

Alternative Energy

Edited by

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Chapter 7

Drying under inert environment: the quality of Mango and Rockmelon

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Abstract

Extensive tests were carried out on the quality related properties, such as, flavor, appearance, texture and nutritional values of mango and rockmelon samples dried under normal air heat pump dryer (HPD), modified atmosphere heat pump dryer (MAHPD) using N_2 and CO_2 , and also vacuum and freeze dryers. For mangoes and rockmelons, the MAHPD dried samples show better flavor than HPD dried samples. The freeze and vacuum dried samples are considered even better than MAHPD dried samples, although at a much higher costs. For MAHPD, N_2 drying leads to a better color retention than CO_2 drying. The HPD dried samples show a higher value of textural hardness than MAHPD samples, whereas the freeze dried samples show the lowest textural hardness. Freeze drying leads to the best vitamin C retention, followed by vacuum, MAHPD and HPD drying. In the case of MAHPD, the CO_2 drying shows slightly higher retention of vitamin C than N_2 .

INTRODUCTION

Drying is the oldest method of food preservation, which has become a very lucrative and competitive market today due to tremendous developments of food drying technologies. Research into better drying methods which produce dried foods at lower operating costs, greater energy efficiency and improvements in quality-related properties of the dried product are ongoing due to demands in the food industries.

Freeze drying, a method that offers products with excellent quality, has been in great demand. However, due to its high operating cost, usually only high-value pharmaceutical and food products are freeze-dried. Therefore, there is a need to research into alternative drying techniques that can allow food to be dried at lower operating costs, while at the same time, produce dried food products with comparable quality.

Researchers, Chua et al. [1] and Strommen et al. [2], showed that HPD is an energy efficient method that gives better product quality than the conventional hot air dryer. Hawlader et al. [3] has shown the effect of