SMART SOLAR VEGETABLE DEHIDRATATION, A WAY TO SUPPORT A SUSTAINABLE ACTIVITY

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EXTENDED ABSTRACT

This paper describes the development of a modular solar vegetable dehydrator, portable, low-energy consumption and low-cost equipment, working with renewable energy (solar thermal and photovoltaic) that can operate even under unfavourable weather conditions. The purpose of this equipment, currently in the prototype phase, it is to process small amounts of farm products like fruit and vegetables, to minimize the waste, particularly by utilizing fruit that would not be viable for sale but can be utilized by cutting and dehydrating and subsequently sold as dried fruit. This process contributes to the sustainability of small-scale agricultural producer's activity. The development of this dehydrator was based on the assumption that to optimize the dehydration process is essential to improve the factors: Time, Product Quality, Energy Efficiency, Cost, Flavour and Aroma. This is achieved by actively controlling dehydration air temperature and air circulation velocity at any given time. The developed equipment optimizes the dehydration process by measuring the ambient temperature and relative humidity at the inlet and outlet air of the dehydrator, allowing at any time through the mixture control system to adjust the operating conditions of the equipment. The equipment consists in a mobile device, easily moved and placed in the position that best suits the dehydration process at every moment, increasing the efficiency of operation, considering the local conditions of the production site. With the development and implementation of this equipment, it was found that it was possible to utilize damaged and unfit fruit for commercial purposes. After being sliced thinly and dehydrated, it was sold, enabling economic valorisation of the activity and consequently promoting its sustainability.

Keywords – Sustainable Dehydration, Solar energy, Vegetables, Fruit and vegetable farmers

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