THE EFFECT OF A HTST PULSE ON PHASE TRANSITIONS OF CRISPY DRIED BANANAS

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This study was conducted to investigate the effect of a high temperature and short time (HTST) drying pulse at 150 ºC, combined with a hot air-drying process stage at 70 ºC, on phase transitions of crispy dried bananas. In order to obtain a crispy and stable product, the air-drying stage at 70 ºC was performed to water activity values below 0.3. Desultory samples were collected during different drying times to be analyzed. For the analyses of phase transitions, samples were divided into two groups: the internal part formed during drying (middle samples); and a crust formed on the external surface during drying (surface samples). The glass transition temperature was determined by differential scanning calorimetry. Finally, sorption isotherms were determined by the gravimetric method for samples collected at the last time of drying (the dryer samples). According to the results, the loss in the structure of the surface samples was directly related to glass transition temperatures. The middle samples presented only a melting peak, corresponding to the higher water content inside samples; on the other hand, all surface samples presented the glass transition temperature. As was expected in view of the plasticizing effect of water in the hygroscopic region, glass transitions shifted toward lower temperatures with increasing water content. The Guggenheim-Anderson-de Boer (GAB) model was found to be the best-fitted equation and gave information about the shelf-stability for the samples.