



Consumers' Perception On Indigenous Spiced Smoked Catfish (*Clarias gariepinus*) Among Households In Oyo State

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ABSTRACT

The use of various available spices on catfish for smoking is perceived differently and products differ in preference by people. This study was conducted to investigate the perception of consumers on indigenous spiced smoked catfish among households in Oyo state. Using Multistage Sampling techniques, 150 respondents were selected for the study. Data on personal characteristics were elicited using structured questionnaire and were subjected to descriptive analysis while Chi square analysis and regression were used to test Hypotheses. Results on Socio economic characteristics revealed that majority (85.5%) of the respondents were within the age range of 20-30 years, 79.9% had secondary education while 57% had estimated monthly income of #50,000 respectively. Majority (84.7%) of the respondents was aware of consumption of indigenous spiced smoked catfish, 31.4% had friends and family as source of awareness while 84.5% consumed spiced smoked catfish respectively. Results on perception showed that 40.4% strongly agreed that indigenous spiced smoked catfish taste better. Smoked catfish spiced Chilli pepper was the most preferred. Unacceptability of spiced smoked catfish by other family members was the most challenge faced by the respondents. Chi square analysis revealed significant ($p < 0.05$) relationship between estimated monthly income ($\chi^2 = 10.924$; $df = 3$) and most preferred indigenous spiced smoked catfish. The study concluded that the respondents had the perception that indigenously spiced smoked catfish taste better while it is recommended that nutritional campaign on the use of indigenous spices on catfish to be smoked be embarked on by the nutrition workers and extension service unit in the study area and in Nigeria at large.

Keywords: consumers, perception, indigenous, spiced, smoked-catfish

INTRODUCTION

Fish is an important source of animal protein for many households. According to FAO (2007), fish contributes more than 60% of the world supply of protein, especially in the developing countries. The Federal Government of Nigeria (FGN, 2011) disclosed that about 10 million Nigerians are actively engaged in both the upstream and downstream areas of fisheries operations. According to figures provided by the National Bureau of Statistics in 2013, the fisheries sector contributed 1.31% of total GDP in 2012, and this rose to 1.38% at the end of the third quarter of 2013. These figures represent 3.3% and 3.5% of agricultural GDP respectively.

Herbs and spices consist of the dried leaves, flowers, buds, fruits, seeds, barks or rhizomes of various plants. For example, Bhandary (1991) used a mixture of red pepper, turmeric, black pepper, garlic, onion and ginger, in powder or fresh form at different levels of formulations and observed that the spice applications on some mackerel reduced mould growth considerably. Nigeria is rich in indigenous spices, their food and other uses as well as anti-microbial and preservative properties have not been widely exploited. The spices (aromatic in nature), depending on the part of the plant being used can be classified into fruits, seed leaves or floral parts and bulbs. Achinewhu *et al* (1995) investigated the

chemical composition of thirty wild spices indigenous to Nigeria and observed that they contained high amounts of fats as well as essential oils.

Depending on consumers' preference, there are several forms in which fish can be consumed; fresh, dried, frozen, fermented, brined etc. In Bangladesh majority of the people reported a preference for fresh fish but limitations such as the low keeping quality of the fish after harvest and the distances between fishing grounds and marketing outlets make this very difficult. Various factors are responsible for fish spoilage. The enzymes begin to break down fish tissues. In the dead fish, the control system fails and the enzymes begin to act on the alimentary system and fish flesh, thereby resulting in soft destructive changes. This process is referred to as autolytic spoilage. The central concern of fish processing is to prevent fish from deteriorating and to ensure that fish and fish products get to the consumer in acceptable quality. Therefore, the fish has to be processed, preserved and stored which will invariably reduce post-harvest losses. Various traditional methods are employed to preserve and process fish for consumption such as refrigeration, freezing, canning, smoking, salting, and drying (Nwachukwu *et. al*, 2013). Besides this, some of these techniques can also be used to enhance the value of fish, such as smoked fish. The technique has developed to a point where once common food has become a delicacy and there is need for corresponding concern for safety issues in smoked fish consumption (Riches, 2012). The smoking process was basically used in the past for preservative purposes, although the changes in color, odor, flavour and texture which were provoked in foods by this process were also judged as desirable. Nowadays, due to the great advance of preservative techniques, smoking is used fundamentally for the development of sensory properties in food (Guillén *et. al* 2006). Ward (1995) reported that smoke-drying had been used for centuries in preserving fish, and is still widely used for this purpose among several communities in the third world where up to 70% of the catch is smoked.

METHODOLOGY

The study population was the households in Oyo State, Nigeria. Multistage sampling techniques were used in the selection of the villages and respondents. One hundred and fifty (150) respondents were interviewed based on structured interview guide. The data collected were analyzed using descriptive and inferential statistics.

RESULTS AND DISCUSSIONS

Socio-economic characteristics of the respondents

Data on the socio-economic characteristics of the respondents are shown in Table 1.

Majority (85.5%) of the respondents were within the age range of 20-30 years, 11.9% were within 31-60 years which 0.7% were above 60years respectively. This result implies that the respondents are still in the economically active age.

Majority (60.9%) of the respondents were female while male were (39.1%). This implies that more females are consuming indigenous spiced smoke dried catfish than their male counterparts in the study area.

More than half (60.9%) of the respondents are single, 20.5% are married and 0.7% are widowed. This result is a clear indication of relatively large proportion of singles in the consumption of spiced smoke dried catfish in the study area. According Eyo 1992, single respondents are thought to have an advantage with regards to less or no responsibility.

Results on religion revealed that 69.5% of the respondents were Christians followed by Muslims (29.8%) and least was traditionalist (0.7%).

Educational level showed that majority 79.9% of the respondents had secondary education followed by those who had primary education 16.6%, no formal education 2.0% and the least were tertiary education 0.7%. This indicates that adoption of innovation will be enhanced since most of the respondents have good level of education. Ahmad *et al.*, (2014) opined that an increase in the level of education had a positive influence on consumption.

Results on occupation revealed that 37.2% of the respondents were involved in other type of occupation, traders (25.7%), farmers (16.9%), civil servants (16.9%) and artisan (3.4%). It shows that majority of the respondents are based on other occupations.

Minor occupation revealed that 63.8% of the respondents are farmers, artisan (36.2%). This implies that households complement their income mostly with farming. This result is in accordance with Adebo *et al.*, 2014 which reported that in most households, main employments are been complimented with other jobs to boost standard of living of the family members

Results on ethnicity showed that people consuming spiced smoke dried catfish are majorly Yoruba (87.2%), while there are Igbo too (8.8%) and minor consumers Hausa (4.1%).

Table 1: Distribution of respondents by their socio economic characteristics

VARIABLES	FREQUENCY	PERCENTAGE	n=150
AGE			
Less or Equal 20	46	30.5	
21-30	83	55.0	
31-40	13	8.6	
41-50	2	1.3	
51-60	3	2.0	
Above 60	1	0.7	
SEX			
Male	59	39.1	
Female	92	60.9	
RELIGION			
Christianity	105	69.5	
Traditional	1	0.7	
Islam	45	29.8	
MARITAL STATUS			
Single	119	78.8	
Married	31	20.5	
Widowed	1	0.7	
EDUCATIONAL QUALIFICATION			
No formal Education	3	2.0	
Primary Education	25	16.6	
Secondary Education	120	79.9	
Tertiary Education	1	0.7	
FAMILY SIZE			
2-4	77	52.0	
5-7	52	35.1	
8	9	6.1	
Above 8	10	6.8	
INCOME PER MONTH			
Less or equal ₦50,000	81	57.0	
₦51,000-₦200,000	39	27.5	
₦201,000-₦250,000	7	4.9	
Above ₦250,000	15	10.6	
MAIN OCCUPATION			
Farming	25	16.9	
Trading	38	25.7	
Artisans	5	3.4	
Civil servants	25	16.9	
Others	55	37.2	
MINOR OCCUPATION			
Farming	44	63.8	
Artisans	25	36.2	
ETHNICITY			
Yoruba	129	87.2	
Hausa	6	4.1	
Igbo	13	8.8	

Source: Field Survey, 2020.

Awareness of the respondents are presented in table 2

Spices awareness: Result on spice awareness showed that majority (84.7%) were aware and 15.3% are unaware of the indigenous spices

Awareness of spiced smoked catfish: Results on awareness of spices for catfish showed that majority 84% are aware and 11.3% are unaware of using indigenous smoke dried catfish

Sources of awareness: Results on information of spices shows that majority 31.4% get information from friends and family, followed by fish marketers 17.9% and the least ways of them getting information is Newsprint and national campaign. However, this implies that the household finds it easy to get information via friends and family.

Table 2: Distribution of respondents by their awareness of indigenous spices

VARIABLES	FREQUENCY	PERCENTAGE
SPICES AWARENESS		
Yes	127	84.7
No	23	15.3
AWARE SPICES FOR CATFISH		
Yes	132	84
No	17	11.3
IF YES		
Extension Agent	14	10.0
Radio	15	10.7
Television	16	11.4
Newsprint	2	1.4
Family & Friends	44	31.4
Workshop	9	6.4
Fish marketers	25	17.9
Nutritional campaign	2	1.4
Fish processors	13	9.3
WHEN KNOWN		
1-5yrs	57	40.1
6-10yrs	70	49.3
10yrs and above	15	10.6
CATFISH CONSUMPTION		
Yes	125	84.5
No	23	15.5

Sources: Field survey, 2020

Perceptions of respondents of consumption of indigenous spiced smoked catfish

Table 3 shows the perception on the consumption of different indigenous spices. The result shows that 31.1% of the respondents agreed that consuming catfish spiced with garlic makes them feel like vomiting, this implies that garlic has an irritating odour which makes the consumers to feel like vomiting; 49.2% of the respondents agreed that catfish spiced with ginger is pepperish and they don't like it, this implies that ginger is too pepperish and that is why the respondents don't like it. Majority (73.2%) of the respondents strongly agreed that indigenous spiced smoke dried catfish tastes better than the one without spices, this implies that spices enhances the taste of smoked catfish. Most (62.6%) of the respondents agreed that garlic mix with ginger spiced smoked catfish is good for hypertensive patients, this implies that the fish spiced with ginger mix with garlic has many health benefits. However, 25.2% of the respondents were undecided on indigenous spiced smoked catfish aids sleeping; 52.0% agrees that spiced smoked catfish reduces cholesterol. Less than half (38.4%) of the respondents were undecided and few (13.9%) agreed that muscle of indigenously spiced smoked catfish will be rigid or tough to chew. Above half (57.3%) agreed that indigenous spiced smoked catfish gives better aroma, this implies that the aroma of the indigenous spices is very attractive and nice. Moreover, 30.1% of the respondents were undecided about the availability of spiced smoked catfish. Majority (42.4%) are also undecided about if consuming indigenous spiced smoked catfish controls menstrual cramps, this implies that the respondent don't have the knowledge of the importance of the indigenous spices. Majority (37.7%) of the respondent were undecided on indigenous spiced smoked catfish contains anti-microbial agents; this also implies that the respondent are not so sure of the spices which contains antimicrobial agent. Majority (38.1) of the respondent are undecided that indigenously spiced smoked catfish causes diarrhea/stooling, this implies that the

respondent believes that indigenous spices can cause stooling. Majority (36.1%) are also undecided that indigenous spices enhance weight loss, this implies that the respondent don't have the physiological importance of indigenous spices. Majority (38.4%) are also undecided about the consumption of indigenous spiced smoked catfish which controls diabetics, this implies that the respondent also lack the knowledge of the indigenous spices. Majorities (38.4%), (33.8%), (42.4%) (32.8%), (44.4%), (40.7%), (41.4%), (41.7%), (39.7%), (46.4%), (42.7%), (43.0%), (40.4%), (41.4%), (45.0%), (40.4%) were undecided perception statements that catfish spiced with mixture of garlic, ginger and turmeric reduces adipose tissue, which implies that there is knowledge on the benefits of consuming smoked catfish spiced with indigenous spices in the study area.

Table 3a: Distribution of respondents by their perception on consumption of indigenous spiced catfish

Source: Field survey, 2020

S/N	Perception statements	SA	A	U	D	SD
1.	Consuming catfish spiced with garlic makes me feel like vomiting	29(19.2)	47(31.1)	13(8.3)	33(15.2)	33(21.9)
2.	Catfish spiced with ginger is pepperish and I don't like it	29(19.2)	46(30.1)	14(9.3)	34(22.5)	27(17.9)
3.	Indigenously spiced smoked catfish tastes better than the one without spices	61(40.4)	50(32.8)	18(11.9)	12(7.9)	9(6.0)
4.	Garlic and ginger spiced smoke dried catfish is good for hypertensive patients	43(28.5)	52(34.1)	35(23.2)	12(7.9)	8(5.3)
5.	Indigenously spiced smoke dried catfish aids sleeping	37(24.5)	36(23.5)	38(25.2)	22(14.6)	17(11.3)
6.	Indigenously spiced smoke dried catfish reduces cholesterol level	32(21.2)	47(30.8)	44(29.1)	7(4.6)	20(13.2)
7.	Indigenously spiced smoke dried catfish has longer shelf life	34(22.2)	38(25.2)	53(35.1)	12(7.9)	13(8.6)
8.	I think the muscle of indigenously spiced smoke dried catfish will be rigid or tough to chew	21(13.9)	35(22.8)	58(38.4)	16(10.6)	20(13.2)
9.	Indigenously smoke dried catfish gives better aroma to food	45(29.8)	42(27.5)	41(27.2)	7(4.6)	15(9.9)
10.	Indigenously spiced smoke dried catfish is not always available	32(21.2)	31(20.5)	46(30.1)	15(9.9)	26(17.2)
11.	Consuming smoke dried catfish spiced garlic, ginger and turmeric control menstrual cramps	27(17.9)	36(23.5)	64(42.4)	11(7.3)	12(7.9)
12.	Indigenously spiced smoke dried catfish contains antimicrobial Agents	26(17.2)	40(26.2)	57(37.7)	13(8.6)	14(9.3)
13.	Indigenously spiced smoke dried catfish causes diarrhea/stooling	15(9.9)	27(17.9)	58(38.1)	18(11.9)	32(21.2)
14.	Indigenously spiced smoke dried catfish enhances weight loss	18(11.9)	28(18.5)	55(36.1)	19(12.6)	30(19.9)
15.	Consuming indigenously spiced smoke dried catfish controls diabetics	20(13.2)	46(30.1)	58(38.4)	10(6.6)	16(6.6)
16.	The selected indigenous spices are culturally accepted	31(20.5)	40(26.5)	51(33.8)	12(7.6)	16(10.6)
17.	Indigenously spiced smoke dried catfish can be used to control colds	10(6.6)	30(19.9)	64(42.4)	18(11.6)	28(18.5)

Table 3a: Distribution of respondents by their perception on consumption of indigenous spiced catfish

S/N	Perception statements	SA	A	U	D	SD
18	Consuming smoke dried catfish spiced garlic, ginger and turmeric is good for treating fibroid	55(36.4)	29(19.2)	50(32.8)	8(5.3)	8(5.3)
19	Consuming smoke dried catfish spiced garlic, ginger and turmeric reduces adipose tissue	30(19.9)	42(27.5)	67(44.4)	7(4.6)	4(2.6)
20	Consuming smoke dried catfish spiced pepper serve as pain reliever	20(13.2)	47(31.1)	62(40.7)	8(5.3)	13(8.6)
21	Consuming smoke dried catfish spiced ginger can help treat chronic indigestion	22(14.6)	43(28.5)	63(41.4)	9(6.0)	13(8.6)
22	Indigenously spiced smoke dried catfish can be used to control blood pressure	26(17.2)	34(22.2)	63(41.7)	12(7.9)	15(9.9)
23	Indigenously spiced smoke dried catfish can be used to improve bone health	28(18.5)	41(26.8)	60(39.7)	10(6.6)	11(7.3)
24	Indigenously spiced smoke dried catfish contains anticancer	19(12.6)	36(23.5)	70(46.4)	10(6.6)	15(9.9)
25	Indigenously spiced smoke dried catfish lower the risk of heart disease	26(17.2)	38(25.2)	65(42.7)	6(4.0)	15(9.9)
26	Consuming indigenously spiced smoke dried catfish aids athletic performance	21(13.9)	37(25.2)	65(43.0)	10(6.6)	17(11.3)
27	Consuming indigenously spiced smoke dried catfish is good for treating chronic indigestion	26(17.2)	42(27.5)	61(40.4)	10(6.6)	11(7.3)
28	Consuming indigenously spiced smoke dried catfish lower the risk of heart disease	20(13.2)	42(27.8)	63(41.4)	8(5.3)	16(10.3)
29	Consuming indigenously spiced smoke dried catfish is good for treating intestinal disorders	24(15.9)	33(21.5)	68(45.0)	7(4.6)	18(11.9)
30	Indigenously spiced smoke dried catfish can be used to control cardiovascular disease	26(17.2)	36(23.5)	61(40.4)	11(7.3)	16(10.6)

Commonly consumed indigenous spices

Table 4 shows the commonly used indigenous spices on catfish. The result shows that pepper is the most used 1.8146 by the consumer followed by mixture of pepper and garlic 1.7219 and mixture of ginger, garlic and turmeric 1.6291 and the lowest is garlic 1.3974. This was captured using Sensory evaluation

Table 4: Distribution of respondents by their commonly used indigenous spices on catfish

Commonly used indigenous spices on catfish	Mean	Rank
Catfish spiced with Ginger	1.4106	6 th
Catfish spiced with Garlic	1.3974	7 th
Catfish spiced with Turmeric	1.4570	5 th
Catfish spiced with Pepper	1.8146	1 st
Catfish spiced with Ginger and Turmeric	1.5629	4 th
Catfish spiced with Ginger, Garlic and Turmeric	1.6291	3 rd
Catfish spiced with Pepper and Garlic	1.7219	2 nd

Source: Field survey, 2020

Challenges faced by the respondents on the consumption of indigenous spices

Table 5 shows the challenges of the consumption of indigenous spiced catfish which implies that spiced smoked dried catfish by the other member of the family is the major challenge which can be lack of information or knowledge of the other member of the family while the least challenge is the uncertainty of the quality used of the indigenous spice which implies that the consumers are not very sure of the quality added to the fish

Table 5: Distribution of respondents by their challenges of consumption of indigenous spiced smoked catfish

Challenges	Mean	Rank
Uncertainty of the quality of indigenous spices used	1.3245	8 th
Uncertainty of the quantity of indigenous spices used	1.5099	5 th
Unavailability of spiced smoke-dried catfish	1.5762	2 nd
Unattractive of spiced smoke-dried catfish	1.5298	4 th
Unpleasant smell of spiced smoke-dried catfish	1.5430	3 rd
Bad taste of spiced smoke-dried catfish	1.4901	6 th
Unacceptability of spiced smoke-dried catfish by other family members	1.5828	1 st
Consumption of indigenous spiced smoke-dried catfish is out of fashion	1.4371	7 th

Source: Field survey, 2020

Test of relationship using Chi square analysis showed that estimated income ($\chi^2 = 10.924$; df:3) was significantly ($p < 0.05$) related with the most preferred indigenous spiced smoked catfish. Therefore, the null hypothesis is rejected. However, all other socio economics characteristics test were not significantly ($p < 0.05$) related with the most preferred indigenous spices, hence the null hypothesis is rejected.

Table 6: Test of relationship of socioeconomic characteristics and most preferred spiced smoked catfish

S/N	Variable	χ^2	df	p-value	Decision
1	Age	2.403	5	0.791	NS
2	Sex	0.05	1	0.943	NS
3	Marital status	2.275	2	0.321	NS
4	Religion	1.329	2	0.515	NS
5	Educational level	7.014	4	0.135	NS
6	Household size	1.427	3	0.699	NS
7	Estimated income monthly	10.924	3	0.012	S
8	Major occupation	3.329	4	0.504	NS
9	Minor occupation	1.295	1	0.255	NS
10	Ethnicity	2.324	2	0.313	NS

Test of relationship using regression analysis showed that estimated income has the highest value on the Beta column 14.6% and ethnicity showed the least at 2.3% in relation to the spices. Age determined a higher factor in the sigma relationship and educational level being the least .This shows that there was no significant difference observed

Table 2: The test of relationship using regression analysis

Models	Beta	Sig	Decision
Age	3.3	81.7	NS
Sex	4.4	3.6	NS
Marital Status	7.3	7.6	NS
Religion	6.2	52.5	NS
Educational level	7.9	3.0	NS
Household size	4.2	6.6	NS
Estimated monthly income	14.6	4.7	NS
Main occupation	7.3	44.9	NS
Minor occupation	8.7	38.0	NS
Ethnicity	2.3	81.5	NS

Source: Field survey, 2020

CONCLUSION

It can be concluded that indigenous spiced smoked catfish tastes better than the non-spiced and Chilli pepper spiced smoked catfish was more preferred than the other spices.

RECOMMENDATIONS

Based on the findings in the study, the following recommendations are made

- ❖ Awareness programme on medicinal uses of the spices for rural and urban populace should be sponsored by the Government through the extension officers
- ❖ Further research should be carried out on spicing smoked catfish

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