Accepted Manuscript

Feasibility of using spectral profiles for modeling water activity in five varieties of white quinoa grains

Wilson Castro, Jose M. Prieto, Roenfi Guerra, Tony Chuquizuta, Wenceslao T. Medina, Brenda Acevedo-Juárez, Himer Avila-George

PII: S0260-8774(18)30262-0

DOI: 10.1016/j.jfoodeng.2018.06.012

Reference: JFOE 9295

To appear in: Journal of Food Engineering

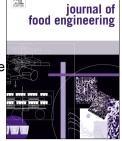
Received Date: 19 November 2017

Revised Date: 18 May 2018

Accepted Date: 11 June 2018

Please cite this article as: Castro, W., Prieto, J.M., Guerra, R., Chuquizuta, T., Medina, W.T., Acevedo-Juárez, B., Avila-George, H., Feasibility of using spectral profiles for modeling water activity in five varieties of white quinoa grains, *Journal of Food Engineering* (2018), doi: 10.1016/j.jfoodeng.2018.06.012.

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.



22

Feasibility of using spectral profiles for modeling water activity in five varieties of white quinoa grains

Wilson Castro^{a,*}, Jose M. Prieto^b, Roenfi Guerra^b, Tony Chuquizuta^c, Wenceslao T. Medina^b, Brenda Acevedo-Juárez^d, Himer Avila-George^d

 ^a Facultad de Ingeniería, Universidad Privada del Norte. Cajamarca, Cajamarca 06002, Perú.
^b Escuela Profesional de Ingenieria Agroindustrial, Universidad Nacional del Altiplano,

^o Escuela Profesional de Ingenieria Agroindustrial, Universidad Nacional del Altiplano, Puno 159, Perú

^c Facultad de Ingeniería Zootecnista, Agronegocios y Biotecnología, Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas. Chachapoyas, Chachapoyas 01001, Perú. ^d Centro Universitario de los Valles, Universidad de Guadalajara. Ameca, Jalisco 46600, México

Abstract

In this paper, the feasibility of using spectral profiles for modeling water activity a_w in white quinoa grains (Chenopodium quinoa Willd.) is studied. For this 2 purpose, five hundred samples of five white varieties were stabilized at different a_w values using the isopiestic method. Next, hyperspectral images (HSIs) of ten grains for each combination (variety, a_w value), covering the range of 400-1000 nm were acquired, and mean spectral for each grain extracted. Then, due to a linear relationship that the spectral profiles are shown, the modeling was performed with a_w values over 0.741 using partial least square regression (PLSR). From total spectra, three hundred spectrum were selected and randomly divided into training and validation sets. The results shown coefficient of determination 10 from 0.59 to 0.834 concluding than for a_w over 0.741, HSI+PLSR show potential 11 for a_w prediction in white quinoa grains. 12 Keywords: Quinoa grains, Water activity, HSI, PLSR

13 1. Introduction

Quinoa is an important food crop for people living in Andean rural regions (Carrizo et al., 2016). However, there are few studies related to the main pa-

June 12, 2018

Email address: wilson.castro@upn.edu.pe (Wilson Castro) Preprint submitted to Journal of Food Engineering

Download English Version:

https://daneshyari.com/en/article/6664424

Download Persian Version:

https://daneshyari.com/article/6664424

Daneshyari.com