

**GELATIN EXTRACTION FROM SILVER CATFISH (*PANGASIUS
SUTCHI*) SKIN AND DETERMINATION OF ITS FUNCTIONAL
PROPERTIES**

NAJIHAH BINTI SHUKOR

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

JANUARY 2013

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF ABBREVIATIONS	viii
ABSTRACT	ix
ABSTRAK	x
 CHAPTER 1 INTRODUCTION	
1.1 Introduction	1
1.2 Significance of study	4
1.3 Objectives of study	5
 CHAPTER 2 LITERATURE REVIEW	
2.1 Gelatin	6
2.1.1 Mammalian gelatin	6
2.1.2 Fish gelatin (Cold water and warm water fish gelatin)	7
2.2 Application of gelatin	8
2.2.1 Application of mammalian gelatin	8
2.2.2 Application of fish gelatin	8
2.3 Methods of gelatin extraction	9
2.3.1 Method of mammalian gelatin extraction	9
2.3.2 Method of fish gelatin extraction	10
2.4 Functional properties of gelatins	10
 CHAPTER 3 METHODOLOGY	
3.1 Chemical and Materials	13
3.2 Pre-treatment of <i>Pangasius sutchi</i> skins	13
3.3 Extraction of gelatin from <i>Pangasius sutchi</i> skins	13
3.4 Functional properties of gelatin	15
3.4.1 Solubility of gelatin	15
3.4.2 Protein solubility as a function of pH	15
3.4.3 Protein solubility of gelatin as a function of sodium chloride concentration	15
3.4.4 Emulsifying capacity and stability	16
3.4.5 Determination of water holding capacity	16
3.4.6 Determination of fat-binding capacities	17
3.4.7 Determination of foaming properties	17
 CHAPTER 4 RESULTS AND DISCUSSION	
4.1 Solubility of gelatin	18
4.2 Protein solubility as a function of pH	19
4.3 Protein solubility as a function of sodium chloride	20
4.4 Emulsifying capacity and stability	21
4.5 Water holding capacity	23

4.6 Fat binding capacities	24
4.7 Foaming properties	25
CHAPTER 5 CONCLUSION AND RECOMMENDATIONS	27
CITED REFERENCES	28
APPENDICES	35

LIST OF TABLES

Table	Caption	Page
4.1	Solubility (%) of silver catfish skin gelatin extracted at 6, 8, 10 and 12 hours and commercial bovine gelatin.	19
4.2	Protein solubility (%) as a function of pH of silver catfish skin gelatin extracted at different extraction time.	20
4.3	Protein solubility (%) as a function of sodium chloride concentration of silver catfish skin gelatin extracted at different extraction time.	21
4.4	Emulsifying capacity and stability, water holding capacity, fat binding capacities and foaming capacity and stability of silver catfish skin gelatin extracted at 6, 8, 10 and 12 hours and commercial bovine gelatin	22

ABSTRACT

GELATIN EXTRACTION FROM SILVER CATFISH (*Pangasius sutchi*) SKIN AND DETERMINATION OF ITS FUNCTIONAL PROPERTIES

Silver catfish (*Pangasius sutchi*) skin gelatin was extracted to determine the effects of extraction time on the functional properties of the gelatin produced. Silver catfish skin gelatins were also compared with commercial bovine gelatin in terms of solubility, protein solubility as a function of pH and sodium chloride concentration, emulsifying capacity and stability, water holding capacity, fat binding capacities and foaming properties. Silver catfish skins were washed in sodium chloride (NaCl) solution prior to pre-treatment in sodium hydroxide (NaOH) solution and acetic acid solution. Then, the skins were extracted at 50 °C for 6, 8, 10 and 12 hours extraction times and the extracted gelatins were freeze dried. Silver catfish skin gelatins extracted for 12 hours were higher in emulsifying capacity (52.63%), emulsifying stability (47.83%), water holding capacity (31.78 mL/g), fat binding capacities (54.76), foaming capacity (41.47 mL) and foaming stability (56.42%) than gelatin extracted at other extraction time. Commercial bovine gelatin was more soluble than silver catfish skin gelatin (63.41%). The extraction of silver catfish skin gelatin at 50 °C for 12 hours is more effective than extraction at 6, 8 and 10 hours. The longer the extraction time, the better are the functional properties of the gelatin. The different functional properties of commercial bovine gelatin compared to silver catfish gelatin could be due to differences in manufacturing method. Based on its good functional properties, silver catfish skin gelatin may be useful in food applications such as soups, sauces and gravies.