

Title Development of thick layer re-wetting model for brown rice packaged with LDPE and PBT films
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Abstract

A mathematical model was developed to predict a moisture content profile during the thick layer re-wetting process of brown rice unpackaged and packaged with low density polyethylene (LDPE) and polybutylene terephthalate (PBT) films. Model validation was carried out by comparing predicted with measured moisture content derived from relative humidity data obtained from the brown rice re-wetting test for 6 days at 25 °C and 90% RH. The moisture standard errors of the model validation for brown rice packaged in LDPE and PBT films were 0.08% wet basis (wb) and 0.11% wb, respectively. It was concluded that the proposed re-wetting model could successfully describe the thick layer re-wetting of brown rice under the experimental conditions. Using this model, re-wetting simulations were carried out to estimate the time required to condition the moisture content of brown rice at various water vapor permeabilities of film. The cracking ratio of brown rice was also investigated empirically during the re-wetting process of packaged and unpackaged brown rice.