STUDY OF PHYSICO-CHEMICAL PROPERTIES AND SENSORY EVALUATION OF WHITE BREAD USING DIFFERENT COMMERCIAL BRANDS OF HIGH GLUTEN FLOUR

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AUTHOR DECLARATION

بسم الله الرحمن الرحيم

I hereby declare that the work in this dissertation is my own except for quotations and summaries which have been duly acknowledged.

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ABSTRAK

Kajian ini telah mengkaji kandungan gluten dalam empat jenama komersial tepung yang tinggi kandungan gluten (A, B, C dan D digunakan sebagai kawalan) dan seterusnya mengkaji kualiti roti yang dihasilkan. Roti-roti tersebut telah dianalisis untuk analisis proksimat (serat kasar, protein kasar, kandungan lembapan dan kandungan abu), fizikal (warna kerak, kestabilan, ketinggian dan berat) dan deria (ujian analisis kuantitatif deskriptif dan ujian hedonik). Sampel-sampel tepung mengandungi anggaran kandungan gluten 11.58-18.88%. Untuk analisis fizikal, terdapat perbezaan yang signifikan antara semua sampel roti berdasarkan ciri kestabilannya. Berdasarkan ujian analisis warna, didapati bahawa roti C mempunyai nilai "a" dan "L" yang paling tinggi. Nilai tertinggi bagi nisbah berat terhadap tinggi yang telah diperolehi adalah roti D. Keputusan daripada sifat-sifat kimia pada sampel-sampel roti menunjukkan bahawa linkungan kandungan protein kasar (dari 8.37%-10.54%); serat kasar (dari 0.082%-1.066%); lembapan (dari 27.90%-40.95%); abu (dari 0.67%-1.02%); karbohidrat (dari 43.41%-56.66%); nilai tenaga (dari 243.36 Kcal-292.59Kcal). Daripada ujian QDA, sampel B dan D tidak mempunyai perbezaan yang signifikan untuk setiap atribut kecuali kekerasan. Para panel telah memilih roti D sebagai roti yang paling bole diterima berbanding dengan semua sampel roti dalam ujian hedonik. Kandungan lembapan di dalam roti C adalah signifikan berbanding sampel – sampel lain pada nilai $P < 0.05$. Nilai abu tidak mempunyai perbezaan signifikan di antara sampel roti A-C kecuali D, sampel kawalan. Terdapat perbezaan yang signifikan di antara semua sampel roti dalam kandungan protein dan karbohidratnya. Tepung sampel C mengandungi kandungan gluten paling tinggi yang menghasilkan roti yang mengandungi kandungan protein, serat, tenaga, dan karbohidrat paling tinggi, seteusnya mempunyai kandungan lembapan paling rendah dan sederhana kandungan abunya. Oleh itu, ia boleh dirumuskan bahawa sampel C adalah tepung yang terbaik antara semua sampel tepung untuk menghasilkan roti yang mengandungi banyak ciri-ciri nutrisi, manakala roti D adalah roti yang terbaik dalam penerimaan. Sensori secara keseluruhannya.

Kata kunci: Roti, Tepung Tinggi gluten, Ciri-ciri fiziko-kimia, Penilaian sensori, Jenama.

ABSTRACT

This study was aimed to study the gluten content in four commercial brands of high gluten flour (A, B, C and D which served as control) and the quality of bread produced from these flour were assessed for physic-chemical and sensory properties. The breads were analyzed for proximate compositions (crude fiber, crude protein, moisture content and ash content), physical (crust colour, firmness, height and weight) and sensory (Quantitative Descriptive analysis test and hedonic test). The flour samples had gluten content that ranged from 11.58-18.88%. For physical analysis, there were significant differences among all the bread samples in term of firmness. The colour analysis observed that bread C had the highest "a" value and "L" value. The highest value of weight to height ratio was obtained in bread D. Results of chemical properties on bread samples indicated that crude protein ranging from (8.37%-10.54%); crude fiber (from 0.082%-1.066%); moisture (from 27.99%-40.95%); ash (from 0.67%-1.02%); carbohydrate (from 43.41%-56.66%); energy value (from 243.36 Kcal-292.59Kcal). From QDA test, bread B and bread D did not differ significantly for each attributes except hardness. Panelists chose bread D as the most acceptable among the other bread samples in hedonic test. The moisture content of bread C was significantly different from other samples at $P < 0.05$. The ash values were not significant different among breads A-C, except D, the control sample. There were significant different among all bread samples in term of protein and carbohydrate content. Flour sample C had the highest gluten content which produced bread that had the highest protein, fiber, energy and carbohydrate contents, and had lowest moisture content and moderate ash. Hence, it can be concluded that sample C is the best among the flour samples to produce bread that contains much of the nutritional properties while bread D had the best overall sensory preference.

Keywords: Bread, High gluten flour, Physico-chemical Properties, Sensory Evaluation, Brands.

ملخص البحث

تهدف هذه الدراسه إلى دراسة محتوى الغلوتين في أربعة ماركات التجارية من الطحين عالية من الغلوتين (أ, ب, س, د التي استخدمت كعينة ضابطة) و تم تقييم جودة الخبز المنتج من هذه الدقيق من حيث الخواص الفيزيائية, الكيميائية و الحسية. وقد تم تحليل الخبز للتركيبات (الألياف الخام، البروتين الخام، محتوى الرطوبة والرماد)، المادي (لون القشرة والحزم، والطول والوزن) والحسي (اختبار التحليل الوصفي_ الكمي واختبار التلذذ). تراوح محتوى الغلوتين في عينات الدقيق من 11.58% الى18.88 .%. للتحليل الفيزيائي، كانت هناك اختلافات كبيرة بين جميع عينات الخبز في المدى من الحزم. تحليل اللون أظهر بأن عينة الخبز س حصلت على أعلى قيمة. تم الحصول على أعلى قيمة من وزنه إلى نسبة الارتفاع في عينة الخبز د. وأشارت نتائج الخصائص الكيميائية على عينات الخبز الذي البروتين الخام تتراوح بين (8.37% -10.54%)؛ الألياف الخام (من 0.087% -1.066%)؛ الرطوبة (من 27.90% -40.95%)؛ الرماد (من 0.67% -1.02%)؛ الكربوهيدرات (من 43.41% -56.66%)؛ قيمة الطاقة (من 243.36 كيلو كالوري-292.59 كيلو كالوري). التحليل الحسي اظهر بأن عينة الخبز ب, دلا تختلف كثيرا في كل الصفات إلا صلابة. اختار المشاركون الخبز د باعتبارها الأكثر قبولا بين عينات الخبز الأخرى في اختبار التلذذ (المتعة). وكان محتوى الرطوبة في الخبز س تختلف كثيرا عن عينات أخرى. وكانت القيم الرماد لا تختلف كثيرا بين عينات الخبز ماعدا عينة الخبز د, العينة الضابطة. كان هناك اختلاف كبير بين جميع عينات الخبز في المحتوى البروتيني والكربوهيدراتي. أعلى محتوى من الغلوتين كان في عينة الدقيق س, والتي انتجت الخبز الذي امتلك أعلى محتويات البروتين، والألياف، والطاقة، والكربوهيدرات، وكان أدنى نسبة الرطوبة والرماد كان معتدل. وبالتالي، فإنه يمكن استنتاج أن عينة س هو الأفضل من بين عينات الدقيق لإنتاج الخبز الذي يحتوي على الكثير من الخصائص الغذائية بينما كان الخبز د أفضل تفضيل الحسي بشكل عام.

كلمات المفتاحية:

الخبز, طحين عالي الغلوتين, خصائص الفيزيائية والكيميائية, التقييم الحسي, الماركات.

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ABBREVIATIONS

ANOVA	Analysis of Variance
AACC	American Association of Cereal Chemists
AOAC	American Official Analytical Chemist
USIM	Universiti Sains Islam Malaysia
A	Daimond brand flour
B	Layang- Layang brand flour
C	Gunung-mas brand flour
D	Hovis brand flour (control)