

Accepted Manuscript

Water transfer in bread during staling: Physical phenomena and modelling

Jean-Yves Monteau, Emmanuel Purlis, Emna Besbes, Vanessa Jury, Alain Le-Bail



PII: S0260-8774(17)30152-8

DOI: [10.1016/j.jfoodeng.2017.04.016](https://doi.org/10.1016/j.jfoodeng.2017.04.016)

Reference: JFOE 8851

To appear in: *Journal of Food Engineering*

Received Date: 12 September 2016

Revised Date: 8 March 2017

Accepted Date: 8 April 2017

Please cite this article as: Monteau, J.-Y., Purlis, E., Besbes, E., Jury, V., Le-Bail, A., Water transfer in bread during staling: Physical phenomena and modelling, *Journal of Food Engineering* (2017), doi: 10.1016/j.jfoodeng.2017.04.016.

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.

Water transfer in bread during staling: physical phenomena and modelling

Jean-Yves Monteau^{a,b,*}, Emmanuel Purlis^{a,b,c}, Emna Besbes^{a,b},
Vanessa Jury^{a,b}, Alain Le-Bail^{a,b}

^a*UBL, Oniris, département GPA, rue de la Géraudière, B.P. 82 225
44322 Nantes CEDEX 3, France*

^b*GEPEA UMR CNRS 6144, Nantes, France*

^c*Centro de Investigación y Desarrollo en Criotecnología de Alimentos (CIDCA), UNLP,
CONICET, Facultad de Ciencias Exactas, 47 y 116, La Plata (1900), Argentina*

Abstract

Starch retrogradation and water loss have effects of the same intensity on the increase in firmness in the phenomenon of bread staling. Writing the equations of this system, in order to understand the mechanisms of water transfer in the vapour and liquid phases, is apparently simple. Nevertheless, choices are necessary for the simplifying hypotheses. Two models, differing in their geometry and their equations, were developed. Besides investigating the water transfer mechanisms in the vapour and liquid phases, the aim of this study is to compare the results of the two models and to conclude as to their individual interest. Concerning the physical phenomena, the study shows that a part of the water lost by the crumb escapes into the atmosphere while another part is absorbed by the crust. As regards the modelling the study shows that the most complete model is not the best choice and specifies the simplifying assumptions that should be retained or eliminated.

*Corresponding author

Email address: jean-yves.monteau@oniris-nantes.fr (Jean-Yves Monteau)

Download English Version:

<https://daneshyari.com/en/article/4908935>

Download Persian Version:

<https://daneshyari.com/article/4908935>

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