

EFFECT OF MICROWAVE AND INFRARED RADIATION ON DRYING OF ONION SLICES

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ABSTRACT

Onion slices (*Allium cepa* L.) weighing 100 g with a moisture content of 7.3 g water/g dry matter were dried using microwave and infrared radiation methods to a moisture content of 7% (wet basis). Three different output power levels of 200, 300 and 400 W were used for microwave drying, whereas the infrared drying treatment involved three intensity levels that were 3000, 4000 and 5000 W/m², a drying air temperature of 35 °C and air velocity of 0.5 m/s. A comparison of the drying kinetics, data revealed that microwave drying was more effective in shortening drying time when compared with infrared drying. Results also revealed that microwave dried onion slices were lighter in color and had higher rehydration ratios meanwhile, onion slices were darker in color and had lower rehydration ratios when infrared drying method was employed. To evaluate the drying kinetics of onion slices, experimental data obtained in this study were fitted with four models i.e. Newton, Henderson & Pabis, Page and modified Page models. The goodness of fit for each model was evaluated using coefficient of determination (R^2) and chi-square (χ^2) of these drying models, with the Page model yielding the best fit ($R^2 = 0.998$, $\chi^2 = 0.00016$).

KEYWORDS: Microwave, Infrared Radiation, Onion Slices, Drying, Modeling, Color, Rehydration