

Title A magnetic resonance imaging study of wheat drying kinetics
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Abstract

A spin-echo (SE) magnetic resonance imaging (MRI) technique was used to study non-invasively moisture levels as a function of time in single wheat kernels. Internal moisture distribution during drying of wheat at temperatures of 30, 40, and 50 °C for 4 h was analysed from the MR images. The influence of the individual wheat components on the drying process was observed using physically different wheat kernels: intact kernels, mechanically scarified kernels with incisions in the pericarp, and kernels with the embryo removed. Drying rate curves for these different kernels were obtained at three different temperatures and the effects of temperature on the drying curves were discussed. A calibration curve of MR image intensity versus the moisture content of the grain was obtained using nuclear magnetic resonance (NMR) spectra of wheat at different, known, moisture contents. Results obtained from this study provided details of the drying kinetics in wheat kernels.