

Title Study of drying paddy rice using infrared radiation
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Abstract

Infrared drying technology has been widely used in many different fields, such as textile, electronics, and paint industries, but its applications in food industry are still at its early stage. Since infrared technology has many advantages for drying, such as energy saving and high drying rate, it may offer a promising potential in drying and dehydration applications in food and agricultural products. Conserving energy and improving quality are two most important tasks to be addressed in paddy rice drying. In this study, possibility of using infrared radiation for drying paddy rice was investigated with respect to energy saving, reduction of drying time and improvement of quality. Paddy rice harvested at 20% and 24.5% moistures (w.b.) was used for the study. The rice samples were dried, using a flameless catalytic gas-fired infrared dryer at 35, 45 and 54 °C of rice temperature to remove various pre-determined moistures. The rice samples were then tempered at a corresponding temperature for 4 h and further dried to 13.5% moisture by using ambient air. The energy consumption of the drying processing and milling quality of dried rice samples were determined. Test results were compared with the results obtained with conventional hot air drying at the similar conditions. Results revealed that infrared radiation drying is significantly faster than hot air drying. As an example, 3% moisture reduction by the infrared drying at 54 °C of rice temperature took only 7 min compared to 80 mins by using hot air drying at the same temperature. The research results approved that infrared drying was an efficient way of drying paddy rice with high quality of milled rice.