

NUTRITIONAL COMPOSITION AND ACCEPTABILITY OF FISH SNACK AMONG THE ELITE AND LOCAL INDIGENES OF IGBOORA COMMUNITY

¹Bankole, A.F., ¹Adeosun, O., ¹Awofodu, B.O., ²Olawepo, A. N. and ¹Adesope M. A.

¹Department of Fisheries Technology, ²Department of Home and rural Economics, Oyo State College of Agriculture and Technology, Igboora

Corresponding author's E-mail: flakybanks@gmail.com

Abstract

*The nutrient composition and acceptability of oven-dried fish snacks (filleted *Clarias gariepinus*) was compared among 10 members of the OYSCATECH community and 10 from the host community with no formal education. The proximate compositions of raw fillets and processed fillet showed that raw samples presented low protein, lipids, ash and fibre contents; high moisture (21.45%) and carbohydrate contents (6.84%). Decrease in moisture content (16.32%), carbohydrate (4.40%) and increased crude protein content (68.10%) were the most prominent changes in the fillets after drying. Result of the organoleptic assessment shows that the two groups considered appreciated the fish sample, none of them agreed to like the sample slightly. Overall acceptability was highest (90%) among the members of the Igboora community as against those of the OYSCATECH community (70%). Response on forms of utilisation shows 40% of the indigenes choose to use the specimen as a condiment or additive to soups and vegetables, 30% of the elite saw its use as snack/small chop; whereas a fraction of the Igboora community (20%) considered its use as snack /small chops. The percentage of elites that indicated eating the fish balls alongside drinking local drink/beer is smaller (30%) when compared to their counterpart with 40% for the same purpose. On willingness to pay ₦100 for a ball; 70% of the members of the OYSCATECH community agreed to pay the said amount, while 60% showed willingness from the Igboora community.*

Keywords: Sensory evaluation, *Clarias gariepinus*, proximate composition, elites and local indigenes

Introduction

Fish is a major source of cheap protein. Catfish (*Clarias gariepinus*) a very important fresh water fish in Nigeria and has enjoyed wide acceptability in most part of the country because of its unique taste, flavour and good texture. It is a good source of protein, its vitamins and minerals are essential nutrients required for supplementary both infant and adult diets and it is extensively cultivated in ponds (Abdullah *et al.*, 2001).

In general, fish is usually eaten when freshly caught, preserved or processed to form a much cherished delicacy that cuts across socio-economics, age, religious and educational backgrounds (Adebayo *et al.*, 2008). To further increase fish utilisation and ease of accessing processing fish, this study is aimed at determining the nutritional composition of fish snack as well as investigating consumers (elites and local indigenes) attitude towards the snack.

Materials and methods

Experimental site

The experiment was carried out at the Teaching and Research Farm, Oyo State College of Agriculture (OYSCATECH) Igboora, situated in Ibarapa Central Local Government Area, Oyo State, Nigeria, having its administrative sits in Igboora.

Preparation of fish snacks

5kg table size fresh catfish (*Clarias gariepinus*) were brought from Olugbon fish farm, Igboora. The fish were beheaded, gutted, and washed with cold water. Skin and bones were removed by hand to produce pure fillets. The fillets were obtained using sharp knife. The fish fillets were chilled with ice block immediately after filleting each fish.

The fillets harvested was seasoned with a mix of grated fresh scotch bonnet, salt, curry, thyme and seasoning cube thereafter the mixture was moulded into balls. The fish balls made were then oven dried at 70°C for 10 hours after which the balls were allowed to cool. Dried fish snacks were packed in nylon and stored at room temperature prior to sensory analysis. Proximate analysis of fish samples was determined using Association of Official Analytical Chemists methods (AOAC, 1994) at the microbiology

laboratory Federal University of Agriculture, Abeokuta (FUNAAB).

Sensory evaluation

The subjective evaluation of the product quality was carried out by 20 assessors, 10 composed of staff and students from Agricultural Technology Department and Fisheries Technology Department of Oyo State College of Agriculture and Technology, Igboora represented the elite community, the remaining 10 from local residents of Igboora were purposively selected among artisans and market women with no formal education, they represent the local people. The finished product sample was served to each member of the panel.

Quality attributes investigated include Taste, Texture, Aroma and Appearance. Panel members scored all factors on a 9 points Hedonic scale [9= Like extremely (LE), 8 = Like very much (LVM), 7 – Like moderately (LM), 6 – Like slightly (LS), 5 = Neither like nor dislike (NLNDL), 4 = Dislike slightly (DLS), 3 = Dislike moderately (DLM), 2 = Dislike very much (DLVM), 1 = Dislike extremely (DLE)].

Data analysis

Descriptive analysis was used to analyze sensory evaluation results, while the proximate was analyzed using Analysis of Variance (ANOVA). Means were separated using Duncan Multiple Range Test

Results and discussion

Table 1: Proximate Compositions of Raw and Oven-dried Fish Snack

Proximate Compositions	Wet (%)	Oven-dried(%)
Moisture	21.45 ^a	16.32 ^b
Protein	19.81 ^a	68.10 ^b
Lipids	15.28 ^a	30.11 ^b
Ash	4.06 ^a	4.60 ^b
Fibre	1.08 ^a	2.06 ^b
Carbohydrate	6.84 ^a	4.40 ^b

Values in the same row followed by different letters are significantly different (P<0.05)

Table 2: Sensory Attributes ofOven-dried Fish Snack (Elite Community)

Hedonic Scale (%)	LE	LVM	LM	LS	NL/NDL	DLS	DLM	DLVM	DLE
Parameters									
Taste	30	10	60	-	-	-	-	-	-
Texture	50	40	10	-	-	-	-	-	-
Aroma	40	40	20	-	-	-	-	-	-
Appearance	40	50	10	-	-	-	-	-	-
Overall Acceptability	70	20	10	-	-	-	-	-	-

Table 3: Elite Community's Response to Usage and Willingness to buy

	Frequency (f)	Percentage (%)
Additive condiment	4	40
Snack/small chops	3	30
Enjoyed with local drink/beer	3	30
Pay ₦100	70(Yes)	30(No)

Table 4: Sensory Attributes of Oven-dried Fish Snack (Local Community)

Hedonic Scale (%)	LE	LVM	LM	LS	NL/NDL	DLS	DLM	DLVM	DLE
Parameters									
Taste	30	10	60	-	-	-	-	-	-
Texture	60	20	20	-	-	-	-	-	-
Aroma	50	50	-	-	-	-	-	-	-
Appearance	60	30	10	-	-	-	-	-	-
Overall Acceptability	90	-	10	-	-	-	-	-	-

Table 5: Local Community's Response to Usage and Willingness to buy

	Frequency (f)	Percentage (%)
Additive condiment	4	40
Snack/small chops	2	20
Enjoyed with local drink/beer	4	40
Pay ₦100	60(Yes)	40(No)

Discussion

Proximate composition

The proximate compositions of raw fillets and processed fish snack are presented in Table 1. Raw samples presented low protein, lipids, ash and fibre contents; high moisture (21.45%) and carbohydrate contents (6.84%), similar to previous reported by Ogbonnaya and Ibrahim (2009) and Eyo (1998). Decrease of moisture content (16.32%), carbohydrate (4.40%) and increased crude protein content (68.10%) were the most prominent changes in the fillets after drying. Lipids, ash and fibre contents increased significantly in processed samples ($P < 0.05$), this trend is in agreement with the results by Tao and Linchun (2008). The significant increase in protein levels ($P < 0.05$) in oven-dried fish snack, when compared with the wet sample, suggests that protein nitrogen was not lost during drying. This is in accordance with the findings of Puwastien *et al.* (1999), Gokoglu *et al.* (2004) and Tao and Linchun (2008).

After drying there was a significant increase in lipids content (30.11%). Electric oven-dried samples retained higher lipids content ($P < 0.05$). This validates the report of Ogbonnaya and Shaba (2009) that electric oven drying preserves fat than smoking kiln.

Sensory, Physical characteristics, and overall acceptability

Result of the organoleptic assessment of the fish snack (Table 2) shows that the two groups considered appreciated the fish sample, none of them agreed to liking the sample slightly. The two parties also exhibited the same taste for oven-dried fish snack; OYSCATECH (10%, 60% and 30%), while Igboora had 10%, 60% and 30%. On texture both indicated extreme likeness for fish sample. For Aroma; panellist from Igboora community were divided between two options; half of them liked the sample very much, while the remaining half liked extremely. Members of the OYSCATECH community liked in ratio 40:20:40 for liked very much, like moderately and extremely respectively. On appeal to sight; 60% of the illiterates liked the appearance extremely, while 50% of the elites liked it very much. Overall acceptability was highest (90%) among the members of the Igboora

community as against those of the OYSCATECH community (70%).

Respondents' response to the use and amount they are willing to pay for the fish snack (Table 3), 40% of the communities choose to use the specimen as a condiment or additive to soups and vegetables, 30% of the elite saw its use as snack/small chop; whereas a fraction of the Igboora community (20%) considered its use as snack /small chops. The percentage of elites that indicated eating the fish balls alongside drinking local drink/beer is smaller (30%) when compared to their counterpart with 40% for the same purpose. On willingness to pay ₦100 for a ball; 70% of the members of the OYSCATECH community agreed to pay the said amount, while 60% are in support from the Igboora community.

The positive overall acceptability the OYSCATECH community and Igboora community had for the product as well as their willing to pay an appreciable amount for the product, could be linked to the fact that fish and its attendant products are universally acceptable to all race, sect and religion since no taboo is attached to it.

Conclusion

The proximate compositions of processed fish snack showed better values for nutrient composition over the raw fillet, moisture and carbohydrate content was greatly reduced with marked increase in crude protein, lipids/fats, and ash and fibre contents. Sensory evaluation showed that the fish ball was not in anywise unappreciated formal education or lack of it was not an impediment to its likeness, consumption and willingness to purchase it. In addition the fish ball can be incorporated in infant's meal since it is void of bones and possesses good nutritive value.

References

- Abdullahi S. A., Abolude, D.S. and Ega R.A. (2001). Nutrient Quality of four oven Dried fresh water Cat fish in Northern Nigeria. *J.Trop.Biosci* pp: 70.
- Adebayo-Tayo B.C., Onilude, A. A. and Patrick U.G. (2008). Mycoflora of smoked dried Fishes sold in Uyo, Eastern Nigeria. *World j.Agric sci*.
- Association of Official Analytical Chemists, AOAC. (1994) Official Methods of Analysis of the



- Association of Official Analytical Chemists, Vols. I and II, Association of Analytical Chemists, Arlington.1994; 1298pp.
- Eyo, A.A. (1998). Shelf-life of Moonfish (*Citharus citharus*) and Tunk Fish (*Mormyrus mormyrus*) During Storage at Ambient Temperature and on Ice. FAO Fisheries Report No. 574, pp: 35-37.
- Gokoglu, N., P. Yerlikaya and E. Cengiz, (2004). Effects of Cooking Methods on the Proximate Composition and Mineral Contents of Rainbow Trout (*Oncorhynchus mykiss*). Food Chem., 84: 19-22.
- Ogbonnaya, C. and Shaba, I. M. (2009). Effects of Drying Methods on Proximate Compositions of Catfish (*Clarias gariepinus*). World Journal of Agricultural Sciences 5 (1): 114-116, 2009 ISSN 1817-3047 © IDOSI Publications, 2009
- Ogbonnaya, C. and Ibrahim, M.S., 2009. Effects of drying methods on proximate Compositions of catfish (*Clarias gariepinus*) World Journal of Agricultural Sciences 5(1): 114-116.
- Puwastien, P., K. Judprasong, E. Kettwan, K. Vasanachitt, Y. Nakngamanong and L. Bhattacharjee, (1999). Proximate Composition of Raw and Cooked Thai Freshwater and Marine Fish. J. Food Composition and Analysis, 12: 9-16.
- Tao, W. and M. Linchun, (2008). Influences of Hot Air Drying and Microwave Drying on Nutritional and Odorous Properties of Grass Carp (*Ctenopharyngodon idella*) Fillets. Food Chem., 110 (3): 647-653.