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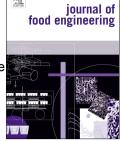
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### Feasibility of using spectral profiles for modeling water activity in five varieties of white quinoa grains

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#### 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-

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