

Specific energy consumption and drying kinetics of far-infrared dried

This study was conducted to evaluate specific energy consumption in various drying systems including advantages of infrared assisted drying process. Tests were conducted using instant rice berry under various experimental conditions as follows: In far-infrared drying were 50 and 700C, air velocity levels 0.5 m/s and 2 intensity levels (1 and 2 kW/m²). Drying kinetics and qualities in terms of moisture content final moisture of 8% (d.b.), color, morphology and rehydration of the instant rice berry were experimentally investigated. Experimental results showed that specific energy consumption at 2 W/m² was 5.8 kWh/kg of water removed resulting in a 55% energy saving when compared to 1 kW/m² of far-infrared intensity. The drying rate rapidly increased to a maximum value and then gradually decreased into the falling rate period. The increase in far-infrared power caused a rapid increase in the temperature at the surface of kernels, resulting in an increase of the water vapor pressure inside the kernels and thus in higher drying rate. The higher far-infrared intensity, however, resulted in the larger total color differences of the product. Increasing far-infrared intensity from 1 kW/m² to 2 kW/m² led to the dramatic increase in rehydration ratio by 30%.

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