Postharvest Damage of Mangosteen and Quality Grading Using Mechanical and Optical Properties as Indicators

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Source: INTERNATIONAL JOURNAL OF FOOD PROPERTIES **Volume:** 12 **Issue:** 2 **Pages:** 414-426 **Article Number:** PII 909792435 **DOI:** 10.1080/10942910701837262 **Published:** 2009

Abstract: Postharvest damage in fresh mangosteens at wholesale level in Thailand was investigated from April to October 2004. A total of 37.1% of the production yield was rendered inedible by damage during this period; damages included fruit cracking, hardened rinds, rough surfaces, translucent flesh, gummosis and decay. This study focused on a method of predicting damage based on the color of the skin of the affected mangosteen. As a first step, diameter, height, weight, and volume of large, medium, small, and undersize mangosteens were measured. The term, dimension ratio, was introduced as a sizing parameter identifying conventional trade size. The coefficient of static friction of the glossy- and rough-surface mangosteens on plexiglass, plywood, and galvanized steel sheet varied from 0.31 to 0.46. The color of sound and defective fruits was measured in terms of their tristimulus values X, Y, and Z. The corresponding chromaticity coordinates of a mangosteen, x and z, depended on the maturity stage of the fruit while y depended on the type of fruit surface. A ratio was proposed to test the accuracy of predicting internal defects from the color variation between two spots on the surface of the same fruit. The highest percentage of correct prediction was 67.4% with a color ratio of X1 (pink blush color on yellow ground color) to X2 (pink color) that was greater than 1.25.

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