

**PHYSICOCHEMICAL PROPERTIES OF PALM STEARIN AND RICE
BRAN OIL BLENDS**

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ABSTRACT

PHYSICOCHEMICAL PROPERTIES OF PALM STEARIN AND RICE BRAN OIL BLENDS

Oil blends were formulated by mixing palm stearin (PS) and rice bran oil (RBO) in different ratios of 70:30, 50:50, and 30:70. The solid fat content (SFC), slip melting point (SMP), iodine value (IV), hardness index (HI), triglyceride profiles, major fatty acids, polymorphism and microstructure were evaluated. Results indicated that blending PS with RBO lowered the SFC, SMP and HI of the blends while the IV was increased significantly ($p < 0.05$). The decrease in palmitic acid and an increase in unsaturated oleic and linoleic acid were observed in all blends. X-ray diffraction analysis revealed that all the blends resulted in mixtures of both β and β' polymorphs. Small thin needle-like crystals were identified in the blends which can contribute to the soft and smooth texture of products such as margarine and fat spread. Blend 30:70 PS:RBO was found to be most suitable for food application due to its good spreadability and ability to melt completely at body temperature.

CHAPTER 1

INTRODUCTION

1.4 Background and problem statement

A demanding challenge that the food industry has been facing is for the replacement of trans fat in various food products. This lies in the development of formulations and processes which are both beneficial towards functionality and also towards economic viability. Blending is the simplest method of fat modification whereby it involves mixing two or more different kinds of fat to produce a fat with greater oxidative stability, higher nutritive value, and required melting behaviour with a low or zero-level of trans fatty acid. Blending of vegetable oil of different origins or their combination with animal fats is justified for technological, nutritional, and economic reasons. If the fatty acid composition of different vegetable oil is known, they can be combined in certain proportions to obtain products of improved composition and better functional properties, such as improved oxidative stability or shifted melting points (Adamczak & Bednarski, 2010).

By blending different types of oils, the consumer can be offered a better quality product with respect to flavour and nutritive value (Chopra *et al.*, 2004). In the last century, there has been more emphasis on edible oils based on regional production due to traditional taste and flavour preferences in the different regions. Blending would also reduce the pressure for regional preferences of specific individual oil, thereby indirectly helping in stabilising the edible oil price in a country (Chopra *et al.*, 2004). There are basically three parameters to