PERFORMANCE OF EMULSIFIED GELATIN FILMS FOR FOOD PACKAGING

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ABSTRACT

The purposes of this study were to prepare emulsified edible films using sunflower oil as an emulsifier and to determine the properties of emulsified films such as tensile strength and elongation, thickness, moisture content, color and infrared spectroscopy. Edible film has potential to increase shelf-life and to maintain microbial safety of food products by applying renewable sources as film such as lipids, polysaccharides and proteins which to control moisture content, good barriers to gases and as carriers of functional ingredients such as antimicrobial and antioxidant agents. Food processing, storage and marketing may cause changes in film quality such as water and gas losses due to mass transfer between the food products and its surrounding. Therefore, edible film is applied in food industries in order to maintain food quality so that its shelf-life will last longer. Sunflower oil is the main raw material that being used as an emulsifier in this project for producing emulsified edible film. Lipid-based is used in order to form good water vapor barrier properties of edible film due to its hydrophobic nature. In this study, different concentrations of sunflower oil will be used so that the most suitable concentration of oil can be selected based on parameters determined. Other raw materials are glycerol as plasticizer and gelatin. Plasticizer helps to improve film flexibility while gelatin helps to improve mechanical properties of edible film. All raw materials have their own good properties and complement to each other. Sunflower oil, gelatin,distilled water and glycerol were mixed and homogenized. The mixture was dried at 55°C for 24hours. From the results, tensile strength of films increased as SO volume increased. Thickness of film affects the film opacity and moisture content of films increased due to good moisture barrier and hydrophobicity nature of sunflower oil. Quality of the edible film mainly depends on glycerol and sunflower oil.

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CHAPTER 1

INTRODUCTION

1.1 Research Background

Edible film refers to thin and continuous layer of edible material placed on food components. It is made to produce natural biopolymer-based edible films with specific properties so that shelf-life of food products will last longer. Edible films can be classified into three materials which are protein-based film, lipid based-film and polysaccharide-based film. Firstly, protein-based film is used to protect foods from bacteria and as an antioxidant agent. Food packaging can be formed from many layers of materials using protein-based films together with non edible films (Wittaya, 2012). Secondly, lipid-based film shows high polarity thus they can form continuous stable layer on the food surface (Lin and Zhao, 2007). Lipid-based film has high resistance towards water vapor and gas compared to polysaccharides-based film and protein-based film (Greener, 1992). Thirdly, polysaccharide-based film is not a good in controlling moisture loss due to high permeability towards water vapor. Besides, plasticizer is added to improve mechanical properties of polysaccharide-based film (Musavi, 2007). Properties of films that need to be emphasized are mass transfers, mechanical properties and senses requirement such as taste, touch and smell. Mass transfers refer to controlling food moisture, good oxygen