

SURVEY OF TILAPIA CONSUMPTION IN BENUE STATE NIGERIA: A CASE STUDY OF MAKURDI METROPOLIS

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ABSTRACT: *This study examined and verified the interest of consumers on Tilapia consumption in makurdi metropolis Benue state. 50 structured questionnaires were used by random sampling techniques to collect Data from respondents. Statistical analysis was carried out using frequency distribution and statistical packages for social sciences (SPSS) the study reveals high consumers preference for Tilapia consumption, it was observed that family size and educational level have a significant positive effect on consumption of Tilapia. The result also revealed significantly high ($p < 0.05$) tilapia consumption among married (60%) and students (48%). Family size of 6-10 accounted for 26% while 1-5 made up 18% consumption levels respectively. Fourteen percent (14%) of the study shows that tilapia consumption is high in Makurdi and can contribute to the economic growth of Benue state and Nigeria at large. Therefore, fish farmers should engage themselves in production of tilapia for improved wellbeing and overall benefits of farmers, marketers and the nation.*

KEY WORDS: Survey, consumer preference, tilapia, consumption.

INTRODUCTION

Fish plays an important role in human diet in towns and villages in Benue State by providing 77% of the total animal protein intake (Salam, 2005) while it constitutes about 16% to world animal protein consumption (FAO, 1999). Fish represents an essential and often irreplaceable food for the poor in developing countries in form of animal protein (Salam, 2005). Studies on fish demand and consumption has received little or no research attention resulting in insufficient knowledge on consumer preferences which is necessary information for fisheries development and products development geared towards meeting specific demand by consumers. It is a particularly important protein source in regions where livestock is relatively scarce-fish supplies less than 10% of animal protein consumed in North America and Europe,

but 17% in Africa, 26% in Asia and 22% in China (FAO, 2000). About one billion people world-wide have been estimated to rely on fish as their primary source of animal protein (FAO, 2000). Fish also contribute to social and economic development. The FAO estimates the value of fish traded internationally to US\$ 51 billion per annum while over 36 million people are employed directly through fishing and aquaculture (FAO, 2000), and as many as 200 million people derive direct and indirect income from fish (Garcia and Newton, 1997).

Tilapia culture has expanded worldwide at an average annual rate of 14.2 percent since 1984 (FAO, 1998). Global tilapia production through aquaculture reached 800,000 metric tons (MT) in 1996 (Food and Agriculture organization of the United Nations (1998). Cultured tilapia production has increases to constitute 57 percent of total tilapia production (wild-caught and cultured) worldwide. In Africa the production of tilapia is less than 20 percent of the total aquaculture production of tilapia (FAO, 1998). Egypt is the second largest producer, worldwide, of tilapia and generates 58 percent of the total Africa production.

As a tropical fish, the distribution of tilapia production would be expected to be concentrated in area with tropical climate by Alcester C.C 2001. This is largely the case, and tilapia production has grown rapidly in the tropical areas. Nevertheless, tilapia production has also expanded in to areas with temperature climates. The Unites States alone produced over 9,000 MT of tilapia in 2000 (American Tilapia Association, 2001). Much of the U.S. production is indoor or greenhouse facilities. Given the well-developed air freight system in most regions of the world (Neiraet *al.*, 2003) the tropical areas would be expected to continue to have a competitive advantage in tilapia production for many years to come.

Fishing is an ancient economic activity In Nigeria. It activities cover both the coastal and inland waterways and it was of tremendous economic value to the pre-colonial Nigerians (Ethinmore, 2007). Fish was one of the major articles among Nigerian commodities of trade. Fish of various kinds were either dried in the sun or smocked in order to preserve them for long or short distance market (Strde and lfeka, 2006). Fresh fish were said to be marketed mostly in short distance areas owing to the perishable nature and problem of storage facility. Professional fishing is characterized by craftsmanship and special skills, such as boat, canoe, paddle, float, buoy and net construction coupled with invention of a variety of indigenous fishing techniques and gear. Fishing in pre-colonial Nigeria till date engenders migration as many of its practitioners would have to leave their original settlements for better prospects elsewhere (Ayodeji, 2008). Fishing of the migratory type was very prominent among these tribes: Ilaje, Izo, Itsekiri, EfikJukun, Ijebu, Awori etc. from the precolonial period to date, the Ilaje are to have been the most migratory, famous and professional both in land deep sea-fishing not only in Nigeria but in West and Central Africa (IUCN, 2007). Around the early 16th century, fishing is said to be practiced with rudimentary techniques and tools such as raffia materials, wood and grasses add with very limited scope (Ehinmore, 2007).

By the late 18th century to early 19th century, most Nigerian fishermen had started developing improved fishing gear and techniques such as clapnets, castnets, ita, egho, asuren, ojijon, agada, ighee, iyanma, ekobiufo, riro, (Ethinmore, 1998) etc. Nigerian fishing economy was in this progressive stage of development on the eve of British colonization. The 1960 Independence led to advanced civilization and pronounced developments. It is on record however that the old in system (trade by barter) phased out many decades, prior independence, gave room to the

emergence of commercialization and trading in various commodities including fish which started gaining prominence.

According to Alverson and Paulik (2002) Marketing is as old as human beings. It is closely related so all endeavours. During the slave trade, marketing was primitive; it c in the form of barter (an exchange of goods for goods) and later graduated into monetary trade (Cowries and shells were commonly used in Nigeria then).

Tilapia Fish marketing in Nigeria, however, is hinged on some basic questions: What do consumers want? Which species? What price, size, form, quality, quantity and grading? Others are: what services do they want? When to sell? Where do people buy? etc. according to (Sen, 2005). It is important to know that: the less familiar specie is the greater the risk that it will be rejected or taken a long time to build up demand for it, people's taste are formed slowly and strongly influenced by traditional eating habits. Demand increases at the time of festival and holidays. As prices rise, less is bought and as prices fall, more is bought and poor people are more likely to look for change substitutes than rich people.

The Environmental factors asserted by Flood 2006 have a major part to play in Nigeria's fish marketing system. In Nigeria market, a fall in income per head results in the reduction of fish to be purchased, an awareness campaign about the importance of fish to human health will lead to increase in the purchase and consumption rate, a growth in population will lead to an increase in fish demand, a bumper harvest in other sectors of Agriculture, results in more money in circulation hence increase in demand for fish and A ban on fish importation leads to a rising demand for local fish.

With the progressive development of the ice conservation facilities, Nigerian Government embarked on the importation of frozen fish to complement local production supply and to cover the deficit in consumer demand. The increment in demand was a result of increase in population (between 10-15% annual growth rate) and shift in consumption due to favourable fish price compared to its substitutes. Also the rapid awareness that Tilapia is rich in nutrient contributing an average of 20 — 25% of per caput animal protein intake and could be as high as 80% in coastal and riverside communities (FAO, 2000).

The importation is exclusively limited to small pelagic, which are made up of horse mackerels and sardines. In 2002 alone, the total value of fish import was \$159 million (FAO, 2005). Frozen fish imports constitute the category most widely distributed in the country, through a network of privately owned cold stores located in major cities. The fish is available frozen in city markets, and part of it is smoked for further distribution to village markets. The freshly frozen landings of the industrial fish trawlers also follow the same distribution network, but its availability far beyond the coastal landing sites is constrained by its limited quantity relative to the cheaper imports.

There is a high demand from the large population and income levels close to the port. The major freshwater species: Tilapia are preferred fresh, but are available fresh only at high cost. For reservoirs and lakes which are within or close to major human settlements, markets develop around the landing sites and the product is usually disposed of within hours of landing, partly to direct consumers and partly to marketers who may preserve for few days.

Most other landing sites in the inland water system are remote and facilities for preservation, other than smoking, are bob-existent. Cooling vans also engage in distribution and marketing. Larger commercial marketing channels through supermarkets and open markets do exist catering for majority of wholesalers, retailers and urban consumers. Also, the processing and packaging has been improved over the years, such that it has the highest shelf life among the local products and is available in the markets of the very densely populated cities of Nigeria.

This necessitated research into this study to find out consumer's preference for tilapia consumption and its marketing trend within Makurdi metropolis, Benue State-Nigeria.



Plate 1: Southern Mouth-brooder



Plate 2: Redbreast Tilapia

MATERIALS AND METHODS

Description of the Study Area

Benue is a state in the mid-eastern region of Nigeria with a population of about four million two hundred and fifty three thousand six hundred and forty one (4,253,641) in 2006 National Population Census (NPC, 2006). Idoma and Tiv, are spoken predominantly. There are other ethnic groups, including Igede, Etulo and Abakwa. Jukun, Hausa, Akweya and Nyifon. With its capital at Makurdi, Benue is a rich agricultural region; some of the crops grown are potatoes, cassava, soya bean, guinea corn, flax, yams, sesame, rice, and ground nuts. Benue State is named after the Benue River and was formed from the former Benue-Plateau State in 1976. The state capital is Makurdi which lies on longitude $8^{\circ}55'99''$ and latitude $7^{\circ}7'252''$ (Google Map, 2015)

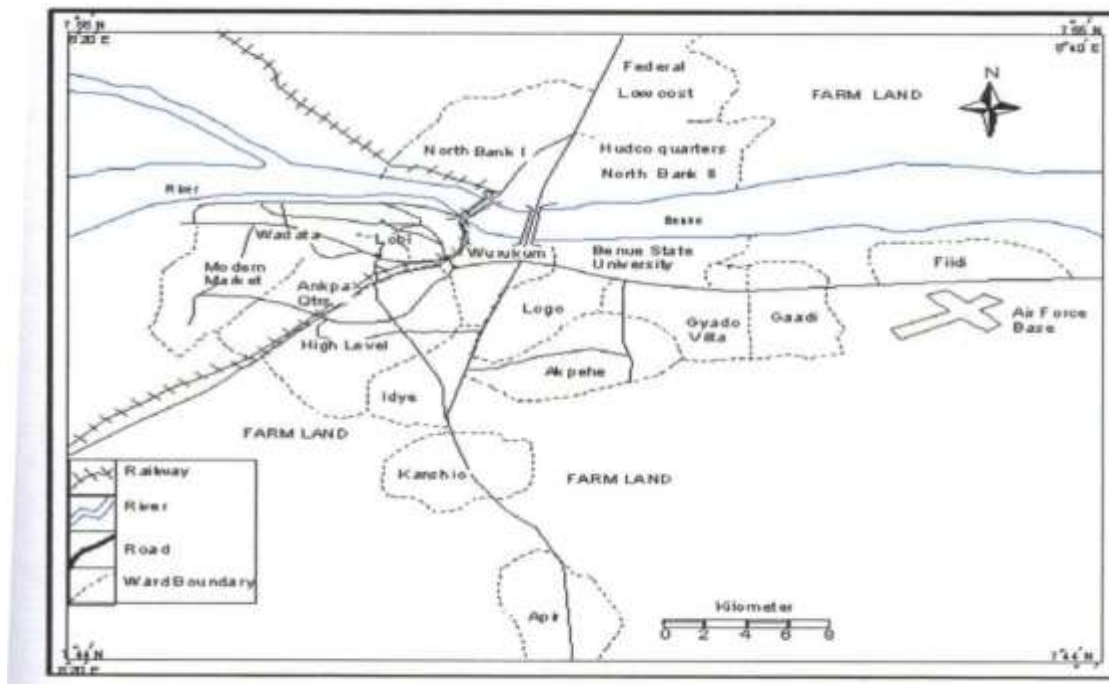


FIGURE 1: THE MAP OF MAKURDI LOCAL GOVERNMENT SHOWING THE STUDY AREAS. (Source: <http://www.online Nigeria>.)

METHOD OF DATA COLLECTIONS

The study areas were purposively selected due to high population densities and existence of commercial oriented fish farmers most of whom were starting to turn to entrepreneurial aquaculture practices. A random sampling was done in the identified areas to select fish consumers to participate in the same as respondents. A total of 50 questionnaires were administered to respondents in Makurdi Metropolis. Questions on age, sex, marital status, household's family size, and educational levels were included in the questionnaire as they were found to relate to reasons for food purchases. Data collected from the field was analysed

statistically using descriptive statistics of frequency and distribution with Statistical Packages for social Sciences (SPSS).

RESULTS

The survey on consumer preference on tilapia revealed the age distribution, sex distribution, marital status, occupation, educational levels of consumers of tilapia to significant difference.

Demographics status of respondents

Table 1: Sex Distribution of Consumers of Tilapia in Makurdi Metropolis

Research question	Options	Frequency	Percentage
Sex	Male	19	38%
	Female	31	62%
Total frequency and percentage		50	100

The result as showing in Table 1 revealed that 62% of the respondents were female and out of this, 50% consumed tilapia and 12% does not eat tilapia 38% of respondents were male and out of this only 30% eat tilapia.

Marital status of respondents

Table 2: Marital status of consumers of tilapia in Makurdi Metropolis.

Research Question	Options	Frequency	Percentage
Marital Status	Divorce	2	4%
	Single	18	36%
	Married	30	60%
Total frequency and percentage		50	100

Marital status determines whether family pattern affects tilapia consumption in the study area. The result in the table 2 shows that 36% of respondents were single and out of this, 30% consume tilapia while 6% do not. A greater majority fell within married status, making up to 60% and among whom 55% consumed tilapia and the remaining 5% don't like tilapia. The lowest respondent was divorce category which was 4% and they consume tilapia respectively.

Occupation of respondents

Table 3: Occupational levels of consumers of tilapia in Makurdi Metropolis

Research question	Options	Frequency	Percentage
Occupation	Fisher farmer	2	4%
	Civil Servant	17	34%
	Business	6	12%
	Students	25	50%
Total frequency and percentage		50	100

Table 3 shows that the majority of the respondents are students and carried the highest percentage of 50% amounted to 48% of tilapia consumption while 2% were left out. Thirty four percent (34%) were civil servants of which 20% eat tilapia while the remaining 14% don't like tilapia. Twelve percent (12%) of respondents were business men and only 2% relish tilapia while 10% were left out. The finding also revealed that, 4% of respondents are fish farmers and all (100%) of them eat tilapia in the study area.

Age distribution of the respondents

Table 4: Age distribution of consumer of tilapia in Makurdi metropolis

Age groups (years)	Frequency	Percentage
<20	7	14
21 – 25	10	20
26 – 30	12	24
31 – 35	7	14
36 – 40	4	8
> 40yrs	10	20
Total frequency and percentage	50	100

The age of the respondents play an important role in the consumption pattern of the consumers shown in Table 4. The age distribution revealed that 14% fall within 0 - 20 and only 4% eat tilapia but greater majority fall within the middle age groups of 26 - 30 which make up to 24% and out of this 20% were recorded that eat tilapia and 4% were not. Ages between 21-25 made up to 20% and only 10% eat tilapia while 15% do not eat at all. Furthermore, 14% of respondents are ages 31 - 35 and out of this 11% eat tilapia and 3% do not. Similarly, ages 40 and above constituted 20% of respondent, and all (100%) of them eat tilapia, in contrast ages 36 - 40 had the lowest percentage of 8% of those that consume tilapia which shows that between the age group of 26-40 and above there is a significant difference between 26 - 40 and 0 - 25 age of consumers.

Educational level

Table 5: Relationship between Educational levels of consumers of tilapia in Makurdi metropolis

Research question	Options	Frequency	Percentage consumption (%)
Educational Level	Non-Formal- Education	5	10
	Primary	5	20
	Secondary	13	25
	Tertiary	27	45
Total frequency and percentage		50	100

The distribution of respondents on the basis of their educational attainment shows that they all had one form of education or the other. Non-formal education respondents has 10% and 8% of this eat tilapia while 2% do not. Primary education has 10% of respondents and all (100%) of

them eat tilapia while secondary education has about 12% of respondents and 10% eat tilapia where as 2% is count out but a greater majority of respondents are in tertiary education with highest percentage of 54% and out of this, 50% were recorded for eating tilapia and only 4% is left out. It was observed that the educational level of the respondents determines the quality and quantity of fish consumed especially the tilapia among aquacultural system. This revealed that quality of education has a significant difference in fish consumption rate.

Consumer preference of tilapia

Table 6: Reasons for consumers' preference to tilapia consumption in Makurdi Metropolis

Research question	Options	Frequency	Percentage (%)
Why do you prefer Tilapia	Very cheap	20	40
	Easy access	8	16
	Very sweet	16	32
	Marketable	1	2
	Always available	5	10
Total frequency and percentage		50	100

In table 6 above, the highest percentage of respondents (40%) preferred tilapia because of its affordability. Thirty two percent (32%) of respondent also preferred tilapia for its sweet taste while 16% liked it for it easy accessibility and the lower percentage of respondents were found from the marketability and availability which is 2% and 10% respectively

Table 7: Frequency of Consumption of Tilapia in Makurdi Metropolis

Research question	Options	Frequency	Percentage (%)
How often do you eat Tilapia in a week	No response	21	42
	1 time	12	24
	3 times	10	20
	5 times	6	12
	7 times	1	2
	Total frequency and percentage		50

Table 7 shows that 42% of the respondents cannot tell or give account of how often they eat tilapia in a week which means it's not common to them, 24% of respondents, which is second greater number of respondent that eats tilapia only once in a week. While 20% eat 3 times and only few numbers of respondents eat tilapia regularly in a week which is making up to 12-7 times in a week respectively.

Table 8: Consumer preference of tilapia in Makurdi Metropolis

Research question	Options	Frequency	Percentage (%)
How best do you enjoy tilapia?	Fresh	2	4
	Roasting	22	44
	After cooking	5	10
	Dried	17	34
	Other forms	4	8
Total frequency and percentage		50	100

There are different forms of tilapia preparation or processing, and it is determined by consumers' choice in the study area. Roasting is however identified to be the best choice of some respondents in the study area. Table 8 shows that 44% of respondents who enjoy tilapia best in roasting form is the highest, 34% enjoying tilapia best in dried form while after cooking and other form were also not left out either and very few respondent choose fresh form of tilapia respectively.

Table 9: Frequency of tilapia consumption in Makurdi Metropolis

Research question	Options	Frequency	Percentage (%)
Consumption of tilapia in household's	No	13	26
	Yes	36	72
	No Responses	1	2
Total frequency and percentage		50	100

About 72% of respondents that had a household consumed tilapia in their household while 26% do not consume tilapia in their household and only 2% do not respond that has household.

Table 10: Consumers preference of tilapia over meat in Makurdi Metropolis

Research question	Options	Frequency	Percentage (%)
Preference of fish over meat	Its proteinous	7	14
	Its affordable	20	40
	Easily available	9	18
	Easy to cook	6	12
	It is more tasty	8	16
Total frequency and percentage		50	100

The table 10 shows that the majority of respondents which accounted for 40% preferred fish over meat because it is affordable in price compared to meat, 18% of respondents also preferred fish for its easy access than meat, while 16% and 14% were attributed its proteinous and tasty and finally 12% was because the fish is very easy to cook and fast to be done.

Table 11: Consumers choice of where to buy tilapia in Makurdi Metropolis

Research question	Options	Frequency	Percentage (%)
Place of purchase	No response	1	2
	Wild	12	24
	Local	37	74
Total frequency and percentage		50	100

The result in table 11 shows the location and the place where tilapia is been purchased by consumers in the study area. About 74% of the respondents purchase or obtained their tilapia from the local market while 24% was from wild and 2% of consumers was not respond to this question

Table 12: Consumers price of tilapia in MakurdiMertropolis

Research question	Options	Frequency	Percentage (%)
Price (N/kg)	>200	8	16
	200- 300	10	20
	300 - 400	10	20
	400 – 500	11	22
	500 – 600	10	20
	600-700	1	2
Total frequency and percentage		50	100

The above table indicates the price per/kg of fish purchased by consumers. It shows that 22% of respondents purchased the tilapia at the rate of 400 - 500 which has the highest percentage among the consumers and 20% of respondent also get their tilapia at the rate of 200 - 300, 300-400, and 500 - 600 respectively, while 16% buy the tilapia less than 200 and 2% get it at the rate of 600 - 700 in the study area.

Table 13: Numbers of consumers Metropolis family that eat tilapia in Makurdi

Research question	Options	Frequency	Percentage (%)
How many are you in your family?	1 - 5	9	18
	6 -10	28	36
	11-15	7	14
	15-20	6	12
Total frequency and percentage		50	100

Above table 13 analysed the size of family of the respondents in the study area. The table shows that 26% of respondents has about 6 - 10 family number, 18% has 1 - 5 while 14% of respondents has 11 - 15 family number and only 12% has 15 - 20 respectively.

Table 14: Consumers preference of fish in Makurdi Metropolis

Research question	Options	Frequency	Percentage (%)
Why do you dislike tilapia than other fish	It is bony	4	8
	Small in size	33	66
	It has no taste	13	26
Total frequency and percentage		50	100

The above table shows the challenges and problems of tilapia towards consumers in the study area which is major factor hinder the marketability of Tilapia species of fish.

Table 14 the result shows that 66% of respondents dislike tilapia because of its size which refer 8% which is small and bony, while 26% avoid it because of the taste and only 8% of respondents recognized the stature of the tilapia which they refers to bony form and this is simply means it is bony.

Table 15 Consumers preference on form of tilapia in Makurdi Metropolis

Research question	Options	Frequency	Percentage (%)
How do you prefer tilapia	Fresh	32	64
	Dried	18	36
Total frequency and percentage		50	100

The result in table 15 shows that 64% of respondents preferred tilapia in a fresh form while 36% of respondents prefer dried form of tilapia respectively.

Table 16 Consumers advice to those who don't eat tilapia Makurdi Metropolis

Research question	Options	Frequency	Percentage (%)
Advice to those who dislike tilapia	No response	10	20
	They should start eating it	15	30
	Encourage to eat it	15	30
	It is proteinous	10	20
	Total frequency and percentage		50

Above table shows the consumers responds about the tilapia in the study area. The result shows that 30% of the respondents encourage those who dislike tilapia to eat it with no reason while 20% respondents encourage eating it because it is considered proteinous and good for body while 20% do not responds to the question.

DISCUSSION

It was observed in the course of this study that the sex distribution in the table one(1) revealed that 62% of respondents were female and out of this 50% consumed tilapia and 12% was count out while 38% of respondents were male and out of this 30% of them eat tilapia and the remaining 8% don't eat, this shows that there is significance differences between female and male. This is similar to a study in Kenya which assessed urban consumers' fish preferences and determinants influencing fish selection and consumption. Esilaba *et al.*, (2017) however another work was carried out in India that reported a similar trend (Mugaonkar *et al.*, 2011).

Table 2 Marital status of consumers of tilapia in Makurdi metropolis shows that 36% of respondents were single and out of this 30% consumed tilapia while greater majority fall within the married people which is making up to 60%. Among of this, 55% consumed tilapia and the remaining 5% don't eat tilapia. In table 4 Age distribution of consumers of tilapia in Makurdi metropolis also observed that the size of some family determined the number of people that eat tilapia in the study area. This observation was also noted in the Kenya study which assessed urban consumers, fish preferences and determinants influencing fish selection and consumption (Esilaba *et al.*, 2017).

The result obtained in table 3 Occupational level of consumers of tilapia in Makurdi metropolis revealed that the majority of respondents are students which carried the highest percentage of 50% which about 48% eat tilapia and only 2% were left out. 34% were civil servant and 20% eat tilapia and 12% were business men 2% eat tilapia and 10% were count out while 4% were fish farmers and they all eat tilapia. In table 4 The Age distribution of respondents shows that 14% fall within the 0 - 20 and only 4% eat tilapia but the greater majority fall within the middle age group of 26 - 30 which make up to 24% and out of this 20% were recorded that eat tilapia and 4% were not, 21 - 25 age group make up to 20% and only 10% eat tilapia where as 15% don't eat at all, while 31-35 were 14% of respondents and out of this 11% eat tilapia and 40 and above make up to 20% and they all eat tilapia. This is shown that between the age group of 26 - 40 and above revealed that there are significant differences between the age group of 26 - 40 and 0 -25 ages of consumers. This study supports the findings of Erdogan *et al.*, 2011 and Storey and Forshee, 2007 who reported a strong positive relationship between fish consumption and age.

The result in table 5 Relationship between educational levels of consumers of tilapia in Makurdi metropolis. Shows that the respondents had one form of education or the other but the majority are tertiary education which counted for 54% and out of this 50% were recorded that eat tilapia and only 4% is left out. Non-formal education respondents had 10% and 8% of this eat tilapia while 2% don't and primary education had 10% of respondents and all of them eat tilapia whereas secondary education had 12% of respondents and 10% eat tilapia where by 2% is count out. This is in line with Agbebi and Fagbenro, (2006) that the educational level of respondents determined to a great extent of skills possess by their cognitive ability and so the opinion of Eyo and Ita, (1990) which viewed formal education as an important factor in the performance and management of fish marketing and fisheries sectors in general. In the table 5 It also observed that the educational level of the respondents determined great extend the quality and balance diet of fish generally for the human body especially the tilapia as fish among aquacultural systems. This revealed that there is a significant difference between the tertiary education and other form of education.

The result in table 7 Frequency of consumption of tilapia in Makurdi metropolis shows that the respondents on the question how often do you eats tilapia? stated that there was a very poor performance of people respond to that question which is shows that the tilapia is been consumed within the limit of the time and non-respond to this has the highest percentage, while very few number of respondents eat tilapia regularly in a week which is making up to 2 — 7 times in a week in the options of the question. In table 7 Most of respondents on the question how best do you prefer tilapia believed the roasting of tilapia as their best choice among the options and it has the highest percentage of 44% while those enjoy tilapia after cooking are average and other options has a very poor performance of the respondents. This is similar to the report of (Brunso *et-al* 2009) which revealed that lack of the ability from consumers to evaluate fish quality is another constraint to fish consumption.

The result derived in table 9 Frequency of tilapia consumption in Makurdi metropolis indicates that about 72% of respondents had an house hold that consumed tilapia and it has a greater number of respondents while No responds to this question were average among other options. The table 10 Consumers preference of tilapia over meat in Makurdi metropolis also indicates number of those that preferred fish over meat and the result shows that the highest percentage of respondents

Preferred fish than meat which counted for 40% because of his affordable prices, accessibility and quality of it nutrition to the body. The observed consumers perception is similar to that of observation reported by Trondsen *et al.* (2004). The perception of most consumers in this study is that fish consumption is healthier than that of meat consumption. The result in table 11 Consumers choice of where to buy tilapia in Makurdi also shows that 74% of respondents obtained or purchased the tilapia in local market which has a very good reputation and has a greater number among the options. In Table 12 Consumers price of tilapia in Makurdi metropolis. The result shows the price per kg of fish purchased by consumers. It understood that respondents whose buy tilapia at the rate of 400 - 500 are the majority while 500 - 600 and 200 300, 300 - 400 are the average number of respondents.

In table 13 Number of consumers family that eat tilapia in Makurdi metropolis. The results analyse the number of respondents in the study area. This shows that 36% of respondents have the highest family number from the research work. Table 14 Consumers preference of fish in Makurdi metropolis. Also shows in the options why do you disliked Tilapia than other fish, the tilapia is profitable in the study area but the greatest challenges it faces is that, is very small in size and it has a greater percentage of 66% which shows significant difference with other fish from the research work while 26% of respondents dislike it because it has no taste which determined by the consumers choice but very few dislike it because of his bony structure. The result obtained from table 15 Consumers preference on form of tilapia in Makurdi metropolis. Shows or indicates how consumers or respondents prefer tilapia and it is understood from the work done that the respondents preferred tilapia in a fresh form among the two options which has the highest value of 64% and those prefer tilapia in dried form are average number which is making up to 36% respectively. Table 16 Consumers advice to those who don't eat tilapia in Makurdi metropolis. Give the description of the advice given to those who dislike tilapia in the study area. The result shows that 30% of the respondents encourage those who don't like tilapia to eat it and this has the highest percentage while 20% of respondents also encourage eating it because of its nutritious value especially in terms of protein and this has no any significant different. The findings are consistently similar to a previous study in Turkey that showed 84.47% of consumers ate fish and other seafood because of their beneficial effects to human health (Erdogan *et al.*, 2011). Similarly, a study carried out by Verbeke *et al.*, 2007 showed that the general attitude towards eating fish was strongly positive and consumers were most strongly convinced that fish consumption is healthy and nutritious.

CONCLUSION

The study shows that the consumers preferred tilapia mostly in fresh and dried form. Similarly, most of the respondents preferred fish to other animal protein sources mainly for its affordability, nutritive value, availability and palatability respectively. This can contribute to the growth of Benue state economy and Nigeria entirely; however, the research helps provided statistical record of fish production and market distribution of tilapia in the study area. The various problems confronting tilapia fish in the study area is low level production of tilapia and lack of research into culturing of hybrid tilapia.

REFERENCES

- Agbebi F.O. and Fagbenro O.A (2006). Tilapia Culture and Risk Management in Nigeria. Available (online) <http://ag.arizona.edu/lazagna/istal/STA7/paper.htm>.

- Alverson, K.P. and Paulik, T.T. (2002). Fisheries in the Nineties from Development to Management and Improved Marketing. *Journal of Fisheries Economics*, 27 (3) 3 – 7.
- Ayodeji, O. (2008). Fishing, Migrations and Inter-ground Relations in the Gulf of Guinea (Atlantic Coast of West Africa) in the 19th and 20th.
- Brunso K, Verbeke W, Ottar O.S fruensgaard JL, (2009) motives, barriers and quality evaluation in fish consumption situations; Exploring and comparing heavy and light users in Spain and Belgium. *British food journal*;111(7):699-716.
- Ethinmore, O. M. (2007), Fishing in south-western Nigeria in the 19th Century: A study of the Ilaje Fishing Economy. *African Studies Review*, 1(1), 56.
- Ethinmore, O.M. (1998). A History of fishing in Ondo State (1950— 1997): A Case Study of the Ilaje coastal Area. M. A. Thesis, submitted to Fisheries Department, University of Lagos.
- Erdogan BE, Mol S, Cosanca S, (2011) Factors influencing the consumption of seafood in Istanbul, Turkey, *Turkish journal of fisheries and Aquatic sciences*;11;631-639.
- Esilaba F, Moturi WN, Mokuu MA. (2017) urban consumers fish preferences and the determinants influencing fish selection and consumption; A case study of Nakuru, Kenya. *International journal of fisheries and aquatic studies*;5(3);356-360.
- Eyo, A. A. Ita E. O. (1990) Investment prospect in inland capture fisheries revolving loan scheme to artisanal fishermen. In proceeding annual conference of the FISON 22nd — 28th September (1986) Ilorin National Institute for Fresh Water Research. Pp. 105 — 120.
- Food and Agricultural organization FAO. (1999) The Importance of Food Quality and Safety for Developing Countries. Available on online at www.fao.org/docrep/meeting/xl845E.htm.
- Food and Agricultural organization FAO. (1999) the Importance of Food Quality and Safety for Developing Countries. Available on online at www.fao.org/docrep/meeting/xl845E.htm.
- Food and Agricultural organization FAO (2005). Annual Statistics of Fishing Nations. Vol. 54:78
- Garcia S. and Newton, C. (1997) Currents Situation Trends and Prospects in World Capture Fisheries. In *Global Trends: Fisheries Management*, eds. E. L. Pikitch, D. D. Huppert and M. P. Sissenwine, Bethesda, MD American Fisheries Society, pp. 2 — 27.
- Google map, 2015
- IUCN (2007). *Caring for the World: A strategy for sustainable living*. World Conservation United Nations Environmental Programmes and World Wildlife Fund, Gland, Switzerland. 50pgs.
- Mugaonker PH, Ananthan PS, Small SS, Debnath B.A, (2011) study on consumers at organised Retail outlet, *Agricultural economic Research Review*;24;133-140
- Neira, I., C.R. Engle, and K. Quagraine (2003). Potential Restaurant markets for farm raised Tilapia in Nicaragua. *Aquaculture Economics and Management* 7(3/4): 1-17.
- Salam M.A. (2005) *Introduction to Tilapia Nutrition* Kevin Fitzsimons University of Arizona.
- See G., Stride T. and Ifeka C. (2006). *People and Empires of West Africa*. Hong Kong: Thomas Nelson.
- Sen, S. (2005). The Environmental Effects of Trade in the Fisheries Sector. *The Environmental Effects of Trade*, 1, 103 — 122.

Trondsen T, Braaten T, lund E, Eggen A.E eggen (2004) Health and Seafood consumption patterns among women Aged 45-69 years. A Norwegian seafood consumption study. Food quality and preference;15:117-128.

Verbeke w,Vanhonacker f, Sioenl, Camp JV, Dehenauw s, (2007) perceived importance of sustainability and ethics Related to fish;A consumer behaviour perspective.Ambio;36(7);580-585.