PHYSICAL PROPERTIES OF CHITOSAN FILM AS AFFECTED BY LACTIC ACID AND GLYCEROL

BY :

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4. Enhanced Research Title and Objectives

Original Title as Proposed:

Antimicrobial and Physical Properties of Chitosan Film as Affected by Lactic Acid and Glycerol and Its Application on Bread Quality

Improved/Enhanced Title:

Physical Properties of Chitosan Film as Affected by Concentration of Lactic Acid and Glycerol

Original Objectives as Proposed:

i. To evaluate the effects of different concentration of glycerol added with lactic acid on the physical properties of chitosan film
ii. To evaluate the quality of bread coated with the chitosan film in terms of shelf life, microbial contamination, moisture content and texture

Improved/Enhanced Objectives:

i. To evaluate the effect of lactic acid and glycerol concentration on the physical, barrier and mechanical properties of chitosan film developed

5. Report

5.1 Proposed Executive Summary

Chitosan is a natural polysaccharide comprising copolymers of glucosamine and *N*-acetylglucosamine. It can be obtained by the partial deacetylation of chitin from crustacean shells. Chitosan can be used as an edible coating material because of its ability to form a film. The films have sufficient water permeability and can be used to increase the shelf life of fresh products due to its capacity to inhibit bacterial and fungal growth and to decrease the transfer rate of oxygen and carbon dioxide gases from fresh foods. However, films made only from chitosan has drawback in elasticity because film makes with chitosan alone is brittle. Glycerol is a plasticizer that can be used in this research to reduce the intermolecular forces and increase the mobility of the biopolymer chains. Food product such as bread is a perishable food that will become spoiled by mould after 5 to 7 days without preservatives. Chitosan which have the antimicrobial effect can help increase the shelf life of bread by inhibiting the growth of bread mould. This research is aimed to develop chitosan-based packaging material that is able to increase the shelf life of bread. The intention of this research are to evaluate the effects of difference concentration of glycerol added with lactic acid on the physical properties of chitosan film (thickness, water activity, tensile strength, percentage elongation, water vapour transmission rate, thermal activity, and colour), to determine the antimicrobial activity of the chitosan film produced by disc and well diffusion method, and to evaluate the quality of bread coated with the chitosan film in terms of shelf life, mould growth, and texture profile analysis.