DETERMINATION OF FATTY ACID IN FRESH COOKING OIL AND USED COOKING OIL USING GAS CHROMATOGRAPHY EQUIPPED WITH FLAME IONIZATION DETECTOR (GC-FID) AND GAS CHROMATOGRAPHY EQUIPPED WITH MASS SPECTROMETRY DETECTOR (GS-MSD)

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ABSTRACT

DETERMINATION OF FATTY ACID IN FRESH COOKING OIL AND USED COOKING OIL USING GAS CHROMATOGRAPHY EQUIPPED WITH FLAME IONIZATION DETECTOR (GC-FID) AND GAS CHROMATOGRAPHY EQUIPPED WITH MASS SPECTROMETRY DETECTOR (GS-MSD)

Fatty acid in fresh and used (a few times) cooking oil used were determined by using gas chromatography flame ionization detector (GC-FID) and gas chromatography mass spectrometry detector (GC-MSD). The injector port and detector temperature for GC-FID analysis was 250 °C with 70.0 mLs^{-1} carrier gas flow, while for GC-MSD analysis, the injector port and detector temperature were 200 °C and 300 °C respectively with 1.0 $mLmin^{-1}$ carrier gas flow. The concentration of fatty acid in different samples were determined for methyl laurate, methyl myristate, methyl palmitate, methyl stearate and methyl linoleate. The concentration were compared between fresh cooking oil and oil that had been used for five times. The cooking oil for FRESH sample has the highest amount of fatty acids which were methyl laurate (71.3 ppm), methyl myristate (1505.7 ppm), methyl palmitate (355973.7 ppm), methyl stearate (63702.7 ppm) and methyl linoleate (12894.6 ppm). The cooking oil for COOK4 sample which had been used for four times has the lowest amount of fatty acids which were methyl laurate (14.5 ppm), methyl myristate (203.3 ppm), methyl palimtate (43635.8 ppm), methyl stearate (7265.1 ppm) and methyl linoleate (2074.6 ppm). Based on this study, as the number of times the oil was used increased, the fatty acid content decreased but at the second time frying, the fatty acid content increased followed by decreasing at fourth time frying.

CHAPTER 1

INTRODUCTION

1.1 Background of study

Cooking oil consists of edible vegetable oils are derived from olives, palms, peanuts, and safflowers, and others. As oil is liquid at room temperature, cooking oils are sometimes added during the preparation of processed foods. They are also used to fry foods and to make salad dressing. Thousands of years ago, people in many regions began to process vegetable oils, utilizing whatever food stuffs they had on hand to obtain oils for a variety of cooking purposes. People learned to use the sun, fire, to heat oily plant products so that the plants exuded oil which could then be collected. The Chinese and Japanese produced soy oil as early as 2000 B.C., while southern Europeans had begun to produce olive oil by 3000 B.C. In Mexico and North America, peanuts and sunflower seeds were roasted and beaten into a paste before being boiled in water. Africans also grated and beat palm kernels and coconut meat and then boiled the resulting pulp, skimming the hot oil off the water. Recently, some oils have become available as the extraction technology gas improved (Toussaint-Samat, 2009).