of food items tend to visit market and purchase more food items and subsequently tend to

consume more fish than men. Marital status of household head influence the choice for food items like fish and subsequently enhance their consumption pattern. The table 3 showed that the percentage of monthly income spent on fish by household who are single (10.21%) is smaller than that spent by households heads who are married (11.96%). The table also shows that monthly expenditure on forms of fish by married household heads was higher than that spent households headed by singles. This could be attributable to the fact that married people with larger family size/members have greater responsibilities in terms of expenditures on food items and therefore tend to spend more son fish, than the unmarried household heads (single) with lesser responsibilities due to smaller household size.

Table 3 presents the average of monthly expenditure on fish and substitutes by income groups in order to determine the degree of fish consumption in relation to its substitute beef, turkey and egg. It was revealed that average monthly expenditures on fish, beef, turkey and egg increased as income increased. This is an indication that a higher income, better food items such animal protein would be consumed. The percentage of monthly income spent on fish beef, turkey and egg by the income groups however, declined with an increase, with an increase in income as observed in the table. This confirmed Engel's assertion that as income increases, the percentage of income spent on food items decreases. It could also be observed from the table that low and middle income earners committed more of their monthly expenditure on fish consumption than on beef, turkey and egg, this could be attributed to the relative cheapness and high protein content of fish to its substitutes. However, the expenditures on beef by high income group is higher than on fish, this is because as people become more affluent, there is tendency to consume relatively more meat than fish.

Table 3: Household Monthly Expenditure on forms of Fish by Income Group

I G	A M I (₦)	A M E F W F (₦)	AM ESF (₦)	A M E F F (₦)	% ISFWF	% ISSF	% ISFF	% ISF
IncomeGroup								
Low	9,453.45	198.97	437.93	681.93	2.10	4.63	7.24	13.97
Middle	21,000	531.10	837.56	1,229.24	2.52	3.62	5.82	11.96
High	50,080	3,216	812	1,514	6.42	1.62	3.02	11.06
Total	80,533.45	3,946.07	2,087.49	3,425.13	11.04	9.87	16.08	36.99

Household size								
1-4	21,546.77	1,004.03	403.23	891.13	4.65	1.87	4.13	10.65
5-8	23,708.85	993.26	510.38	1,076.92	4.19	2.15	4.54	10.90
9-12	13,500	800.00	925.00	1,500	5.90	6.90	11.10	23.91
Total	58755.12	2,797.29	1,838.61	3,468.05	14.74	10.92	19.77	45.46
Education								
No- formal Education	6,375	-	5812.5	443.75	-	9.1	6.9	16.0
Primary Education	12,846.15	80.76	396.15	873.07	.63	3.1	6.79	10.52
Secondary Education	15,384.62	360	434.62	982.70	2.4	2.82	6.38	11.60
Tertiary Education	27,074.73	1,512.33	506.85	1,104.11	5.57	1.86	4.07	11.83
Total	61,680.5	1,953.09	1,918.87	3,403.63	8.6	16.88	24.14	49.95
Age								
21-30	21,619.99	1,650	-	671.67	8.26	-	3.36	11.62
31-40	16,875	787.50	443.18	911.59	4.70	2.62	5.40	12.72
41-50	25,919.36	769.35	624.19	1,015.51	3.07	2.40	3.91	10.61
51 above	21,933.33	753.33	833.33	1,086.67	3.43	3.79	4.95	12.17
Total	86,347.68	3,960.18	1,900.70	3,684.44	19.46	8.81	17.62	47.12
Sex								
Male	18,840.43	1,086.17	410.43	754.25	5.76	2.17	4.0	11.93
Female	21,241.10	993.83	526.02	1,090.41	4.7	2.47	5.13	12.27
Total	40081.33	2,080	936.45	1,844.66	10.43	4.64	9.13	24.20
Marital Status								
Single	18,767.86	1,146.43	-	771.43	6.10	-	4.11	10.21
Married	21,261.27	943.48	503.70	1,096.74	4.44	2.36	5.16	11.96
Total	40,029.13	2,089.91	503.70	1,868.17	10.54	2.36	9.27	22.17
Income								

Group(₦)								
Low	1,318.79	1,279.31	350.50	250	13.97	13.50	3.71	2.64
9,453.45								
Middle21,000	2,097.90	2,650.57	724.90	450	11.96	12.62	3.45	2.14
High 80,533.45	8,957.8	10,079.9	2,425.4	3,925.4	36,99	38.4	9.85	6.37

Source: Field Survey, 2012.

NOTE on Table 3: IG = Income Group, AMI = Average Monthly Income (₦), AMEFWF = Average Monthly Expenditure on fresh water fish (₦), AMESF = Average Monthly Expenditure on Smoked fish (₦), AMEFF = Average Monthly Expenditure on frozen fish (₦), PISFWF = % of income spent on fresh water fish, PISSF = % of income spent on Smoked fish, PISFF = % of income spent on frozen fish, PISF = % of income spent on fish

4.3   CONSUMER PREFERENCE ANALYSIS

Consumer preference for food items is an important variable used in determining the extent on the degree of household purchasing ability. Households make choice out of various food items available at their disposal and this in turn determines the level and extent to which consumption would be based. Therefore, an analysis of consumer preference for forms of fish is important, and this may be useful for fish production, planning, trade, distribution and marketing.

3.3   Distribution of respondents by Most Preferred Form of Fish in the study area

Table 4 showed the most preferred form of fish by households. From the table, 36.67% of the households preferred fresh water fish, and 13.33% preferred smoked fish while 50% of the sampled households (60) preferred frozen to other forms of fish. Majority of the household preferred frozen fish to other forms of fish probably due to its relative cheapness, ability to preserve for a longer period of time and more importantly its availability in all corner of the market and throughout the season.

Table 4: Most Preferred Form of Fish by Households in the study area

Form Of Fish	Number of Household	Percentage Distribution
Fresh Water	44	36.67
Smoked	16	13.33
Frozen	60	50.0
Total	120	100.00

Source: Field Survey, 2012.

3.4.0 Tobit Regression Analysis Results

The analysis of `effect of some determinants of the household preference and consumption for selected forms of fish was done using Tobit regression technique as shown in the methodology. The choice of Tobit model was made due to the benefit of obtaining the elasticity due to the probability of consumption of fish type. The regression parameters and diagnostic statistics were estimated using the Maximum Likelihood Estimation (MLE) technique. The software package used is the LIMDEP version 7.0. The result of the analysis is presented below.

3.4.1 Determinants of Fresh Water Fish Consumption

Table 5 presented the determinants of fresh water fish Consumption. From the table, factors having significant effects on the consumer's choice decision for fresh water fish include pork, turkey, egg, education of household head, taste of fish, cleanliness of fish, ease of preparation of fish. Pork had coefficient of 4.0968 and this is an indication that as households consumed pork, the consumption of fish will increase by 4.0968 units. Also, as households consumed turkey and egg, the consumption of fresh water fish will increase by 0.6920 and 1.1201 times respectively. The educational attainment of household head determines the consumption of food items. The coefficient of education is 299.20 and this is an indication that consumers who viewed education as an important factor that enhances their preference will increase their consumption by 299.20 units, and it follows that high level of education creates awareness for high proteinous food items like fresh water fish. Coefficient of taste is 63.515 and this means that households who viewed taste as important will increase their consumption of fish by 63.515 unit while cleanliness of the product was important to some consumers in the purchase of fresh water fish with the coefficient of 1185.2, which means they are able to buy fish 1185.2 times due to its cleanliness.

Ease of preparation and safeness to eat (less bone) were key determinants in the choice of fresh water fish by some households. Consumers who viewed ease of preparation as an important factor would increase their consumption by 1678.1 times while those who preferred fresh water fish based on safeness will increase their consumption by 698.26 times. In general, educational attainment of household heads in addition to other attributes of fish like taste, cleanliness, ease of preparation revealed the determinant factors that enhanced choice of fresh water fish by household in the study area.

Table 5: Maximum Likelihood Estimates of the Tobit Regression for fresh water fish

Variable	Coefficient	Standard Error	T-Value
Beef	0.4672	1646.0	0.0007
Pok	4.0968	0.1476	27.756***
Tuk	68.201	12.530	5.204***
Egg	1.1201	0.6162	1.819*
Age	20.427	31.388	0.651
Edu	299.20	91.552	3,268***
HHS	-343.01	111.08	-3.088
APP			
Odr	586.23	595.39	0.985
Tst	-335.70	375.86	-0.893
Frh	63.515	311.35	2.040*
Cln	-136.56	1365.9	-0.100
Eas	1685.2	1044.11	1.614*
Saf	1678.1	635.86	2.639***
Ava	698.26	601.38	1.161
Sex	-206.55	393.80	-0.525
Mar	-569.24	404.28	-1.408
Constant	343.61	572.17	0.601
Sigma(Σ)	-3611.6	16460.0	-2.194
	1561.8	133.66	11.686***

Source: Computer Printout of Tobit Regression

***= Significant at1% level, **= Significant at 5% level, *= Significant at 10% level

3.4.2 Determinants of Smoked Fish Consumption

Table 6 Showed the determinants of smoked fish consumption. From table 5, factors having significant effects on the purchase and consumption of smoked fish include beef, household size, ease of preparation of fish, availability of fish among others. The coefficient of beef is 0.2336 and this means those consumers who eat beef are likely to increase the consumption of smoked fish by 0.2336 times. Household size has a coefficient of 56.390 and this indicates that as household size is becoming larger, consumer increase their consumption of fish by 56.390 units. Ease of preparation of fish has coefficient of 132.06 and this is an indicator that households will always expect their choice of fish to be easily prepared at home and so

considered it important for choosing smoked fish because it can be prepared with ease and therefore then are likely tio increase their consumption by 132.06 unit Availability of the product in the open market was considered by certain households as an influencing factor in the purchase and consumption of fish. Availability has coefficient of 225.32 and this is an indicator that because the product is always available in all corners of the market, consumers will increase their consumption of smoked fish by 225.32 unit. In general, the larger size of households, the more the need for food items and due to the relative cheapness of smoked fish and availability in all corners of the marker with the ease in p0reparing this form of fish, most households would rather go for smoked fish at the expense of other forms of fish.

Table 6: Maximum Likelihood Estimates of the Tobit Regression for Smoked Fish

Variable	Coefficient	Standard Error	T- Value
Bef	0.2336	0.5179	4.512***
Pok	0.2200	0.4495	0.489
Tuk	-0.8542	0.8197	-0.104
Egg	- 01997	0.2144	0.931
Age	-47643	10.268	- 0.464
Edu	-20.109	18.613	-1.080
HH	56.390	37.151	2.518*
APP	140.13	78.92	0.783
Odr	121.37	125.53	0.967
Tst	1.2247	434.24	0.003
Frh	378.58	358.15	1.570
Cln	413.37	437.71	0.944
Eas	132.06	236.21	2.559*
Saf	-20.778	194.84	-0.107
Ava	225.327	128.51	2.323*
Sex	-44.29	137.22	-0.020
Mar	-115.56	200.99	-0.575
Constant	325.47	442.41	0.736
Sigma	575.29	44.541	12.916***

Source: Computer Print Out of Tobit Regression
Note: *** = Significant at 1%, ** = Significant at 5% , * = Significant at 10%

3.4.3 Determinants of Frozen Fish Consumption

Table 7 presented the determinants of frozen fish consumption. From table 7, factors having significant effects on the purchase and consumption of smoked fish include beef, household size, ease of preparation of fish, availability of fish among others. The coefficient of beef is 0.2336 and this means those consumers who eat beef were likely to increase the consumption of smoked fish by 0.2336 times. Household size has a coefficient of 56.390 and this indicates that as household size is becoming larger, consumer increase their consumption of fish by 56.390 units. Ease of preparation of fish has coefficient of 132.06 and this is an indicator that households will always expect their choice of fish to be easily prepared at home and so considered it important for choosing smoked fish because it can be prepared with ease and therefore then were likely to increase their consumption by 132.06 unit Availability of the product in the open market was considered by certain households as an influencing factor in the purchase and consumption of fish. Availability has coefficient of 225.32 and this is an indicator that because the product is always available in all corners of the market, consumers will increase their consumption of smoked fish by 225.32 units. In general, the larger size of households, the more the need for food items and due to the relative cheapness of smoked fish and availability in all corners of the market with the ease in preparing this form of fish, most households would rather go for smoked fish at the expense of other forms of fish.

Table 7: Maximum Likelihood Estimates of the Tobit Regression for Frozen fish

Variable	Coefficient	Standard Error	Z-Value
Bef	0.1098	0.6231	1.761*
Pok	-0.5375	0.5514	0.975
Tuk	-0.5081	0.9655	0.526
Egg	0.2800	0.2583	1.960**
Age	-3.3871	12.133	-0.279
Edu	58.088	22.318	2.603***
HH	93.107	44.556	2.900***
App	-194.89	218.08	-0.894
Odr	-57.411	150.24	-0.382
Tst	-527.76	534.01	-0.988
Frh	602.88	440.95	2.381**

Un	54.410	538.26	1.010
Eas	48.59	279.85	2.827**
Saf	407.27	233.08	1.747*
Aua	212.61	151.35	2.020**
Sex	-217.28	162.61	-1.336
Mar	1.1941	240.28	0.005
Constant	-23.335	531.15	-0.044
Sigma(∑)	710.00	47.304	15.009**

Source: Computer Print Out of Tobit   Regression

Note: ***** = Significant at 1%, ** = Significant at 5% , * = Significant at 10%

3.4.4 Elasticities of the probability of consuming various forms of fish by households.

Table 8 showed the coefficient of elasticities of the probability of consuming various forms of fish by households. For fresh water fish, it could be observed that the coefficient of elasticity of probability of consuming beef is 0.8977, hence it is inelastic. This showed that 100 percent increase in consuming beef will lead to 89.77 percent increase in the probability of consuming fresh water fish while the coefficients for smoking fish and frozen fish are 0.5342 (inelastic) and 0.7603 (inelastic) respectively. The probability of consumption of fresh water fish as a result of pork consumption has an elasticity coefficient of 0.3065 (inelastic) while that of frozen fish is 0.7603 (inelastic) which indicate increase in the probability of consuming them but the coefficient of elasticity of smoked fish is – 0.7041 (inelastic) and this means that for every 100 percent increase in the consumption of pork, the probability of consuming smoked fish is decreased by 70.41 percent.

The elasticity coefficients of probability of consuming fresh water fish, smoked fish and frozen fish as a result of consuming turkey are 0.1928 (inelastic), 0.1238 (inelastic) and 0.2531 (inelastic) respectively. For every 100 percent increase in consuming egg will lead to 70.25 percent, 40.4 percent and 69.9 percent increase in consumption of fresh water fish, smoked fish and frozen fish respectively while the coefficient of the probability of consuming fresh water fish as a result of rise in level of education of household head is 1.2410 (elastic) which means that for every 100 percent rise in level of education of household head is 1.2410 (elastic) which means that for every 100 percent rise in level of education of household head,

the probability of consuming fresh water fish is increased by 124.10 percent while for smoked and frozen forms of fish, their coefficients are 0.1565 (inelastic) and 0.09801 (inelastic). The probability of fresh water fish as a result of increase in household size has an elasticity coefficients of 0.20903 (inelastic) while for smoked and frozen forms of fish are 0.7089 (inelastic) and 1.4023 (elastic) respectively. This indicates that for frozen fish, every 100 percent increase in household size, the probability of consuming frozen fish in increased by 140.23 percent while for fresh water and smoked forms of fish, the probabilities increased by 20.93 and 70.89 percent.

Table 8: Coefficient of Elasticities of Consumption of Fish in the study area

Variable	Elasticities of Probability of Consumption		
	Fresh Water Fish	**Smoked Fish**	**Frozen Fish**
Beef	0.8977	0.5342	0.7603
Pork	0.3065	-0.7041	0.5021
Turkey	0.1928	0.1238	0.2531
Egg	0.7025	0.4040	0.6990
Age	0.4020	0.8336	0.66787
Education	1.2410	0.1565	0.09801
Household	0.2093	0.7089	1.4023

Source: Derived from the Result of Tobit Regression

4. CONCLUSION AND RECOMMENDATION

The overall objective of a country food policy is to improve household food security and making sure households have access to adequate food in both quantity and quality. Since food items, especially the protein ones like fish are found to be important in the nutrition of people in a country, and considering the larger proportion of monthly expenditure on fish especially among the low income earners, there should be plans by the government to bring a reduction in the prices of fish products through improved accelerated fish production and distribution. Since, majority of consumers buy fish because of its nutritional value and its relative cheapness, efforts should be made by government at all levels toward increasing the supply of the important commodity in the market.

There should be incentives, support and encouragement for people to take up any aspect of fish production and marketing processes while those who are already in the business but lack

enough capital for improvement and enlargement should be given credit facilities. This will include strict compliance to issues and practices involved in the economic of production, marketing, management with a view to developing a modernized package of technology for fish producers. The country should also develop the fishery manpower through regular seminars, workshops and conferences.

REFERENCES

[1] Adeniyi OR, Omitoyin SA and OO Ojo (2012); Socio-economic determinants of Consumption pattern of fish among households in Ibadan North Local Government Area of Oyo State, Nigeria. AJFAND Online. African Scholarly Scientist Communication Trust 12(5) 6538.

[2] Agriculture and Agri-Food Canada (2010); International Markets Bureau. Market Analysis Report May 2010. The Canadian Consumer Behaviour, Attitudes and Perceptions Toward Food Products p9.

[3] Akpinar M.G, Dagistan E, Mazlum Y, Gul M, Kol B and Yilmaz Y (2009); Determining Household preferences for fish consumption in Turkey. Journal of Animal Veterinary Advances 8(11)2215-2222.

[4] Brunso K (2009); Consumer trends, consumer attitudes and consumers' selection and preferences in relation to seafood. Published by the Food and Agriculture Organisation (FAO) p1.

[5] Brunsø, K. (2003); Consumer research on fish in Europe. pp. 335–344, in: J.B. Luten, J.

[6] Oehlenschlaeger and G. Olafsdóttir (editors). Quality of Fish from Catch to Consumer – Labelling, Monitoring and Traceability. Wageningen Academic Publishers, Wageningen, The Netherlands.

[7] FAO (2002); The state of the world fisheries and aquaculture 2002. Rome, Food and Agriculture Organization of the United Nations.

[8] FAO and WHO, (1993): Nutrition and Development. A Global Assessment, International Conference on Nutrition summary,

[9] Grunert, K.G., Bech-Larsen, T. & Bredahl, L. (2000); Three issues in consumer quality perception and acceptance of dairy products. *International Dairy Journal*, 10: 575–584.

[10] Kumar G, Engle C and Quagrainie K (2005); Household Preferences and Consumption Patterns for Farm-Raised Catfish in the U.S. School of Agriculture, Fisheries and Human

Sciences. Cooperative extension program, University of Arkansas at Pine Bluff, United States Department of Agriculture, and County Governments Cooperating p22.

[11] Mugaonkar P H, Ananthan P S, Samal S S and Debnath B (2011); A Study on Consumer Behaviour at Organized Fish Retail Outlet. Agricultural Economics Research Review 24: 133-140.

[12] Roininen, K., Tuorila, H., Zandstra, E.H., de Graaf, C. and Vehkalahti, K. (2001); Differences in health and taste attitudes and reported behaviour among Finnish, Dutch, and British consumers: a cross-national validation of the Health and Taste Attitude Scales (HTAS) *Appetite*, 35:33–45.

[13] Vannoppen, J., Verbeke, W. and Van Huylenbroeck, G. (2002); Consumer value structures towards supermarket versus farm shop purchase of apples from integrated production in Belgium. *British Food Journal*, 104: 828–844.

[14] Verbeke, W. (2006); Functional foods: consumer willingness to compromise on taste for health? *Food Quality and Preference*, 17: 126–131.

[15] Tobin, J. (1958): Estimation of Relationships for Limited Dependent Variables, Econometrics Point of View, 26 (1958), pp 24-36.