

# THE PHILIPPINE JOURNAL OF FISHERIES



Published semi-annually by the  
BUREAU OF FISHERIES AND AQUATIC RESOURCES  
Intramuros, Manila  
1975

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Official Publication of the Bureau of Fisheries and Aquatic Resources  
Intramuros, Manila 2801, Philippines

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Vol. 10

January-December 1972

Nos. 1 & 2

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# PRELIMINARY STUDIES ON THE PREPARATION OF FISH PROTEIN CONCENTRATE FROM LIZARD FISH

By

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## ABSTRACT

A high quality fish protein concentrate was prepared from Lizard fish, locally known as Kalaso (*Saurida tumbil*), a species of fish with low commercial value. The laboratory process for its preparation was from the meat portion only, utilizing isopropanol as solvent. The chemical composition of the product are as follows: moisture content, 5.81%; crude protein (N x 6.25) 91.31%; ash 2.35%; and fat 0.5%; while the yield of the fish protein concentrate was 18.56%.

## INTRODUCTION

In the Philippines, one of our serious problems as in other developing countries today, is protein malnutrition which may be solved through increased production and consumption of especially protein-rich foods. Various world agencies such as the WHO, the FAO, and the UNICEF, together with other related organizations are working together to solve this problem of protein deficiency. Thus, a multi-nation cooperative program to produce a satisfactory fish protein concentrate from whole fish was initiated. The purpose of the program was to help alleviate the protein malnutrition that seriously affects majority of the world's population and at the same time provide stimulus to the fishing industry. The utilization of fish for this program is generally accepted because there are unlimited species of fish in the sea that could be used for this purpose aside

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from the fact that the concept of Fish Protein Concentrate (FPC) is a new one.

Dr. Glaslow (1970) noted that many species of fish rich in protein are now used for industrial purposes while there are others not harvested at all. "I see FPC as only a start of a new concept in utilizing these vast aquatic resources and converting them into high-quality protein for human benefit," he said.

Also, experts concerned with population explosion and the desperate need to find new food resources believe FPC can become a life line to a better tomorrow for the hungry millions throughout the world. Today, about two million of the more than three billion people on earth including the 50-70% of pre-school children, suffer from protein malnutrition.

Scientists also found that FPC or fish protein concentrate blends well with other foods and addition of which as ingredients to soups, bread and gravy and cookies gave good results and increased the food value appreciably.

This is a preliminary investigation on the feasibility of preparing fish protein concentrate from Lizard fish or *Kalaso*, a species of Philippine market fish of low commercial value. The authors also evaluated the possibility of making readily available fish in processed form to especially remote rural areas where the supply of fresh fish is scarce.

The scope of this research project is limited only to the preliminary studies on the preparation of fish protein concentrate from a cheap species of Philippine market fish. Further studies will be made to find out what other cheap species of Philippine market fishes and shellfishes could be suitable for making fish and shellfish protein concentrate.

## MATERIALS AND METHODS

The fish used in this research investigation was Lizard fish, provided from the catch of one of the fishing boats of the Bureau of Fisheries and Aquatic Resources.

The fish, upon arrival at the laboratory was weighed and prepared and the meat portion taken as fillets. The weight of the edible portion was also calculated and after all the necessary preparations, the fish flesh was grounded.

For every kilo of the fish flesh sample, sufficient 99% isopropyl alcohol was added to attain a 70:30 isopropyl water ratio in the mixture. In the absence of a stainless steel tank, the material was stirred and mixed in a round-bottom flask for fifteen minutes, during which time, sufficient glacial acetic acid was added until a pH of 5.5 was attained. The addition of the acid partly hydrolyzed the connective tissues, thus, making the collagen and the gelatin more soluble. The fish flesh at this point, was dehydrated and slightly denatured by the alcohol.

The ground fish-alcohol mixture was maintained at 178° to 180° F with constant agitation for thirty minutes. A glass reflux condenser was utilized to prevent the loss of alcohol. The material was then transferred to a cheese cloth bag and pressed to remove the liquid portion consisting of the extracted fat and water-soluble materials.

The shredded fish flesh again was placed in the flask with a 70:30 iso-propanol-water mixture. The temperature of the mixture was maintained at 178° to 180° F for fifteen minutes with constant agitation, after which the mixture was again transferred to the cheese cloth and pressed to remove further the remaining extracted fat and water-soluble materials.

Again the shredded sample was placed in the flask and 99% iso-propanol was added with the temperature of the mixture maintained at 178° to 180° F for fifteen minutes with constant agitation after which the mixture was again transferred to the cheese cloth and pressed. Finally, the ground cake was dried in trays from 24 to 36 hours depending on the local weather condition.

For determining the proximate chemical composition of the fish protein concentrate produced, the sixth edition of the Association of Official Agricultural Chemists (1945) was used as reference with little modification whenever necessary.

#### RESULTS AND DISCUSSION

The flour-like fish protein concentrate was creamy yellow in color with a yield of 18.56% of the raw material and the product has a shelf life of more than six months as packed in jars. The keeping quality of the product is attributed to the very low fat

content and moisture content which is 0.5% and 5.81% respectively. The product revealed the following chemical composition:

Protein (N x 6.25) .....	91.31%
Moisture .....	5.81%
Fat .....	0.5%
Ash .....	2.35%

The fish protein concentrate produced from the project was supplied to the Food Research Laboratory, National Institute of Science and Technology, Manila as approved by the Director of Fisheries and Aquatic Resources.

With this fish protein concentrate as one of their raw materials, the Food Research Laboratory developed a weaning food formulation comparing it to other high protein foods like Mung bean flour and Coco cereal. The title of the project by Payumo, E. *et al* was the "Development of Drum-Dried Weaning Foods Based on Indigenous High Protein Sources."

#### CONCLUSION

This study indicates that Lizard fish or *Kalaso* could be one of the potential sources of fish protein concentrate.

The study also showed that fish could be distributed in other forms, in most, if not in all, parts, of the country and thereby minimize the prevalent cases of malnutrition attributed to protein deficiency.

Finally, this project could help solve the country's malnutrition problem especially with regards to protein deficiency, and could also allow full utilization of cheap protein from fish species which are neither properly utilized nor very palatable in ordinary food preparations.

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