PARTIAL SUBSTITUTION OF WHEAT FLOUR WITH LOCUST

(*Locusta migratoria*) POWDER IN WHITE SALTED NOODLE

INCORPORATED WITH SPI AND MTG WITH INCOMPLETE

INFORMATION: AN EXPERIMENTAL STUDY.

by

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

NUR AMIRAH BINTI ZAINALABIDIN

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LIST OF ABBREVIATIONS AND SYMBOLS

Abbreviation	**Caption**
g	Gram
LMW	Low molecular weight
HMW	High molecular weight
MTG	Microbial Transglutaminase.
SPI	Soy Protein Isolate.
WN-L0	Controlled wheat noodle.
WN-L5	Wheat noodle with 5% of locust powder.
WN-L5A	Wheat noodle with 5% of locust powder using 45g of water.
WN-L5B	Wheat noodle with 5% of locust powder using 48g of water.
WN-L5C	Wheat noodle with 5% of locust powder using 50g of water.
WN-L5/MTG	Wheat noodle with 5% of locust powder and microbial transglutaminase.
WN-L5/SPI	Wheat noodle with 5% of locust powder and soy protein isolate.
WN-L10/SPI	Wheat noodle with 10% of locust powder and soy protein isolate.
WN-L10/SPI10	Wheat noodle with 10% of locust powder and 10g of soy protein isolate.
WN-L10/SPI/MTG	Wheat noodle with 10% of locust powder, soy protein isolate and microbial transglutaminase.
°C	Degree Celsius
±	Plus minus

PENGGANTIAN SEBAHAGIAN TEPUNG GANDUM DENGAN SERBUK BELALANG JUTA (*Locusta migratoria*) DALAM MI MASIN PUTIH YANG DICAMPUR DENGAN PROTIN KACANG SOYA TERASING DAN TRANSGLUTAMINASE MIKROB YANG MAKLUMATNYA TIDAK LENGKAP: KAJIAN UJI KAJI.

ABSTRAK

Peningkatan populasi mengancam keselamatan makanan kerana sumber protin dari tumbuhan dan haiwan tidak mencukupi. Belalang juta dibenarkan dalam Islam dan mengandungi kandungan protin yang agak tinggi. SPI dan MTG mungkin dapat membantu mengukuhkan struktur mi. Tujuan penyelidikan adalah untuk mengkaji kemungkinan formulasi mi putih masin yang diperbuat daripada serbuk belalang dengan menilai kualiti memasak mi masin putih apabila 5 dan 10% berat tepung serbuk belalang mengganti sebahagian daripada tepung gandum dan menyiasat kesan SPI dan MTG sebagai pengikat makanan. Pembuat mi menguli bahan selama 3 minit dan membiarkannya berehat selama 8 minit. Kemudian, pembuat mi mengeluarkan adunan secara automatik dan mi dilapisi dengan lapisan tepung nipis untuk mengelakkannya melekat. Mi kemudian dikukus selama 30 minit, dimasak dalam air suling mendidih. Semua formulasi tidak berjaya dibuat kecuali L0 dan L5 / SPI. Semakin bertambahnya jumlah peratusan serbuk belalang dalam mi masin putih, struktur jaringan dalam mi gandum semakin lemah apabila jumlah peratusan gluten menurun apabila diperhatikan secara visual dan masa yang diperlukan untuk memasak mi juga meningkat secara optimum. Perumusan selanjutnya diperlukan dengan menggunakan serbuk belalang yang dibuat dari bahagian badan sahaja dan memastikan pH mi sesuai untuk pengaktifan MTG.

PARTIAL SUBSTITUTION OF WHEAT FLOUR WITH LOCUST (*Locusta migratoria*) POWDER IN WHITE SALTED NOODLE INCORPORATED WITH SOY PROTEIN ISOLATE AND MICROBIAL TRANSGLUTAMINASE WITH INCOMPLETE INFORMATION: AN EXPERIMENTAL STUDY

ABSTRACT

The increasing population is threatening the food security as the protein source from plants and animals is insufficient. Migratory locust is permissible in Islam and contain quite high protein content. SPI and MTG may help to strengthen the noodle structure. The aim of the research is to survey the possible formulation for white salted noodle made from locust powder by evaluating the cooking quality of white salted noodle as locust powder is partially substituted locust powder (5 and 10% by flour weight) and investigate the effect of SPI and MTG as food binder. The noodle maker kneaded the ingredients for 3 minutes and let it rest for 8 minutes. Then, the noodle maker extruded the dough automatically and noodles were coated with a thin layer of flour to prevent sticking together. The noodle was then steamed for 30 minutes, cooked in boiling distilled water. All formulations were not form successfully except for L0 and L5/SPI. As the amount of locust powder percentage in white salted noodle increasing, network structure in the wheat noodle was weaken as the amount of gluten percentage decreases when observed visually and the time necessary to cook the noodle optimally increases. Further formulation is needed using locust powder made from body part only and ensure the noodle's pH suitable for MTG activation.