

Udomsak Kitthawee 2011: Mechanical Bruising of Mangosteen Rind and Young Coconut Husk. Doctor of Engineering (Agricultural Engineering), Major Field: Agricultural Engineering, Department of Agricultural Engineering. Thesis Advisor: Assistant Professor Siwalak Pathaveerat, Ph.D. 111 pages.

The objective of this research was to study the mechanical properties of hard rind mangosteen for quality controlling and to determine young coconut fruit bruising mechanism subjected to quasi-static compression and impact test.

The research included the mechanical property of firmness (F/D) and a firmness index (A/t) to evaluate the mangosteen that was compressed by rigid flat plate installed to the Universal Testing Machine (Instron 5569) and impacted by impacting rod. There were three control factors: a) 6 loading (100, 80, 60, 40, 20 and 0 % of rupture force) b) 2 maturity stages (Pink and Dark Purple) and c) 3 storage days (0, 4 and 8 days after testing day). Analysis was achieved by using ANOVA and DMRT. Results showed that compressive and impact loading, maturity and storage significantly affected firmness and firmness index at  $p < 0.05$ . When the solution in the cell oxidize by surrounding atmosphere due to cell wall failure, the mangosteen would hard rind by lignifications. The pink mangosteen tended to be hard rind less than the dark purple fruit. The hard rind of mangosteen was the "Bruise" in the mesocarp of fruit.

The sample young coconut included three different maturity stages (immature, mature, overmature) were studied for bruising response below and beyond the bruise threshold. Overmature young coconut exhibited the most bruise under loading.

---

Student's signature

---

Thesis Advisor's signature