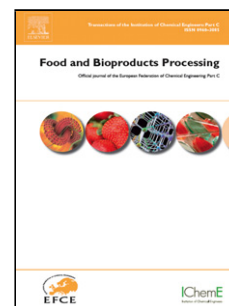


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Mathematical model, validation and analysis of the drying treatment on quality attributes of chicory root cubes considering variable properties and shrinkage

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Highlights

- Three dimensional mathematical model to describe the drying process of chicory root (*Cichorium intibius* L.) cubes
- Consideration of temporal variations as function of the sample humidity content for shrinkage and transfer properties
- Process representation by mathematical modeling
- Application of first principles equations and semi-empirical correlations
- Sensitive analysis for the main mass and heat transfer parameters.

Abstract

This work presents an exhaustive three dimensional mathematical model to describe chicory root cubes drying process (*Cichorium intibius* L.) using a Fick's diffusion model considering a variable diffusion path length in three dimensions. Experimental data obtained at laboratory scale is used to validate the proposed model. Experiments are conducted using a forced convection laboratory dryer at temperatures of 60°C and 80°C and air velocities of 0.2 and 0.7 m/s to dry chicory

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