

**BACHELOR THESIS**

**THE EFFECT OF REPLACING PALM OIL BASED  
EMULSIFIER WITH RAPESEED OIL BASED EMULSIFIER  
ON THE PHYSICAL-CHEMICAL CHARACTERISTICS  
AND PERFORMANCE RESPONSE TO NON-DAIRY  
CREAMER**

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**PENGARUH PERUBAHAN EMULSIFIER BERBAHAN  
DASAR MINYAK KELAPA SAWIT DENGAN EMULSIFIER  
BERBAHAN DASAR MINYAK *RAPESEED* TERHADAP  
KARAKTERISTIK *NON-DAIRY CREAMER***



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SOEGIJAPRANATA CATHOLIC UNIVERSITY  
SEMARANG**

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Submitted to the faculty of Agricultural Technology in Partial Fulfillment of the  
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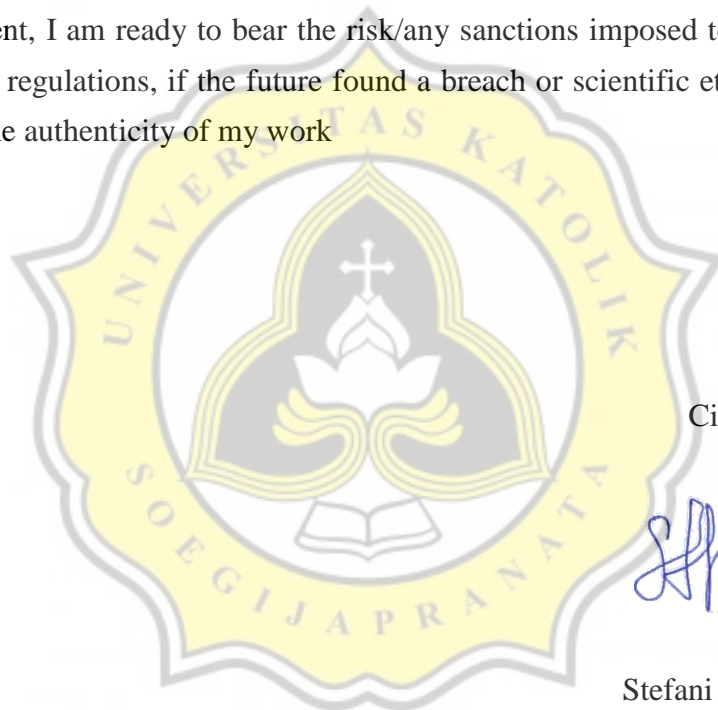
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2020**

## DECLARATION AUTHENTICITY

I, with this, declare that the thesis entitled. "THE EFFECT OF REPLACING PALM BASED EMULSIFIER WITH RAPESEED BASED EMULSIFIER ON THE PHYSICAL CHEMICAL CHARACTERISTICS AND PERFORMANCE RESPONSE TO NONDAIRY CREAMER" that, this thesis has no work that has been submitted to obtain a degree in a university. All its content is truly the work of my own and I did not do plagiarism or quotation in ways that are inconsistent with the prevailing ethic in the scientific community.

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Cikarang, 3 July 2020



Stefani Charina Widyastuti

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## HALAMAN PENGESAHAN

Judul Tugas Akhir: : The Effect of Replacing Palm Oil Based Emulsifier with Rapeseed Oil Based Emulsifier on the Physical Chemical Characteristics and Performance Response to Non-Dairy Creamer

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Menyetujui untuk memberikan kepada Universitas Katolik Soegijapranata Semarang Hak Bebas Royalti Noneksklusif atas karya ilmiah yang berjudul “The Effect of Replacing Palm Based Emulsifier with Rapeseed Based Emulsifier on The Physical Chemical Characteristics and Performance Response to Nondairy Creamer“ beserta perangkat yang ada (jika diperlukan). Dengan Hak Bebas Royalti Noneksklusif ini Universitas Katolik Soegijapranata berhak menyimpan, mengalihkan media/formatkan, mengelola dalam bentuk pangkalan data (database), merawat, dan mempublikasikan tugas akhir ini setelah 3 tahun dari tanggal karya ilmiah ini dibuat, selama tetap mencantumkan nama saya sebagai penulis / pencipta dan sebagai pemilik Hak Cipta. Demikian pernyataan ini saya buat dengan sebenarnya.

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Stefani Charina Widyastuti

## SUMMARY

Palm oil (*Elaeis guineensis*) is a widely used ingredient in various foods and drinks, one of which is an emulsifying agent in non-dairy creamer products. Non-dairy creamer is a milk substitute product that was not made from animal ingredients and contains high fat, commonly used as a mixture in coffee drinks or cakes. In general, the non-dairy creamer made from coconut oil, glucose, lactose, caseinates, stabilizers, emulsifiers, and free-flowing agents, where the ingredients are mixed, cooked, and then heated by spray drying method to produce the white powder product. Emulsifiers in non-dairy creamer have an essential role in helping bind the components of the water phase with the oil phase. In creating this situation, an oil component is needed in an emulsifier product such as palm oil. This research was conducted to examine the presence or absence of physically, chemically, and sensory differences to the control sample, due to the replacement of palm oil in the emulsifier by another vegetable oil, namely rapeseed oil. Fat content was tested using the Gerber method, ash content using the drying method, protein content using the Kjeldahl method, and water content using the drying method. A bulk density test was also performed. Sensory evaluations were carried out based on the CAR method and group discussions. There are five samples tested in this study, namely S0161 (Emulsifier A 1%); S0162 (Emulsifier A 1.25%); S0163 (Emulsifier B and 1%); S0164 (Emulsifier B 1.25%); and S0165 (Vana Blanca 60 Fat / Control). This research was conducted in one batch with three repetitions. The results show that the replacement of palm oil with rapeseed oil on the emulsifier did not have different effect on non-dairy creamer. The fat content of each sample has an average of 55% - 61%; ash content has an average of 4.11% - 4.81%; protein content has an average of 4.36% - 4.56%; water content has an average of 0.66% - 1.67%; and the bulk density has an average of 476.97 g / L - 509.47 g / L. The sensory evaluation shows that there is no significant difference from each attribute tested. Therefore, it can be concluded that the use of rapeseed oil still provides optimal performance on non-dairy creamer products.

## RINGKASAN

Kelapa sawit (*Elaeis guineensis*) merupakan salah satu bahan pangan yang banyak digunakan di berbagai macam makanan dan minuman, salah satunya sebagai pengemulsi dalam produk *non-dairy creamer*. *Non-dairy creamer* adalah produk pengganti susu yang terbuat bukan dari bahan hewani dan mengandung lemak tinggi, biasa digunakan sebagai campuran pada minuman kopi ataupun kue. Pada umumnya *non-dairy creamer* dibuat dari bahan minyak kelapa, glukosa, laktosa, kaseinat, *stabilizers*, *emulsifier*, dan *free flowing agent*. Bahan-bahan tersebut dicampur, dimasak lalu dipanaskan dengan metode *spray drying* hingga akan menghasilkan produk berupa bubuk putih. Emulsifier pada *non-dairy creamer* memiliki peran penting untuk membantu pengikatan komponen fase air dengan fase minyak. Dalam menciptakan situasi tersebut dibutuhkan komponen minyak di dalam sebuah produk emulsifier seperti, minyak kelapa sawit. Penelitian ini dilakukan untuk meneliti ada atau tidak adanya perbedaan secara fisika, kimia, dan sensori terhadap sampel control, akibat penggantian minyak kelapa sawit dalam emulsifier dengan minyak nabati lainnya yaitu, minyak *rapeseed*. Uji kadar lemak dilakukan dengan metode Gerber, kadar abu menggunakan metode pengeringan, kadar protein menggunakan metode Kjeldahl, dan kadar air menggunakan metode pengeringan, juga dilakukan uji *bulk density*. Evaluasi sensori yang dilakukan berdasarkan *CAR method* dan diskusi grup. Terdapat 5 sampel yang diuji dalam penelitian ini yaitu S0161 (Emulsifier A 1%); S0162 (Emulsifier A 1,25%); S0163 (Emulsifier B 1%); S0164 (Emulsifier B 1,25%); S0165 (Vana Blanca 60 Fat/Kontrol). Penelitian ini dilakukan sebanyak satu *batch* dengan tiga kali pengulangan. Hasil memperlihatkan bahwa, penggantian minyak kelapa sawit dengan *minyak rapeseed* pada emulsifier tidak memberikan efek perbedaan pada *non-dairy creamer*. Kandungan lemak dari setiap sampel memiliki rata-rata 55% - 61%, kandungan abu memiliki rata-rata 4,11% - 4,81%, kandungan protein memiliki rata-rata 4,36% - 4,56%, kandungan air memiliki rata-rata 0,66% - 1,67%, dan pada *bulk density* memiliki rata-rata 476,97 g/L - 509,47 g/L. Hasil sensori juga memberikan data yang tidak berbeda nyata dari setiap atribut yang diuji sehingga, dapat disimpulkan bahwa penggunaan minyak *rapeseed* tetap memberikan performa optimal pada produk *non-dairy creamer*.

## FOREWORD

The Effect of Replacing Palm Oil Based Emulsifier with Rapeseed Oil Based Emulsifier on The Physical-Chemical Characteristics and Performance Response to Non-Dairy Creamer is a study of the chemical-physical analysis of non-dairy creamer products that have changed the oil content of the emulsifier used. The analysis carried out to ensure that there are no changes in the effects caused by the changes made. This research is one of the first real research throughout the author's life also one of the requirements for obtaining a bachelor's degree in Agricultural Technology Faculty. Research conducted for approximately six months gives valuable experience in the author's life. Meeting a new world that is far different from the previous author's life, interacting with new people makes the author get many valuable lessons. The author also would like to thank all those who played a role in conducting this research. The author wants to thank the Lord Jesus Christ because of His blessings so the author can finish this thesis. The author also would like to thank PT. Kievit Indonesia for the opportunity so that it can establish good cooperation with Seogijapranata Catholic University.

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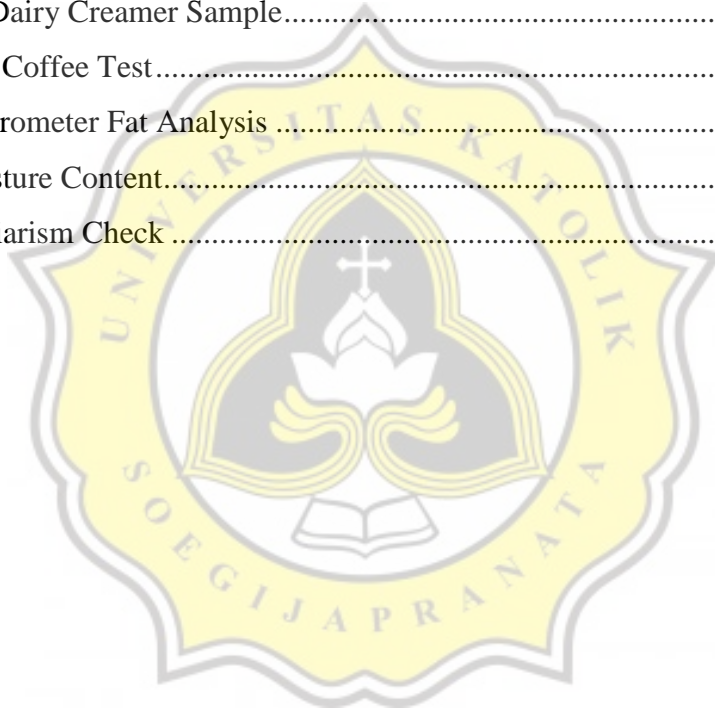
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