

Title Evaluation of the Distance of Dehydrated Tissues in Osmotically Dehydrated Fruits and Vegetables Using TA-XT2

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Abstract

The water transfer between a sucrose solution and sample tissues (apples, potatoes, carrots, and pineapples) was determined by evaluating the concentration profile of water and the force-distance curves obtained by an appropriate test method with a Texture Analyzer (SMS-TA-XT2). Changes in mechanical properties of osmotically dehydrated apples were investigated to determine the appropriate test method. The mechanical parameters obtained by blade cutting method, which present the most significant changes of textural properties during osmotic dehydration, were the distance at yield point (YP) and the distance at minimum force point (MFP). However, the distance at the MFP showed a good correlation to the distance calculated from the concentration profile method and can be used as parameter to determine the depth of affected sample tissue at various processing time. The blade cutting method was much faster and easier to carry out than the concentration profile method. Under the used conditions of osmotic dehydration (66% w/w sugar solution, at 20 ± 2 °C under constant agitation and at atmospheric pressure, sample thickness = 10 mm) the time to dehydrate the samples down to the center was 6 h for apples, 3 h for potatoes, and 5 h for carrots, and 2 h for pineapples. All four products, except pineapples, can be time-estimated by evaluating both water concentration profile and blade cutting method.