





**DEVELOPMENT AND PHYSICOCHEMICAL ANALYSIS OF WHOLEMEAL  
BREAD INCOPORATED WITH PASSION FRUIT PEEL POWDER**


**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  
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## ENDORSEMENT

The project report entitled **development and physicochemical analysis of wholemeal bread incorporated with passion fruit peel powder** by **Tan Chun Yi**, Matric No. **UK16598** 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 fulfillment of the requirement of the degree of 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

The study is to determine the physicochemical characteristic and sensory of passion fruit peel powder (PFPP) and the wholemeal bread with the substitution of PFPP. The substitution with PFPP into the bread is up to 20%. The substitution with PFPP increases the crude fiber content in the wholemeal bread insignificantly. Ash content and moisture content of the wholemeal bread is also increase from the control to 20% of substitution. The other proximate analysis like crude fat and carbohydrate content is reducing from control to 20% of PFPP substitution. The protein content of the products is decreasing as well but increase in 15% follow with the drop on 20%. The color of bread crust and bread crumb is affected by the substitution of PFPP with increasing brightness in bread crumb but decrease in bread crust. However, the redness and yellowness of both bread crumb and bread crust do not show any trend like the brightness does. The loaf volume and specific volume of the bread is decreasing and the 20% substitution shows the lowest. Microstructure of the wholemeal bread shows the distribution of the pore and also the pore size of the bread was affected by the substitution. Sensory test shows that the acceptance of the wholemeal bread with PFPP substitution is not accepted in the highest substitution level but is accepted in lower substitution level.

## ABSTRAK

Kajian ini adalah untuk mengkaji sifat fizikokimia dan penilaian deria untuk serbuk kulit buah markisah (SKBM) dan juga roti gandum penuh dengan menggantikan SKBM. Penggantian SKBM dalam roti gandum penuh tersebut adalah sebanyak 20%.Penggantian ini telah meningkatkan kandungan gentian kasar dalam roti gandum penuh secara tidak signifikansi.Kandungan abu dan kandungan kelembapan dalam roti gandum penuh juga telah meningkat dari kawalan sehingga 20% penggantian. Analisis proksimat seperti lemak kasar dan kandungan karbohidrat menurun dari kawalan ke 20% SKBM penggantian. Kandungan protein dalam roti ini juga menyusut tetapi menaikkan lagi di 15% dan diikuti oleh penyusutan dalam 20%. Warna kulit roti dan isi roti dipengaruhi oleh penggantian SKBM dengan peningkatan keterangan dalam isi roti tetapi keterangannya menurun dalam kulit roti. Akan tetapi, kedua-dua kemerahan dan kekuningan tiada corak seperti corak yang ditunjukkan oleh keterangan. Isipadu sebuku dan isipadu spesifik menurun dan 20% penggantian adalah yang terendah. Mikrostruktur dalam roti gandum penuh menunjukkan taburan liang lubang dan juga saiz lubang roti dipengaruhi oleh penggantian. Penilaian deria menunjukkan penerimaan keseluruhan roti gandum penuh dengan penggantian SKBM adalah tidak diterima pada tahap penggantian yang tertinggi tetapi ia diterima pada tahap penggantian yang rendah.