

Characterization of watermelon rind powder using foam mat drying with different types of foaming agents and temperatures

ABSTRACT

Utilization of food waste as the new source for food product is of interest in current research field. Watermelon rind is one of the natural food wastes that can provide nutrients including carbohydrates, proteins, and lipids. This study aims to evaluate the best conditions of foam mat drying using three different temperatures (50, 60, 70 °C) and foaming agents (maltodextrin and egg albumin) at different concentrations (10, 15, 20%) to produce watermelon rind powder. The rind powder was characterised by its powder's foam density, foam expansion, solubility index and water absorption. Drying with maltodextrin as foaming agents at 50°C showed significantly ($p < 0.05$) high solubility (23.94%), low water absorption (0.21), Hausner ratio (1), Carr index (3.16%) with foam expansion of 12.04%, bulk and tapped density at 0.66 g cm⁻³ and 0.68 g cm⁻³, respectively. Maltodextrin aid in increasing the solubility of rind powder due to its high-water solubility and low moisture content properties. This finding may assist fruit industry to apply the watermelon by-product into a useful food ingredient in bakery, confectionary and beverages thus benefits in waste management.

Keyword: Watermelon rind; Foam mat drying; Egg albumin; Maltodextrin