





**OPTIMIZATION OF COLLAGEN EXTRACTION FROM SILVER CATFISH  
(*Pangasius sp.* ) WASTE AND ITS PROPERTIES**

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UNIVERSITI MALAYSIA TERENGGANU  
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**OPTIMIZATION OF COLLAGEN EXTRACTION FROM SILVER CATFISH  
(*Pangasius sp*) WASTE AND ITS PROPERTIES**


**By  
Nur Fatinah Binti Zulkipli**

**Research Report submitted in partial fulfillment of  
the requirement for the degree of  
Bachelor of Food Science (Food Technology)**

**DEPARTMENT OF FOOD SCIENCE  
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## ENDORSEMENT

The project report entitled **Optimization of collagen extraction from silver catfish (*Pangasius sp.*) waste and its properties** by **Nur Fatimah Binti Zulkipli**, Matric No. **UK 17618** has been reviewed and corrections have been made according to the recommendations by examiners. This report is submitted to the Department of Food Science in partial fulfilment of the requirement of the degree of Food Science (Food Technology), Faculty of Agrotechnology and Food Science, University Malaysia Terengganu.

  
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## DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledge.

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## ABSTRACT

The objective of this study is to optimize the collagen extraction from silver catfish (*Pangasius sp.*) waste using Response Surface Methodology. The effects of acetic acid concentration (M), pepsin concentration (%) and extraction time (h) were studied in order to obtain optimum collagen yield. A three-level factor face-centered central composite design (CCD) was adapted in this study resulted in twenty runs of experiments were employed. The generated model gave a quadratic fit with experimental data. The optimal condition for collagen extraction from silver catfish waste were found to be at 0.2 M of acetic acid, 0.5% of pepsin and 24.7 h of extraction time. The predicted collagen yield under optimal conditions was 5.64%, while the actual experimental yield was 4.61%. Silver catfish collagen showed the highest solubility at pH 9 and minimum solubility at pH 2. The solubility of collagen decreased gradually from 0% NaCl until 12% NaCl. The viscosity of silver catfish collagen decreased gradually at increased temperature.



## ABSTRAK

Objektif kajian ini ialah untuk mengoptimumkan pengekstrakan kolagen daripada sisa buangan ikan Patin (*Pangasius sp.*). Kesan kepekatan asid asetik (M), kepekatan pepsin (%) dan masa pengekstrakan (jam) telah dikaji untuk mendapatkan hasil kolagen yang optimum. Rekabentuk '*face-centered central composite design*' (CCD) dengan tiga-tahap telah digunapakai dalam kajian ini, menghasilkan 20 eksperimen. Model yang telah dijana oleh RSM memberikan hubungan kuadratik dengan data eksperimen. Keadaan optimum untuk pengekstrakan kolagen dari sisa buangan ikan patin didapati ialah pada kepekatan asid asetik 0.2M, kepekatan pepsin 0.5% dan masa pengekstrakan selama 24.7 jam. Pada keadaan optimum, hasil kolagen yang diramal oleh model yang dijana ialah 5.64%, manakala data eksperimen sebenar memberikan nilai 4.61%. Kolagen ikan patin menunjukkan keterlarutan maksimum pada pH 9 dan yang paling minimum pada pH 2. Keterlarutan kolagen ikan patin berkurang secara beransur-ansur bermula daripada 0% NaCl sehingga 12% NaCl. Kelikatan kolagen ikan patin menurun perlahan apabila suhu meningkat.