Drying Modeling of Banana Using Cellular Automata

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Abstract : Drying is one of the oldest preservation methods for food and agriculture products. Appropriate control of operation can be obtained by modeling. Limitation of continues models for complex boundary condition and non-regular geometries leading to appearance of discrete novel methods such as cellular automata, which provides a platform for obtaining fast predictions by rule-based mathematics. In this research a one D dimensional CA was used for simulating thin layer drying of banana. Banana slices were dried with a convectional air dryer and experimental data were recorded for validating of final model. The model was programmed by MATLAB, run for 70000 iterations and von-Neumann neighborhood. The validation results showed a good accordance between experimental and predicted data (R=0.99). Cellular automata are capable to reproduce the expected pattern of drying and have a powerful potential for solving physical problems with reasonable accuracy and low calculating resources.

Keywords : banana, cellular automata, drying, modeling

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