

EFFECT OF DRYING METHODS AND PRETREATMENTS ON THE DRYING CHARACTERISTICS OF GARLIC

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ABSTRACT

Garlic is a semi-perishable vegetable spice and nearly 30% of the crop is wasted due to respiration and microbiological spoilage during storage. Through garlic is produced abundantly and consumed as such, little efforts have so far been made to produce dehydrated garlic and garlic powder. The proper drying techniques are the most important aspect of fruits and vegetables preservation. The use of solar dryer helps not only to reduce losses and improves the quality of product but also helps in conserving the convectional energy sources. A greenhouse type solar dryer was used the experiments were conducted to develop dehydrated garlic slices so as to enhance the availability of garlic slices during off season. In the present study, fresh garlic slices were pretreated in two ways (i) KMS treated samples (ii) NaCl treated samples (ratio of water 1:4 w/w) and untreated garlic slices were also dried as control samples. The slices were dried at different thicknesses of 3.0 mm, 4.5 mm, and 6.0 mm under greenhouse type solar dryer and in open sun. Physico-chemical analysis i. e. moisture content, moisture ratio, drying rate, ascorbic acid, acidity, total sugar, reducing sugar, colour, and pungency were evaluated during the experiment. Experiments were also conducted to study the effect of drying conditions on sensory quality and rehydration characteristics. It was found that total drying time decreased in drying air temperature at 51.63⁰C under greenhouse type solar dryer condition. Major drying took place in falling rate period. The average drying rate increased with increase in temperature and decrease with time and thickness. Chemically treated samples dried under greenhouse type solar dryer took lesser time than untreated samples. It was observed that total moisture loss increased with increase in drying temperature. The rehydration ratio for dehydrated garlic increased under greenhouse type solar dryer as compared to open sun drying. The product quality was found to be more acceptable in case of 3.0 mm thickness, KMS treated samples dried under greenhouse type solar dryer.

KEYWORDS: Colour, Garlic, Greenhouse Type Solar Dryer, Open Sun, Dehydration Ratio, Organoleptic Score, Treatments