

THE EFFECTS OF PHYSICOCHEMICAL AND SENSORY
CHARACTERISTICS OF COOKIES MADE WITH
BUTTER, MARGARINES AND SHORTENING

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**THE EFFECTS OF PHYSICO-CHEMICAL AND SENSORY
CHARACTERISTICS OF COOKIES MADE WITH
BUTTER, MARGARINES AND SHORTENING**

MOK HOO SIN

**RESEARCH PROJECT submitted in partial fulfillment of the requirements for the
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(Food Service and Nutrition)**

**FACULTY OF AGROTECHNOLOGY AND FOOD SCIENCE
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DECLARATION

I hereby declare that this research project is based on my original work except for quotations and summaries, which have been duly acknowledged.

3rd MAY 2006



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PN. FARIDAH YAHYA

(Supervisor)

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ABSTRACT

Margarine (MA) and shortening (SO) was applied into cookies at different percentages of fat blends to determine the effects on the physico-chemical characteristics and the sensory acceptance of cookies. Ten treatments of butter (BU), margarine (MA), and shortening (SO) were prepared according to the three conventional component mixture design to prepare cookies. SAS programme was used to determine the Analysis of Variance (ANOVA) and Duncan's Multiple Range Test (DMRT). Contour plots of each characteristic or attribute and superimposed of contour plots were generated by using the Stat-ease Design Expert programme. Statistical analysis regarding physical characteristics of cookies indicated that treatments have no significant effect on hardness, fracturability and colour of cookies. The hardness of cookies increased with increased levels of margarine and butter while the fracturability of cookies increased with increased levels of shortening. The lightness and redness of cookies decreased with increased level of butter and margarine while yellowness of cookies decreased with increased level of shortening. Chemical analysis has also significant effects on moisture content of cookies while fat content showed no significant change. The moisture content of cookies decreased but the fat content of cookies increased while with increased levels of shortening. The optimum ranges for butter were 50-100%, 0-50% margarine and 0-6% shortening. Formulation A that made with 100% butter and Formulation D that made with 50% butter and 50% margarine was in the optimum range or optimum regions of the fat blends. There are 50 panels involved in the affective sensory test. Cookies that prepared with higher percentage of butter and margarine were more acceptable by the panels and showed significant different ($p < 0.05$) with the acceptance of cookies which made with high percentage of shortening. This indicated that proper composition of margarine and shortening have the potential to substitute part of the butter in cookie-making.

KESAN CIRI-CIRI FIZIKOKIMIA DAN SENSORI KE ATAS BISKUT YANG DIHASILKAN DARIPADA MENTEGA, MARJERIN DAN LEMAK SAYURAN

ABSTRAK

Majerin (MA) dan lemak sayuran (SO) telah digunakan dalam penyediaan biskut dalam gabungan lemak dalam peratusan yang berbeza untuk mengkaji kesan ke atas ciri-ciri fizikokimia dan sensori biskut. Sepuluh rawatan daripada mentega (BU), majerin (MA), dan lemak sayuran (SO) telah disediakan berpandukan rekabentuk campuran konvensional tiga komponen untuk menyediakan biskut. Program SAS digunakan untuk melakukan analisis varians ANOVA dan Duncan's Multiple Range Test (DMRT). Plot contour bagi setiap ciri fizikokimia dan sensori atribut dijana dengan menggunakan Stat-ease Design Expert. Analisis statistik yang berkait dengan ciri-ciri fizikal biskut menunjukkan bahawa rawatan itu tidak mempunyai kesan yang signifikan dalam kekerasan, kerapuhan dan warna biskut. Kekerasan biskut meningkat dengan penambahan aras mentega dan majerin manakala kerapuhan biskut meningkat dengan penambahan aras lemak sayuran. Kecerahan dan warna kemerahan biskut menurun dengan penambahan aras mentega dan majerin sementara warna kekuningan menurun dengan penambahan aras lemak sayuran. Analisis kimia mempunyai kesan signifikan dalam kandungan kelembapan biskut manakala kandungan lemak menunjukkan perbezaan yang tidak signifikan. Kandungan kelembapan biskut menurun sementara kandungan lemak meningkat dengan penambahan aras lemak sayuran. Julat respons optimum untuk mentega ialah 50-100%, 0-50% majerin, dan 0-6% lemak sayuran. Formulasi A yang dihasilkan daripada 100% mentega dan Formulasi D yang dihasilkan dengan 50% mentega dan 50% majerin adalah berada dalam julat optimum. Sebanyak 50 panel terlibat dalam ujian afektif bagi penilaian sensori. Biskut yang disediakan dengan mentega dan majerin pada peratusan yang tinggi menunjukkan perbezaan yang signifikan ($p < 0.05$) dengan penerimaan biskut yang dihasilkan dengan peratusan lemak sayuran yang tinggi. Ini mencerminkan penambahan majerin dan lemak sayuran dalam peratusan yang sesuai adalah berpotensi untuk menggantikan sebahagian daripada mentega dalam penghasilan biskut.