Title Modeling mass transfer during osmotic dehydration of strawberries under high hydrostatic pressure conditions

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Citation Innovative Food Science & Emerging Technologies, Volume 12, Issue 3, July 2011, Pages 338-343

Keywords High hydrostatic pressure; Osmotic dehydration; Mathematical modeling; Strawberry

Abstract

Simultaneous application of high hydrostatic pressure (200–400 MPa) during osmotic dehydration of strawberries was studied in this investigation. The high hydrostatic pressure treatment improved the diffusion coefficients of water and soluble solids compared to atmospheric pressure operation. Effects of process pressure on diffusion coefficients were achieved through an Arrhenius-type equation. Mathematical modeling of mass transfer was performed applying Newton, Henderson–Pabis, Page and Weibull models. Based on statistical results, the Weibull model gave the best goodness of fit on the experimental data under the studies' operative conditions.

Industrial relevance: This article deals with the mathematical modeling of mass transfer during simultaneous high hydrostatic pressure treatment and osmotic dehydration of strawberries. Transfer of water and soluble solids during this combined process were satisfactorily simulated with the Weibull model. Results indicated that application of this innovative technology improved strawberries dehydration rates compared to atmospheric pressure operation resulting in a dried fruit with intermediate moisture content ready to be used as input material of further processes.