




Investigation of drying kinetics, nutrient profile, physicochemical and functional properties of purple yam (*Dioscorea alata*) under different drying conditions

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Abstract

In the present investigation, fresh purple yam slices were blanched in hot water (80 °C) for 8–10 min, followed by drying under a cabinet dryer at 45, 55 and 65 °C, and open sunlight. This research aimed at comparing the drying kinetics, nutritional profile, functional properties, sensory characteristics and microbial stability of purple yam. The drying temperature of 45 °C was suggested to retain the quality of dried purple yam in terms of physical properties, sensory qualities, nutritional content: proximate compositions and functional properties: swelling capacity and bulk density. In comparison to other treatments, drying at 65 °C produced the fastest drying of slices. Moreover, the anti-oxidant activity, phenolic and flavonoid contents and water and oil absorption capacity increased with temperature rise. The study found that purple yam dried in a cabinet dryer had better microbial stability than those dried under open sunlight. The drying kinetics was calculated using Newton, Page, Henderson and Pabis, Logarithmic and Two-term models. Among them, the Page model was the best-fit model to explain the drying kinetics of purple yam for all treatments. This study on comparing drying treatments for purple yam will improve the science of drying purple yam in both controlled and uncontrolled conditions, enhancing quality retention and shelf life.

Keywords Cabinet dryer · Drying kinetics · Nutrient profile · Open sun drying · Purple yam