QUALITY ATTRIBUTES OF VACUUM FRIED AND ATMOSPHERIC DEEP FRIED PURPLE SWEET POTATO CHIPS

PENGARUH PENGGORENGAN UBI JALAR PADA TEKANAN VAKUM DAN ATMOSFER TERHADAP KUALITAS KERIPIK

BACHELOR THESIS

Submitted in partial fulfillment of the requirements for a Food
Technology Bachelor's degree in Faculty of Agricultural Technology

By:
JESSICA DEASY BUDIONO
16.11.0078

DEPARTMENT OF FOOD TECHNOLOGY
FACULTY OF AGRICULTURAL TECHNOLOGY
SOEGIJAPRANATA CATHOLIC UNIVERSITY
SEMARANG

2020

HALAMAN PENGESAHAN

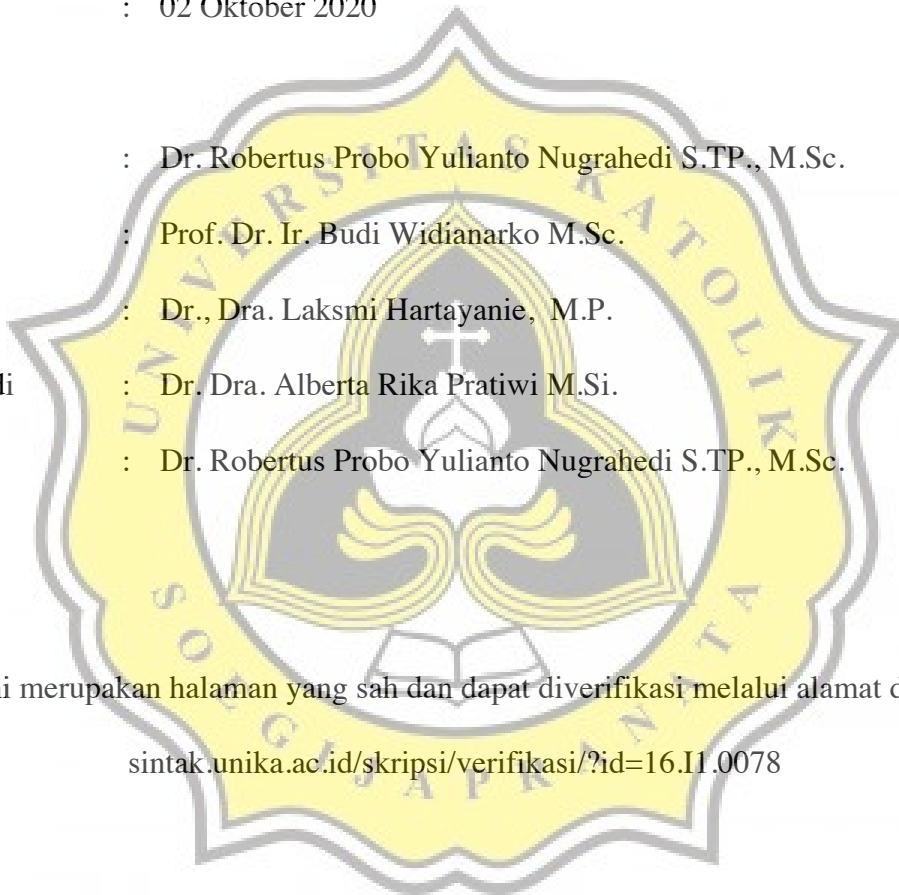|		
Judul Tugas Akhir:	:	QUALITY ATTRIBUTES OF VACUUM FRIED AND ATMOSPHERIC DEEP FRIED PURPLE SWEET POTATO CHIPS
Diajukan oleh	:	Jessica Deasy Budiono
NIM	:	16.I1.0078
Tanggal disetujui	:	02 Oktober 2020
Telah setujui oleh		
Pembimbing 1	:	Dr. Robertus Probo Yulianto Nugrahedi S.TP., M.Sc.
Penguji 1	:	Prof. Dr. Ir. Budi Widianarko M.Sc.
Penguji 2	:	Dr., Dra. Laksmi Hartayanie, M.P.
Ketua Program Studi	:	Dr. Dra. Alberta Rika Pratiwi M.Si.
Dekan	:	Dr. Robertus Probo Yulianto Nugrahedi S.TP., M.Sc.

Halaman ini merupakan halaman yang sah dan dapat diverifikasi melalui alamat di bawah ini.

sintak.unika.ac.id/skripsi/verifikasi/?id=16.I1.0078

HALAMAN PERNYATAAN ORISINALITAS
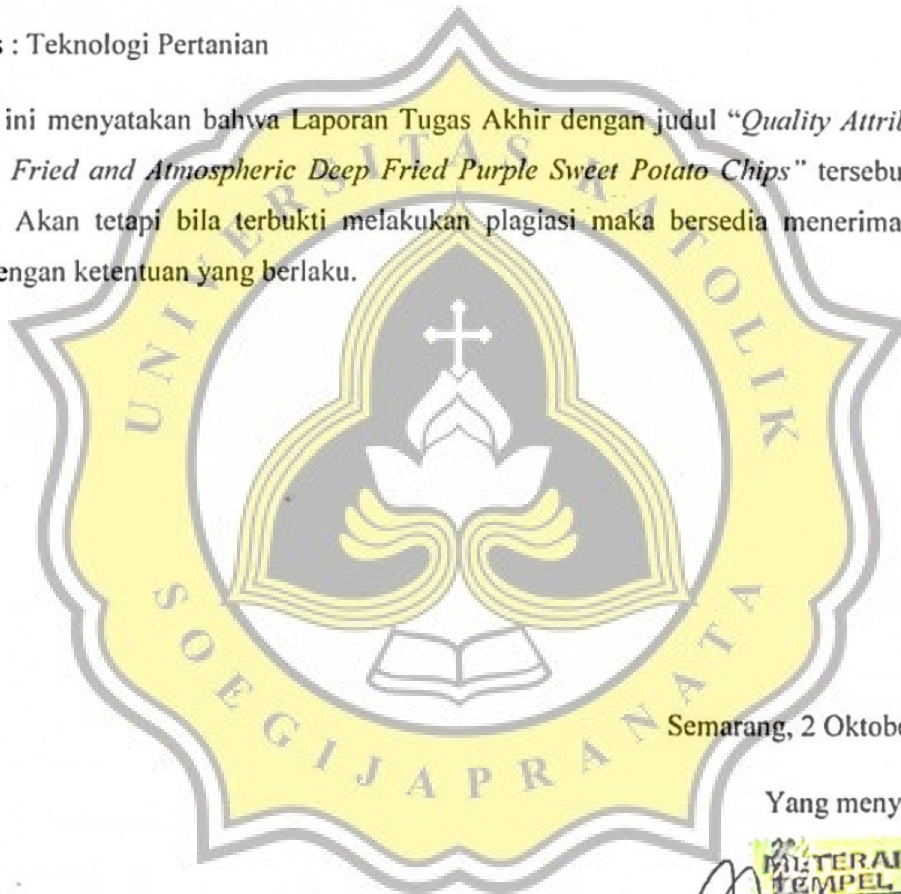
Yang bertanda tangan dibawah ini:

Nama : Jessica Deasy Budiono

NIM : 16.I1.0078

Progdi / Konsentrasi : Teknologi Pangan

Fakultas : Teknologi Pertanian

Dengan ini menyatakan bahwa Laporan Tugas Akhir dengan judul *"Quality Attributes of Vacuum Fried and Atmospheric Deep Fried Purple Sweet Potato Chips"* tersebut bebas plagiasi. Akan tetapi bila terbukti melakukan plagiasi maka bersedia menerima sanksi sesuai dengan ketentuan yang berlaku.

Semarang, 2 Oktober 2020

Yang menyatakan,

Jessica Deasy Budiono

SUMMARY

Consumers' increasing interest toward healthy food has led to healthier processing of snacks, to reduce the risk of overconsumption of snacks with high oil content. Vacuum frying is a considerably new method of food processing which is frying at low pressure, resulting in a lower boiling point of water, hence lowering the temperature of frying. Various benefits can be obtained, such as retaining nutritional content and preserving natural color and flavor. Vacuum frying is able to give the unique combination of flavor and texture that deep-frying gave with lower temperature and less excessive darkening. Purple sweet potato (*Ipomoea batatas*) was used as a frying sample in this research. Purple sweet potato is a tuber that has high carbohydrate and fibers, low protein and fat content, which is suitable to improve consumers' nutrition level. The objective of this study is to compare the quality attributes of vacuum fried purple sweet potato chips and atmospheric fried purple sweet potato chips.

The research was carried out in Taichung, Taiwan. The sample was fried at 105°C for 420s, while for conventional frying the sample was fried at 160°C for 120s. The color was analyzed using a spectrophotometer (Konica Minolta CM-5). The texture analysis was performed using Texture Analyzer (TA.XTplusC) with P/2 probe. The water content analysis was conducted using AOAC (2005) method, while the oil content analysis was performed according to AOCS (2017). The method used for Monomeric Anthocyanin Content (mg/L) was also conducted using AOCS (2005) with the absorbance was analyzed using UV-Vis Spectrophotometer. The sensory analysis was conducted according to 9-point-hedonic-rating-test.

Regarding the moisture and oil contents of chips, vacuum fried sample showed significantly higher and lower compared to atmospheric fried chips, respectively. While for the colors, vacuum fried sample showed lower L value and higher a* and b* value, with almost no difference in the texture, compared to atmospheric fried chips. The total anthocyanin content of chips decreased greatly compared to fresh purple sweet potato and was higher in vacuum fried chips compared to atmospheric fried chips. For the sensory evaluation of chips, the acceptability rate for each fried chips was not much different. In conclusion, vacuum frying is more appropriate compared to atmospheric frying in terms of manufacturing, resulting in better and healthier chips attributes.

RINGKASAN

Meningkatnya ketertarikan konsumen terhadap makanan sehat menyebabkan terjadinya perubahan cara pengolahan snack menjadi lebih sehat untuk mengurangi resiko konsumsi snack berlemak secara berlebihan. Penggorengan vakum merupakan metode penggorengan baru yang prosesnya berjalan dalam tekanan rendah sehingga menurunkan titik didih air, sehingga menurunkan temperatur penggorengan yang dibutuhkan. Manfaat yang didapatkan karena metode ini beragam, salah satunya dapat menjaga kandungan nutrisi serta warna dan rasa alami dari ubi jalar ungu. Penggorengan vakum dapat memberikan kombinasi rasa dan tekstur yang unik khas penggorengan rendam namun tanpa temperatur tinggi dan tanpa memberikan warna kecokelatan yang berlebih. Pada penelitian ini, ubi jalar ungu (Ipomoea batatas) digunakan sebagai sampel penggorengan. Ubi ini merupakan umbi yang memiliki kandungan karbohidrat dan serat yang tinggi, kandungan lemak dan protein yang rendah, sehingga sesuai untuk meningkatkan gizi konsumen. Penelitian ini bertujuan untuk membandingkan atribut kualitas keripik ubi ungu yang digoreng dengan tekanan vakum dan atmosferik.Penelitian ini dilakukan di kota Taichung, Taiwan.

Sampel digoreng pada suhu 105 °C selama 420 detik, sedangkan untuk penggorengan konvensional sampel digoreng pada suhu 160 °C selama 120 detik. Untuk analisis warna digunakan spektrofotometer (Konica Minolta CM-5). Analisis tekstur dilakukan menggunakan Texture Analyzer (TA.XtplusC) dengan probe P/2. Analisis kadar air dilakukan dengan metode AOAC (2005), sedangkan analisis kadar minyak dilakukan menurut metode AOCS (2017). Metode yang digunakan untuk analisis kandungan antosianin monomerik (mg/L) adalah AOCS (2005) dengan uji absorbansi dianalisis menggunakan spektrofotometer UV-Vis, sedangkan analisa sensori dilakukan dengan uji organoleptik 9 poin rating hedonik.

Mengenai hasil kandungan air dan kandungan minyak dari keripik, keripik yang digoreng secara vakum menunjukan hasil yang lebih tinggi dan rendah secara signifikan dibandingkan dengan keripik yang digoreng secara atmosfer. Sedangkan untuk analisis warna, nilai L keripik vakum lebih rendah, sedangkan nilai a dan b lebih tinggi dibandingkan keripik atmosferik. Total kandungan antosianin monomerik keripik menurun secara signifikan jika dibandingkan dengan ubi jalar ungu mentah, dan kandungan pada keripik vakum lebih tinggi dibandingkan keripik atmosfer. Untuk evaluasi sensori keripik, tingkat penerimaan keduanya tidak jauh berbeda. Pada kesimpulannya, penggorengan vakum lebih tepat digunakan untuk menghasilkan atribut keripik yang lebih sehat dibandingkan penggorengan atmosfer.

HALAMAN PERNYATAAN PUBLIKASI KARYA ILMIAH UNTUK KEPENTINGAN AKADEMIS

Yang bertanda tangan dibawah ini:

Nama : JESSICA DEASY BUDIONO

Program Studi : TEKNOLOGI PANGAN

Fakultas : TEKNOLOGI PERTANIAN

Jenis Karya : SKRIPSI

Menyetujui untuk memberikan kepada Universitas Katolik Soegijapranata Semarang Hak Bebas Royalti Nonekslusif atas karya ilmiah yang berjudul "PENGARUH PENGGORENGAN UBI JALAR PADA TEKANAN VAKUM DAN ATMOSFER TERHADAP KUALITAS KERIPIK" beserta perangkat yang ada (jika diperlukan). Dengan Hak Bebas Royalti Nonekslusif ini Universitas Katolik Soegijapranata berhak menyimpan, mengalihkan media/formatkan, mengelola dalam bentuk pangkalan data (database), merawat, dan mempublikasikan tugas akhir ini selama tetap mencantumkan nama saya sebagai penulis / pencipta dan sebagai pemilik Hak Cipta. Demikian pernyataan ini saya buat dengan sebenarnya.

Semarang, 2 Oktober 2020

Yang menyatakan

Jessica Deasy Budiono

PRE FACE

Praise in the name of Jesus Christ, because only by His grace and blessing, the author would have the opportunity to complete the thesis entitled "Comparing Quality Parameters of Vacuum Fried and Atmospheric Deep Fried Purple Sweet Potato Chips". This thesis was written to fulfill the requirement to acquire Bachelor Degree of Food Technology in Soegijapranata Catholic University, Semarang, Indonesia.

The author would not be able to finish the thesis alone, and only by huge support and guidance given by the great and very helpful people around the author this report could be finished. The author's highest gratitude is given to:

1. Almighty God that always blessed, saved and guided author in every step from the beginning to the end.

2. Dr. R. Probo Y. Nugrahedi, M.Sc. as supervisor and dean of faculty of agricultural technology Soegijapranata Catholic University, for giving the author the opportunity to finish this final thesis.

3. Professor Junquan Roger Wang as author's supervisor during the Internship in Providence University, for giving the author a great opportunity to do this project and the excellence guidance and advice during the process. Professor Yun-Chin Chung and Dr. Peiming Wang for giving author guidance and advice during author's internship.

4. Jane and Iris as author's lab instructor during the internship. Thank you for giving me such a great help for my final thesis, your guidance in conducting the research, and the great patience during the research. Astrid and Katie, for guiding the author during her internship and creating such a positive learning environment. The author would also send her upmost gratitude toward every single student in Lab G212 for being a part of her internship.

5. Families, parents (Tan Mie Ling and Budijono Sarwono) and sister (Janice Devina) for the support.

6. Yasmine Nathania, Maria Natasha, Kenny Andita, Olivia Margaretha, Maura Yosefina. Thank you for the support given to author during difficult times.

7. Steven Caprileo, Cindy Agustine, and Edward Calvin S for their help in technical aspects of completing this thesis.

The author realizes that there were unintended errors in writing this report. The author really allows all readers to give suggestions to improve its content. However, the author hopes that this report can be an inspiration and provide useful information for others.

Semarang, 2nd October 2020

Author,
Jessica Deasy Budiono

LIST OF CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES