





**EFFECTS OF DIFFERENT TEXTURE ENHANCERS ON THE QUALITY AND  
SENSORY ACCEPTABILITY OF ROSELLE PICKLES**

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**UNIVERSITI MALAYSIA TERENGGANU**

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SENSORY ACCEPTABILITY OF ROSELLE PICKLES**

**BY**

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**Research Report submitted in partial fulfillment of The Requirements for the degree of  
Bachelor of Food Science (Food Technology)**

**Department of Food Science**

**FACULTY OF AGROTECHNOLOGY AND FOOD SCIENCE**

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## ENDORSEMENT

The project report entitled **Effects of Different Texture Enhancers on the Quality and Sensory acceptability of Roselle Pickles** by Siti Nuraini Binti Sulong, Matric No UK 16735 has been reviewed and corrections have been made according to the recommendations by examiners. This report is submitted to the Department of Food Science in partial fulfilment of the requirement of the Bachelor of Food Science (Food 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

Roselle (*Hibiscus sabdariffa L*) is a species of *Hibiscus* used for the production of roselle pickles with combination of four types of food grade texture enhancers (calcium lactate, calcium phosphate, calcium chloride and calcium propionate). Each types of calcium used has different characteristics towards the texture of roselle pickles. This study was conducted to investigate the sensory acceptability, microbiological quality, nutritional content and physicochemical characteristics of roselle pickles using four different types of calcium. The preliminary studies were carried out at three different concentrations (0.5%, 1.0%, and 1.5%) using four types of calcium. The best concentration for calcium lactate and phosphate was 1.0% while for calcium chloride and calcium propionate was 0.5%. Calcium chloride showed the crunchiest texture followed by calcium phosphate, calcium lactate and the least crunchiest was calcium propionate. For sensory acceptance, calcium chloride had received the highest score for most of sensory attributes followed by calcium lactate, calcium phosphate and calcium propionate. For microbiological analyses, there was significant differences ( $p < 0.05$ ) of Aerobic Plate Count (APC) between samples. However, other types of microbes were not detected in all samples. In conclusion, calcium chloride was found to be the most suitable among other calcium sources studied as texture enhancers because it gave the highest reading for texture analysis, ash content, ascorbic acid and minerals. The second best was, calcium lactate, where it also gave good texture, retain better anthocyanin and higher total soluble solids compared to other calcium sources.



## ABSTRAK

Roselle (*Hibiscus sabdariffa L*) ialah satu spesies *Hibiscus* digunakan untuk pengeluaran jeruk roselle dengan gabungan empat jenis bahan penambahbaikan tekstur (kalsium laktat, kalsium fosfat, kalsium klorida dan kalsium propionat). Setiap jenis kalsium yang digunakan mempunyai ciri- ciri yang berbeza dalam membentuk tekstur jeruk roselle. Kajian ini dijalankan untuk mengkaji penilaian penerimaan deria, kualiti mikrobiologi, kandungan nutrient dan ciri- ciri fiziko- kimia dalam jeruk roselle yang menggunakan empat jenis kalsium yang berbeza. Kajian awal dijalankan ke atas setiap jenis kalsium pada kepekatan yang berbeza (0.5%, 1.0%, dan 1.5%). Kepekatan terbaik untuk kalsium laktat dan fosfat ialah 1.0% manakala untuk kalsium klorida dan kalsium propionat ialah 0.5%. Kalsium klorida merupakan kalsium yang paling rangup teksturnya diikuti oleh kalsium fosfat, kalsium laktat dan yang paling kurang kerangupan ialah kalsium propionat. Bagi ujian penilaian penerimaan deria, kalsium klorida menunjukkan skor tertinggi untuk kebanyakan attribut diikuti oleh kalsium laktat, kalsium fosfat dan kalsium propionat. Untuk analisis mikrobiologi perbezaan yang ketara ( $p < 0.05$ ) diperolehi pada Aerobic Plate Count (APC). Namun begitu antara sampel dalam ujian mikrob yang lain menunjukkan, tiada pertumbuhan mikrob. Sebagai rumusan, kalsium klorida merupakan kalsium yang paling sesuai antara kalsium- kalsium lain yang dikaji sebagai bahan penambahbaikan tekstur kerana ia memberi bacaan tertinggi untuk kerangupan tekstur, kandungan abu, asid askorbik dan mineral. Kalsium kedua terbaik adalah kalsium laktat , di mana ia juga memberi kerangupan tekstur yang baik, nilai antosianin yang lebih tinggi dan kandungan pepejal larut yang lebih tinggi berbanding sumber-sumber kalsium yang lain.