

Title Prediction of thermal conductivity of kernels and a packed bed of brown rice
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Abstract

The effective thermal conductivity of brown rice was measured by the transient heat flow method using twin probes at selected moisture contents, temperatures and bulk densities. Air and corn oil were used as fluids to fill the gap in the sample-packed bed. The effects of temperature, bulk density, and moisture content on the effective thermal conductivity of samples were investigated. The thermal conductivity of brown rice kernels was estimated using a compound model of series and parallel structural heat transfer models, and represented as a function of moisture content. In addition, the partial area of the fluid layer arranged in parallel toward the heat flow of the compound model was related to temperature and porosity, and a new model to predict the effective thermal conductivity of brown rice was proposed.