

Accepted Manuscript

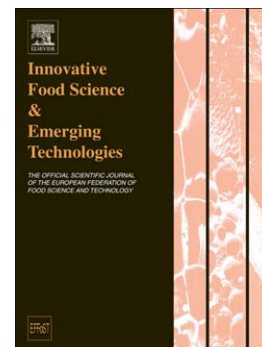
Prediction of moisture content uniformity of microwave-vacuum dried mangoes as affected by different shapes using NIR hyperspectral imaging

Yuan-Yuan Pu, Da-Wen Sun

PII: S1466-8564(15)00216-7
DOI: doi: [10.1016/j.ifset.2015.11.003](https://doi.org/10.1016/j.ifset.2015.11.003)
Reference: INNFOO 1400

To appear in: *Innovative Food Science and Emerging Technologies*

Received date: 6 September 2015
Revised date: 3 November 2015
Accepted date: 4 November 2015



Please cite this article as: Pu, Y.-Y. & Sun, D.-W., Prediction of moisture content uniformity of microwave-vacuum dried mangoes as affected by different shapes using NIR hyperspectral imaging, *Innovative Food Science and Emerging Technologies* (2015), doi: [10.1016/j.ifset.2015.11.003](https://doi.org/10.1016/j.ifset.2015.11.003)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Prediction of Moisture Content Uniformity of Microwave-Vacuum Dried Mangoes as Affected by Different Shapes Using NIR Hyperspectral Imaging

Yuan-Yuan Pu, Da-Wen Sun*

Food Refrigeration and Computerized Food Technology (FRCFT), School of Biosystems and Food Engineering, University College Dublin, National University of Ireland, Agriculture and Food Science Centre, Belfield, Dublin 4, Ireland

Abstract

The prediction of moisture content uniformity on mango slices as affected by four different shapes (square, rectangle, regular triangle, and round shape) during microwave-vacuum drying (MVD) was investigated using near-infrared hyperspectral imaging in combination with multivariate chemometric analysis. Applying spectral pretreatment of a 2nd derivative followed by mean-center to raw spectra was found to be greatly beneficial for the reduction of noise and scattering levels. Seven wavelengths (951, 977, 1138, 1362, 1386, 1420, and 1440 nm) with larger absolute values of regression coefficients derived from a partial least square regression model were identified as feature variables for moisture prediction. An optimized model based on the selected wavelengths was developed using multivariate linear regression, achieving a high prediction accuracy with $R_p^2 = 0.993$ and $RMSEP = 1.282\%$. From the moisture distribution map, a similar non-uniform drying pattern was found on square, rectangle and regular triangle-shaped samples, while round-shaped mango slices achieved better drying results. The current study suggested that NIR hyperspectral imaging was a promising technique in predicting the

* Corresponding author. Tel: +353-1-7167342, Fax: +353-1-7167493, E-mail: dawen.sun@ucd.ie,

Website: www.ucd.ie/refrig; www.ucd.ie/sun.

Download English Version:

<https://daneshyari.com/en/article/8415747>

Download Persian Version:

<https://daneshyari.com/article/8415747>

[Daneshyari.com](https://daneshyari.com)