

## Comparative Study On Fish Paste And Mince From (*Lates Niloticus*)

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**Abstract:** Fish products (paste and mince) were produced from *Lates niloticus* (Giwa ruwa as called in Hausa language) obtained from Lake Kainji basin in Nigeria. The products were analysed for both nutrient content by AOAC, 2000 and sensory evaluation using hedonic scale of 0-5 rating. The results were subjected to Analysis of variance to compare the means for significant difference at ( $P < 0.05$ ). The paste was found to have moisture content of  $46.30 \pm 0.73^a$ , Ash content of  $3.52 \pm 1.44^b$ , Fibre  $1.13 \pm 0.18^a$  crude protein  $19.84 \pm 1.65^b$  Fat,  $25.63 \pm 1.00^a$  and NFE,  $3.60 \pm 1.75^b$  while the mince had moisture to be  $9.09 \pm 0.61^a$ , ash content  $9.08 \pm 0.32^a$ , crude protein  $46.49 \pm 1.32^a$ , fat content  $19.95 \pm 0.54^b$ , while NFE is  $13.89 \pm 1.48^a$ . The fish mince had the highest crude protein and NFE than fish paste. It is therefore suggested to consume more of fish mince for more of high crude protein and NFE with less fat content. Sensory evaluation of fish paste samples U1, U2, and U3 respectively shows there were no significant different in colour, texture, flavour and taste (U1  $3.80 \pm 0.42^a$ , U2  $3.40 \pm 0.52^a$  and U3  $3.40 \pm 0.70^a$ ) texture (U1  $3.60 \pm 0.52^a$ , U2  $3.80 \pm 0.42^a$  and U3  $3.50 \pm 0.71^a$ ), flavour (U1  $3.60 \pm 0.70^a$ , U2  $3.10 \pm 0.57^a$  and U3  $3.10 \pm 0.57^a$ ) while taste value (U1  $3.50 \pm 0.71^a$ , U2  $2.70 \pm 0.95^a$  and U3  $3.10 \pm 0.88^a$ ). Also the same in fish mince samples M1 M2 and M3 Colour (M1  $3.80 \pm 0.42^a$  M2  $3.80 \pm 0.42^a$  and M3  $3.30 \pm 0.82^a$ ) texture (M1  $3.00 \pm 0.47^a$ , M2  $3.40 \pm 0.52^a$  and M3  $3.10 \pm 0.32^a$ ) excerpt in flavour value (M1  $2.90 \pm 0.57^a$  M2  $3.20 \pm 0.79^a$  and M3  $2.80 \pm 0.43^{ab}$ ) and taste (M1  $3.20 \pm 0.63^a$ , M2  $2.40 \pm 0.52^b$  and  $2.70 \pm 0.48^{ab}$ ) There is significant different in flavour and taste value in mince. Fish is an important source of protein to human, so the higher percentage of crude protein and lower crude fat content that are needed for the replacement of worn-out tissue in human body system makes the fish mince to stand out compared to fish paste. The fish products also create variety to the monotony of smoking fish or fresh fish stewing in sauce/ tomato.

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**Keywords:** Comparative; Study; Fish; Paste; Mince; *Lates Niloticus*

### Introduction.

Fish are the group of cold-blooded animals typically with fins and primarily dependent on water as a medium to live, fish contribute the ultimate expression of the biological productivity of lakes/reservoirs, rivers, pond and economics conservation giving them high importance. Fish are the most numerous among the vertebrate consisting of about 2000 species compared with bird 8600 reptiles, 6000 mammals and amphibians 2500 their shape range from streamlines to round shape while some are flat or triangular shape also their weight ranges from less than 1gram at adult stage e.g clupeid to 140kg e.g Nile perch (*Lates Niloticus*) or 25metric tone e.g shark. Fish is very important part of animal protein in the diet of man and often provided the much needed nutrient that is not provided in cereal based diet (Clucas and Sutcliffe, (1981). Aquatic product (Fish) are among the most important sources of food in existence as they can provide a good source of protein which is an essential part of the human diet therefore consumption of aquatic product in a society can contribute to its overall health. Fish is rich in protein with amino acid composition well suited to human dietary requirement

comparing favorably with eggs, meat and milk in the nutritional value of the its protein (Waterman, 1976) Fish is an important component of the diet and it form about 14% of the world consumption and animal protein. Fish is indispensable to the diet because of its high quality protein content, a nutrient essential for health, growth and maintenance of the body. The Nile perch (*Lates niloticus*) is a species of freshwater fish in family latidae of order perciforme. It is widespread throughout much of the Afrotropic ecozone, being native to Congo, Nile, Senegal, Niger and Lake Chad, Volta, Lake Turkana and other river basin. It also occurs on brackish water of Lake Maryut in Egypt originally described as *labrius niloticus* among the marine grasses, the species has also been referred to as *Centroponus niloticus* common names include African Victoria Perch (a misleading trade name as the species is not native to Lake Victoria) and a large number of local names in various African languages. Its name in Hausa language is Giwan ruwa meaning Water Elephant *Lates niloticus* is silver in colour with a blue tinge. It has distinctive dark-black eyes, with a bright-yellow outer ring one of the largest freshwater fish, it reaches a maximum length of nearly 2m (more

than 6ft) weighing up to 2000kg (Azeroual *et al.*, 2010). Mature fish average 121-137cm (48-54mch) although many fish are caught before they can grow this large (Wood,1998) Adult Nile Perch occupy all habitat of a lake with sufficient oxygen concentration, while juvenile are restricted to shallow or near shore environment a fierce predator that dominate its surrounding, the perch feeds on fish (including its own spescrustaceans and insect the juvenile also feed on zooplankton) Nile perch use schooling as a mechanism to protect themselves from other predator. The species is of great commercial importance as a food fish. The Nile perch is also with sport angles, as it attacks artificial fishing lures and is also raised in aquaculture. Generally it is often eaten fresh or smoked so this afford another method of preparation to be use for fish paste or mince.

#### **Fish Paste**

Fish paste is fish which has been broken down by a fermentation process until it reaches the consistency of a soft creamy purse or paste, alternatively it refers to cooked fish. which has been physically broken down by pounding, grinding, pressing, mincing, blending, and/or sieving, until it reaches the consistency of paste (Larousse,2000). Monosodium glutamate (MSG) is required, to season food which is an advantageous in food preparation and MSG is absent. Fish paste is used as a condiment or seasoning to add flavor to food or in some cases to complement a dish. Chemically, fish paste is reduced to a thick, rich concentrate which has usually been cooked for long time. It can be contrasted with fish sauce, which is like a fish paste except it is not cooked for so long and is a thick liquid rather than a concentrated paste, and may include seasoning and other flavouring. During low fishing period sometimes fishers use their abundant catch of small fish to make fermented fish paste and smoked fish with the assistance of family member (FAO,2008).

**Fish Mince:** The most common way of separating edible flesh from waste is by filleting, but a greater amount of flesh can be reserve in the form of a coarse mince by putting either the unfileted fish or waste left after filleting, through a bone separator. This research was designed to know the nutritional composition on fish paste and mince from *Lates niloticus* Monotony of stored fresh fish. The project source for variety of fish product in order than stored fresh fish, value addition on our product is mostly appreciated in Nigeria; the most common method of preserving fish is by smoking. Fish can also be prepared in another way like pasting and mincing in order to add value to our product. The aim of this project is to determine the nutritional composition and sensory evaluation of fish paste and mince from Latis

niloticus and replace favourably other imported fish product that are over chemicalized

#### **Materials And Methods**

The study was carried out in the fish processing laboratory of the department of fisheries technology, Federal College of Freshwater Fisheries Technology, New busa Niger state. The chemistry laboratory of National Institute of Freshwater Fisheries Research New Bussa, Niger State (NIFFR).

**Materials:** The materials used for the study include; Fish (*Lates niloticus*) Knife, chopping board, glass cup, clean water, 1.5 of salt for every 2kg of fish to be use, 0.5 pepper, 1.5 teaspoon corn flour and 6 teaspoons of cold water, bowl, frying pan, disposable hand glove, sensitive weighing balance, nose mask, metal spoon and groundnut oil.

#### **Sources of Material (Data Collection).**

The fish (*Lates niloticus*) was purchase from Fakun near dam site along mokwa road a fishing settlement area New Bussa from same lake that cut across the village in kainji New Bussa Niger State. The fish was transported in a clean black polythene bag and very fresh as well. The fish was then transported to the fish processing laboratory of F.C.F.F.T. the fish was gutted and washed thoroughly in order to avoid deterioration and was kept in refrigerator for 24hours. The chopping board was gotten from the laboratory of F.C.F.F.T. and then some other equipment were gotten from the same laboratory. Pan, bowl, glass cup, groundnut oil, salt and pepper were obtain from Monday market, disposal hand glove and nose mask were bought from the Tolu pharmaceutical store. The corn flour also was bought from the Monday market.

#### **Procedure Of Samples Preparation**

The fish were kept in the refrigerator after 24 hours was clean again with clean water and then filleted both side that double filleting, the fillet fish was place on the chopping board which has been washed with water and rinsed thoroughly. Then during process of filleting the fish the water. Salt was mix, it was combine with the pepper corn flour in a small glass cup and stir and mix thoroughly 6 teaspoons of clean water was kept in fridge for some time. Then after the filleting the fish meat was scrap with the metal spoon and was it chop with the knife and the mixture solution were then added gradually and the chopping continue for a little while then was the remaining solution added and it was stir in one direction until the fish paste become sticky the stirring continued for about 8-10 minutes after which the paste was gathered and into the bowl and hit against the mixing until paste is springy for about 3-4min the pack springy was placed into the bowl and it was allow to ferment for 5minutes after the fermentation the paste

was fried and the sensory evaluation was carried out that same day. From the samples some species were taken to the chemistry laboratory for the nutritional composition analysis in (NIFFR).

### The Study of Area

The study was carried out in the fish processing Laboratory of the Department of Fisheries Technology, Federal College of Freshwater Fisheries Technology, New Bussa Niger State and analysis was done in the chemistry laboratory of National Institute of Freshwater Fisheries Research New Bussa Niger State (NIFFR).

### Sources of Materials (Data Collection).

The fish *Lates niloticus* was purchased from cover dam near dam site along Mokwa road in Kaya New Bussa Niger state. The fish was transported fresh in clean black polythene bag to the processing laboratory of F.C.F.F.T. It was gutted de-blood to avoid deterioration it was then stored in the processing refrigerator for 24hours the chopping board was gotten from the laboratory of F.C.F.F.T, and some other wares like beaker, trays, muslin cloth and spatular were gotten from central laboratory while some other

materials salt, knife, and cotton wool was purchased from the Monday market.

### Sources Preparation/Sample Procedures

The fish was brought out of the refrigerator after 24hours and it was washed with clean water placed on the chopping board which had been washed thoroughly with clean water. The fish was chopped into pieces (0.5-1cm) with sharp knife the pieces was mix with 4-5% of salt for 2kg of fish and the water 1:1(40-45°C) was added, the mixture was shaken, and the mixture was allowed to settle and lipid fraction was removed, the settled mixture is soaked for 20-30min in 0.4-0.5%, then sodium bicarbonate added to regularize the pH to 6.5-7 after was the fish washed.

### Statistical Analysis:

Data were statistically analyzed using software program for social science (SPSS) Version 17.0; Independent sample T-TEST was used to compare the means of data for significant difference in proximate analysis. Analysis of variance (ANOVA) was used to compare the means for significant difference. Difference were accepted as significant at ( $P < 0.05$ ).

Table 2: Shows sensory evaluation of fish paste.

TREATMENT	COLOUR	TEXTURE	FLAVOUR	TASTE
U1	3.80±0.42 <sup>a</sup>	3.60±0.52 <sup>a</sup>	3.60±0.70 <sup>a</sup>	3.50±0.71 <sup>a</sup>
U2	3.40±0.52 <sup>a</sup>	3.80±0.42 <sup>a</sup>	3.10±0.57 <sup>a</sup>	2.70±0.95 <sup>a</sup>
U3	3.40±0.70 <sup>a</sup>	3.50±0.71 <sup>a</sup>	3.10±0.57 <sup>a</sup>	3.10±0.88 <sup>a</sup>

MEAN ± Standard deviation with different superscript letter in a column differ significantly ( $P < 0.05$ )

Table 3: Shows sensory evaluation of fish mince.

TREATMENT	COLOUR	TEXTURE	FLAVOUR	TASTE
M1	3.80±0.42 <sup>a</sup>	3.00±0.47 <sup>a</sup>	2.90±0.57 <sup>a</sup>	3.20±0.63 <sup>a</sup>
M2	3.80±0.42 <sup>a</sup>	3.40±0.52 <sup>a</sup>	3.20±0.79 <sup>a</sup>	2.40±0.52 <sup>b</sup>
M3	3.30±0.82 <sup>a</sup>	3.10±0.32 <sup>a</sup>	2.80±0.43 <sup>a</sup>	2.70±0.48 <sup>ab</sup>

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U2	3.40±0.52 <sup>a</sup>	3.80±0.42 <sup>a</sup>	3.10±0.57 <sup>a</sup>	2.70±0.95 <sup>a</sup>
U3	3.40±0.70 <sup>a</sup>	3.50±0.71 <sup>a</sup>	3.10±0.57 <sup>a</sup>	3.10±0.88 <sup>a</sup>

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M3	3.30±0.82 <sup>a</sup>	3.10±0.32 <sup>a</sup>	2.80±0.43 <sup>a</sup>	2.70±0.48 <sup>ab</sup>

MEAN ± Standard Deviation with different superscript letters in a column differ significantly ( $P < 0.05$ )

### Discussion

The protein content of fish paste is 21.00% while that of fish mince is 47.42% therefore that shows that the protein content in fish mince is higher, it is

advisable to eat more of fish mince because of its higher protein content. We all know how important protein is to our body its help renew and repair our body tissue which are constantly undergoing wear and

tear such tissue are found in the sole of our feet, nails, hair and skin. In proximate composition it show that protein content in fish mince is higher ( $46.47 \pm 1.32$ ) and the significant difference shows that protein content is also higher in the statistical analysis. According to (FAO,2008) to get fish paste with high protein content, one should use small fishes because the concentration of protein is high, while in fish mince one should use fish with high fat content such as *Clarias* and *Lates niloticus* because the fat is eliminated to some extent in order to maintain a particular fat, this is because some people do not like much fat in food and also much fat consumption is not good for our health, In this research work frying shows to be the best method in preserving fish mince.

### Conclusion:

From this research title: (Comparative study on fish paste and fish mince from *Lates niloticus*) It can be conclude that fish mince has high protein content this study also reveal that frying of fish concentrate and increase the nutritional value of fish since most of the moisture are lost during the process. The overall preference and higher protein content value of fried fish is higher in fish mince and its should be encourage to consume. This is also a method of preserving fish use by some business women who fry fish for sell and consumption. The study also reveal that although frying of fish is good but it should not be consume very much because even health wise it is not encourage to be eating too much fatty food is not good older people. Because it can result to high blood pressure but it is good for growing up children. Because according to the procedure use in processing the mince the concentration of fat is remove so as to attain a particular fat content which the body requires.

### Recommendation:

It is therefore, recommended that fish mince should be eaten by both young and old people because of the presence of high percentage of crude protein and low crude fat content that are needed for the replacement of worn-out tissue in human body system.

### References

1. AOAC (1990): official methods of analysis of the Association of official analytical chemists 15<sup>th</sup> ed.
2. Albano, H., Todorov, S.D., van Reenen, C.A., Hogg, T., Dicks, L.M.T. and Teixeira, P., 2007. Characterization of two bacteriocins produced by *Pediococcus acidilactici* isolated from “Alheira”, a fermented sausage traditionally produced in Portugal. *Int. J. Food Microbiol.* 116: 239-247.
3. Azeroual O., Koch K., Delfaud F., Moriaud F. & de Brevern A.G. (2010), Classification of binding sites with MED-SuMo Multi approach: an application on Purinome, *Protein Science*, 19(4):847-67.
4. Bio preservation an ecological approach to improve the safety and shelf life of foods” In; A Mendez-Vilas (ED) communicating current research and educational topic and trend in applied microbiology, Formatex. ISBN 978-84-611-9423-0.
5. Clucas I.J. and Sutcliffe P.J. (1981). An introduction to fish Handling and Processing. Tropical Products Institute. London, 86pp.
6. Eyo, A.A., 1992. The nutritive value of traditionally prepared fish meals. FAO fisheries report. No. 467. sup 147-149.
7. FAO (2005). Preservation technique Fisheries and aquaculture department Rome .
8. FAO Fisheries and Aquaculture (2008) Globalization and fisheries; Proceeding of an OECD-FAO Workshop. Organization for Economic co-operation and Development, OECD Publishing ISBN 978-92-64-03776-2.
9. FAO (2001); Processing fish and fish products. Fisheries and aquaculture department. Rome, Refriened 14 march 2011.
10. FAO (2005). Handling Of Fish And Fish Product. Fisheries And Aquaculture Depart, Rome Retrieved 14 March 2011.
11. FAO. 2001. Global Forest Resources Assessment 2000: main report. FAO Forestry Paper 140.
12. FAO. 2005b. *Domestic support: trade related issues and the empirical evidence.* FAO Trade Policy Technical Notes on issues related to the WTO negotiations on agriculture, No. 5. Rome (available at <ftp://ftp.fao.org/docrep/fao/007/j5012e/j5012e00.pdf>).
13. FAO. 2005c. *Export competition: selected issues and the empirical evidence.* FAO Trade Policy Technical Notes on issues related to the WTO negotiations on agriculture, No. 4. Rome (available at <ftp://ftp.fao.org/docrep/fao/007/j5013e/j5013e00.pdf>).
14. Huss H.H (1988) Quality and quality change in fresh fish FAO Fisheries Technical Paper 348 Rome ISBN 92-5-10350-5
15. Larousse Gastronomique Hamlyn. (2000) P. 949. ISBN 0-600-602354
16. Royal Society Of Edinburgh (2004 ) Inquiry into the future of the scottish fishing industry 128pp.
17. Waterman (1976). The Production of Dried Fish. FAO Fish. Tech. Paper (160):115-120 Website: [http://www.youtube.com/watch: v=NQC3u4v2zo.com](http://www.youtube.com/watch?v=NQC3u4v2zo.com) and [www.seasaltwithfood.com](http://www.seasaltwithfood.com)