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Saya telah menyemak semua pembetulan/pindaan yang dilaksanakan oleh ~~Encik~~/~~Puan~~/Cik Wan Zulaikha Adrina binti Wan Ahmad Zikri

mengenai disertasinya sebagaimana yang dipersetujui oleh Panel Pemeriksa di *Viva Voce*-nya.

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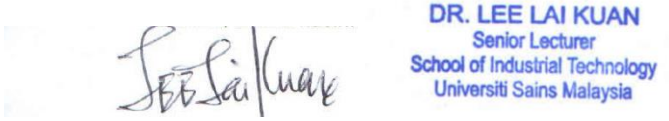
Sekian, terima kasih.



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GLYCEMIC INDEX VALUES OF INSTANT MULTIGRAIN BEVERAGE: CURRENT KNOWLEDGE AND FUTURE PROSPECTS

by

WAN ZULAIKHA ADRINA BINTI WAN AHMAD ZIKRI

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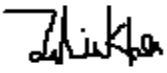
DECLARATION BY AUTHOR

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 of 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 my degree or diploma in any university or other tertiary institution.



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LIST OF ABBREVIATIONS

Abbreviations	Caption
%	Percentage
℃	Degree celcius
AACC	American Association of Cereal Chemists
ANOVA	Analysis of Variance
AOAC	Association of Analytical Communities
ASN	American Society of Nutrition
AUC	Area Under The Curve
BMI	Body Mass Index
CHO	Carbohydrate
CVD	Cardiovascular Disease
DM	Diabetes Mellitus
FAO	Food and Agriculture Organization
g	Gram
GDH-FAD	Glucose Dehydrogenaseflavin adenine dinucleotide
GI	Glycemic Index
GL	Glycemic Load
GOD-POD	Glucose Oxidation-Peroxidase
HI	Hydrolysis Index
HDL	High-density lipoprotein
HI	Hydrolysis Index

IDF	Insoluble dietary fibre
kcal	Kilocalorie
M	Molar
mg	Miligram
min	Minute
ml	Millilitre
MoH	Ministry of Health
Na	Sodium
PDCAAS	Protein Digestibility Corrected Amino Acid Score
pH	Potential of Hydrogen
RDS	Rapidly Digestible Starch
RS	Resistant Starch
SD	Standard Deviation
SDF	Soluble dietary fibre
SDS	Slowly Digestible Starch
SEM	Standard Error of the Mean
SPSS	Statistical Package for the Social Sciences
TDF	Total dietary fibre
USDA	United States Department of Agriculture
WHO	World Health Organization

GLISEMIK INDEKS MINUMAN SEGERA BIJIRAN CAMPURAN: PENGETAHUAN SEMASA DAN PROSPEK MASA DEPAN

ABSTRAK

Biji-bijian sering dikonsumsi sebagai makanan tetapi dengan teknologi canggih, biji-bijian dalam bentuk serbuk dapat digunakan oleh pengguna kerana mereka dapat menyiapkannya dengan serta-merta. Produk minuman segera bijiran campuran adalah sesuai untuk orang yang tidak aktif dan ia mempunyai tempoh ketahanan yang lama. Kajian ini bertujuan untuk menentukan nilai indeks glisemik untuk minuman segera bijiran campuran berdasarkan pengetahuan semasa dan prospek masa depan, menilai perbezaan antara kaedah berdasarkan kaedah *in vitro* dan kajian klinikal untuk penentuan indeks glisemik dan mencadangkan nilai indeks glisemik yang disyorkan untuk minum segera bijian campuran berdasarkan kajian terdahulu. Dari hasilnya, kekuatan kajian dalam ujian klinikal lebih besar daripada kaedah *in vitro* kerana ketepatannya. Walau bagaimanapun, kajian sebelumnya menunjukkan bahawa kaedah *in vitro* mempunyai batasan yang lebih sedikit berbanding dengan ujian klinikal yang digambarkan sebagai mahal, memakan masa, sukar dan diperlukan di kalangan manusia yang termotivasi untuk menyelesaikan penyelidikan kajian. Dan dapat disimpulkan bahawa minuman segera bijiran campuran dianggap mempunyai nilai GI rendah berdasarkan beberapa kajian sebelumnya yang dilakukan oleh penyelidik di seluruh dunia. Sebilangan besar produk bijiran campuran dinilai sebagai GI rendah kerana kandungan serat makanannya yang tinggi, kandungan protein yang tinggi dan faktor lain yang menghasilkan tindak balas glisemik yang perlahan ketika memakan produk bijiran campuran. Nilai glisemik yang disyorkan adalah antara 30-40, mengambil jumlah purata iaitu 35.

GLYCEMIC INDEX OF INSTANT MULTIGRAIN BEVERAGE: CURRENT KNOWLEDGE AND FUTURE PROSPECTS

ABSTRACT

Grains often consumed as food but with advanced technology, it is in powdered form which is convenient to consumers as they can prepare it instantly. Instant multigrain beverage product provides longer shelf life and convenient to sedentary people. The study is aimed to study the glycemic index values for instant multigrain beverage based on current knowledge and future prospects, observe the differences between methods based on *in vitro* and clinical trial method for determination of glycemic index and to suggest the recommended glycemic index values for instant multigrain beverage based on previous studies. From the results, the strength of the current study on clinical trial is greater than *in vitro* method because of its accuracy. However, previous studies shown that *in vitro* method have fewer limitations compared to clinical trial that were described as costly, time-consuming, laborious and required participants among human beings that are motivated to complete the study research. And it can be concluded that instant multigrain beverage is considered having low GI value based on several previous studies done by researchers worldwide. Most multigrain products evaluated as low GI due to their high dietary fibre content, high protein content and other studies that resulted in slow glycemic response when consuming multigrain products. The recommended glycemic value between 30-40, averaged as 35.