

TABLE OF CONTENTS

	page
COVER	
STATEMENT OF THESIS AUTHENTICITY	
APPROVAL BY THESIS SUPERVISOR	
APPROVAL BY THESIS EXAMINATION COMMITTEE	
ABSTRACT.....	v
ACKNOWLEDGEMENT	vi
TABLE OF CONTENTS.....	viii
LIST OF FIGURES	x
LIST OF TABLES	xi
LIST OF APPENDICE.....	xii
CHAPTER I INTRODUCTION	
1.1 Background.....	1
1.2 Research Problems	3
1.3 Objectives	4
1.3.1 General Objectives.....	5
1.3.2 Specific Objectives	5
CHAPTER II LITERATURE REVIEW	
2.1 Cookies	6
2.2 Ingredients	8
2.2.1 Chayote	8
2.2.2 Toughening Ingredient.....	10
2.2.3 Tenderizing ingredients	11
2.2.3.1 Sugar.....	11
2.2.3.2 Fat.....	12
2.2.3.3 Leavening Agents.....	13
2.3 Particle Size	14
2.4 Fat Mimetics	15
2.5 Antioxidant	16
2.6 Phenolic Compounds.....	19
CHAPTER III MATERIAL AND METHOD	
3.1 Material and Equipment	20
3.2 Research Method	20
3.2.1 Preliminary Stage.....	21
3.2.2 Main Research Stage.....	23
3.3 Experimental Design	25
3.3.1 Preliminary Stage.....	25
3.3.2 Main Research Stage.....	26
3.4 Analysis Procedure	27

3.4.1 Physical Properties	27
3.4.1.1 Spread Ratio (Boz, 2019)	27
3.4.1.2 Hardness and Fracturability(Boz, 2019)	28
3.4.1.3 Color (Toledo <i>et al</i> , 2017)	28
3.4.2 Proximate Compositions	29
3.4.2.1 Moisture Content (Ervianingsih <i>et al</i> , 2020).....	29
3.4.2.2 Fat Content (Patrignani <i>et al</i> , 2015).....	29
3.4.6 Antioxidant Activity and Total Phenolic Content	30
3.4.6.1 Sample Extraction.....	30
3.4.6.2 Total Phenolic Content (Yesilkanat and Savlak, 2021)	30
3.4.6.3 FRAP Assay (Yesilkanat and Savlak, 2021).....	31
3.4.7 Sensory Evaluation	32
3.4.7.1 Hedonic Test (Boz, 2019)	32
3.4.7.2 Scoring Test (Pestorić <i>et al.</i> , 2015).....	33
CHAPTER IV RESULT AND DISCUSSION	
4.1 Preliminary Stage	34
4.1.1 Chayote Taxonomical Verification.....	34
4.1.2 Moisture and Fat Content Comparison between Fresh Chayote and Chayote Powder	34
4.1.3 Antioxidant activity and Phenolic Content Comparison between Fresh Chayote and Chayote Powder.....	35
4.2 Main Research Stage	36
4.2.1 Effect of Addition of Chayote Powder on Spread Ratio.....	37
4.2.2 Effect of Addition of Chayote Powder on Texture of Cookies	38
4.2.2.1 Effect of Addition of Chayote Powder on the Hardness of Cookies	38
4.2.2.2 Effect of Addition of Chayote Powder on the Fracturability of Cookies	41
4.2.3 Effect of Addition of Chayote Powder on the Color of Cookies.....	43
4.2.4 Effect of Addition of Chayote Powder on the Moisture Content of Cookies	44
4.2.5 Effect of Addition of Chayote Powder on the Antioxidant and Total Phenolic Content of Cookies	45
4.2.6 Effect of Addition of Chayote Powder on the Sensory Properties of Cookies	49
4.2.6.1 Effect of Addition of Chayote Powder on the Scoring Test of Cookies	50
4.2.6.2 Effect of Addition of Chayote Powder on the Hedonic Test of Cookies	54
4.3 Chosen Formulation	58
CHAPTER V CONCLUSION AND SUGGESTION	
5.1 Conclusion	60
5.2 Suggestion	61
APPENDICES	62

LIST OF FIGURES

	page
Figure 2.1 Phenol	19
Figure 3.1 Flowchart for Preparation of Fresh Chayote.....	21
Figure 3.2 Flowchart of Production of Chayote Powder	22
Figure 3.3 Flowchart of Production of Cookies.....	24
Figure 4.1 Effect of Different Concentration of Chayote Powder on Cookie's Spread Ratio	38
Figure 4.2 Effect of Different Particle Size and Concentration of Chayote Powder on Cookie's Hardness.....	39
Figure 4.3 Effect of Different Concentration of Chayote Powder on Cookie's Fracturability	42
Figure 4.4 Effect of Different Concentration of Chayote Powder on Cookie's Antioxidant Activity.....	46
Figure 4.5 Effect of Different Concentration of Chayote Powder on Cookie's Taste (Scoring)	52
Figure 4.6 Effect of Different Concentration of Chayote Powder on Cookie's Crunchiness (Scoring)	54
Figure 4.7 Effect of Different Concentration of Chayote Powder on Cookie's Compactness (Hedonic)	56
Figure 4.8 Effect of Different Concentration of Chayote Powder on Cookie's crunchiness (hedonic).....	57
Figure 4.9 Effect of different concentration of chayote powder on cookie's Overall Likeness (hedonic)	58

LIST OF TABLES

	page
Table 2.1 Quality Requirements for Cookies.....	8
Table 3.1 Cookies Formulation.....	24
Table 3.2 Replications in Preliminary Stages	26
Table 3.3 Experimental Design of Main Research Stage.....	26
Table 3.4 Hedonic scale	33
Table 4.1 Moisture content and fat content of chayote	35
Table 4.2 Total phenolic content and antioxidant activity of chayote	36
Table 4.3 Effect of Chayote Powder Usage on Cookies' Chroma Value	43
Table 4.4 Effect of Chayote Powder Usage on Cookies' Hue Angle	43
Table 4.5 Effect of Chayote Powder Usage on Cookies' Moisture Content.....	45
Table 4.6 Effect of Chayote Powder Usage on Cookies' Total Phenolic Content	47
Table 4.7 Effect of Chayote Powder Usage on Cookies' Color Intensity (Scoring)	50
Table 4.8 Effect of Chayote Powder Usage on Cookies' Compactness Intensity (Scoring).....	50
Table 4.9 Effect of Chayote Powder Usage on Cookies' Color Likeness (Hedonic)	54
Table 4.10 Effect of Chayote Powder Usage on Cookies' Taste Likeness (Hedonic).....	55
Table 4.11 Comparison of Chosen Formulation to Control.....	59

LIST OF APPENDICES

Appendix A. Result of Raw Material Identification	A-1
Appendix B. Result of Fat Content	
B.1 Fat Content of Fresh Chayote and Chayote Powder	B-2
B.2 Statistical Paired Sample t-Test Analysis Result of Fat Content of Fresh Chayote and Chayote Powder	B-3
Appendix C. Result of Moisture Content (Preliminary)	
C.1 Result of Moisture Content of Fresh Chayote and Chayote Powder	C-1
C.2 Statistical Paired Sample t-Test Analysis of Fresh Chayote and Chayote Powder	C-2
Appendix D Result of Antioxidant Activity (Preliminary)	
D.1 Standard Curve of FRAP Assay	D-1
D.2 Result of FRAP assay	D-2
D.3 Paired Sample t-Test Analysis of Fresh Chayote and Chayote Powder ...	D-3
Appendix E Result of Total Phenolic Content (Preliminary)	
E.1 Standard Curve of Total Phenolic Content	E-1
E.2 Result of Total Phenolic Content	E-3
E.3 Paired Sample t-test Analysis of Fresh Chayote and Chayote Powder.....	E-5
Appendix F. SNI of Cookies.....	F-1
Appendix G. Result of Spread Ratio (Main Research)	
G.1 Result of Spread Ratio of Cookies with Different Formulations	G-1
G.2 Statistical Univariate Analysis of Cookies' Spread Ratio	G-3
Appendix H. Result of Texture Analysis	
H.1 Result of Hardness of Cookies	H-1
H.2 Statistical Univariate Analysis of Cookies' Hardness	H-13
H.3 Result of Fracturability of Cookies	H-14
H.4 Statistical Univariate Analysis of Cookies' Fracturability	H-25
Appendix I. Result of Color	
I.1 Result of Color Analysis of Cookies.....	I-1
I.2 Statistical Univariate Analysis of Cookies' Chroma.....	I-4
I.3 Statistical Univariate Analysis of Cookies' Hue Angle	I-4
Appendix J. Result of Moisture Content	
J.1 Result of Moisture Content of Cookies	J-1
J.2 Statistical Univariate Analysis of Cookies.....	J-3

Appendix K. Result of FRAP Assay	
K.1 Standard Curve of FRAP Assay	K-1
K.2 Result of FRAP Assay	K-3
K.3 Univariate Analysis of Cookies	K-7
Appendix L. Result of Total Phenolic Content analysis	
L.1 Standard Curve of total phenolic content.....	L-1
L.2 Result of Total Phenolic Content	L-3
L.3 Univariate Analysis of Cookies	L-7
Appendix M. Result of Sensory Evaluation	
M.1 Sensory Consent Form.....	M-1
M.2 Scoring and Hedonic Test Questionnaire	M-2
M.3 Result of Scoring Test.....	M-4
M.4 Univariate Analysis of Scoring Test	M-8
M.5 Results of Hedonic Test of Cookies.....	M-10
M.6 Univariate Statistical Analysis of Hedonic Test of Cookies.....	M-15
Appendix N. Research Documentation	N-1

