The Effect of Local Processing Method (Kilishi) on the Nutrient Profiles of *Heterobranchus Birdosalis* in Owerri Municipal Local Government Area

Ekeledo, B. C.,

Department of Fishery Technology, Federal Polytechnic Nekede, Owerri-Nigeria

Chukwueke, B. O.,

Department of Science Technology, Federal Polytechnic Nekede, Owerri-Nigeria

Abstract

The effect of local processing method (Kilishi) on the proximate compositions of catfish (Heterobranchus birdosalis) was determined using standard procedures of AOAC. Some quantities of catfish were purchased form a fish pond in owerri and they were shared into two parts. One part was processed to fish Kilishi while the other was left unprocessed (raw flesh). The proximate composition of the kilishi and raw flesh of H. birdosalis were determined. The percentage mean protein, lipid, ash, fibre for the kilishi were 66.95, 17.44, 1.55, 2.00 which were higher than those of the raw flesh except for moisture 10.51 and carbohydrate 1.55. The results indicate that kilishi method of fish processing induced positive changes on the catfish, thus it is recommended for healthy eating.

Keywords: kilishi, Nutrient profiles, Heterobranchus birdosalis

Introduction

There are various reasons for the merits of eating fish. One of such reasons is that fish is less tough and more digestible compared to meat. This is possible because of the greater ratio of muscle protein in fish to other animals, thus making fish acceptable by infants and adults alike (Eyo, 2001).

However, processing provides a higher production, less waste, improved nutrient levels, variety and thus high foreign exchange (Andrade, 2000). Processing also prolongs the storage time of fish and permits a state of wholesomeness in long distribution and marketing channel (Njoku, 2005).

The dried meat product, kilishi is produced mainly by the Hausas and Fulanis in the Northern part of Nigeria a country in West Africa. The desirable qualities of meat kilishi include ease for bulk transportation, fortified nutrient levels and its long shelf life (Alonge, 1981).

This research investigates the feasibility of adopting the kilishi traditional meat processing with the view to improving the nutritional qualities of *Heterobranchus birdosalis*

Materials/Method

4000g of *H. birdosalis* were bought from a pond in owerri and they were beheaded, washed, eviscerated and skinned. They were shared into two equal parts; one part was saliced into fillets. The fillets were washed and spread on a clean dry tray and were sun dried for five hours. 50g defatted

groundnut, 20g ground pepper, 10g sliced garlic, 10g ground ginger, 3g clove, 3g salt, 1 cube magi were mixed together in a clean bowl and were spread on the sundried fillets respectively. The infused fillets were smoked dried and were turned intermittently for three minutes to blend and obtain the finished product, fish kilishi.

The fish kilishi and the raw flesh were taken to the food processing laboratory to determine the proximate compositions using standard methods of AOAC (1990).

Organoleptic assessment of the fish kilishi was determined using five point hedonic scale.

Results

Table 1: *Average value of duplicate determinations on proximate compositions of kilishi and raw flesh of H. birdosalis (%)*

Sample	Moisture	Crude protein	Lipid	Total ash	Crude fibre	Carbohydrate	Some minerals
Fish kilishi	10.51	66.95	17.44	2.00	1.55	1.55	0.013
Raw flesh	75.00	18.90	2.22	0.55	0.45	2.88	0.009

Table 2: *Average value of duplicate determinations on proximate compositions of kilishi mixed ingredients (%)*

Sample	Moisture	Crude protein	Lipid	Total ash	Crude fibre	Carbohydrate
kilishi mixed ingredients	6.75	40.75	15.57	5.12	13.43	18.38

Table 3: *Sensory assessment of the fish kilishi*

Sample	Taste	Aroma	Texture	Rancidity	Overall acceptability
Fish kilishi	8.0	8.0	7.0	Nill	7.7

Table 4: *Some mineral compositions of raw flesh and kilishi of H. birdosalis (%)*

Minerals	Raw flesh	kilishi
Calcium	0.0018	0.0040
Sodium	0.0033	0.0043
Potassium	0.00013	0.00042
Phosphorus	0.00012	0.00030
Iodine	0.0035	0.0040
Magnesium	0.00019	0.00036

Discussion

The proximate composition of the raw flesh and fish kilishi of *H. birdosalis* are presented in Table 1. Each value is the mean value of the duplicate determinations showing nutritive effect of the processing method.

Eyo, 2001 states that the major compositions of fish tissue (muscle) are water, protein, lipid and micronutrients of varying proportions. This statement is in line with the result in the raw flesh and kilishi product obtained.

The raw flesh sample presented low protein, lipid, crude fibre and ash content but high moisture, which is similar to the report of Eyo (2001). As the water content of the fish increases, the

protein, lipid, ash and fibre decrease. The increase in protein level of the fish kilishi when compared to the raw fish suggests that reduction of the moisture content of the fish increased the concentration and digestibility of protein, thus the availability of amino acids (Eves, 1993). The increase in protein could also be attributed to the mixed ingredients (defatted groundnut) used in the processing as can be related to the work done by Suleiman and Abdullahi (2008) and on *Claris gariepinus* by Ekeledo and Ekeoma (2009) of which the results are not quite significantly different (P>0.05).

From the report, there was a decline in the moisture content of the fish kilishi due to heat cure (sun drying and smoking) given to it. Eyo (2001) stated that the heat from the sun, drainage of fish and wind passing all over the fish will aid dehydration. This statement is in agreement with the result obtained.

The lipid content of the kilishi product increased due to the fact that as moisture is reduced, fat content is increased. Fats were not lost through dripping during smoking because the space of time for the smoking of the fillets was very short.

The ash content of kilishi was higher than raw flesh sample. Perhaps smoking increased the ash content of the fish kilishi.

The increased fibre content of the kilishi was as a result of celluloses and lignin that were deposited on the product from the wood used in the smoking of the kilishi. Eyo (2001) stated that the woods used for smoking are composed of celluloses, hemicelluloses and lignin.

The heat applied to the kilishi resulted to the breaking and decrease in the carbohydrate content of the product.

Table 2 explains that the kilishi ingredients used have nutritive qualities which were impacted into the product to enhance its nutritive values and consumer's acceptability.

Table 3 reports the sensory assessment of the fish kilishi. The taste, aroma, and texture of the product were good, thus the acceptability of the product by the panelists were high. There was no taste of rancidity in the product, hence the product was fresh and it did not deteriorate. Ferriera (1987) reported in agro industry that smoking is not only a conservation method but it is also a flavor, aroma and coloration improving method which are attributes sought by consumers.

Conclusion

The proximate compositions, protein, lipid, ash, crude fibre and minerals of catfish were influenced positively, it is therefore concluded that fish kilishi processing is an acceptable processing method for improving the nutritional qualities of *Heterobranchus birdosalis* considering that majority of these are gotten are from the wild.

Recommendation

It is recommended that oven drying should be used in place of smoke drying in order to enhance the color and appearance of the product and to promote consumer's acceptability of product.
While sun drying the fillets it should be covered with net to avoid dust, dirt from resting on the fillets and to avoid vermin from attacking the fillets.

References

Andrade, E.G. and Oliveira, P.R., (2008). A composicao centesimal de quarto species de pieces de a gua doce, submetidas a um processo de defumacco. In congress brasileiro de ciencia e technology de Alimentos, 12, Fortaleza, Resymos.

AOAC., (1990). Official methods of analysis of the association of official analytical chemist, (15th ed) Virginia 1298pp.

Ekeledo, C.B. and Ekeoma, R.I., (2009). The Effect of local processing method (kilishi) on the nutrient profiles of Clarias gariepinus in Owerri Municipal L.G.A. Int. J. Health and Envt. (3):1.8-9.

Eves, A. and Brown, R., (1993).Effect of traditional drying on nutritional values of fish. Tropical Science, 33:183-189pp

Eyo, A.A., (2001). Fish processing in tropics. National Institution for fresh water fisheries research (NIFFR) New Bussa, Nigeria. 8-131pp

Ferreira, S.O., (1987). Applicacao detechnologia e species de pescado de agua visando atender a agro industria rural master of science dissertation Universidad de Sao Paulo, Escola superior de Agricura "Luiz de queiroz"- ESALQ-USP. Sao Paulo. Brazil, 122pp

Njoku, D.C. and Ejiogu, C.O., (2005). Fisheries and wide life of Nigeria. Okson publishers, Owerri, Nigeria, 191pp