PEMBANGUNAN MI SEGERA CAMPURAN RUMPAI LAUT MERAH, *Eucheuma denticulatum*

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FAKULTI SAINS MAKANAN DAN PEMAKANAN

UNIVERSITI MALAYSIA SABAH

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PEMBANGUNAN MI SEGERA CAMPURAN RUMPAI LAUT MERAH, *Eucheuma denticulatum*

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IJAZAH	:	**SARJANA MUDA SAINS MAKANAN (TEKNOLOGI MAKANAN DAN BIOPROSES)**
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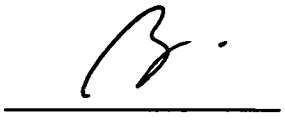

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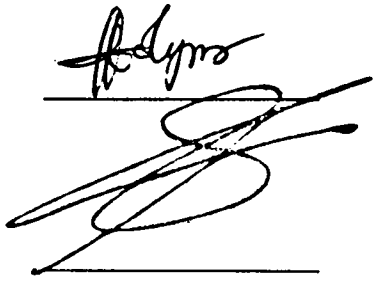

4. DEKAN

ASSOC. PROF. DR. SHARIFUDIN MD SHAARANI

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ABSTRAK

Kajian ini bertujuan untuk menghasilkan mi segera campuran serbuk rumpai laut merah, *Eucheuma denticulatum*. Formulasi 2 yang mengandungi 7.5% serbuk *Eucheuma denticulatum* telah dipilih sebagai formulasi terbaik menerusi ujian kualiti pemasakan, fizikal, pemeringkatan BIB, sensori hedonik, komposisi kimia, antioksidan dan kualiti penyimpanan. Mi segera dengan campuran 7.5% serbuk *Eucheuma denticulatum* mempunyai jangka masa pemasakan selama 3.25 minit. Aktiviti air dan kehilangan masakan mi segera dengan campuran 7.5% serbuk *Eucheuma denticulatum* adalah lebih rendah daripada sampel kawalan tetapi hasil masakan adalah lebih tinggi daripada sampel kawalan ($p<0.05$). Analisis proksimat menunjukkan bahawa sampel tersebut mengandungi 9.64% kelembapan, 1.86% abu, 11.90% protein, 1.85% lemak, 8.79% serat diet dan 65.95% karbohidrat. Analisis mineral menunjukkan bahawa sampel tersebut mengandungi 134.01mg/100g kalium, 39.22mg/100g natrium, 70.33mg/100g magnesium, 34.10mg/100g kalsium, 4.70mg/100g besi dan 2.35mg/100g zink. Analisis aktiviti antioksidan menunjukkan sampel jisim kering tersebut mempunyai nilai FRAP 120.21 mM/g, nilai DPPH 74% pemerangkapan dan 4.42 mg GAE/g jumlah kandungan fenolik. Perbandingan telah dibuat di antara formulasi terpilih dan sampel kawalan semasa kajian mutu simpanan (25±5°C). Kekuatan tensile, kekerasan, nilai pH, aktiviti air, mi segera dengan campuran 7.5% serbuk *Eucheuma denticulatum* semakin menurun, warnanya semakin gelap dan kelembapannya semakin meningkat sepanjang lapan minggu penyimpanan ($p<0.05$). Ujian mikrobiologi menunjukkan tiada pertumbuhan mikrob yang didapati pada mi segera rumpai laut selepas 8 minggu penyimpanan. Imej pengimbasan elektron menunjukkan campuran 7.5% serbuk *Eucheuma denticulatum* melemahkan struktur dalaman *mi* segera. Ujian pengguna menunjukkan *mi* segera dengan 7.5% *Eucheuma denticulatum* mempunyai penerimaan sensori yang baik. Kesimpulannya, penambahan 7.5% serbuk rumpai laut dapat mengekalkan kekuatan tensile, meningkatkan nutrisi proksimat, serat diet, mineral, antioksidan dan memperbaiki kualiti pemasakan mi segera. Ini dapat memberi kemudahan kepada masyarakat untuk mencapai pemakanan yang seimbang serta mempelbagaikan makanan fungsian di Malaysia.

ABSTRACT

The objective of this study was to develop instant noodles with red seaweed powder derived from Eucheuma denticulatum. Formulation 2 was chosen as the best formulasion that contained 7.5% Eucheuma denticulatum seaweed powder through physical analysis, BIB Design Test, Hedonic Test, chemical composition analysis, antioxidant activity analysis and storage study. The cooking time of seaweed instant noodles with 7.5% Eucheuma denticulatum seaweed powder was 3.25 minutes. The water activity and cooking loss of instant noodles with 7.5% Eucheuma denticulatum powder was less than the control sample but the cooking yield was higher than the control sample ($p<0.05$). Proximate analysis showed that this sample contained 9.64% moisture, 1.86% ash, 11.90% protein, 1.85% fat, 8.79% dietary fibre, and 65.95% carbohydrate. Mineral analysis showed that this sample contained 134.01mg/100g potassium, 39.22mg/100g sodium, 70.33mg/100g magnesium, 34.10mg/100g calcium, 4.70mg/100g iron and 2.35mg/100g zinc. Antioxidant activity test showed that the dry weight of this sample had a FRAP value of 120.21mM/g, DPPH value of 74% inhibition and 4.42mg GAE/g total phenolic content. Comparison was made between the selected formulation and control sample during storage (25±5°C) studies. The tensile strength, hardness, pH value, water activity of seaweed instant noodles with 7.5% Eucheuma denticulatum seaweed powder were lower, the colour was darker and the moisture content was higher. The microbiological test showed that no microorganism growth on the seaweed instant noodles with 7.5% Eucheuma denticulatum seaweed powder after 8 weeks of storage. Micrograph scanning electron showed that addition of 7.5% Eucheuma denticulatum seaweed powder weaken internal structure of instant noodles. Consumer test showed that instant noodles with 7.5% Eucheuma denticulatum seaweed powder had good sensory acceptance. In conclusion, the addition of 7.5% Eucheuma denticulatum seaweed powder retained tensile strength, increased proximate nutrients, dietary fiber, mineral, antioxidant and improved cooking quality of instant noodles, thus offering convenience for the society to maintain a balanced diet and increased the variety of functional food in Malaysia.

ISI KANDUNGAN

SENARAI RAJAH

SENARAI JADUAL

SENARAI FORMULA

SENARAI SINGKATAN

ANOVA	*Analysis of Variance*
TDF	Jumlah serat diet (*total dietary fibre*)
cm	sentimeter
g	gram
PP	Polipropilena
mg	miligram
ml	mililiter
mm	milimeter
PCA	*Plate Counte Agar*
PDA	*Potato Dextrose Agar*
SPSS	*Statistical Package for Social Science*
tpc	*Total Plate Count*
YMC	*Yeast and Mould Count*
pps	*Pulses per second*
in	inci
kpa	kilopaskal
mmHg	*Millimiter of mercury*
ppm	*Parts per million*
kcal	Kilo kalori
µg	mikrogram
GAE	Asid galik setara
λ	Panjang gelombang
µM	Micrometer

TPTZ	*2,4,6-Tripyridyl-s-Triazine*
HCL	Asid hidroklorik
EtOH	Etanol (95%)
Ca	Kalsium
Na	Natrium
Zn	Zink
Fe	Besi
DHA	Asid docosahexanoik
K	Kalium
Mg	Magnesium
µmol	Micromol
µg	Microgram
BHA	*Butylated Hydroxyanisole*
cfu	Unit pembentukan koloni
MPN	*Most probable number*
BCB	Ujian antioksidan ß-karotena *bleaching*
WSN	Mi putih bergaram (*white salted noodles*)
YAN	Mi kuning beralkali (*yellow alkali noodles*)
FRAP	Ujian antioksidan*Fluorescence Recovery After Photobleaching*
DPPH	Ujian antioksidan *2,2-Diphenyl-1-Picrylhydrazyl*
TPC	Jumlah kandungan fenolik
HDL	*High density lipoprotein*
BC	2000 tahun lepas(*Before Christ*)
BIB	*Balance Incomplete Blok*
LSD	*Least significance difference*

PPO	aktiviti polifenol oksidasi
Tukey-HSD	*(Honestly Significant Difference) test*

SENARAI SIMBOL

%	Peratus
°C	Darjah Celsius
&	Dan
=	Sama dengan
×	Darab
<	Lebih kurang daripada
>	Lebih besar daripada
±	*Plus minus*
ω	*Omega*
R^2	*R-square*

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