

Title Relation of computerized tomography Hounsfield unit measurements and internal components of fresh chestnuts (*Castanea* spp.)

Author Irwin R. Donis-González, Daniel E. Guyer, Anthony Pease and Dennis W. Fulbright

Citation Postharvest Biology and Technology, Volume 64, Issue 1, February 2012, Pages 74-82

Keywords CT-number; Postharvest quality; Nondestructive; Attenuation coefficient; Chestnut components

Abstract

Little is known about Chestnut (*Castanea* spp.) *in vivo* cultivar characterization and morphology, the effect of mechanical harvesting, peelability, postharvest mold, physiological kernel decay, and quality. Thus, there is a need to develop a nondestructive technique able to assess fresh chestnut internal components, especially disorders. In this study, a medical grade computed tomography (CT) was used to obtain transversal two-dimensional (2D) images from decayed and healthy fresh chestnuts, from the hybrid cultivar ‘Colossal’ and ‘Chinese seedlings’. Attenuation coefficients, referred to as Hounsfield-units (HU) or CT numbers, were acquired from different 2D CT image regions including air, and several chestnut components containing decayed tissue, healthy tissue, various imperfections such as pellicle invagination into healthy kernel, and void spaces. Results offer an *in vivo* accurate insight of fresh intact chestnuts, and suggest that CT technology is appropriate for inline sorting. HU measurements can be used as a nondestructive predictor of fresh chestnut internal components with a 90.6% overall accuracy rate.