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Effect of pH on the properties of protein-based film from silver catfish (*Pangasius sp.*) mince / Lee Kar Yen.

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Lihat Seberah

**HAK MILIK**  
PUSAT PEMBELAJARAN DIGITAL SULTANAH NUR ZAHIRAH

**EFFECT OF PH ON THE PROPERTIES OF PROTEIN-BASED FILM FROM  
SILVER CATFISH (*Pangasius* sp.) MINCE**

**By  
Lee Kar Yen**

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

**DEPARTMENT OF FOOD SCIENCE  
FACULTY OF AGROTECHNOLOGY AND FOOD SCIENCE  
UNIVERSITI MALAYSIA TERENGGANU  
2012**

## ENDORSEMENT

The project report entitled **Effect of pH on the properties of protein-based film from silver catfish (*Pangasius sp.*) mince** by **Lee Kar Yen**, Matric No. **UK16451** 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 fulfillment of the requirement of the degree of Bachelor of Food Science (Food Technology), Faculty of Agrotechnology and Food Science, Universiti Malaysia Terengganu.



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(Assoc. Prof. Dr. Amiza Mat Amin)


Main supervisor

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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  
acknowledged.

Signature :   
Name : Lee Kar Yen  
Matric No. : UK16451  
Date : 2 February 2012

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## ABSTRACT

The effects of pH of film-forming solutions from unwashed silver catfish mince on film formation, thickness, mechanical properties, water vapour permeability, colour, light transmission, transparency, film solubility and biodegradability were investigated. It was found that film from silver catfish mince had been successfully formed at pH 1-4 and pH 9-12. The thickness, tensile strength, elongation at break, water vapour permeability and film solubility were significantly different for films obtained ( $p > 0.05$ ). Higher thickness was obtained for the film prepared at pH 11 and pH 12. The study showed the resulting films had improved water vapour barriers than other fish mince films. Tensile strength was found to be higher for the films prepared at extreme pH region (pH 1, 2, 3, 11 and 12). The films formed gave high value of elongation at break owing to the presence of weaker bond which stabilized the film matrix. Higher pH of film-forming solutions with enhanced dispersion capacity in water favoured higher film solubility. The biodegradability of film showed the similar trend with film solubility. Nevertheless, pH of the film-forming solutions had no impact on colour of the silver catfish mince films. All resulting films had excellent UV barrier properties at the wavelength of 200-280 nm regardless of pH of the film-forming solutions. These films also showed low light transmission at visible range (400-800 nm).

## ABSTRAK

Kesan-kesan daripada pH dalam larutan pembentukan filem yang dihasilkan daripada isi ikan patin yang tidak dicuci terhadap pembentukan filem, ketebalan, sifat mekanikal (kekuatan tegangan dan pemanjangan), kebolehtelapan wap air, warna, sifat penghantaran cahaya, kelarutan filem, dan biodegradasi dikaji. Ia didapati filem daripada isi ikan patin telah berjaya dihasilkan pada pH 1-4 and pH 9-12. Ketebalan, kekuatan tegangan, pemanjangan, kebolehtelapan wap air, kelarutan filem, dan biodegradasi adalah jauh berbeza untuk filem-filem yang diperolehi ( $p > 0.05$ ). Ketebalan yang lebih tinggi telah diperolehi bagi filem yang disediakan pada pH 11 dan pH 12. Kajian itu menunjukkan filem-filem yang terhasil telah bertambah baik wap air halangan berbanding dengan filem-filem daripada isi ikan lain. Kekuatan tegangan adalah didapati lebih tinggi untuk filem-filem yang disediakan di julat pH melampau (pH 1, 2, 3, 11 dan 12). Filem-filem yang dibentuk memberi nilai pemanjangan yang tinggi disebabkan oleh kehadiran ikatan lemah yang menstabilkan matriks filem. pH yang lebih tinggi dalam larutan pembentukan filem dengan peningkatan kapasiti penyebaran dalam air menyebabkan kebolehlarutan filem yang lebih tinggi. Biodegradasi filem menunjukkan trend yang serupa dengan kelarutan filem. Walau bagaimanapun, pH dalam larutan pembentukan filem tidak mempunyai kesan terhadap warna filem daripada isi ikan patin. Semua filem yang dihasilkan mempunyai UV halangan yang sangat baik pada panjang gelombang 200-280 nm tanpa dipengaruhi oleh pH dalam larutan pembentukan filem. Filem-filem ini juga telah menunjukkan sifat transmisi cahaya yang rendah dalam julat cahaya nampak (400-800 nm).