

DEVELOPMENT OF SOY BASED FISH SAUSAGES.

BY

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DECLARATION

The work described in this thesis was carried out by me under the supervision of Prof.Arthar Bamunuarachchi and Ms. Indira Wichramasingha and a report on this thesis has not been submitted in whole or in part to any any institution for another Degree / Diploma.

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To my loving parents and teachers for their guidance

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DEVELOPMENT OF SOY BASED FISH SAUSAGES.
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ABSTRACT

Sausages are commonly consumed among most of the urban population in Sri Lanka. When we concern about sausage manufacturing, chicken, beef and mutton sausages have been successfully introduced to the market. But at present most of the people refuse meat based foods according to their health conditions. Soy based fish sausage would properly serve the non meat eating population.

Marine fish is an excellent source of high quality protein and omega -3 fatty acids. The raw materials for fish sausage are not necessarily certain particular species of fish. But sausage can not be made however from fish having a large amount of dark muscle. Big eyed scade was used in this laboratory scale formula, it has pleasant taste, high elasticity property and low market price. According to elasticity of processed meat and market price most of the white and red flesh fish species can be used as the raw material.

Various trials were conducted to develop a suitable recipe to produce the soy based fish sausage with good quality. Eating quality of the sausage was improved by adding prawn pieces.

According to proximate analysis, the product consists of 28.80% crude protein, 5.58% total fat, 2.26% ash and 64.17% moisture.

Determination of microbial stability of the recommended period showed that the mean number of colony forming units per gram is $\approx 10^2$ and no records were found on visible Coliform development. The Peroxide Value test suggested that the stability of the soy based fish sausages can be maintained for 6 months.

The results of the sensory studies reflected that the product has higher level of acceptance compared to the sausages available in market.

CHAPTER 1

INTRODUCTION

Marine fisheries are of considerable social and economic importance around the entire 1 770 km of Sri Lanka's coastline. The Exclusive Economic Zone of the country extends to 517 000 km², of which some 2 800km² form the continental shelf. The marine area from the shore to the edge of the continental shelf is the coastal sub-sector. Annual sustainable yields from the coastal sub sector have been estimated at 250 000 metric tonnes (mt) (170 000 mt of pelagic species and 80 000 mt of demersal species).

About 285 000 t of fish was landed, of which 90 percent was consumed locally and 10 percent was exported. This fish catch is used in form of a number of different preserved products , such as sausages, dried fish , salted fish , canned fish, marinated etc. Most of this products have longer shelf life than refrigerated fish.

Sausages are products in which fresh raw materials are modified by various processing methods to yield desirable organoleptic and keeping properties. Generally we know that meat is the main raw material of sausage manufacturing. But in present most of people refuse meat based foods because of their health condition. Therefore we need to modify conventional sausage formula according to peoples' requirements and demands. In this matter we need to select nutritional and cheaper raw material for sausages manufacturing. Fish which is a good source of high quality protein with the essential amino acids of high biological value and omega -3 fatty acids. Edible fish muscle normally has about 18% protein and usually contain 1%-2% ash. The balance 80% of wet weight of muscle is made up of lipid and water. Lipid has been traditionally considered as an energy source. Beside that, marine lipids are receiving increasing attention as a source of C 20 and C 22

carbon Omega -3 poly unsaturated fatty acids (PUFA) namely eicosapentaenoic acid (EPA ,C 20 5 n-3) and docosahexaenoic acid (DHA , C 22 6 n-3). The health benefits of omega -3 fatty acids which are reduce the risk for cardiovascular diseases and also fish is a available and cheaper resource in Sri Lanka.

Soy also a high quality protein source and a good binder. So , combining fish and soy we can get a better quality sausages affordable to the consumers. Further prawns help to enhance the taste and quality of the sausages.

This study was conducted to develop a health friendly sausage by combining fish , soy , prawns, fat, spices and binders and to develop an acceptable sausage by modifying the convectional sausage formula and also to determine the microbial stability, nutritional value sensory quality and shelf life of the product.

Objectives of the Research Project,

To develop a value added fish sausage.

To formulate a favorable soy based fish sausage.

To study the nutritional value, microbial content and shelf life of the product.

To study the acceptability of the product by sensory evaluation.

CHAPTER 2

LITERATURE REVIEW

2.1 Importance of Fish

Fish has served as a major source of animal protein and lipid since early civilization. Marine fish lipids which are rich in long chain omega-3 poly unsaturated fatty acids have attracted much interest and are the main focus of attention. And also fish proteins possess excellent amino acids scores and digestibility characteristics¹⁷.

And also fish provide a wide variety of vitamins and minerals, including vitamins A and D, phosphorus, magnesium, selenium, and iodine³⁰.

2.2 Fish Proteins

Sea food products are derived from various tissues including the whole fish body, muscle, roe, stomach, kidney, liver, skin and fins. Muscle tissue contains hundreds of different proteins along with other nitrogen-containing molecules referred to as non-protein nitrogen (NPN). Protein and NPN together are called 'Crude Protein'. The cellular functions of nitrogenous compounds in the living animal include roles in enzyme catalysis, osmoregulation, antifreeze, intermediary metabolism, nitrogen storage, cell structure, muscle contraction and transport processes. Nitrogenous compounds contribute to the food value and utility of fishery products in many ways. They collectively influence all the distinctive food attributes i.e. color, flavor, texture, nutrition, safety, and the post harvest deterioration of fish meat. Nitrogenous compounds in fish meat are also important because they contribute to chemical and physical changes during processing of fishery products. Further more like other living animal food; seafood contains protein