DOI :10.31357/fapsmst.2012.00397

COMBINED PROCESSING OF FLYING FISH (*Cheilopogon* sp.) BY PRESSURE COOKING, SMOKING, CHILLING, FREEZING AND DRYING

By

Hewawasan Sarukkalige Gayathri Nadeesha Fernando

This Thesis submitted in partial fulfillment of the requirements for the Degree of Masters of Food Science and Technology,

Department of Food Science and Technology,

Faculty of Applied Science,

University of Sri Jayewardenepura, Sri Lanka.

2012

DECLARATION

The work described in this thesis was carried out by me, under the supervision of

Dr.(Mrs.) Indira Wickramasingha and Prof.Arthar Bamunuarachchi and the report on this thesis has not been submitted in whole or in part to any University or any other institution for other Degree/Diploma.

28/02/2014

Date

H.S.G.N.Fernando

"We certify that the above statement made by the candidate is true and this thesis is suitable for submission to the university for the purpose of evaluation."

28/02/2014

Supervisor, Date

Prof.A.Bamunuarachchi

Department of Food Science and Technology,

Faculty of Applied Sciences,

University of Sri Jayawardanapura

Sri Lanka

28/02/2014

Supervisor, Date

Dr. (Mrs.)Indira Wickramasingha

Head of the Department of Food Science and Technology,

Faculty of Applied Sciences,

University of Sri Jayawardanapura

Sri Lanka

Dedicated to my loving Parents and Teachers for their guidance

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to my supervisors Dr.(Mrs.)Indira Wickramasingha, the Head of the Department of Food Science and Technology, University of Sri Jayewardanapura and Prof. Arthar Bamunuarachchi for their invaluable guidance counseling and monitoring the workthrough out my research.

I would like to thank Mrs.Rupika Perera Coordinators assistant, Mr.D.P Rupasinghha Laboratory assistant and the other staff members of the Food Science and Technology Department.

I remember my colleagues and all non academic staff members of the Department of food science and technology, with gratitude for their immeasurable assistance to carry out this project successfully. I never forget to thank my friends who helped in numerous ways and for their enormous support on numerous occasions for making this research a success.

Finally I would like to thank my ever loving parents, brother and husband, without those blessings, support and encouragement I would never have completed this study successful.

COMBINED PROCESSING OF FLYING FISH (*Cheilopogon* sp.) BY PRESSURE COOKING , SMOKING, CHILLING, FREEZING AND DRYING

By

Hewawasan Sarukkalige Gayathri Nadeesha Fernando

ABSTRACT

Flying fish *(Cheilopogon sp.)* is an underutilized fish species in Sri Lanka which is wasted in huge amounts during its season .Therefore this study was carried out to bring a new palate to the fish consumers in Sri Lanka as well as to increase the shelf-life of the product by using two different processing methods: pressure cooking and smoking. Further, the storage stability of fish products was determined by storing the processed fish under three different conditions: chilled, frozen, and dry conditions for a period of three months. .

Dressed fish were separated into two batches and one batch was subjected to pressure cooking while the other batch was smoked using the hard wood of cinnamon (*Cinnamomum zealanicum).* Finally the heat treated two batches were again separated into three samples which were stored separately at 4 $^{\circ}$C , -18 $^{\circ}$C and under dry conditions. The fish products were subjected to chemical and microbiological analysis during the storage period. Sensory evaluation was also done to test the consumer preference for each product.

The proximate analysis revealed that the protein, fat, and ash content of all samples were around 19%, 3.5% and 2.2% respectively. Histamine content of all fish samples did not exceed the critical level of 30 ppm. Due to continuous moisture absorption, the microbial content of products stored under dry condition increased gradually over the storage period. Moisture content influences the growth and the flora of the microorganisms in dried fish and causes microbial spoilage indirectly.

CHAPTER 1

INTRODUCTION

Fish is greatly perishable but very important food stuff, especially in third world countries, due to its high protein and polyunsaturated fatty acid content and affordability.
The rate of fish spoilage depends on handling during processing, acidity level, species of fish, weather, mode of storage, and temperature during transportation (Oladosunet al., 1996). Chemical breakdown of protein, fat and water content contributes to quick spoilage of fish. Quality losses might occur very rapidly after catch, especially in hot climates and tropical areas, where cold preservation techniques are often missing. Food preservation particularly in fishes had been practiced since ancient times. Ancient people had used different kinds of techniques to preserve fish.

Fish and fish products received considerable attention of researchers and scientists in the recent years due to their nutritional and pharmaceutical benefits to human beings. Fish provide a good source of high quality protein and contain a range of fat soluble vitamins (A, D, E and K) and essential fatty acids, all of which are vital for the healthy functioning of the body.

Today a wide variety of methods are available to maintain and enhance the appearance and taste of fish. Fish processing and preservation methods also create products that are convenient to consumers, such as products that are ready to eat or require minimal preparation and cooking.

To increase fisheries production, there is a need to turn to presently underutilized species. Reasons for not using certain fishes are varied, but small size is frequently cited as one of the chief impediments. This is principally because most people throughout the world are accustomed to eating boneless fillets of fish, and small fish are usually uneconomical to debone or fillet. Direct consumption of these fish is difficult because of the abundance of small bones and spines, and filleting is impractical because of the cost.
Pressure cooking is a cooking method that uses accumulated steam from the liquids and juices used in the cooking process to increase the temperature and pressure. Pressure cooking helps to produce healthy food by preserving the nutritional quality and the actual taste of the