

CHAPTER I

INTRODUCTION

1.1 Background

As stated by KPPU (2012), Indonesia is the largest palm oil producer in the world. About 31% world consumption of palm oil is supported by Indonesia. In Indonesia, palm oil is the largest consumption of edible oil, followed by soybean oil, corn oil and coconut oil.

Frying is one of the fastest and relatively cheap methods of cooking food, with appealing typical flavor, color and crispy texture. In deep frying, the food is totally immersed in the oil at high temperature, ranging of 160-190°C. In a typical institutional frying, frying oils are commonly reused for several frying cycles before being discarded, unlike in the home-frying where oil is usually used only in few times. However, it is commonly found in both types of frying, particularly in Indonesia, that the oils are stored for subsequent frying. Such prolonged and intermittent frying results in diminishing acceptability and nutritive value of the fried product due to the hydrolytic, oxidative and thermal degradation in the oil (Saguy and Dana, 2003; Aladedunye, 2011).

A wide range of vegetable oils are available in the market. However, there is no single vegetable oil that is met with consumer satisfaction in terms of physicochemical properties for both fried products and frying oils. Oxidative stability of oil can be improved by modification of fatty acid composition and addition of antioxidants to the oil. Blending of oils modifies fatty acid

composition of oils without any chemical or biological process (Choudhary and Grover, 2013; Chung, Lee and Choe, 2004).

Several research studies have demonstrated the quality and properties of composite oil. As reported by Tiwari, Tiwari and Toliwal (2014), palm-sesame oil blends in different proportions are more stable to oxidative deterioration due to heating as compared to sesame oil. As far as the nutritional quality is concerned, the sunflower-palm oil blend give a higher intake of tocopherols and polyunsaturated fatty acids and a reduced intake of palmitic acid with respect to the use of palm oil (Marco *et al.*, 2007).

As stated by Boskou and Elmadfa (1999), the presence of rice bran oil in frying oils provides additional stability which is due to not only to the fatty acid composition, but mainly to the constituents of anti-polymerization and antioxidant properties. Rice bran oil is rich in sterols known for their anti-polymerization and γ -oryzanols for their natural anti-oxidative compound.

The aim of this thesis research is to evaluate the effect of rice bran oil addition into palm oil in terms of oil deterioration processes, including oxidation and thermal stability during intermittent deep-frying. In this thesis research, it is used the local palm oil, which is originated from Indonesia and soybean curd as the fried product (Rossell, 2001).

1.2 Research Problem

During intermittent deep-frying, frying oils are susceptible to physical and chemical changes due to various deterioration processes, including oxidation and thermal alteration. In order to improve their stability during intermittent deep-

frying, the physicochemical properties of palm-rice bran composite oil will be monitored in certain period of time.

1.3 Objective

The objective of this thesis research is divided into general objective and specific objective.

1.3.1 General Objective

The general objective of this thesis research is to evaluate the oil quality of palm-rice bran composite oil during intermittent deep-frying process.

1.3.2 Specific Objective

The specific objectives of this thesis research are:

1. To determine the optimum ratio of palm-rice bran composite oil for maintaining the physicochemical quality of oil during intermittent deep-frying.
2. To analyze the effect of frying duration towards the physicochemical quality of oil during intermittent deep-frying.