

**A COMPARATIVE STUDY ON THE STABILITY AND FRYING
PERFORMANCE OF REPLENISHED AND NON-REPLENISHED SOYBEAN
OIL**

By

Wan Zunairah Binti Wan Ibadullah

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ABSTRACT

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WAN ZUNAIRAH BT WAN IBADULLAH

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The stability and frying performance of replenished and non-replenished used soybean oil were determined by several analyses. Peroxide value (PV) and induction period using Rancimat were used to determine the oxidative stability. Free fatty acid (FFA), color, polar and polymer compounds and sensory evaluation were conducted to determine the quality and frying performance of the oils. PV, FFA, polar, and polymer compounds in both replenished and non-replenished used soybean oils increased with increase in frying time, while induction period for both oils decreased with increase in frying time. The effect of frying time on the odor of both replenished and non-replenished used oils showed that there were no significant differences ($p>0.05$) in odor. There were also no significant differences ($p>0.05$) in the acceptability of chicken nuggets fried in replenished and non-replenished used soybean oil. For overall assessment in terms of stability, quality and frying performance, the replenished used soybean oil was much better than the non-replenished used soybean oil.

CHAPTER 1

INTRODUCTION

Fats and oils are a unique class of agricultural products with a high degree of interchangeability. In the world market, there are many types of oil. Examples are palm oil, corn oil, sunflower oil, canola oil and many others (O'Brien, 1998). Most unrefined oils have relatively high levels of free fatty acids. Refined oils and fats that are ready for use in foods have free fatty acids level of less than 0.05%. Some of the common fatty acids found in naturally occurring oils are lauric, palmitic, stearic, linoleic and linolenic acids (Lawson, 1995; 1985).

Soybean oil is the most important vegetable oil produced in the world because of its high quality and low cost. Favorable agronomic characteristics, reasonable returns to the farmer and processor, high quality protein and edible oil products and plentiful, dependable supply of soybean available at a competitive price will enable soybean oil to maintain its dominance in both domestic and world market (Hui, 1996).

The advantages of soybean oil include: (i) a high level of unsaturation with the oil remaining liquid over relatively wide temperature range, (ii) it can be hydrogenated selectively blending with semi solid or liquid oils; when partially hydrogenated, it can be used as a pourable, semi solid oil, (iii) phosphatides,