



PROXIMATE COMPOSITION AND CARCASS QUALITY OF SMOKED AND FRESH GREY MULLET (*LIZA FALCIPINNIS*) COLLECTED FROM LAGOS LAGOON

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ABSTRACT

The purpose of this research was to determine the quality of smoked grey Mullet (*Liza falcipinnis*). The fish were divided into two portions; one portion was processed using NIOMR smoking kiln. All of smoked mullet samples were subjected to chemical analysis. The proximate composition shows that moisture content in smoked sample was very low (5.43%) while it was high (72.89 %,) in fresh sample. There was no significant difference in both smoked and fresh sample values obtained for crude protein (25.7% and 22.2%) respectively, while lipid, ash and carbohydrate values obtained shows significant difference ($p>0.05$). Also, there were no significant difference in the moisture and lipid values obtained for smoked tissue, whole fish, and carcass of mullet, but there were significant differences in the values obtained for crude protein, ash and carbohydrate respectively.

Keywords: Proximate, smoked, fresh, mullet, Lagos Lagoon.

INTRODUCTION

Fish is one of the most important sources of animal protein available in the tropics (Andrew 2001). According to Ayuba and Omeji (2006), fish is a major source of protein in the coastal areas, especially when smoked or dried. Most mullet are found in coastal marine, brackish and fresh water. In estuarine waters, grey mullets feed on detritus, diatoms, algae and microscopic invertebrates which they filter from mud and sand through their mouth and gills (QFMA, 1991; MCDonough and Wenner, 2003). *Liza falcipinnis* is the probably the dominant mullet species in West Africa coast and contribute significantly to the fishery in Nigeria. Mullet is a common landing of most artisanal fishermen in the coastal areas, such as Lagos, Bonny River and Niger Delta, Fagade and Olaniyan (1993). Fish if not sold or cooked fresh, preservation methods should be used to extent the shelf -life. these include smoking, freezing, sun drying etc (Ogbonnaya and Ibrahim 2009). The aim of this study is to determine the proximate composition and carcass quality smoked and fresh grey mullet collected from the wild.

MATERIAL AND METHOD

Study Area: Lagos Lagoon is located between longitude 30°33'E and 30°35'E and Latitude 60°24' and 60°27' has an area of 208km². It has the largest of the Coastal Lagoon of South West Nigeria. It inhibits coastal waters, estuaries and fresh water in tropical and temperature waters (Render et al. 1995)

Sample Collection and Preparation: Grey mullet with average weight of 188.5g and total length of 24cm was collected, gutted, washed and smoked using NIOMR smoking Kiln at temperature

of 90 to 100 °C for about 6hours, and continue the next day for approximately 3 hours, the proximate analysis was carry out in the Nigerian Institute for Oceanography and Marine Research (NIOMR) Pilot plant in food engineering unit.

Proximate Analysis: Crude protein, moisture, lipid and ash contents were determined according to AOAC methods (AOAC, 1994).

Statistical Analysis: Data was subjected to analysis of variance (ANOVA) at 5% level of significant.

RESULT AND DISCUSSION

Proximate composition of smoked and fresh mullet (*Liza Falcipinnis*) collected from Lagos Lagoon.

Table 1. Shows the proximate composition of smoked and fresh sample of mullet. Moisture value obtained in smoked sample is very low(5.43%) while the fresh sample was very high (72.89%), no significant different in both smoked and fresh sample protein value obtained (25.7% and 22.16%) respectively. smoked and fresh sample value obtained for lipid, ash, and carbohydrate shows significant different ($p<0.05$). Table 2 shows proximate composition of tissue, whole fish and carcass (fins, skeleton and head) of mullet. value obtained for moisture for DTM,DWM and DCM shows no significant different($p<0.05$), protein there was significant different between DTM, DWM and DCM. Lipid there was no significant different between DTM, DWM and DCM. The value obtained for Ash and carbohydrate were significantly different between DTM, DWM and DCM ($p<0.05$) respectively.

Table 1: Proximate composition of smoked and fresh mullet (*Liza Falcipinnis*) collected from Lagos Lagoon.

Parameter	Smoked Fish			Fresh Fish		
	mean±SD	min.	max.	mean±SD	min.	max.
Moisture	5.43±1.61 ^a	4.01	7.18	72.9±2.33 ^b	70.7	75.3
Crude protein	25.7±2.26 ^a	24.4	28.3	22.2±1.57 ^a	20.4	23.1
Lipid	3.36±0.93 ^a	2.29	4.01	0.58±0.34 ^b	0.30	0.97
Ash	9.99±3.33 ^a	6.66	13.3	3.33±0.00 ^b	3.33	3.33
Carbohydrate	2.96±0.42 ^a	2.50	3.30	0.10±0.04 ^b	0.08	0.15

Each value is the mean (±SD) of three replicates. Value with different superscript are significantly different from each other (p<0.05).

Table 2: Proximate composition of processed (smoked) mullet collected from the wild

Parameter	Treatment				
	Moisture	Crude protein	Lipid	Ash	Carbohydrate
DTW	4.02±1.01 ^a	34.8±1.12 ^a	2.71±0.85 ^a	2.36±0.65 ^a	0.87±0.10 _a
DWM	5.43±1.61 ^a	25.7±2.26 ^b	3.36±0.98 ^a	9.99±3.33 ^b	2.96±0.42 ^b
DCM	5.16±2.59 ^a	43.3±0.37 ^c	2.23±0.81 ^a	20.0±0.00 ^c	3.71±0.30 ^c

DTM(dry tissue matter), DWM (dry whole matter) and DCM (dry carcass matter). Each value is the mean (±SD) of three replicates. Value with different superscript are significantly different from each other (p<0.05).

The result indicate that there are difference in proximate composition of smoked and fresh mullet (*L. falcipinnis*) collected from the wild. Smoked mullet sample shown a significant reduction in the moisture content and increase in protein, lipid, ash and carbohydrate compared to the fresh sample. Moisture content of the mullet which is of great important in storage was observed to be low in smoked sample and high moisture for fresh sample is one of the factors that increase muscle spoilage in fresh fish (Gallegher 1991 and Ahmed et al.2011). This agreed with the finding of Salan et al. (2006) and Kumolu-johnson and Ndimele (2001) which reported that spoilage can be slow down by addition of salt or smoking of fish from the action of enzymes and bacteria. Since protein for smoked and fresh fish sample is (25.7% to 22.2%), the high protein content would make it an ideal source of animal protein that can be used to control diet. The low ash, carbohydrate, lipid, and high protein and moisture content value obtained from the proximate analysis as show in table 1 agreed with other work carry out by Effing and mohammed(2008), Mumba and Jose (2005) and Abdullahi (2001). Lipid content was very low for smoked sample 3.36% and fresh 0.58% hence, mullet is considered lean fish. Table 2. Shows, Moisture content for all the processed fish sample were very low, higher protein value in the tissue and carcass, low lipid in tissue, whole fish and high lipid in the carcass while low ash value was observed in tissue, whole and high ash value was obtained in carcass sample. This indicate that the mullet is a good sources of minerals such as calcium, potassium, zinc, iron and magnesium.

CONCLUSION

This study shows that grey mullet has high nutritional value, low fat and good source of minerals, therefore, it can be suitable for smoking, canning and other value addition to extent the shelf life and also a suitable source of animal protein useful for controlling diet.

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