APPLICATION OF CHICKEN FEET GELATIN INCORPORATED WITH LEMONGRASS EXTRACT AS FOOD PACKAGING

NURNAJIHAH FARHANI BINTI AZHAR

BACHELOR OF SCIENCE (Hons.) APPLIED CHEMISTRY FACULTY OF APPLIED SCIENCES UNIVERSITI TEKNOLOGI MARA

AUGUST 2024

UNIVERSITI TEKNOLOGI MARA | Fakulti Sains Gunaan

SUBMISSION FOR EVALUATION
FINAL YEAR PROJECT 2 - RESEARCH PROJECT

APPLICATION OF CHICKEN FEET GELATIN INCOPORATED WITH LEMONGRASS EXTRACT AS FOOD PACKAGING

Name	:	NURNAJIHAH FARHANI BINTI AZHAR
Student ID	:	2021899556
Program	:	APPLIED CHEMISTRY
Course code	:	AS245
Mobile Phone	:	
E-mail	:	najihahfarhaniazhar@gmail.com

Approval by Main Supervisor :

I certify that the work conducted by the above student is completed and approve this report to be submitted for evaluation.

Supervisor's name	:	SALAMIAH BINTI ZAKARIA
Date	:	28/7/2024
Turnitin Similarity %	:	23%
Signature	:	

APPLICATION OF CHICKEN FEET GELATIN INCORPORATED WITH LEMONGRASS EXTRACT AS FOOD PACKAGING

NURNAJIHAH FARHANI BINTI AZHAR

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

28 JULY 2024

ABSTRACT

APPLICATION OF CHICKEN FEET GELATIN INCORPORATED WITH LEMONGRASS EXTRACT AS FOOD PACKAGING

The widespread utilization and improper disposal of non-biodegradable synthetic plastics cause significant environmental challenges, demanding the requirement for sustainable packaging alternatives. Chicken feet, which are a byproduct of the poultry industry, contain a substantial amount of gelatin which provides a biodegradable and renewable alternative suitable for food packaging, but it has challenges in preserving its structural integrity. Lemongrass, recognized for its potent antioxidant and antibacterial characteristics, can improve the efficacy of gelatin. This study aims to study the potential applications of chicken feet gelatin (CFG) incorporated with lemongrass extract (LGE) by performing tests for antioxidant and antibacterial activity, and preservation studies on sausages and grapes. This study involved the extraction of CFG and lemongrass, then the CFG was combined with different concentrations of LGE (10, 20, and 30 w/w). The incorporated solution was analyzed using FTIR analysis, pH testing, and percentage yield (%) assessment to determine its chemical composition and characteristics. The antioxidant value of LGE and CFG with varying LGE concentrations was assessed through DPPH radical scavenging activity using a UV-Vis spectrophotometer, while antibacterial tests were conducted against Gram-positive and Gram-negative bacteria, including *Salmonella* and *Staphylococcus aureus*. The preservation studies evaluated the weight loss of grapes and sausages over 10 days under different conditions, including at room temperature and in a chiller, as well as the browning index of grapes. The result showed that the CFG incorporated with LGE (30w/w) show the highest radical scavenging value in antioxidant test which is 58.1590% and it has largest inhibition zone in the antibacterial susceptibility test against *Salmonella* and *Staphylococcus aureus* which are 11.00±1.0 and 14.00±1.0 respectively. Both sausages and grapes coated with CFG incorporated with LGE (30w/w) in chiller show the least percentage weight loss with the value of 51.33% and 2.69% correspondingly. The grapes coated with CFG incorporated with LGE (30w/w) in chiller has no browning due to the developed antioxidant and antibacterial properties of the gelatin coating combined with lemongrass extract, which helped control oxidative reactions and microbial growth, thus preserving the quality of the grape. Hence, this indicate the high antioxidant and antibacterial properties have led to significant reduction of weight loss of sausages and grapes and low browning index of grapes. In conclusion, the antioxidant and antibacterial properties of chicken feet gelatin are improved significantly by the incorporation of lemongrass extract, thereby extending the shelf life of food products. This show its potential as a biodegradable packaging material that is suitable for industrial applications, providing a sustainable alternative to conventional packaging.

TABLE OF CONTENT