



Proper Fish Handling a Pre-Requisite to Quality Product

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ABSTRACT

Fish is an extremely perishable food item (Agbon et al; 2002). Soon after death, fish begins to spoil. In the healthy like fish, all the complete biochemical reactions are balanced and the fish is sterile. After death however, irreversible changes set in which results to fish spoilage. The resultant effect is the decomposition of the fish (Akinola et al; 2006). Various factors are responsible for fish spoilage. These factors include: Microbial spoilage, enzymatic spoilage and chemical spoilage. Obviously, the quality of capture is important at determining the rate of spoilage. The fish health status the presence of parasites, bruises and wounds on the skin and the mode by which the fish is handled determine the quality of fish in others words the caught fish quality, depends on the handling and preservation, the fish received from the hands of the fisher practice after capture affects the degree of spoilage of the post-harvest losses of fish, the researchers have carried out a survey on proper handling of fish using 30 fishermen at river Benue and 30 fish farmers in Gboko to ascertain the level of fish handling. Results have shown that only 10% out of 30 fish farmers handled the catch as expected. Having done the work, the researcher concluded that it is good to handle fish properly in order to improve its quality and avoid post-harvest losses

Keywords: Harvesting, Biochemical reaction, processing, preservation and spoilage.

INTRODUCTION

Fish plays an important role in the diet of the people of developing nations and developed nations at large. It is a very rich source of protein. In Nigeria, in particular, fish and fishing contribute immensely to the national economy by providing high animal food protein and generating employment, which serves as a means of poverty alleviation (Eyo; 2001). In African countries generally, and Nigeria in particular, fish are poorly handled, some die get mixed up with sand and other contaminating debris at the handling site. In agriculture, the method of harvesting which involves the dragging of seine nets at the bottom of a river, pond or

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reservoir contaminates the fish with mud and silt. In addition to poor handling, most Artisanal fishermen from the rivers, streams and lakes, include the habit of mal-handling the catch. Furthermore, fishes caught either from the culture facilities or from the wild have to pass through a long chain of distribution network before finally reaching the hands of the ultimate consumer. This has called into play the simplified distribution chain which the catch has to follow. The chain starts from fishermen-Whole sellers-Retailers-Consumers. The storing regulation is that fish must remain in an acceptable quality to the end of the chain. The opposite of the farmer will lead to a huge loss of curtailing the mal-handling are those on the handling site. Again, fresh fish are raw material which fast deteriorates. This implies that both the producers and the consumers are very often exposed to risk of buying fish that are not fresh or has even deteriorated. Knowledge of the average shelf life for individual fish specially depends on the handling, preservation or storage but most importantly, is the handling.

Fish contributes a major source of animal protein and good for normal healthy growth, but it is highly perishable. This is because fish flesh is composed of varying proportion of water (60-80%), protein (15-22%) and mineral (1-2%) Clucas; (1982). Spoilage starts immediately after fish dies. Its handling is very important in the fishing industry. Good handling practice is designed to ensure that the fish will be acceptable to the consumers. That is the rule of observing fish which reads: looking the fish in the eye; will hold. This is even so, freezing, canning or smoked dried, since the acceptability of the end product depends very largely on the initial condition of the fish. The basic principles of good fish handling include keeping the fish clean, keeping it cold and not delaying in processing it.

PRELIMINARYY HANDLING OF FRESH WATER FISH

There are several stages in which fishes are been handled. The first stage of the fish handling and processing is:



- i. **Sorting:** - Sorting can be describe as the arrangement of fish according to their species or the basis of freshness, removal of foreign bodies, physical appearance etc. The fishermen sort fish in order to facilitate grading.
- ii. **Grading:** - It's the second state the fishermen or fish farmers arrange their fish according to size, weight e.t.c. At this stage the fisherman is able to classify his fishes according to their length, weight, and the size of the fish.
- iii. **Washing:** - This is very vital stage which has to do with cleaning the slime, dirt and sand on the body of the fish. The effectiveness of the washing procedure depends, inter align on the kinetic energy of the water in the steam, ration of fish volume to water volume and on the water. Again, slime produces a perfect environment for microorganism growth and should be removed by through washing.
- iv. **Scaling:** - This is the removal of the scales on the body of the fish. This is usually done with the aid of a sharp knife or any other sharp blade.
- v. **Cutting of fins:** - This is done by cutting all the fins on the body of the fish. This fins are dorsal fin, caudal fin, pectoral fins, pelvic fins, and anal fins. All the fins are cut with the aid of knife or any other sharp blade. This operation is most frequently done after gutting during the production of beheaded whole fish or fish steak.
- vi. **Salting:-** Salting can either be achieved by spreading salt or soaking it into a strong brime of 70-80%. There are several types of salting which include; Brime salting, dry salting; Kench salting and pickle salting.
- vii. **Brime Salting:** - This type of salting has to do with a solution of salt where fish is properly immersed into a solution of salt. The concentration of the brime ranges between 80-100% which is equivalent to 270-360 grams of salt to a litre of water. The principle involved is based on the fact that as the salt solution penetrates the fish, water is removed. Brimming has the advantages of uniform penetration of salt, better taste and appearance of fish and less spoilage from rancidity during salting as fish are not directly exposed to air.

- viii. **Dry Salting:** - This is another method whereby granular salt is rubbed on the surface of the fish and the fish are left to dry in the sun.
- ix. **Kench Salting:** - The Kench salting involves the rubbing of salt on the surface of a spilt fish (40-50% by weight of fish). The fish is stacked with a sprinkle of salt between each layer of the fish. This method is better use for bigger fishes such as shark and croakers (Obande, 2009).
- x. **Pickle Salting:** - On this method a granular salt is sprinkle on the fish which will dissolve into the surface moisture in layers in a barrel which should be properly sealed to prevent air from entering as oxygen increases oxidation of fats that will cause rancidity of the fish particularly in fatty fishes. This will provide sufficient salt which will go into solution and maintain the pickle at saturation point as salt penetrates the fish and water is removed. The water extracted from the fish also contains blood and other compounds that help to reduce the rate at which fat in the fish is oxidized. Fish preserved by this very method has a shelf-life of 2-3 years (Eyo; 2001).
- xi. **Icing:** - This is another method of handling the catch where by flaked ice is recommended, however care should be taken in the use of flaked ice to avoid bridging is a phenomenon that causes the fish to stick/gun together strongly. This happens particularly in the fish muscles.

MATERIALS AND METHOD

This research work was carried out in two phases. The first phase was that which involved the meeting of fishermen at River Benue and the second step was that which involve the meeting of farmers in Gboko Local Government Area.

Step 1

The researchers made 30 contacts with fishermen at River Benue and all these people were interviewed accordingly, on how they normally handle their catch the landing site Wadata, Makurdi. Thirty questionnaires were distributed to them and every one of them filled the information as the questions demanded. That is everybody answers according to how he handled his catch.



Step 2

The second step was that which 30 fish farmers in Gboko Local Government Area were interviewed through questionnaires so as to know how they handle their catch during their cropping period.

The Study Area

The study was carried out in Benue State of Nigeria. The state lies between longitudes $6^{\circ}35''\text{E}$ and $8^{\circ}10''\text{E}$ of the Greenwich meridian and latitude, $6^{\circ}30''\text{N}$ and $8^{\circ}10''\text{N}$ of the equator, and at an elevation of 97m above the sea level in the southern Guinea Savannah Agro-Ecological Zone.

METHODOLOGY

The method used in analyzing data was the multiple bar chart.

DATA ANALYSIS

Table 1.2 Showing the Average Handling Catch of the Fishermen in Wadata Landing Site, Makurdi.

	AVTotal catch	AVProper handling	AV mal-handling
Grading	106.2	39.9	66.3
Sorting	68.6	26.2	42.4
Washing	176.6	110.8	52.0
Scaling	75.0	23.0	52.0
Cutting off fins	70.9	22.4	48.5
Gutting	75.2	13.6	61.6
Salting	76.9	32.3	44.5
Icing	75.8	28.0	73.0
TOTAL	725.2	27.1	454.2

Table 1.3 Showing the Average Handling Catch of the Fish Farmers in Gboko

	AV Total catch	AV Proper handling	AV mal-handling
Grading	537.6	37.15	520.5
Sorting	683.1	35.38	647.7
Washing	773.1	61.00	712.1
Scaling	536.5	55.00	481.5
Cutting off fins	546.2	73.85	538.8
Gutting	500.8	5.864	494.9
Salting	438.5	8.462	430.0
Icing	553.8	3.538	550.3
TOTAL	4569.65	213.761	4375.76

RESULTS

Table 1.3 states the result of the average total catch of the 10 fishermen among the 30 fishermen who managed to handle their catch closer to the expectation. The table has shown that the ten (10) fishermen used to wash their catch very well. Row 3 of the same table displayed 176.6 as the average total catch, 110.8 as the average proper handling of the catch and 65.8 as the average mal-handled catch. Looking at the multiple bar chart i.e. fig 1.0, washing carries the highest bar. In the same chart, cutting of fins, scaling and icing carry lower figures which means the total figure of 4542 which is less handling of the fish by fishermen, due to the intensive labour involve in the other handling process. In table 1.3 the washing of the fish by the fish farmers had the highest figure as 773.1 for the average total catch, 61.00 for the average handling catch and 712.1 for the average mal-handled catch. Column 7,6,5,8,1 and 3 fish farmers had lesser care for the fish. That is why the multiple bars chart of fig. 1.2; washing is still carrying the highest bar as 773.1. According to Obande R.A (2009) proper handling of fish yields the highest quality product; while the mal-handling of fish accelerate the speed of spoilage.



Microbial Spoilage

Several types of microorganisms cause spoilage in fish but the one that is of major concern to fish processors is the bacterial spoilage. A large number of bacteria are present in the skin, gills and the intestine of the fish. Though they are not harmful to a healthy life but after death, the bacteria and enzymes in the fish start to invade the tissue through the gills, blood vessels and directly through the skin or belly cavity, and even wounds (Talubi .S. O) 1981).

Enzymatic Spoilage

This is a situation whereby enzymes present in skin, gut and tissues digest the fish post-mortem resulting in development of unpleasant odour, and poor texture. This is what is called autolysis i.e self-digestion so many enzymes that involve in autolysis are derived from the gut of the fish (digestive enzymes) and photolytic enzymes present in the skin, gut and tissues. The most active photolytic is called cathepsins (Eyo; 2001).

Chemical Spoilage

The spoilage caused by chemical involves; the reactions in the fat of fish giving rise to unpleasant odours and flavours. This type of spoilage is described as rancidity. Fish oil is more susceptible to spoilage than other oils because of its high number of unsaturated fatty acids, low saponification number and high iodine value, chemical rancidity is the hydrolysis of triglyceride molecules to glycerol and fatty acids which is caused by the presence of water in the fish.

CONCLUSION

The demand of the fish product depends on the fish quality which in turn goes along with the highest profit. On the other hand, poor fish product increases the level of losses in the fish business, therefore all people engaged in the fisheries sector should consider proper fish handling as the best key to succeed in the fish business. Again, fish dealers should not forget the fact that spoiled fish caused serious damage to the health of consumers.

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