

Title Mathematical modeling of intermittent and convective drying of rice and coffee using the reaction engineering approach (REA)

Author Aditya Putranto, Xiao Dong Chen, Zongyuan Xiao and Paul A. Webley

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Abstract

In order to extend shelf life of rice and coffee, drying can be conducted to minimize water content so that chemical and biological changes can be retarded. Several models have been proposed to model drying of coffee and rice. For design of dryer and evaluation of dryer performance, the effective and physically meaningful drying model should be implemented. The reaction engineering approach (REA) is applied in this study to model convective drying of coffee as well as convective and intermittent drying of rice. The REA is a unique approach to model drying; the physics of drying is captured by the relative activation energy which can be generated only from one accurate drying experiment. The relative activation energy can be applied to other conditions of drying provided the same material and similar initial moisture content. Results indicate that the REA describes the convective and intermittent drying of rice and coffee very well.