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Fish Processing and Preservation Techniques Selected Fishing Communities along the Upper Benue River, Taraba State

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Abstract

This study examines the Processing of Fish techniques utilized by Fishermen in the communities along the Benue River Taraba State. The study focuses on the traditional methods and types of Processors used by local Fishermen. The survey design method was used to collect data. The instrument involved the use of questionnaire which was randomly administered on 40 respondents in the 4 communities. Focus group discussion was also used to generate additional information to compliment the questionnaire data. Descriptive statistics was used to analyse the data collected. This study is important because it provide information that will guide Fisheries managers to allow for more adaptation to new and easy methods of Processing fish products.

Keywords: Communities; Fishermen; Processing; Preservation; Techniques

Introduction

Fish is a major source of protein and its harvesting, handling, processing and distribution provide livelihood for millions of people [1]. Freshwater fish processing should assure best market quality, assure health safety of products, apply the most appropriate processing method and reduce wastes to the barest possible extent. Al-jufaili and Opara [1] reported high incidence of fish losses as a major impediment to the realization of government approach towards increasing the contribution of the sector to the overall national economy. The use of appropriate technology is a radical approach to stem up production and processing technique, has become subordinate to social need.

Akinola et al. [2] reported different types of preservation methods; drying, smoking, freezing, chilling and brining. Eves and Brown [3] reported the processing of fish by smoking or drying enhances the nutritive value and promotes digestibility of protein. Processing of fish through smoking or drying are widely used, in the process, moisture content present in the fish is extracted through heating, thus inhibiting the action of micro-organisms and prolong shelf life [4]. Akinola et al. [2] reported that despite the rudimentary nature of process of traditional methods, lack of control over the drying rate, sometimes results to under-drying or over-drying; expose the fish to unexpected winds, dust, dirt, insect infestation and contaminants such as flies. These methods still remain predominant in Nigeria. To reduce post-harvest losses and improve the quality of fish, traditional processors must be improved in Nigeria. This includes upgrading the traditional fish processors and adoption of solar dryers, kilns, ovens and so on [5]. Eyo and Mdaihili reported that about 90% of the fish landed are processed (smoked) and sold by Women and the remaining are consumed fresh [6]. This study was designed to access the status of fish processing and types of processors and their efficiency in the fishing communities in Taraba state.

Materials and Methods

The survey on the processing technologies in four fishing communities in Taraba State was evaluated using a combination of structured questionnaire and personal communication. The survey was carried out between October, 2016 and January 2017. Four fishing communities namely, Mayo-Ranewo, Lau, Gassol and Ibbi was some of the parameters investigated by the questionnaire included different types of fish processing techniques, the most widely used processors efficiency of the processors and constraints to fish processing. A total of 80 questionnaires were randomly administered to the fisher folk in the communities. Descriptive statistics were used to analyse the data collected.

Results and Discussion

The study is an investigation on the type of fish preservation techniques employed in Mayo-Ranewo, Lau, Gassol and Ibi in Taraba State. The findings of this study are presented based on the research questions posed to the fishmongers in the study area.

Table 1 shows the results of demographic characteristics of the respondents in Mayo-Ranewo, Lau, Gassol and Ibi. The result indicates that 80% of the respondents are male and 20% are female in Mayo-Ranewo and 70% male and 30% female in Lau, respectively. The demographic data also show that 10% and 60% are within the ages of 20-30 years for Mayo-Ranewo and Lau, respectively, 20% are between 31 and 40 years old for Mayo-Ranewo and Lau, 10% and 20% are between the ages of 41-50 years and 60% are above 51 years in Mayo-Ranewo. It is also evident from Table 1 that 30% and 50% of the respondents had primary education in Mayo-Ranewo and Lau respectively, while 30% had Secondary education in Lau, 40% and 10% had Qur'anic education in Mayo-Ranewo and Lau respectively had Non-formal education (i.e., Adult education).

Table 1 also indicate the demographic characteristics of the respondents in Gassol and Ibi. The result indicates that 60% and 40% of the respondents were male and female for Gassol and Ibi, respectively. The demographic data also shows that 30% are within the ages of 20-30 years, 40% between 41-50 years and 10% are above 51 years in Gassol

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	Mayo-Ranewo		Lau		Gasol		Ibi	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Gender								
Male	10	100	7	70	6	60	6	60
Female	-		3	30	4	40	4	40
Total	10	100	10	100	10	100	10	100
Marital status								
Married	10	100	7	70	4	40	6	60
Single	-		1	10	-		1	10
Divorce	-		1	10	3	30	2	20
Widow	-		1	10	3	30	1	10
Total	10	100	10	100	10	100	10	100
Educational level								
Non-formal	3	30	1	10	2	20	2	20
Primary	3	30	5	50	2	20	3	30
Post-primary	-		3	30	1	10	5	50
Others (Quranic)	4	40	1	10	5	50	1	10
Total	10	100	10	100	10	100	10	100
Occupation								
Fishing	2	20	1	10	4	40	3	30
Fish monger	5	50	8	80	5	50	4	40
Fishing/fish mon	3	30	1	10	1	10	3	30
Total	10	100	10	100	10	100	10	100
Age								
20-30 years	1	10	6	60	3	30	1	10
31-40 years	2	20	2	20	2	20	4	40
41-50 years	1	10	2	20	4	40	2	20
51 years and above	6	60	-		1	10	3	30
Total	10	100	10	100	10	100	10	100
Sources: Field survey, 2016.								

Table 1: Socio-economic characteristics of respondents in Mayo-Ranewo, Lau, Gassol and Ibi.

are within the ages, while 10% are within the ages 20-30 years, 40% are between 31-40 years and 30% are above 51 years in Ibi.

Table 2 shows the Data on fish Processing/Preservation and the findings of this study reveals that 60% and 90% use salting before smoking in Mayo-Ranewo and Lau, 40% of the respondents only in Mayo-Ranewo smoke the fish directly without salting and 10% practice drying in Lau.

The smoking kiln (Ovens) that is widely used in the study is the mud (Banda) and the drum type. 50% of the respondents use the mud and also the drum types in Mayo-Ranewo, while 70% use the drum type in Lau and 30% use the mud type. The researcher has not come across any mechanized smoking in the area, however, in Mayo-Renewo, the Sarkin-Ruwa reported that, sometimes in the 90s the Directorate of Foods Roads and Rural Infrastructure (DFRRI) brought a big smoking kiln that is being powered by a thermostat and charcoal, when it developed a fault, it was taken to Yola for repairs, that was the end of it. Packaging is one of the most important aspects of fish processing/preservation before the product reach the final consumer in good condition. Basket and carton are used hand-in-hand depending on the availability and the destination of the product. 50% of the respondents prefer the use of carton in both Mayo-Ranewo and Lau, while 50% and 40% use basket in Mayo-Ranewo and Lau, respectively. Only one respondent, representing 10% use sack in Lau.

The result also shows that 20% of the respondents have no formal education and 50% had Qur'an education in both Gassol and Ibi respectively. It is also evident from Table 1 that 40% and 60% of the respondents are married, 30% and 20% are divorces and 30% and 20% are widows for Gassol and Ibi.

The demographic data show the dominance of male in Artisanal fisheries which has been reported by Akpoko [7] and Onemolease and Oriakhi [8]. The risk associated with fishing may be responsible for the low female participation. The female folk participate in processing, smoking and selling of fish. The educational background of artisanal fisher folks are low in western education, but high in Islamic education and this may influence their acceptance of improved fisheries practices. This by extension could also affect the behavioural attitude of fishermen in responding to innovative practices.

Table 2 shows the data in fish processing/preservation in Gassol and Ibi reveals that 50% and 70% practice salting before smoking in Gassol and Ibi, respectively. 30% and 10% practice direct smoking and 30% and 10% practice sun drying.

The smoking kilns that are prevalent in the area are drum type and mud type. 60% and 50% of the respondents use the drum smoking kiln and 40%, 50% use the built mud type for smoking.

The packaging methods that is widely practice in the area is basket and carton. 30% and 40% use basket for packaging, 50% and 30% use carton in packaging and only 20% and 30% use sack in both Gassol and Ibi.

Fish processing/preservation is still predominantly undertaken manually as observed in all the study locations. Traditional fish processors adopted open fire or simple smoking oven such as halved

	Mayo – Ranewo		Lau		Gasol		Ibi	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Processing								
Salting/smoking	6	60	9	90	5	50	7	70
Drying	-		1	10	3	30	1	10
Smoking	4	40	-		2	20	2	20
Total	10	100	10	100	10	100	10	100
Smoking kiln								
Drum	5	50	7	70	6	60	5	50
Mud type	5	50	3	30	-		-	
Futy kiln	-		-		4	40	5	50
Total	10	100	10	100	10	100	10	100
Packaging								
Basket	5	50	4	40	3	30	4	40
Carton	5	50	5	50	5	50	3	30
Sack	-		1	10	2	20	3	30
Total	10	100	10	100	10	100	10	100
Constraint								
Pest infestation	1	10	1	10	4	40	3	30
Lack of storage Facilities	4	40	5	50	5	50	6	60
Transportation of fish products	5	50	4	40	1	10	1	10
Total	10	100	10	100	10	100	10	100
Sources: Field survey, 2016.								

Table 2: Data on fish processing/preservation methods in Mayo-Ranewo, Lau, Gassol and Ibi.

Specie name	Common name	Hausa name
Alestes baremose	Silver fish	Mazari
Alestes nurse	Silver fish	Jan wutsiya
Bagrus bayad	Silver catfish	Ragon ruwa
Clarias anguilaris	Mud fish	Tarwada
Citharinus citharus	Moon fish	Faliya
Lates niloticus	Nile perch	Giwan ruwa
Heterotis niloticus	African bony tongue	Balli
Oreochromis niloticus	Tilapia	Gargaza
Sarotherodon galilaeus	Tilapia	Karfasa
Synodontis gambiensis	Cat fish	Kurungu
Source: Field survey, 2016.		

Table 3: Fish that are commonly found in Mayo-Ranewo, Lau, Gassol and Ibi.

cut drum oven or mud oven. The different types of fish preservation techniques observed were salting or bringing together with smoking, smoking, smoke drying and sun drying.

In rare cases frying is also used for immediate sales. Most common of all these processing technique was smoke drying. Most of the villages sampled favoured the use of drum oven and mud oven.

Constraints to fish processing and preservation are enormous. The investigated constraints in the study area include; Pest, lack of storage facilities and transportation of fish and fisheries products. 20% of the total respondents in the study area said that pest infestation is the problem. 40% and 50% of the respondents revealed that lack of storage facilities is the problem in both Mayo-Ranewo and Lau, respectively. 50% of the respondents said that lack of good roads to Mayo-Renewo, especially during the rainy season hampers good sales, while 40% complained of accessibility to Lau which also attracts low prices to fish products (Table 3).

Conclusion

Fish processing is still predominantly undertaken manually in Nigeria. Traditional fish processors adopted open fire or simple smoking oven. Such as mud or halved cut drum oven. The different types of fish preservation techniques observed were salting/smoking, smoke drying, frying and sun drying. Most common of all these processing techniques was smoke drying. Most of the communities visited favour the halved drum oven and mud oven. Literate processors had higher awareness and willingness to accept and understand new developments than illiterates. Losses during fish processing was significant in the communities because bad handling before reaching the processing unit. Constraint to fish processing and preservation in the communities facilities etc.

Recommendation

Appropriate technology should be developed by researchers and Government that will accommodate the social and cultural settings where they will be used. Training and re-training of fish processors will also give them new knowledge on how to process their fish with less effort.

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