

# THESIS INFORMATION

PhD student: **LÊ THỊ THU HƯƠNG**

Thesis topic: **RESEARCH ON METHODS OF EXTRACTION COLLAGEN FROM TRA FISH (*PANGASIUS HYPOPHthalmus*) SKIN**

Major: **Food and Beverage Processing**

Major code: **62.54.02.01**

Training institute: **Ho Chi Minh City University of Technology, VNU-HCMC**

Scientific supervisor: 1. Associate Prof. Dr. Phan Đình Tuấn

2. Associate Prof. Dr. Nguyễn Hoàng Dũng

## **The aims of this thesis:**

- (1) Research on extraction process of collagen from tra fish (*Pangasius hypophthalmus*) skin;
- (2) Optimisation and kinetics studies on the extraction of collagen from tra fish skin;
- (3) Study on the characterizations of collagen from tra fish skin

## **From the fundamental science point of view:**

- A mathematical model that describe the relations between the different variables (the concentration effect of acetic acid, pepsin enzyme content and ratio of solvent/tra fish skin) and collagen extraction yield have been built.
- Kinetic models based on the second order rate equation were successfully developed to describe the extraction process with different processing variables.
- Determine the nature of the collagen extracted from tra fish skin and its features

## **From the applied science point of view:**

- Offering efficient technical solutions to clean tra fish skin using LASNa to remove lipids and H<sub>2</sub>O<sub>2</sub> to remove melanin pigments from tra fish skin.

- Statistical optimization of process conditions using the central composite design (CCD) appeared to be an effective tool for the extraction process of soluble collagen from the tra fish skin. Each of the three independent variables (acetic acid concentration, liquid to solid ratio, and pepsin content) showed a significant effect in the yield of extracted collagen. The mathematical model gave an  $R^2$  of 0,993 and a P value of less than 0,0001, which implied a good agreement between the predicted values and the actual values of the yield of PSC, thus confirmed a good generalization of the mathematical model.
- The optimal conditions to obtain maximum yield of PSC were identified as follows: 0,47 M of acetic acid concentration, 55 mL/g of liquid to solid ratio and 0,49 % of pepsin content. Under these optimized conditions, the experimental PSC extraction yield agreed closely with the predicted yield of 92,44 %.
- Determine the optimum conditions for removing salt from collagen by dialysis method. The efficiency of separating salt reached 95.75% highest
- Determine the optimum conditions to remove lipids from the crude collagen using supercritical CO<sub>2</sub> technology
- Assessing the quality characteristics of the collagen from tra fish skin. The collagen products suitable for use as a biological material or used in cell culture.

**Scientific supervisor**

**PhD student**

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