



UNIVERSITI PUTRA MALAYSIA

**EFFECTS OF POSTHARVEST STORAGE AND DIPS IN
CALCIUM SALTS ON FRESH-CUT CANTALOUPE
(*Cucumis melo L. reticulates* cv. Glamour)**

MUNIRA ZAINAL ABIDIN

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**MASTER OF SCIENCE
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2012

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ON FRESH-CUT CANTALOUPE (*Cucumis melo* L. *reticulatus* cv. *Glamour*)**

By

MUNIRA ZAINAL ABIDIN

**Thesis Submitted to the School of Graduates Studies, Universiti Putra Malaysia, in
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June 2012

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

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ON FRESH-CUT CANTALOUPE (*Cucumis melo L. reticulates* cv. Glamour)**

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June 2012

Chairman: Rosnah Binti Haji Shamsudin, PhD

Faculty: Engineering

Extending the postharvest storage of the whole fruits at an optimum temperature (10 °C) may decrease the quality of the fruit itself. In this study, postharvest storage and Ca salts were applied to the whole fruit and fresh-cut cantaloupe, respectively, in order to observe the shelf life and to reduce the changes in quality during storage. The observations of the quality of the fresh-cut cantaloupe were carried out every 3±1 days for the physico-chemical (firmness, colour, total soluble solids content (TSS), titratable acidity (TA), and pH), microbiological (total plate counts (TPC) and yeast and moulds (YM)), and sensory analyses during storage at 2 °C and 87% relative humidity (RH) for 19 days. The firmness of the fresh-cut cantaloupe decreased as postharvest storage of the whole fruit and the storage time of the fresh-cut increased. By using a Ca chloride dipping treatment, a higher level of firmness maintenance of the fresh-cut cantaloupe was observed compared to the samples dipped in Ca lactate. Both the TPC and YM counts increased significantly during storage. The microbial growth of the fresh-cut

cantaloupe prepared within one week and treated with Ca chloride can be consumed after up to 15 days of storage, while after more than one week of postharvest storage (W2, W3, and W3), the consumption period of the fresh-cut treated with both types of Ca salts decreased to 12 days of storage. Trained panellists also scored higher firmness and lower juiciness in the samples treated with Ca chloride and prepared within three weeks of postharvest storage. The colour and chemical properties of the fresh-cut cantaloupe were not significantly different ($P < 0.05$) between both types of Ca salt treatment. The TSS increased and the TSS:TA ratio decreased significantly over the postharvest storage period of the whole fruit. No significant difference ($P < 0.05$) between treatments was observed in terms of colour and the other chemical properties as the postharvest storage period of the whole fruits increased. In conclusion, the fresh-cut cantaloupe treated with Ca salts and kept for three weeks of postharvest storage resulted in a reduced amount of quality degradation and were acceptable for consumption.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

KESAN PENYIMPANAN LEPAS TUAI DAN RENDAMAN DALAM GARAM KALSIUM KE ATAS TEMBIKAI SEGAR POTONG (*Cucumis melo L. reticulates* cv. Glamour)

Oleh

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Melanjutkan penyimpanan lepas tuai buah-buahan pada suhu optimum (10 °C) boleh mengurangkan kualiti buah itu sendiri. Dalam kajian ini, penyimpanan lepas tuai dan garam Ca telah digunakan untuk keseluruhan buah dan tembikai segar-potong, masing-masing, dalam usaha untuk melihat hayat dan untuk mengurangkan perubahan dalam kualiti semasa penyimpanan. Pemerhatian kualiti tembikai segar-potong telah dijalankan setiap 3±1 hari untuk fiziko-kimia (ketegasan, warna, jumlah kandungan pepejal larut (TSS), keasidan (TA), dan pH), mikrobiologi (jumlah kiraan plat (TPC) dan yis dan kulat (YM)), dan analisis deria semasa penyimpanan di 2 °C dan 87% kelembapan relatif (RH) selama 19 hari. Ketegasan tembikai segar-potong menurun apabila penyimpanan lepas tuai keseluruhan buah dan masa penyimpanan segar-potong meningkat. Dengan menggunakan rawatan rendaman Kalsium klorida, penyelenggaraan ketegasan tembikai segar-potong diperhatikan pada tahap yang lebih tinggi berbanding

sampel yang direndam dalam Kalsium laktat. Kedua-dua kiraan TPC dan YM meningkat dengan ketara semasa penyimpanan. Pertumbuhan mikrob tembikai segar-potong disediakan dalam tempoh satu minggu dan dirawat dengan Kalsium klorida boleh dimakan selepas sehingga 15 hari penyimpanan, sementara selepas lebih daripada satu minggu penyimpanan lepas tuai (W2, W3, dan W3), tempoh penggunaan segar-potong dirawat dengan kedua-dua jenis garam Kalsium menurun kepada 12 hari penyimpanan. Ahli panel terlatih juga telah mengskor ketegasan lebih tinggi dan sifat berair lebih rendah dalam sampel yang dirawat dengan Kalsium klorida dan disediakan dalam tempoh tiga minggu penyimpanan lepas tuai. Sifat warna dan kimia tembikai segar-potong tidak berbeza secara ketara ($P < 0.05$) di antara kedua-dua jenis rawatan garam Kalsium. TSS meningkat dan nisbah TSS: TA menurun dengan ketara sepanjang tempoh penyimpanan lepas tuai keseluruhan buah. Tiada perbezaan yang signifikan ($P < 0.05$) diperhatikan antara dari segi warna dan sifat-sifat kimia yang lain apabila tempoh penyimpanan lepas tuai buah-buahan meningkat. Kesimpulannya, tembikai segar-potong dirawat dengan garam Kalsium dan disimpan selama tiga minggu penyimpanan lepas tuai menyebabkan amaun kualiti degradasi dikurangkan dan diterima untuk dimakan.

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I certify that an examination committee has met on _____ to conduct the final examination of Munira Binti Zainal Abidin on her Master of Science thesis entitle “Effect of Postharvest Storage and Dips in Calcium Salts on Fresh-Cut Cantaloupe (*Cucumis melo L. reticulates* cv. Glamour)” in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1990 and Universiti Pertanian Malaysia (Higher Degree) Regulation 1981. The Committee recommended that candidate be awarded relevant degree. Members of the Examination Committee were as follows:

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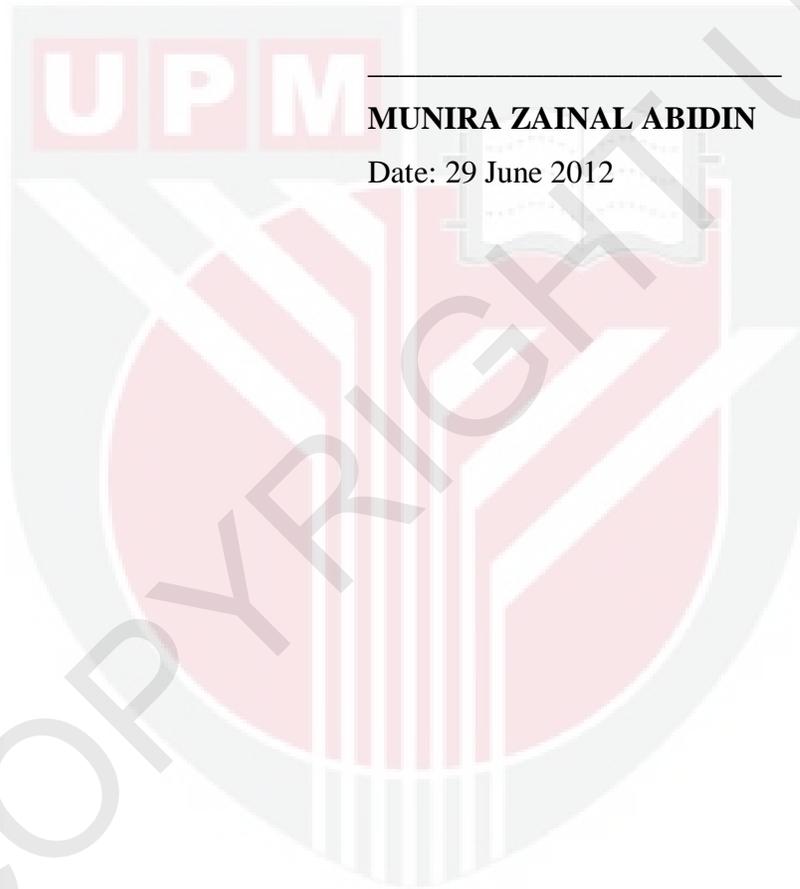
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DECLARATION

I declare that this thesis is my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously, and is not concurrently, submitted for any other degree at Universiti Putra Malaysia or at any other institution.



MUNIRA ZAINAL ABIDIN

Date: 29 June 2012



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