

Abstract

Consumption of energy, outlet moisture content and quality of the dried commodity are important parameters of paddy-dryer performance. The fluidised-bed paddy-dryer has been commercialised for several years and in this paper, paddy drying by pulsed and conventional fluidised-bed dryers are compared. Experimental results have shown that the variation of moisture content at the exits of both dryer types in test runs was very small. Heat utilisation was more effective when such dryers were used to dry paddy at moisture contents above 24% dry basis and up to 50% of the thermal energy was saved by recycling 70–80% of the air. Paddy qualities i.e. head-rice yield and colour of the dried white rice were similar with both dryers and almost the same as the original undried values, or slightly higher in the case of head-rice yield, depending upon the drying conditions. Below 28% dry basis, it is recommended that inlet-air temperature should be lower than 145 °C in order to maintain white colour. The cooked rice obtained from paddy dried at a temperature of 145 °C was harder than naturally dried control samples. A mathematical model based on energy and mass balance predicted values in good agreement with experimental results for both the pulsed and conventional fluidised-bed dryers. Calculated thermal and electrical energy consumptions indicated that the pulsed flow dryer was more economical than the conventional dryer.