

DEVELOPMENT OF FISH PRODUCTS FROM SMALL AND UNDERUTILIZED TILAPIA (*Oreochromis niloticus*) IN KAINJI LAKE AREA.

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ABSTRACT

Fish Protein concentrate (FPC) from small and stunted tilapia (*Oreochromis niloticus*) which would otherwise have been discarded was used in certain proportion (0%, 10%, 20% and 30%, where the zero percent serves as control) in addition with wheat flour, for the production of chin-chin in order to address the problem of inadequate intake of protein and to determine the acceptable proportion of FPC to wheat flour by consumers. From the organoleptic result, 10% FPC + 90% wheat flour was well accepted by the panel of judges and therefore recommended as this will help to increase the protein intake of consumers.

Key words: chin-chin, FPC, tilapia and wheat flour

INTRODUCTION

The rapid increase in the world's population and limited supply of world's food resources as well as shortage in protein intake requires urgent measures to fully utilize all fish resources (Olatunde, 1989). One approach is to reduce the loss that occurs in post harvest sector. Among these post harvest losses are small unmarketable and unpopular fish and stunted tilapia which are wasted or regarded as wasted effort in some areas.

In Nigeria, wastage of fish through spoilage has been estimated at 30-50% of domestic fish production (Dada and Gnanados; 1983; Tobor; 1984). This means that from a production figure of 378.235 metric tons of fish in 1990 up to 100,000 metric tons failed to get to the consumers in whole some state as a result of spoilage and other forms of wastage. In Kainji Lake area, these stuffs especially tilapia are allowed to rot away without being utilized. Similarly wastage in the canning industry where tons of fish offals and waste are discarded annually,

(Eyo, 1986). The under utilized, unused species are small and bony with no particular desirable characteristics. However, the nutritional values of these species are as high as that of any of the more desirable fish species.

Tilapia is a culturable fish that tolerates a wide range of environmental conditions. However, it is known to breed excessively in ponds resulting in overpopulation. As a result of this, there is competition for food and space which leads to stuntedness of tilapia. This constitutes a problem to fish farmers because stunted tilapia does not command good economic value in the market. It is essential therefore essential we learn how to maximize to make better use of this species by converting them to other forms of food such as snacks at a cost that the consumer will be able to afford and gladly pay for. Such fishes can be re-introduced into the human food chain after conversion into fish mince (Eyo, 2001). Furthermore, utilization of tilapia for other

forms of consumption such as fish cakes, fish fingers, etc has been investigated by Eyo, (1988) and Akande, (1989).

In this study, wheat flour and the underutilized tilapia, was used in powdered form as fish protein concentrate (FPC). FPC is defined as powdered form of fish suitable for human consumption wherein the protein is more concentrated than in the raw materials (Windsor and Barlow, 1981). The aim of this experiment was to use underutilized tilapia in Kainji Lake areas as fish protein concentration (FPC) added to wheat flour to produce chin-chin (a common Nigerian snacks) which is low in protein, so as to increase the protein intake of the consumers. And, to determine the acceptable proportion of incorporation of the FPC.

MATERIALS AND METHODS

Tilapia fish (*Oreochromis niloticus*) used for this work were harvested from Monai (a fishing village) along the shore of Kainji Lake. They were properly dressed and steamed for 30 minutes, after which the bones were properly removed. The boiled mixture was pressed manually using cheese cloth while hot to remove lipid and water content in the pressed cake. The pressed cake was then dried using a solar tent dryer. The dried cake was ground using mortar and pestle. It was then packaged in our tight bottles and stored in cool dry place. Other ingredients and materials used includes Wheat flour, salt, sugar, baking powder, butter, water, FPC, Groundnut oil, measuring cups & spoons, frying pan, cutting board, rolling pin, knife. The 'chin-chin' produced from wheat flour fortified with FPC was prepared as follows in order to determine the acceptable proportion of FPC to wheat flour:-

SAMPLE A- 100% wheat flour (control)

SAMPLE B- 10% FPC + 90% wheat flour

SAMPLE C- 20% FPC + 80% wheat flour

SAMPLE D- 30% FPC + 70% Wheat Flour

To each of the samples sugar, salt, baking powder and butter was added and

properly mixed. Water was added carefully to each of the samples to form dough but not too soft, and then it was later rolled out and cut into small sizes using the cutting board, rolling pin and knife. It was fried to golden brown colour in hot deep oil

PROXIMATE ANALYSIS

The fat, protein, moisture and ash content of the 2 samples A and B products were determined according to (AOAC, 1995).

ORGANOLEPTIC ASSESSMENT

Subjective evaluation of each product sample was carried out in accordance with Post *et al* (1991), by an untrained panelist of 10. Coded samples accompanied by questionnaires were presented to the panelist. The quality attributes studied include appearance, taste, smell, texture, general acceptability. The hedonic Scale used was from 1-5, where a score of 5 was "like" much and a score of 1 was dislike" much.

RESULT AND DISCUSSION

From the result of the panel of judges (Table 2) 10% FPC inclusion is 'LIKE MUCH' in term of taste, smell, texture, appearance and general acceptability. This may be due to the moderate proportion of the protein contents which appeal to the taste bud. This was followed by the control (no FPC inclusion) which fall within 'LIKE' in term of taste, smell, texture, appearance and general acceptability. Also next, is that of 20% inclusion of FPC which falls within 'NEITHER LIKE NOR DISLIKE' in term of taste, smell, texture, appearance and general acceptability. However, those of 30% which fall within 'DISLIKE' in term of taste, smell, texture, appearance and general acceptability. The 20-30% FPC incorporation in the chin-chin which was not well accepted may be due to the texture of the FPC and its unpalatable taste in high proportion.

Table 1: Proximate Analysis of Ordinary Chin-Chin and 10% FPC Incorporated Chin-Chin

	Moisture %	Ash %	Crude protein %	Crude fat %	Fibre %	NFE %	Dried matter %
control	3.65	3.20	0.85	12.70	6.28	73.32	96.35
10% FPC inclusion	3.95	2.40	10.46	17.60	5.54	60.05	96.05

Table 2: Organoleptic Assessment of Chin-Chin Incorporated with FPC at Different %.

	CONTROL	A-10%	B-20%	C-30%
TASTE	3.6	4.8	3.1	1.5
SMELL	3.8	5.0	3.0	2.0
TEXTURE	4.1	4.9	3.4	1.8
APPEARANCE	4.0	4.8	3.1	2.1
GENERAL ACCEPTABILITY	3.8	5.0	3.2	2.0

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