

**FORMULATION & QUALITY EVALUATION OF GLUTEN-FREE BREAD  
ADDED WITH FUNCTIONAL RESISTANT STARCH FROM UNRIPE  
BANANA (*Musa paradisiaca formatypica*)**

By

Steven  
11305029



SWISS GERMAN UNIVERSITY  
The Prominence Tower  
Jalan Jalur Sutera Barat No. 15, Alam Sutera  
Tangerang, Banten 15143 - Indonesia

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### STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

Steven

\_\_\_\_\_  
Student

\_\_\_\_\_  
Date

Approved by:

Mutiara Pratiwi, S.TP, M.Si

\_\_\_\_\_  
Thesis Advisor

\_\_\_\_\_  
Date

Ambar Dwi Kusumasmarawati S.TP, M.P

\_\_\_\_\_  
Thesis Co-Advisor

\_\_\_\_\_  
Date

Dr. Dipl.-Ing. Samuel P. Kusumocahyo

\_\_\_\_\_  
Dean

\_\_\_\_\_  
Date

\_\_\_\_\_  
Steven

## ABSTRACT

### FORMULATION & QUALITY EVALUATION OF GLUTEN-FREE BREAD ADDED WITH FUNCTIONAL RESISTANT STARCH FROM UNRIPE BANANA (*Musa paradisiaca formatypica*)

By

Steven

Mutiara Pratiwi, S.TP, M.Si., Advisor

Ambar Dwi Kusumasmarawati, S.TP, M.P., Co-Advisor

SWISS GERMAN UNIVERSITY

Gluten-free bread is an alternative product for celiac disease patient and other disease such as gluten intolerance that require gluten-free bread consumption. Gluten-free bread can be made from many kinds of flour and starch. The purpose of this research was to improve the nutritional and physical value of gluten-free bread that made from the combination of rice flour and functional resistant starch from unripe banana (*Musa paradisiaca formatypica*) that also acceptable in sensory properties. In this research, the formulation of resistant starch was 10%, 20% and 30%. Substitution of resistant starch into the product improves the nutritional value and reduces the starch digestibility. It also improves the texture of the product, makes the product has softer texture. The hardness value is decreasing to 21.15 compared to control 24.68 and it shows significant different with statistics evaluation. Based on sensory evaluation in some sensory properties such as aroma, color, taste and texture attributes, the resistant starch that enriched in gluten-free bread were rated equally with control. Thus, it shows that there are no differences between the control and formulated gluten-free bread with substitution of resistant starch for the panelists.

*Keywords: Gluten-free bread, Resistant Starch, Rice Flour, Banana Starch, Starch Digestibility.*



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## DEDICATION

I dedicate this works to my lecturers and family,  
who always supported and helped me through all obstacles during this thesis making,  
to all my wonderful friends,  
who encouraged me from the beginning until this thesis in finished on time,  
and for a better future.



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## TABLE OF CONTENTS

	Page
STATEMENT BY THE AUTHOR.....	2
ABSTRACT.....	3
DEDICATION.....	5
ACKNOWLEDGEMENTS.....	6
TABLE OF CONTENTS.....	7
LIST OF FIGURES.....	9
LIST OF TABLES.....	10
LIST OF APPENDICES.....	11
CHAPTER 1 – INTRODUCTION.....	12
1.1. Background.....	12
1.2. Research Problems.....	14
1.3. Research Objectives.....	14
1.4. Significance of Study.....	14
1.5. Research Questions.....	14
1.6. Hypotheses.....	14
CHAPTER 2 – LITERATURE REVIEW.....	15
2.1 Celiac Disease.....	15
2.2 <i>Kepok</i> Banana ( <i>Musa paradisiaca formatypica</i> ).....	15
2.3 Resistant Starch.....	15
2.3.1. Types of Resistant Starch.....	16
2.3.2. Resistant Starch for Health Benefit.....	16
2.3.3. Resistant Starch in Bread Processing.....	17
2.4 Hydrocolloid.....	17
2.4.1. Xanthan Gum.....	18
2.5 Gluten.....	19
2.6 Ingredients used in Gluten-Free Bread.....	20
2.6.1. Yeast.....	20
2.6.2. Water.....	20
2.6.3. Sugar.....	20
2.6.4. Salt.....	20
2.6.5. Skim Milk.....	20
2.6.6. Margarine.....	21
2.6.7. Egg.....	21
CHAPTER 3 – RESEARCH METHODS.....	22

3.1.	Venue and Time .....	22
3.2.	Materials and Equipment.....	22
3.2.1.	Raw Materials .....	22
3.2.2.	Chemicals .....	22
3.2.3.	Equipments.....	22
3.3.	Preliminary Research.....	23
3.4.	Design Experiment .....	23
3.5.	Experimental Procedure .....	24
3.5.1.	Extraction of Banana Starch .....	24
3.5.2.	Characterization of Banana Starch.....	25
3.5.3.	Amylose Content .....	27
3.6.	Analytical Procedure .....	29
3.6.1.	Formulation of Gluten-Free Bread.....	29
3.6.2.	Evaluation of Gluten-Free Bread Quality .....	30
<b>CHAPTER 4 – RESULT &amp; DISCUSSION.....</b>		<b>35</b>
4.1	Banana Extraction .....	35
4.2	Characterization of Banana Starch .....	35
4.2.1.	Proximate Analysis .....	35
4.2.2.	Amylose Content & Starch Digestibility.....	36
4.3	Formulation of Gluten-Free Bread .....	37
4.4.	Evaluation of Gluten-Free Bread.....	38
4.4.1.	Nutritional Evaluation .....	38
4.4.2.	Physical Evaluation.....	40
4.4.3.	Sensory Evaluation.....	43
<b>CHAPTER 5 – CONCLUSION &amp; RECOMMENDATION .....</b>		<b>46</b>
5.1	Conclusion.....	46
5.2	Recommendation .....	46
REFERENCES .....		47
APPENDICES .....		50
CURRICULUM VITAE.....		65



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