

**A COMPARISON STUDY ON THE NUTRIENT RETENTION AND
PHYSICAL CHARACTERISTICS OF CARROT AFTER DRYING
TREATMENT USING MICROWAVE OVEN AND
CONVENTIONAL OVEN**

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ABSTRACT

A COMPARISON STUDY ON THE NUTRIENT RETENTION AND PHYSICAL CHARACTERISTICS OF CARROT AFTER DRYING TREATMENT USING MICROWAVE OVEN AND CONVENTIONAL OVEN

The aim of this study was to compare the nutrient retention and physical characteristics of carrot after drying treatment using microwave oven and conventional oven. The nutrient of interest is carotene and lycopene that contained in carrot. Lycopene and carotene are carotenoids pigments which are unsaturated hydrocarbon. Both carotenoid were extracted in hexane and petroleum ether as the solvents. Then, the extracted pigments were separated using column chromatography. Analysis of lycopene and carotene was done by High Performance Liquid Chromatography (HPLC). The carotene and lycopene was found to be high in conventional drying than treat of microwave drying. The colour characteristics were based on visual observation. The color of the carrot treated by microwave drying appeared dark compared to the carrot treated by oven drying. Increasing the sample thickness slowed the lost of water.

CHAPTER 1

INTRODUCTION

Drying using microwave offers an alternative way to improve the quality of dehydrated products. Microwave was used to dry dried food in the low temperature drying and fast mass transfer combined with rapid energy transfer (Yongsawatdiful, Gunasegaram 1996). Microwave has a potential to dry food in a short time but at low temperature. According to Wikipedia the free encyclopedia, microwaves refer to as “micro-kilowaves” that are electromagnetic waves with wavelengths longer than those of Terahertz (THz) wavelengths but relatively short for radio waves. Microwaves have wavelength approximately in the range of 1GHz to 300 GHz. Microwave oven works by passing radiation, usually at a frequency of 2450 MHz with a wavelength of 12.24cm through food. Water, fat and sugar molecules in the food absorbed energy from the microwave beam in a process called dielectric heating. (Kalra et al., 1987).

Normal drying is the oldest method of food preservation and it is a difficult food processing operation because of undesirable change in quality. The removal of water from a food product using conventional air drying may cause serious damage to the dried product (Wang and Xi, 2004). Normal drying takes time to dehydrate completely.