

Comparison of Fried and Baked Fish *Oreochromis niloticus* Cakes

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Abstract

Oreochromis niloticus fish-in-cake were made to improve its food value as well as create new menu. Fried fishin-cake was 66.2% appealing in its colour, taste, texture and odor to assessors than the 64% rating for baked fish-in-cake.

Key Words: Fish-in-cake, food value, new menu.

Introduction

Knowledge of fish utilization has to be widened to enhance its consumption. Current world fish utilization and marketing shows 72% of total catch is used for direct human consumption. Almost all the remainders (26%) are used for the production of fishmeal. Thirty-one (31%) per cent of all fish for human consumption is eaten fresh and 35% is frozen, another 16% is processed as cured fish (dried, salted, smoked) and 18% as canned fish. Thus 31% is consumed within the first two weeks after capture and 69% preserved in some form or the other for later consumption (Toussaint, 1992).

Eyo (2001) stated that between 40-60% of fish frames are discarded along with the bones after and during filleting operations. This is undesirable in the days of world wide protein shortage. This wastage is also unacceptable to the Nutritionist because, valuable minerals are lost or wasted in such process which would have been recovered for 'good' nutrition.

Generally, baked fish-in-cake can be obtained from any species of fish, crustacean or mollusk. It is however better to obtain it from species or materials from where significant value will accrue (Grantham, 1981).

A large number of species of fish exists in almost all parts of the world. Most of these species are underutilized and judging from increase in protein demand, methods of recovering these under utilized species are sought.

In Israel, Gelman *et al* (1985) worked on the use of *Mirogrex terrea* (Cyprinidae) a small sardine endemic to Lake Kinneret. They are the most common species in the lake.

Lee (1972) opined that butter is the best for making pastry. It gives good fluffy paste and good flavour.

Geliadi (1985) was of the opinion that cake should be baked immediately the mixing is completed.

This study is undertaken to try to prepare fish-in-cake food from whole *Oreochromis niloticus*, one of the most important species endemic in Nigeria and other countries in the developing world.

Therefore, the objective of this work is to widening fish utilization. Since about 31% of fish for human consumption are eaten fresh, about 35% are frozen, about 16% are processed as cured fish (dried, salted, smoked) and 18% are canned, there is the need to decrease the percentages of fish utilized raw and increase the percentages of fish that are utilized after some forms of heat treatment.

This work will also compare fried and baked fish for their texture, taste, odour, colour and acceptability.

Materials and Method

Materials

200g *Oreochromis niloticus* fish powder

600g-wheat flour

2g salts

50g sugar
200g margarine
A teaspoonful baking powder
150ml water for batter formation
800ml vegetable oil
3g Nutmeg
5g dry red pepper
Baking pans

Fish preparation

Two kilogram freshly caught Tilapia (*Oreochromis niloticus*) was properly dressed and washed clean. Zain (1980) manual method for minced fish preparation was adopted, except that the bones were not separated from the frames after steaming for 10 minutes to soften the bones. Salt and other spices were added to the fish cut into about 2cm and mixed thoroughly in mixer for 40 minutes for condiment absorption. The mix was later pressed to remove liquid. They were dried in the oven set at 105°C for 24hrs.

Dried fish was milled into fish powder.

Sample A (Fried fish-in-cake with 20% of fish powder to 80% wheat flour).

Sample B (Fried fish-in-cake with 30% of fish powder to 70% of wheat flour).

Sample C (Fried fish-in-cake with 50% of fish powder to 50% of wheat flour).

Sample D (Control) cake without fish with 100% wheat flour.

Samples A1, B1, C1 and D1 are replicates for baked cakes.

Cake preparation.

200g margarine was creamed with 50g sugar until it was white, soft and fluffy. This was divided into eight portions for the experiments. Then 20g fish powder for sample A, 30g fish for sample B, 50g fish powder respectively were gradually added into each of the mix. This was followed with 80g; 70g and 50g wheat flour respectively for samples A, B, C, while sample D had no fish but 100g wheat flour. Another replicates were prepared for baked samples coded A1, B1, C1 and D1 (control)

25g of the mixture were served into baking pans and molded into shapes after rubbing with vegetable oil. Oven was set at 105°C cakes were baked for 25 minutes. The cakes were fried in deep vegetable oil.

Packaging

The products were allowed to cool. After cooling for 3hrs. They were packed into labelled nylons and sealed with sealing machine.

Sensory Evaluation

A total of 10 assessors were randomly drawn and trained (guided). Hedonic method of sensory evaluation was used.

Results

Baked fish showed brown colouration. While, the fried products were brownish to the admiration of assessors.

Baked samples showed similar colour. There was no colour variation among the four samples of the fried cake.

Table I: Calculated values of the Hedonic Assessment of fried fish-in-cake

Parameters/ Samples		A	B	C	D
Weight	g	25	25	25	25
Colour	%	66	68	70	63
Odour	%	20	20	21	18
Texture	%	64	69	78	60
Taste	%	49	80	88	42
Constituency	%	58	67	74	45
General Acceptability	%	51.4	60.8	66.2	45.6

Table II below: Calculated values for Sensory Evaluation of baked fish-in-cake

Parameters/ Samples		A1	B1	C1	D1
Weight	g	25	25	25	25
Colour	%	64	65	70	62
Odour	%	20	21	20	18
Texture	%	61	64	75	58
Taste	%	47	78	85	43
Constituency	%	55	62	70	43
General Acceptability	%	49.4	58	64	44.8

Discussion

None noticeable differences in the colour of the products will likely save any objection or rejection of the products based on their colours if released into the market for sale.

The special preference given to fried fish-in-cake with 50% of fish powder to 50% of wheat flour in terms of taste, texture and constituency may be due to equal concentration of fish powder and wheat flour in the ratio 1:1. This is in line with the submission of Deng (1978) that the quality of baked fish in cake depends on the fish. Good constituency of samples C and C1 and, in texture may have been due to increase in temperature of the batter. Baking results in several key reactions that include expansion of the cakes stabilized from cells gelatinization of starch, evaporative loss of water, which further enhances rigidity and texture development. Chemical reactions of the sugars and protein develop the colour and flavours (Potter and Hotchkiss, 1995).

Wright (1978) stated that the richness of a cake depends chiefly upon the proportion of fat and eggs to flour used. In this study, egg which has scientifically been proven to cause build up of cholesterol in the body (when excessively consumed by some people) has been removed and supplemented with fish, now being referred to as health food. Therefore Tilapia fish may serve as flour additive, supplement. This will enhance the ways Tilapia is utilized in Nigeria as well as improve the food value of the wheat flour.

Conclusion

In order to increase the consumption of Tilapia and by extension under utilized fish are processed into cake.

Production of fried and oven dried cakes on commercial scale from small size Tilapia will go a long way in improving revenue for fish farmers and fish business. It is possible to develop a variety of food products from fish (e. g. Tilapia). On commercial bases, there may be the need for bones separating machine to remove bones from the fish to improve crude preparation of the fish flour. However, the consumption of fish bone was encouraged by Akinsiku (1998).

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