

**PHYSICOCHEMICAL PROPERTIES AND STABILITY OF PALM
OLEIN AND RICE BRAN OIL BLENDS**

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TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF ABBREVIATIONS	viii
ABSTRACT	ix
ABSTRAK	x
CHAPTER 1 INTRODUCTION	
1.1 Background of Study	1
1.2 Problem Statement	3
1.2 Significance of Study	4
1.3 Objectives of study	5
CHAPTER 2 LITERATURE REVIEW	
2.1 Oils and Fats	6
2.2 Palm Oil	7
2.3 Palm Olein	8
2.4 Rice Bran Oil	9
2.5 Fat Modification	11
2.5.1 Blending	12
2.5.2 Hydrogenation	13
2.5.3 Interesterification	14
2.5.4 Fractionation	15
2.6 Frying Oil	15
2.6.1 Stability of Frying Oil	17
2.6.2 Oxidative and Hydrolytic Rancidity	17
2.7 Physicochemical Properties of Frying Oils	18
2.7.1 Smoke Point	18
2.7.2 Cloud Point	19
2.7.3 Iodine Value	19
2.7.4 Free Fatty Acid/Acid Value	20
2.7.5 Fatty Acid Composition	21
2.7.6 Colour	23
2.7.7 Viscosity	23
CHAPTER 3 METHODOLOGY	
3.1 Materials	25
3.2 Methods	25

ABSTRACT

PHYSICOCHEMICAL PROPERTIES AND STABILITY OF PALM OLEIN AND RICE BRAN OIL BLENDS

The objectives of this study were to determine the changes in the physicochemical properties of the oil after blending, to determine the stability of the oil blends and to identify the best mixing ratio for frying oil. Palm olein (POo) was blended with rice bran oil (RBO) at different ratios of 30:70, 50:50 and 70:30 POo:RBO. The physicochemical properties and stability of POo and RBO and their blends were determined based on the major fatty acids, cloud point (CP), smoke point (SP), iodine value (IV), free fatty acid (FFA), induction period (IP), viscosity and colour. Blending POo with RBO results in significant ($p < 0.05$) increased of IV, SP and decrease in CP, FFA, IP and viscosity of all blends. Decreased in IP reduced the stability of oil blends. Blending also increased the oleic and linoleic acids but decreased the palmitic acid. Based on the results obtained, blend 30:70 POo:RBO was the most suitable blend for frying oil since this blend had the highest SP and lowest CP.

CHAPTER 1

INTRODUCTION

1.1 Background of Study

Fats and oils are of limited applications especially if they were in their unmodified forms, due to their specific triacylglycerol (TAG) composition. The physical and chemical properties of fats and oils are dependent on the TAG and fatty acid (FA) compositions. In order to get greater functions of this substance, the natural physical and chemical characteristics have to be changed. Some of modification processes that can be carried for various applications of fats and oils are through blending, fractionation, interesterification, hydrogenation, or combination of these (Abdulkarim *et al.*, 2010).

One of the conventional ways for food preparation through heat processing is frying. Heat and mass transfer occur at the same time during deep frying in food processing operations. The product's quality from deep frying depends on the type of oils and food used as well as frying conditions. Not only serve as a medium of heat transfer, frying oil also act as medium to contribute the flavour and texture characteristics (Debnath *et al.*, 2012).

Hence, frying fats and oils that have been chosen to be filled in the fryer must be not oxidised easily. Palm oil, peanut oil and coconut oil meet this requirement since they have high saturated and monounsaturated fatty acids. However, these types of oils poses minor problem related with the appearance during shelf storage due to cloud formation (Surin, 2004).