PUSAT PENGAJIAN TEKNOLOGI INDUSTRI
UNIVERSITI SAINS MALAYSIA

BORANG PENYERAHAN DISERTASI MUTAKHIR
SATU (1) NASKAH

Nama penyelia: _____Assoc. Prof. Dr. Cheng Lai Hoong_____

Bahagian: _____Teknologi Makanan_____

Saya telah menyemak semua pembetulan/pindaan yang dilaksanakan oleh Encik/Puan/Cik _____Najihah binti Mohd Rafi_____ mengenai disertasinya sebagaimana yang dipersetujui oleh Panel Pemeriksa di *Viva Voce*-nya.

2. Saya ingin mengesahkan bahawa saya berpuashati dengan pembetulan/pindaan yang dilaksanakan oleh calon.

Sekian, terima kasih.

DR. CHENG LAI HOONG
(ASSOCIATE PROFESSOR)
FOOD TECHNOLOGY DIVISION
SCHOOL OF INDUSTRIAL TECHNOLOGY
UNIVERSITI SAINS MALAYSIA

(Tandatangan dan cop)

7/8/2020
(Tarikh)

EFFECTS OF GLUCONO-DELTA-LACTONE (GDL) ON PASTING, RHEOLOGICAL AND TEXTURAL PROPERTIES OF WAXY RICE STARCH

by

NAJIHAH BINTI MOHD RAFI

A dissertation submitted in partial fulfilment of the requirements for the degree of Bachelor of Technology (B. Tech) in the field of Food Technology

School of Industrial Technology

Universiti Sains Malaysia

July 2020

DECLARATION BY AUTHOR

This dissertation is composed of my original work and contains no material previously published or written by another person except where due reference has been made in the text. The content of my dissertation is the result the work I have carried out since the commencement of my research project and does not include a substantial part of work that has been submitted to qualify for the award of any other degree or diploma in any university or other tertiary institution.

……...

Najihah Mohd Rafi

July 2020

ACKNOWLEDGEMENTS

I would like to convey my sincere appreciation and gratitude to my final year project supervisor, Associate Professor Dr. Cheng Lai Hoong, who has the substance of a genius: she convincingly guided and keep me on the correct path. Without her persistent help, this thesis would not have been realized.

I would like to express special thanks to my supervisor's Ph. D student, Ms. Afirah for her insightful helps and suggestions which was really influencing in shaping my experimental methods in this project. Furthermore, I would like to extend my sincere thanks to Encik Rahim for his guidance throughout the pasting, rheology and textural analyses during my research study.

In addition, I wish to acknowledge the support of my course mates, Minden house mates and friends as well as my beloved family members. They kept me going on and this work would have not been possible without their input.

Lastly, I perceive this project as a big milestone in my career development since the normal routines in conducting the research, writing process, motivation and support was greatly affected during the global COVID-19 pandemic. I am truly blessed to have the support of so many beautiful souls which strengthen me in completing this research study.

NAJIHAH MOHD RAFI

JULY 2020

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF SYMBOLS

Symbol	Definition
α	Alpha
°C	Degree Celcius
>	Greater-than
<	Lesser-than
%	Percent
±	Plus-minus
G’	Storage modulus
G’’	Loss modulus

LIST OF ABBREVIATIONS

Abbreviation	Definition
GDL	Glucono-delta-lactone
RVA	Rapid Visco Analyzer
SEM	Scanning electron mircrograph
w/v	Weight over volume

KESAN GLUKONO-DELTA-LAKTON (GDL) ATAS SIFAT-SIFAT PASTING, REOLOGI DAN TEKSTUR KANJI TEPUNG PULUT

ABSTRAK

Glukono-delta lakton (GDL) ialah sejenis asid lemah dan mudah untuk larut di dalam air. Penyelidikan yang fokus pada kesan penambahan GDL pada kanji sangat sukar didapati dan belum pernah ada kajian kesan GDL terhadap kanji dilaporkan dalam literatur. Oleh itu, penyelidikan ini dijalankan untuk mengkaji kesan GDL pada sifat-sifat *pasting*, reologi dan tekstur kanji tepung pulut. Sifat *pasting* dikaji dengan menggunakan "rapid visco analyser" (RVA). Penambahan GDL didapati meningkatkan kelikatan puncak dan kelikatan pecahan pes kanji tepung pulut. Apabila kepekatan larutan GDL meningkat, didapati bahawa kelikatan palung, kelikatan akhir dan kelikatan kemunduran menurun secara berperingkat. Seterusnya, analisis aliran keadaan mantap dan analisi berayun telah dijalankan untuk mengkaji sifat-sifat reologi kanji tepung pulut. Untuk analisis aliran keadaan mantap, apabila kadar ricih meningkat, kelikatan pes kanji tepung pulut dengan penambahan larutan GDL berkurangan dan juga menyebabkan pengurangan dalam nilai tiksotropik. Pes tepung pulut menunjukkan tingkah laku bukan Newtonian dan penipisan ricih. Untuk analisis berayun, nilai G' and G'' meningkat dengan meningkatnya frekuensi, dan G' adalah lebih tinggi nilai berbanding G'' untuk semua frekuensi selari dengan peningkatan kepekatan larutan GDL. Daripada kajian Back Extrusion adalah didapati pes tepung pulut yang disediakan dengan menggunakan larutan GDL 0.03% telah menunjukkan pengurangan yang progresif dari segi parameter keteguhan, ketekalan, kekompakan dan indek kelikatan sepanjang masa penyimpanan. Ini menunjukkan pes tepung pulut dengan penambahan GDL mempamerkan penurunan kecenderungan tahap retrogradasi.