



EFFECTS OF FISH PROCESSING METHODS ON CONSUMERS' PREFERENCE IN GANYE TOWN, ADAMAWA STATE NIGERIA

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ABSTRACT

A survey was conducted in August, 2012 to investigate the effects of fish species processing methods on consumers' preference and by extension determine the relationship between fish species and consumers preference in Ganye town, with a view to provide baseline information for effective fish marketing in the area. A total of 125 well-structured questionnaires were randomly administered to both processors (marketers) and consumers, but only 79 were correctly filled and data obtained were analyzed using descriptive statistics. Analysis of data showed 61% consumers and 87% smoked fish processors. Results implied that the business of fish processing has a good prospect in the area and the high number of smoked fish processors may not be unconnected with the abundance of wood-fuel as the cheapest energy source in the locality respectively. Consumers exhibited highest preference (59%) for smoked fish; this might be because of its characteristic strong flavor. It was therefore concluded that fish processing methods have effect on consumer's preference in Ganye town. Fish species such as *Mormyrus*, *Distichodus*, etc. were the least preferred. This could be due to either one or all of the following reasons; excess fatty-oil content in the fish flesh, which are not considered to be first class food or numerous fine bones in the flesh that make them bothersome to eat, etc. The most preferred fish species in this study include *Clarias gariepinus* and *Oreochromis niloticus*. This might be adduced to their high relative abundance in the market, hence their affordability to most consumers.

Keywords: Processing, Preference, Smoking, Frying, Sun drying, Consumers and Ganye.

INTRODUCTION

Fish is eaten fresh or processed and forms a much cherished delicacy that cut across socio-economic, ages, religious and educational barriers (Adebayo-Tayo *et al.*, 2008). In Nigeria only a negligible proportion of fish caught are marketed fresh, a greater portion is preserved by the various processing methods (Onyia and Adebayo, 2008). As Nigerians have become more involved in fisheries production, there is evidence that processing has been expanding with products distribution to even the remote parts of the country (Bolorunduro and Sule, 2001).

Fish processing is aimed at preventing or reducing post-harvest losses due to mould, bacteria, and insects' infestation (Abolagba and Nunfah, 2011). The processed product has proved relevant to prolonging shelf life, enhancing flavour and increasing utilization in soups, sauce, reducing waste at times of bumper catches, storing for season of

scarcity and increasing protein availability to people through-out the year (Eyo, 2001).

The form of fish product most accepted by consumers varies with fish species, locality and sometimes, time of the year (Abolagba and Nunfah, 2011). The major thrust of this work is to x-ray the relationship between fish processing methods and consumers' preference. The study also attempts to evaluate the association between fish types (species) and consumers' preference in Ganye town with a view to providing baseline information for effective fish marketing.

MATERIALS AND METHODS

The study area (Ganye town) is the administrative centre of Ganye Local Government Area which is located in the southern part of Adamawa State, Nigeria. The Local Government Area lies between latitude 8° 30' N and longitude 12° 01' E (Figure 1). The area has a land mass of

2291.42 km² (Adebayo, 1999) and a population of 164,087 people (NPC, 2007).

The area is found within the Guinea Savannah of the Nigerian vegetation zone with a rainfall range of 1100 – 1600 mm (Adebayo, 1999). One hundred and twenty five well-structured questionnaires were administered to both processors (who played overlapping roles as marketers) and consumers. In all, 79 questionnaires were correctly filled and were used for the analysis. Data were analyzed using descriptive statistics.

RESULTS

Fish Processors/Consumers, Processing Methods and Consumers Preference

Table 1 showed 39% fish processors and 61% of fish consumers’ fully participated in the survey by correctly filling out questionnaires. The table also

showed that 87% of processors used smoking method to process fish, while 3% and 10% used sun drying and frying methods respectively. Consumers exhibited highest preference (59%) for smoked fish but the sundried fish was the least (10%) favoured.

Consumers’ preference for fish type (species)

Clarias gariepinus, *Oreochromis niloticus*, *Bagrus bayad* and *Lates niloticus* were the most preferred fish species with preference percentage level of 21, 15, 13 and 11% respectively (Table 2), while *Synodontis clarias* (2%), *Citharinus citharus* (2%), *Mormyrus rume* (1%) and *Distichodus rostratus* (1%) were the least preferred. The moderately preferred fish include *Alestes nurse*, *Heterotis niloticus*, *Hydrocynus vittatus* and *Gymnarchus niloticus* with preference level of 8, 8, 6, and 6% respectively.

Table 1: Consumers’ preference of fish processing methods

Variables	Frequency	Percentage
Processors/Marketers	31	39
Consumers	48	61
Total	79	100
Fish Processing Methods		
Smoking	27	87
Sundrying	1	03
Frying	3	10
Total	31	100
Consumers’ Preference for Fish Processing Methods		
Smoked fish	28	59
Sundried fish	5	10
Fried fish	15	31
Total	48	100

Table 2: Consumers' fish species preference

Common name	Vernacular name (Hausa)	Frequency	Percentage
Clarias (African catfish)	Tarwada	10	21
Tilapia	Karfasa	7	15
Bagrus	Ragun-ruwa	6	13
Lates	Giwan-ruwa	5	11
Alestes	Jan-wutsiya	4	8
Heterotis	Bargi	4	8
Hydrocynus	Mai-hakuri	3	6
Gymnarchus	Dan-sarki	3	6
Synodontis	Kurungu	2	4
Citharinus (moon fish)	Faliya	2	4
Mormyrus	Aron-baki	1	1
Distichodus	Chichiyawa	1	2

DISCUSSION

Fish processors/consumers and processing methods

The descriptive analysis of data from the questionnaire (table 1) showed that there were more fish consumers than fish processors in the study area. This implied that fish business has a good prospect in Ganye town. Majority of the processors (87%) smoked their fish. This revelation confirmed the assertion by Abolagba and Nunfah (2011) that smoking is the traditional fish processing method in the tropics, since alternative method such as refrigeration is absent in fishing villages where processing takes place. This could be attributed to the abundance of wood, since the source of energy for smoking is the wood-fuel energy.

The sundry method was recorded as the least amongst fish processors in Ganye town, despite the sunny weather associated with tropical climate. The high atmospheric relative humidity and absence of dry wind prevalence during the peak of the rainy season in the area as reported by Adebayo (1999), might have adversely affected proper drying of fish, thus creating a damp condition for microbes infestation on the fish, consequently resulting in an undesirable products.

In spite of the advantage frying method has in achieving fish preservation varying from a few days to weeks (Haruna, 2003), the method ranked second to smoking method. This might be because additional cost of inputs such as vegetable oil, onions, etc. incurred by processors exert toll on their finances.

Processing methods and consumers' preference

Preference level by consumers for smoked fish in Ganye town was (59%) the highest amongst the

processed product. This finding agreed with Haruna (2003), who stated that smoking give fish its characteristics smoked flavour and colour which are highly favoured in Nigeria. Another reason for this scenario might be because the product can be further preserved by re-smoking to increase shelf-life. Akande (1998) reported that smoked fish can be packed in either a jute bag or basket and stored above billowing smoke (in the kitchen) to provides appropriate storage temperature.

Methods employed for fish processing, should be such that there is minimum loss of flavour, taste, aroma and nutritive value of fish (Onyia and Adebayo 2008). The sundried fish might have lost either one or all of the aforementioned qualities, hence the least preferred product by the consumers. The consumers' preference level for fried fish was three times greater than the sundried but not up to two times less than the smoked fish. This result suggest that frying fish might have further imparted more fatty-oil in the flesh of some fish *species* (*Mormyrus*, *Distichodus*, etc.) thus rendering the products not to be a first class food fish.

Consumers' fish type preference

Clarias has the highest consumers' preference level followed by *Oreochromis niloticus* (table 2). This is in consonance with previous work done by Tobor (1990), that most fish consumed from coastal and inland rural areas in Nigeria are *Clarias* and tilapia. Onyia and Adebayo (2008) also reported similar scenario in some local government areas of Adamawa State. This might be because majority of water bodies in Nigeria have first *Tilapia* and then *Clarias* as the most dominants fish (Ita *et al.*, 1985). In addition to the high relative dominance of *Clarias* in capture fisheries, it is also the only cultured fish species in Ganye town; hence the fish dominance in

the market might have influenced consumers' preference for it.

Reed *et al.* (1967) reported that the flesh of *Bagrus bayad*, *Lates niloticus*, *Alestes nurse* and *Heterotis niloticus* have excellent flavour and relished by Nigerians. However, the consumers' preference level for these fish ranked next to *Clarias* and tilapia in this current investigation. This may not be unconnected with higher prices that are in tandem with such qualities; thus becoming unaffordable to many consumers. Tobor (1990) stated that *Clarias* and tilapia are the most consumed fish in low income areas.

Mormyrus rume, *Distichodus rostratus*, etc. were fish species that recorded least consumers' preference in this study. This was probably so because of the following reasons, high to excess fatty oil content which make fish difficult to cure and they are not considered to be first class food fish (*Mormyrus*, *Distichodus*) too numerous fine bones make them bothersome to eat (Holden and Reed, 1972; Reed *et al.*, 1967). A consumers' preference for fish type may also be influence by its relative abundance in the market. *Gymnarchus* and *Mormyrus* are difficult to catch with most normal type of fishing gear as they are found in deep water around fallen trees and hence under exploited. *Gymnarchus* spawns only very few eggs thus make small part of commercial catches (Reed *et al.*, 1967).

CONCLUSION

Fish processing methods might have chiefly affected consumers' fish preference as evidenced by the consumer highest preference for smoked fish. Also, relative abundance of fish type in the market, fish body's oil content, numerous bones in fish flesh, and fish prices amongst other factors played out in consumers' fish type preference. The study recommends further research into the effects of seasons on consumer's preference of processed fish in Ganye town.

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