EFFECTS OF TEMPERATURE AND HUMIDITY ON SHELF LIFE OF GINGER (*Zingiber officinale* ROSCOE)

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Effects of the storage temperature and humidity on shelf life of ginger (Zingiber officinale Roscoe) / Ili Mahirah Mohd Jamal.

EFFECTS OF THE STORAGE TEMPERATURE AND HUMIDITY ON SHELF LIFE OF GINGER (*Zingiber officinale* Roscoe)

By
Ili Mahirah binti Mohd Jamal

Research Report submitted in partial fulfilment of
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ENDORSEMENT

The project entitled **Effects of the Storage Temperature and Humidity on Shelf Life of Ginger (*Zingiber Officinale* Roscoe)** by **Ili Mahirah binti Mohd Jamal,** Matric No. **UK16008** has been reviewed and corrections have been made according to the recommendations by examiners. This report is submitted to the Department of Agrotechnology in partial fulfilment of the requirement of the degree of Bachelor of Science in Agrotechnology (Post Harvest Technology), Faculty of Agrotechnology and Food Science, Universiti Malaysia Terengganu.

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DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged.

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ABSTRACT

Ginger (*Zingiber officinale* Roscoe), has been used for a very long time as food ingredient, in food preservation and in pharmaceutical products. Nevertheless, the processing part has not been well researched. Ginger consists of two main constituents; ginger oleoresin and ginger oil. Ginger storage method has become necessary since this rhizome are transported worldwide for long period and not classified as perishable goods since it has the ability to stay fresh up to three months at suitable condition. This study emphasized on the importance of determining the right temperature and humidity for a simpler and more applicable storage method thus extending the commodity's shelf life. Treatments applied were storage at 5±1°C, 15±1°C, and 25±1°C with different relative humidity ranging from 75±2% to 90±2%. The parameters measured were percentage of weight loss, firmness, total colour changes, pH, total soluble solid (TSS) and water content, at weekly intervals for four weeks. The data collected from all the analyses were analyzed using the analyses of variance (ANOVA). The significant differences ($P<0.05$) between the treatments were determined using Tukey Test. After four weeks of storage, there were no significant difference among the treatments in the ginger firmness and water content where TSS, pH and weight loss showed significant difference. The lowest storage temperature and the highest relative humidity (5±1°C; 90±2%) showed the best quality retention in ginger during storage.

ABSTRAK

Halia (*Zingiber officinale* Roscoe), telah digunakan sejak dahulu sebagai ramuan dalam makanan, didalam pengawetan makanan dan didalam produk farmaseutikal. Namun begitu, dari segi pemprosesannya masih belum dikaji dengan terperinci. Halia mempunyai dua unsur penting iaitu oleoresin dan minyak halia. Kaedah penyimpanan halia telah menjadi suatu keperluan kerana halia telah diagih ke seluruh dunia dalam tempoh yang panjang dan tidak dikelaskan sebagai barangan mudah rosak kerana keupayaannya untuk kekal segar sehingga lebih daripada tiga bulan pada keadaan yang sesuai. Kajian ini menekankan kepentingan dalam menentukan suhu dan kelembapan yang sesuai untuk kaedah penyimpanan yang mudah dan boleh digunapakai, seterusnya memanjangkan jangkahayat komoditi tersebut. Rawatan yang dilakukan adalah penyimpanan pada suhu 5±1°C, 15±1°C, dan 25±1°C bersama dengan kelembapan relatif berjulat daripada 75±2% sehingga 90±2%. Parameter yang diukur adalah peratus kehilangan berat, ketegaran, perubahan warna keseluruhan, pH, jumlah pepejal terlarut (TSS) dan kandungan air pada setiap minggu selama empat minggu. Kesemua data yang terkumpul daripada semua analisis telah dianalisa menggunakan analisis bervariasi (ANOVA). Perubahan yang ketara ($P<0.05$) diantara rawatan telah ditentukan menggunakan ujian Tukey. Selepas empat minggu penyimpanan, didapati tiada perubahan yang ketara diantara kesemua rawatan didalam ketegaran halia dan kandungan air, manakala TSS, pH dan kehilangan berat menunjukkan perubahan yang ketara. Suhu yang paling rendah dan kelembapan relatif yang paling tinggi (5±1°C; 90±2%) menunjukkan kualiti halia terbaik semasa penyimpanan.