

## EVALUATING THE PERFORMANCE OF DEHUMIDIFIED SOLAR DRIER IN DRYING OF PUMPKINS (CUCURBITAPEPO)

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### **Abstract**

Pumpkin (*Cucurbita pepo*) is increasingly being accepted as an important food crop in Kenya mainly due to increased awareness on its nutritional benefits and ease of crop cultivation in several agro-ecological zones. It is important to dry pumpkin in order to increase diversification and development of pumpkin value chain. The purpose of this work is to evaluate the possibility of using dehumidified solar dryer in drying of the pumpkins and study the effect of the drying treatment on vitamin C content of the pumpkin. The desiccant used was hydrogel. The experimental set up consisted of a cabinet solar dryer, a cotton double membrane with hydrogel placed at the inlet and drying trays. Drying experiments were carried out outdoors for drying pumpkin slices to study the drying characteristics and the dryer performance under two modes: (a) Solar drying with integration of the desiccant unit (b) Solar drying without the integration of desiccant unit. Open sun drying was used as a control for this study. Evaluation of the desiccant bed solar dryer in drying the pumpkin was carried out and analysis of variance performed to ascertain whether or not the use of desiccant had any significant effect on relative humidity of drying air. The losses in vitamin C for dehumidified, un-dehumidified and open sun drying were 68.25, 70 and 81% respectively. The results revealed that the effect of desiccant on relative humidity of drying air was significant ( $p < .005$ ). In addition, results showed that drying time using desiccant was reduced by about 11.25% compared to drying without desiccant. The study demonstrates that hydrogel can be used as a desiccant in dehumidifying drying air in a cabinet solar dryer for drying of agricultural products.

**Key words:** Desiccant, hydrogel, pumpkin slices, drying rate, vitamin C