Title The firmness detection by excitation dynamic characteristics for peach

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Citation Food Control Volume 17, Issue 5, May 2006, Pages 353-358

Keyword Peach; Dynamic; Resonant frequency; Firmness

Abstract

Dynamic resonance frequency based on dynamic frequency response of excited peach was determined by impact factors, such as impact orientation, detected orientation, impact velocity, impact material, and peach physical properties, such as, peach firmness, peach mass, and storage day. Analysis showed that response dominant frequency was significant affected by peach firmness, and mass. Impact orientation, detected orientation, impact velocity and impact material did not significantly affect the dominant frequency. Dominant frequency increased with peach firmness increasing, and dominant frequency decreased with increasing of the peach mass. Better relationship was obtained between dominant frequency and peach firmness or peach mass ($r^2 = 0.827–0.842$), and the stiffness coefficient regressed on Magness–Taylor firmness had a good relationship also ($r^2 = 0.781$). The peach firmness could be considered to detect by using the dynamic resonance frequency analysis.