

**IMPACT OF RED BEET POWDER ON THE PHYSICOCHEMICAL
CHARACTERISTICS OF *MOCAF* COOKIE AND ITS RANCIDITY
DURING STORAGE**

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FISIKOKIMIA *COOKIE MOCAF* DAN KETENGIKANNYA
SELAMA PENYIMPANAN**

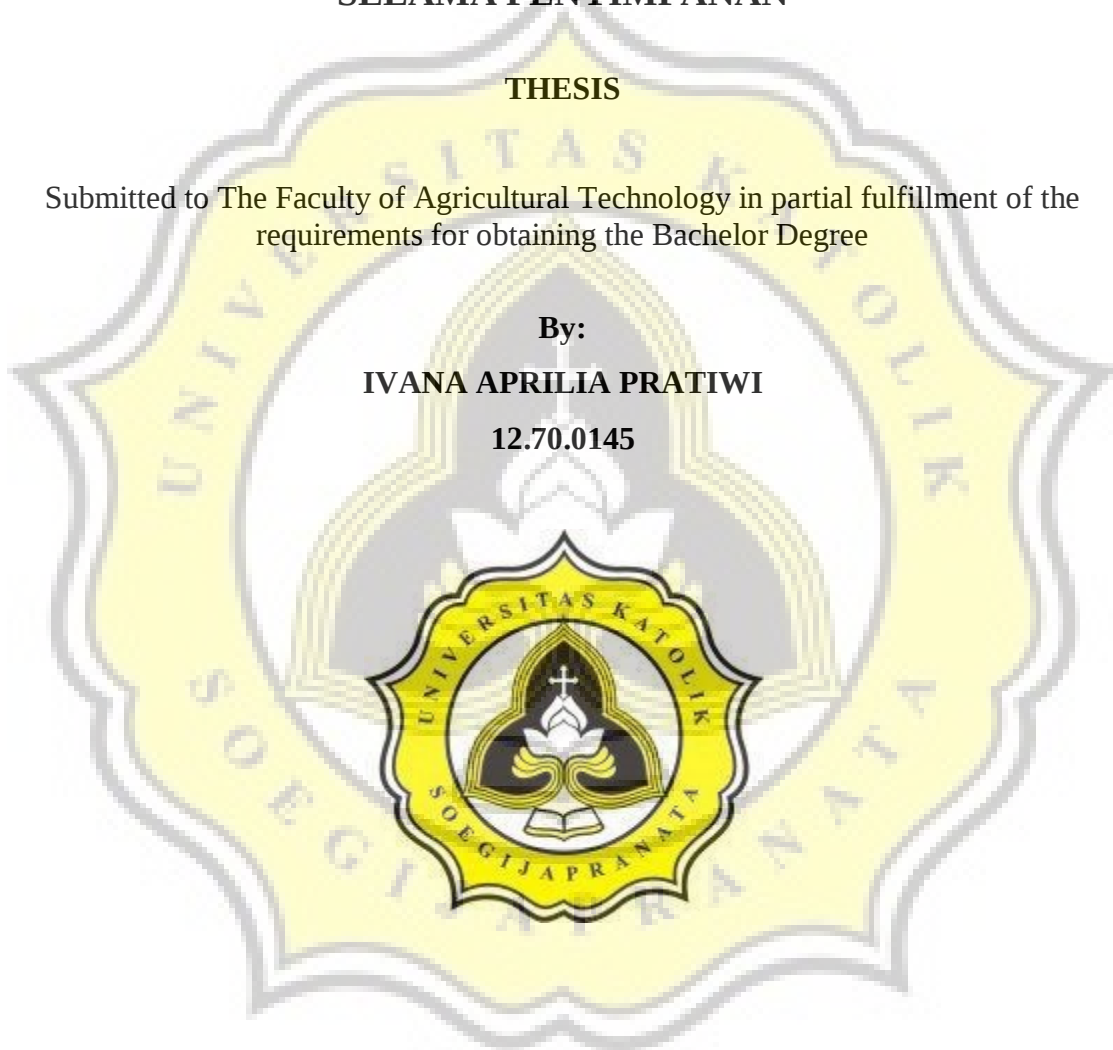
THESIS

Submitted to The Faculty of Agricultural Technology in partial fulfillment of the
requirements for obtaining the Bachelor Degree

By:

IVANA APRILIA PRATIWI

12.70.0145



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

2015

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**This thesis has been approved and defended in front of the examination committee
on 28 October 2015**

Semarang, 9 November 2015

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THE AUTHENTICITY OF A THESIS STATEMENT

I hereby declare that the thesis entitled “**IMPACT OF RED BEET POWDER ON THE PHYSICOCHEMICAL CHARACTERISTICS OF MOCAF COOKIE AND ITS RANCIDITY DURING STORAGE**” contains no work that ever proposed to acquire a bachelorship title in a University, and along to my knowledge, there is no work ever written or published by others, except the ones used as references in this thesis and mentioned in the list of references.

If it is proven in the future that partially or whole thesis is the result of plagiation, therefore I will be willing to be revoked with all the consequences in accordance with the law and regulations applied at Seogijapranata Catholic University and/or valid law and regulations.

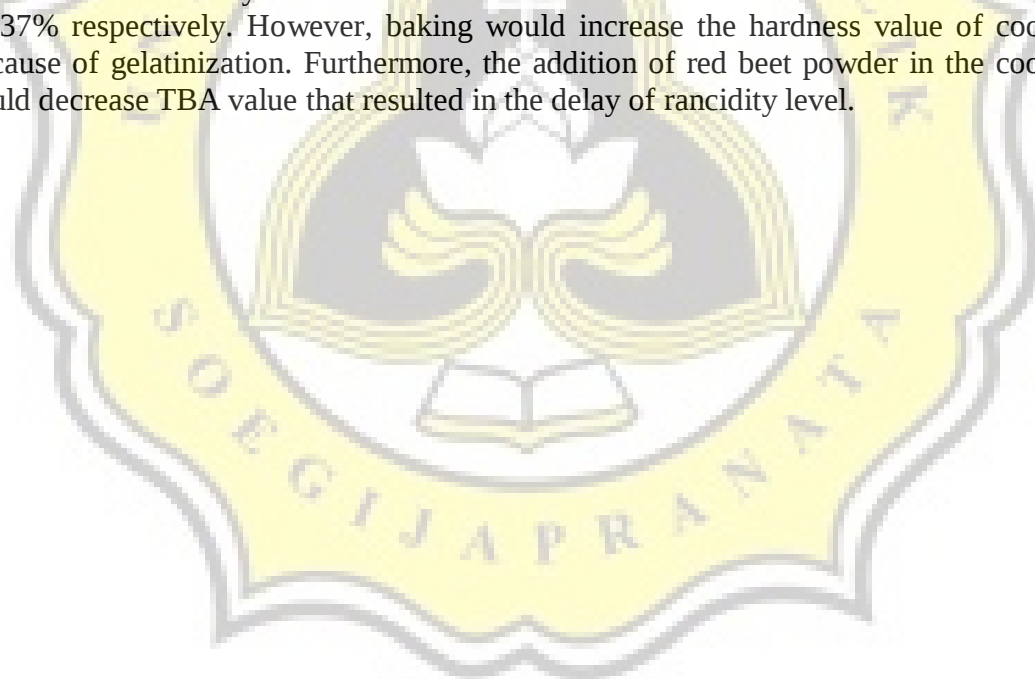
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SUMMARY

Nowadays, people is being concerned about the risk of using synthetic colorants, thus the needs of natural colorants is increasing. Red beet is one of the foodstuffs that began widely used as natural colorant. Red beets as a natural colorant also provide health benefits. As natural colorant, red beet could be applied in the form of extract or powder. Red beet powder has more advantages than red beet extract because it has higher stability. Natural colorant could be applied in bakery product, such as cookies to give colour and make it as functional food. However, the ongoing heating process (baking process) could affect the changes of the cookies' texture, and betalains content that contribute to the changes of the color intensity and antioxidant activity. The aim of this research was to determine the impact of red beet powder on the physicochemical characteristics such as color, texture, betalain content, and antioxidant activity of mocaf cookie and its rancidity during storage. Red beet powder with the concentration of 0%; 10%; and 20% were added. Cookies were analyzed at the time 0; 10; 20; 30 minutes during baking. Baking would decrease the intensity value of a^* , antioxidant activity, and betalain content. At the first 10 minutes of baking, cookies with addition of 20% red beet powder produced the highest reduction of % discoloration which was 28.14%. Besides, at the first 10 minutes of baking, addition of 20% red beet powder resulted in the reduction of betacyanin and betaxanthin content of cookies which were 23.38% and 13.37% respectively. However, baking would increase the hardness value of cookies because of gelatinization. Furthermore, the addition of red beet powder in the cookies could decrease TBA value that resulted in the delay of rancidity level.



RINGKASAN

Pada zaman ini, orang menjadi perhatian tentang dampak negatif dari penggunaan pewarna sintetik, sehingga permintaan dari pewarna alami menjadi meningkat. Bit merah merupakan salah satu dari bahan pangan yang mulai digunakan sebagai pewarna alami. Bit merah selain sebagai pewarna alami juga bermanfaat bagi kesehatan dan tidak beracun. Sebagai pewarna alami, bit merah dapat diaplikasikan pada produk bakery, seperti *cookies* yang identik dengan warna yang menarik. Namun selama proses pemanasan (*baking*) dapat menyebabkan perubahan warna, tekstur, kandungan betalain yang berkontribusi terhadap warna, dan kandungan antioksidan. Oleh karena itu tujuan dari penelitian ini, mengetahui pengaruh serbuk bit merah pada karakteristik fisikokimia *cookies* mocaf dan ketengikannya selama penyimpanan. Perbedaan pemberian konsentrasi serbuk bit merah dan proses pemanasan berbeda nyata terhadap warna sampel. Proses pemanasan akan menurunkan intensitas nilai a^* , kandungan antioksidan, dan kandungan betalain. Pada 10 menit pertama proses *baking* akan pada *cookies* yang diberi 20% penambahan serbuk bit merah memiliki % penurunan antioksidan paling besar, sebesar 28.14. Sedangkan pada betasianin % penurunannya sebesar 23.38 dan pada betasantin sebesar 13.37. Akan tetapi proses *baking* meningkatkan nilai *hardness* pada *cookies* karena proses gelatinisasi. Sedangkan penambahan serbuk bit merah pada *cookies* akan menurunkan nilai TBA dan tingkat ketengikan akan dihambat.



PREFACE

First of all, I want to dedicate my greatest gratitude to Jesus Christ, who has blessed me and gave His grace, wisdom and guidance in the long journey to finish this experiment and thesis. Over a period of practicing the experiment and writing this thesis, author had been searching and obtaining multiple kind of knowledge, information and views that were very useful in compiling this thesis, which the process is very valuable and memorable experience for the author in the journey of stepping the next level in life.

This research titled “THE STABILITY EVALUATION AND RANCIDITY OF RED BEET (*Beta vulgaris L*) POWDER AS A NATURAL COLORANT OF COOKIES”. This modest and imperfect thesis can nicely be done with the help, supports, prayer and advice from several individuals that the author very honored and grateful for. In every phase and every challenge in the way, there will always persons who generously lend their heart, mind and time. The author would like to gratefully acknowledge those wonderful persons:

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Semarang, October 2015

Author,

Ivana Aprilia Pratiwi

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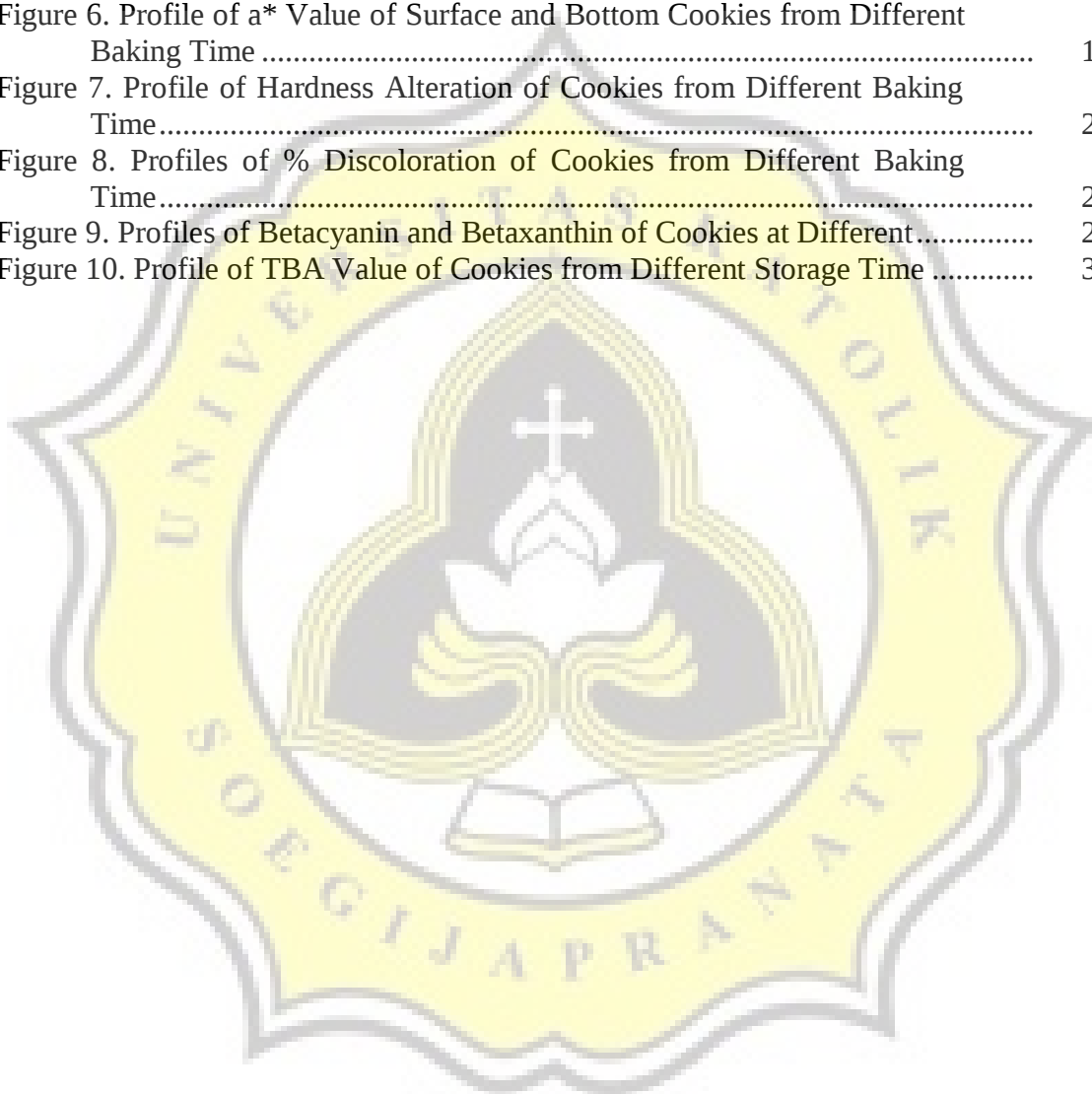
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