Accepted Manuscript

Evolution of physicochemical properties of pear during drying by conventional techniques, portable-NMR, and modelling

Noemi Proietti, Giuseppina Adiletta, Paola Russo, Renato Buonocore, Luisa Mannina, Alessio Crescitelli, Donatella Capitani

PII: S0260-8774(18)30083-9

DOI: 10.1016/j.jfoodeng.2018.02.028

Reference: JFOE 9183

To appear in: Journal of Food Engineering

Received Date: 11 October 2017

Revised Date: 15 January 2018

Accepted Date: 27 February 2018

Please cite this article as: Noemi Proietti, Giuseppina Adiletta, Paola Russo, Renato Buonocore, Luisa Mannina, Alessio Crescitelli, Donatella Capitani, Evolution of physicochemical properties of pear during drying by conventional techniques, portable-NMR, and modelling, Journal of Food Engineering (2018), doi: 10.1016/j.jfoodeng.2018.02.028

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.



ACCEPTED MANUSCRIPT

- Evolution of physicochemical properties of pear during drying by conventional techniques,
- 2 portable-NMR, and modelling
- Noemi Proietti^a, Giuseppina Adiletta^b, Paola Russo^{c*}, Renato Buonocore^c, Luisa Mannina^{a,d}, Alessio
- 4 Crescitelli^e, Donatella Capitani^a
- ^aLaboratorio di Risonanza Magnetica "Annalaura Segre", Istituto di Metodologie Chimiche, Area
- della Ricerca di Roma 1 (CNR), via Salaria Km 29,300 00015 Monterotondo (Roma) Italy
- ^bDipartimento di Ingegneria Industriale, Università di Salerno, Via Giovanni Paolo II, 132, 84084
- 8 Fisciano (SA), Italy
- 9 ^cDipartimento di Ingegneria Chimica Materiali Ambiente, Sapienza Università di Roma, Via
- Eudossiana 18, 00184, Roma, Italy
- dDipartimento di Chimica e Tecnologie del Farmaco, Sapienza Università di Roma, Piazzale Aldo
- 12 Moro 5, Roma, Italy
- ^eInstituto per la Microelettronica e Microsistemi (IMM), Consiglio Nazionale delle Ricerche (CNR)
- 14 Via Pietro Castellino 111 80131 Napoli, Italy.
- *paola.russo@uniroma1.it

17 Abstract

16

- 18 The knowledge of changes in the properties of foods that occur with processing is needed for
- designing better drying methods that preserve desirable characteristics and minimize/eliminate
- 20 undesirable ones. To this aim, this study analysed the effect of convective drying at 45-55°C on
- 21 physicochemical properties of pear. The drying kinetics, shrinkage and SEM images were
- evaluated. Portable-NMR was used to determine the drying moisture profile of pears and thickness
- 23 reduction. Portable-NMR also allowed to investigate water mobility in fresh and dried pears by
- 24 measuring the longitudinal and transverse relaxation times, and the self-diffusion coefficient.
- 25 Results showed that at 55°C the faster drying rate and corresponding energy saving were combined
- with a more uniform water distribution in pear tissues. Finally, a diffusion model considering the
- shrinkage during drying was developed. It assumes that all water in pear is free-water, according to
- NMR result that most of the water lost was from vacuole.
- 30 Keywords: portable NMR; diffusion coefficient; water compartments; drying kinetics; modelling;
- 31 pear

32

29

Download English Version:

https://daneshyari.com/en/article/6664548

Download Persian Version:

https://daneshyari.com/article/6664548

<u>Daneshyari.com</u>