

Title Response of ECH2O Probe and TDR probe in Dielectric Characteristics of Rough Rice during Drying process

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Citation Book of Abstracts, Asia-Pacific Symposium on Assuring Quality and Safety of Agri-Foods, August 4-6, 2008, Radisson Hotel, Bangkok, Thailand.

Keywords rough rice; drying

Abstract

The purpose of this study is to examine the dielectric characteristics of rough rice during the drying process by using ECH2P probe and TDR probe for monitoring the moisture content of rough rice. Highly moistened rough rice was gradually air-dried, and the ECH2O and TDR waveform during drying process were monitored by using EC-5 and EC TE ECH2O probes and conventional two-wire TDR probe, across a range of measurement frequencies between 5 and 150 MHz for ECH2O and around 1GHz for TDR probe. In the drying process, the moisture content (m) of rough rice decreased gradually with passage of time and finally attained about 11% w.b. accompanied by about 5% volume shrinkage. The relative permittivity (ϵ) evaluated from these waveforms generally increased with the moisture content. The high correlation between m and ϵ demonstrates that the m value can be estimated from ϵ obtained from these probes with sufficient accuracy. Therefore, the high correlation between m and m_{cal} demonstrates. Then, m_{cal} is moisture content obtained from the equation that expressed the relation between m and ϵ .