

**PHYSICO-CHEMICAL PROPERTIES OF PALM STEARIN,
SOYBEAN OIL AND THEIR BINARY BLENDS**

NABILAH BINTI ABDUL HADI

**BACHELOR OF SCIENCE (Hons.)
FOOD SCIENCE AND TECHNOLOGY
FACULTY OF APPLIED SCIENCES
UNIVERSITI TEKNOLOGI MARA**

JANUARY 2013

**PHYSICO-CHEMICAL PROPERTIES OF PALM STEARIN,
SOYBEAN OIL AND THEIR BINARY BLENDS**

NABILAH BINTI ABDUL HADI

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

JANUARY 2013

This Final Year Project Report entitled “**Physico-chemical Properties of Palm Stearin, Soybean Oil and Their Binary Blends**” was submitted by Nabilah binti Abdul Hadi, in partial fulfillment of the requirements for the Degree of Bachelor of Science (Hons.) Food Science and Technology, in the Faculty of Applied Sciences, and was approved by

Assoc. Prof. Dr. Norizzah Abd. Rashid
Supervisor
B. Sc. (Hons.) Food Science and Technology
Faculty of Applied Sciences
Universiti Teknologi MARA, MALAYSIA
40450 Shah Alam
Selangor

Assoc. Prof. Dr. Normah Ismail
Project Coordinator
B. Sc. (Hons.) Food Science and
Technology
Faculty of Applied Sciences
Universiti Teknologi MARA,
MALAYSIA
40450 Shah Alam
Selangor

Assoc. Prof. Dr. Noorlaila Ahmad
Programme Coordinator
B. Sc. (Hons.) Food Science and
Technology
Faculty of Applied Sciences
Universiti Teknologi MARA,
MALAYSIA
40450 Shah Alam
Selangor

ABSTRACT

PHYSICO-CHEMICAL PROPERTIES OF PALM STEARIN, SOYBEAN OIL AND THEIR BINARY BLENDS

The objective of this study was to determine the changes in physicochemical properties of palm stearin (PS) and soybean oil (SBO) blends at different mixing ratios in order to identify the suitable blend ratio of PS and SBO for certain food applications. Palm stearin was blended with SBO at different ratios of 70:30, 50:50 and 30:70 PS:SBO. The physicochemical properties of PS, SBO and PS:SBO binary blends were determined based on the major fatty acid composition, triacylglycerol profile, iodine value (IV), solid fat content (SFC), slip melting point (SMP) and hardness index (HI). Results indicated that the addition of SBO into PS caused the changes amount in fatty acid composition (FAC) of PS which cause decreased in the palmitic acid but increased in the linoleic acid. These results was supported with triacylglycerols (TAG) profile where the major TAG for PS which was 2-oleo-dipalmitin (POP) was decreased upon dilution with SBO, and increased the triunsaturated acid namely trilinolein (LLL). Blending PS and SBO resulted the IV increased significantly ($p < 0.05$) with the increasing amount of SBO thus decreased the SFC, SMP, and HI for all of the blends. Based on SFC, the blend 50:50 PS:SBO have a product stability and resistance to oiling out, with good melting point below body temperature which might be suitable for product such as margarine that must be melted in the mouth with minimum waxiness in order to have a good oral-melt.

ABSTRAK

CIRI-CIRI FIZIKOKIMIA STEARIN SAWIT, MINYAK SOYA DAN ADUNANNYA

Objektif kajian ini adalah untuk menentukan perubahan ciri-ciri fizikokimia adunan stearin sawit (PS) dan minyak soya (SBO) pada nisbah yang berbeza untuk mengenal pasti nisbah gabungan yang sesuai untuk diaplikasi dalam makanan tertentu. Stearin sawit telah dicampur dengan SBO pada nisbah yang berlainan 70:30, 50:50 dan 30:70 PS:SBO. Ciri-ciri fizikokimia PS, SBO dan adunan PS:SBO telah ditentukan berdasarkan komposisi asid lemak utama, profil triasilgliserol, nilai iodin, kandungan lemak pepejal, nilai takat gelincir dan indek kekerasan. Keputusan menunjukkan penambahan SBO kedalam PS menyebabkan perubahan dalam komposisi asid lemak PS iaitu asid palmitik telah menurun tetapi terdapat peningkatan kandungan asid linolik. Keputusan ini disokong dengan profil triasilgliserol dimana triasilgliserol utama bagi PS iaitu 2-oleo-dipalmitin (POP) telah menurun apabila pencairan dengan SBO manakala asid tidak tepu iaitu trilinolein (LLL) meningkat. Percampuran PS dan SBO mengakibatkan nilai iodin meningkat dengan ketara ($p < 0.05$) apabila peratus SBO ditambah kedalam PS, dan kandungan lemak pepejal, nilai takat gelincir, dan indek kekerasan semua adunan menurun. Adunan 50:50 PS:SBO mempunyai kestabilan produk dan rintangan daripada meleleh keluar, dengan takat lebur di bawah suhu badan yang sesuai untuk produk seperti marjerin yang mesti cair dalam mulut tanpa rasa “waxy