EXTRACTION AND CHARACTERIZATIONS OF GELATIN FROM PATIN (*Pangasius sutchi*) SKINS

NADIAH HAZWANI HASHIM

Final Year Project Submitted in
Partial Fulfillment of the Requirements for the
Degree of Bachelor of Science (Hons.) Food Science and Technology
in the Faculty of Applied Sciences
Universiti Teknologi MARA

NOVEMBER 2010

APPROVAL SHEET

This Final Year Project Report entitled "Extraction and Characterizations of Gelatin from Patin (*Pangasius sutchi*) skins" was submitted by Nadiah Hazwani Hashim, in partial fulfillment of the requirements for the Degree of Bachelor of Science (Hons) Food Science and Technology, in the Faculty of Applied Sciences, and was approved by

Dr. Normah Ismail
Supervisor
B.Sc.(Hons.) Food Science & Technology
Faculty of Applied Sciences
Universiti teknologi MARA
40450 Shah Alam
Selangor

Puan Fuziah binti Mohamed Othman
Project Coordinator
B.Sc.(Hons.) Food Science & Technology
Faculty of Applied Sciences
Universiti teknologi MARA
40450 Shah Alam
Selangor

Dr. Noriham binti Abdullah
Head of Programme
B.Sc.(Hons.) Food Science & Technology
Faculty of Applied Sciences
Universiti Teknologi MARA
40450 Shah Alam
Selangor

Date: _____

ACKNOWLEDGEMENTS

In the name of Allah, the most Gracious, the Most Merciful. All the praise to Allah, for His mercy has given me idea, patience and strength to complete this Final Year Project. All praise to Allah again. In this opportunity, upon completion of this project, I would like to express my gratitude to many parties.

All the praise to Allah for giving me the chance to be supervised by Dr. Normah Ismail. My heartfelt thanks and appreciation goes for her contribution especially in her time, wisdom, and firm guiding hand to keep me focused when I was floundering in chaos. She has provided me with constructive ideas and comment at every stage of doing this project. Special thanks go to lab assistant Pn. Siti Marhani Madi, Pn. Norahiza Mohd Soheh, Nor Shuhadah Mohd Samri, En Osman Abd Rahman and En Fadzli Kamarudin for their helping in every aspect of this project.

Then I would like to thank my parent, family and also not forgotten all my friends whom have lend a hand and helped me out in completing this project. Your support, cooperation, advices and kindness make me feel very comfortable. I'll appreciate all of your effort and all things that you have done to me. I hope this project will be beneficial and useful to all.

Nadiah Hazwani binti Hashim

TABLE OF CONTENTS

		Page
ACKNOWLEDGEMENT		iii
TABLE OF CONTENTS		iv
LIST OF TABLES		vi
LIST OF FIGURES		vii
LIST OF ABBREVIATIONS		ix
ABSTRACT		xi
ABSTRAK		xii
CHAPTER 1 INTRODUCTION		
1.1	Background	1
1.2	Significance of study	4
1.3	Objectives of study	5
CHAPTER 2 LITERATURE REVIEW		
2.1	Gelatin	6
	2.1.1 Collagen and gelatin	8
2.2	Rational for developing gelatin alternatives from fish sources	10
2.3	Fish gelatin as a gelatin alternatives	13
CHAPTER 3 MATERIALS AND METHODOLOGY		
3.1	Chemicals and raw materials	21
3.2	Pretreatment of patin (*Pangasius sutchi*) skins	21
3.3	Extraction of gelatin form patin (*Pangasius sutchi*) skins	22
3.4	Yield of extracted gelatin	30
3.5	Analysis of gelatin	30
	3.5.1 Determination of gel strength	30
	3.5.2 Texture Profile Analysis (TPA)	31
	3.5.3 Determination of pH of gelatin solution	32
	3.5.4 Determination of moisture content	32
	3.5.5 Colour measurement	33
	3.5.6 Small deformation oscillatory measurement	33
	3.5.7 Differential Scanning Calorimetry (DSC)	34
	3.5.8 Statistical analysis	34

ABSTRACT

EXTRACTION AND CHARACTERIZATIONS OF GELATIN FROM PATIN (*Pangasius sutchi*) SKINS

The primary aim of this study is to determine whether gelatin can be extracted from patin skins (*Pangasius sutchi*). Patin skins became by-products from fish processing industry and utilization of these by-products to produce valuable gelatin can give benefit to the entire world. From this study, gelatins were successfully extracted from patin skins. This study also important to determine the effect of different preservation methods on patin skins to their physical characteristics. Patin skins were preserved by two different methods and then washed by NaCl prior to gelatin extraction process. Patin skins preserved by freeze-drying method (FDPSG) exhibited higher yield extraction of gelatin which was 16.67% compared to yield of gelatin extracted from frozen patin skin at -20 °C (FPSG). However, there were no significant difference ($p>0.05$) between yield of FDPSG and FPSG. Those gelatins were compared with the commercial gelatin (CG) in terms of their pH, moisture content, colour, gel strength, texture profile analysis (TPA), viscoelastic properties and gelling and melting point. Compared to FDPSG and FPSG, CG had a significantly ($p<0.05$) higher pH and moisture content. Gel strength, springiness and chewiness of FDPSG was significantly ($p<0.05$) higher compared to those FPSG and CG. There were no significant ($p>0.05$) difference between FDPSG and FPSG in terms of hardness, cohesiveness and gumminess of gelatin. Patin gelatins are thermostated gels and this was evidenced by viscoelastic properties of FDPSG and FPSG. G' increased at low temperature and decreased at higher temperature. There was a negative relationship between phase angle (δ) and storage modulus (G') where δ decrease when the G' increase. CG was found to have a significantly ($p<0.05$) higher value of melting and gelling point compared to FDPSG and FPSG. Gelling and melting point of FDPSG and FPSG were not significantly ($p>0.05$) different.