



SIMULACIJA KONVEKTIVNOG PROCESA SUŠENJA BANANE

SIMULATION OF THE CONVECTIVE DRYING PROCESS OF BANANA

Danka Kostadinović

Univerzitet u Beogradu, Institut za nuklearne nauke „Vinča“, Beograd

Sušenje je jedan od najstarijih tehnoloških postupaka za konzervisanje hrane. Voće je podložno brzom kvarenju zbog velike količine vode koju sadrži. Plodovi voća se suše kako bi se uklonila vlaga odnosno produžio rok trajanja proizvoda, smanjila njihova zapremina i olakšao transport. U radu je prikazan model konvektivnog sušenja banane. Izvršena je simulacija sušenja banane vazduhom temperature 40 °C. Za rešavanje parcijalnih diferencijalnih jednačina prenosa toplote i mase tokom procesa sušenja korišćena je metoda konačnih elemenata. Prikazana je analiza promene temperature i koncentracije vlage u materijalu tokom procesa sušenja. Formirani model se može koristiti za optimizaciju procesa sušenja banane i drugih vrsta voća i povrća sa ciljem dobijanja proizvoda željenog kvaliteta.

Ključne reči: sušenje; vlaga; temperatura; prenos toplote; prenos mase

Drying is one of the oldest techniques used to preserve food products. Fruits are vulnerable to microbial deterioration due to their high water content. Fruits are dried to remove moisture, i.e. to enhance storage stability, reduce the fruit volume, and facilitate transportation. This paper presents a model of the convective drying process of bananas. A simulation of banana drying with air at a temperature of 40 °C was performed. The finite element method was employed to solve the partial differential equations of heat and mass transfer during the drying process. The analysis of the temperature and moisture distribution inside the product during the drying process is presented. This model can be used to optimize the drying process of bananas as well as the drying of different fruits and vegetables to achieve high-quality dried products.

Key words: drying; moisture; temperature; heat transfer; mass transfer

* Corresponding author:
dankak@vin.bg.ac.rs
<https://orcid.org/0000-0003-2890-4979>

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