

ACKNOWLEDGEMENTS

Thank Jesus Christ, my Savior for His blessing so the thesis report with title of “QUANTIFICATION OF PHENOLIC COMPOUNDS AND THE ANTIOXIDANT CAPACITY IN THE FLESH OF FIVE INDONESIAN MANGO CULTIVARS” can be finished. This thesis report is written as partial fulfillment of the academic requirements to obtain the degree of *Sarjana Teknologi Pertanian Strata Satu*.

The author realizes that this thesis report will not be completed without the help and support from many parties. Therefore, author wish to express his gratitude to those who has lent their support, including:

1. Eric Jobiliong, Ph.D, as the Dean of Science and Technology Faculty
2. Sunie Rahardja, M.S.CE., as the Acting Vice Dean of Science and Technology Faculty
3. Laurence, M.T., as the Director of Science and Technology Faculty
4. Ir. W. Donald R. Pokatong, MSc., Ph.D. as the Head of Food Technology Study Program and academic supervisor for the help and opportunity to implement this research.
5. Prof. Dr. Ir. C. Hanny Wijaya, M.Agr., as the main supervisor who had given lots of time and effort to guide and support the author throughout the thesis preparation until the completion of the report.
6. Natania, M.Eng, as the co-supervisor who had closely guiding, helping, and supporting the author during thesis preparation and report completion and as the head of Food Processing laboratory.
7. Ms. Yuniwaty Halim, MSc, Dr. Tagor M. Siregar, M.Si and Ms. Ratna Handayani, MP as the head of Quality Control, Chemistry, and Research Laboratories, respectively.
8. Pak Adjie, Pak Adi, Pak Yos, Pak Darius, Ko Andra, Ci Virly and all who has assisted author during laboratorial work.

9. Dear loving parents Sam Huang and Lily Tedjokusumo, brother Nicholas Huang and other family members which have given their support and motivation while the writer was doing research.
10. Andrea Angelina, Chyntia Joe Gisela, Mei Diana Sonatha, Rockyand Sicilia Chandra who also did research under the supervision of ma'am Hanny.
11. Loving partner Chyntia Joe Gisela who have given her most for author during research
12. Charles Lee, Christy Nathania, Ellena, Erwin IW, Natasya Angeline and all who did research along author and lent their help and support during research
13. All members of Food Technology family, especially class 2014 C who grow up and gave support to author from the beginning to the completion of study
14. Benny Sanjaya, Bernard Effendie and Kenny Austin from Pikanyut who gave support to author
15. All highschool friends in Bodrex family, who supported author and gave author much love and attention throughout the whole research duration
16. OMK Petrus Paulus and everyone in the family that listens and supports the author during the research
17. And everyone else who author cannot possibly list one by one who gave support and motivation to the author while on internship process.

Author acknowledges every mistake on this report and deeply apologizes for any mistake on this report. Author also requests for any input and critic to further improve this report. Lastly, author hope that this report can be useful to the reader. Thank you and God bless.

Tangerang, February 14th, 2018

TABLE OF CONTENTS

	page
COVER	
STATEMENT OF THESIS APPROVAL	
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 APPENDICES	xii
CHAPTER I INTRODUCTION	
1.1 Background.....	1
1.2 Research Problem	3
1.3 Objectives	3
1.3.1 General Objective	4
1.3.2 Specific Objectives	4
CHAPTER II LITERATURE REVIEW	
2.1 Mango	5
2.1.1 Harumanis cultivar	6
2.1.2 Indramayu cultivar	7
2.1.3 Madu cultivar	7
2.1.4 Golek cultivar	7
2.1.5 Manalagi cultivar	8
2.2 Antioxidant	8
2.2.1 Phenolic compounds	9
2.2.2 Flavonoid compounds	11
2.2.3 Carotenoid compounds.....	11
2.3 Sugar	13
2.3 Organic Acids	14
CHAPTER III RESEARCH METHODOLOGY	
3.1 Materials and Equipment.....	16
3.1.1 Materials	16
3.1.2 Equipments	16
3.2 Research Methodology	17
3.2.1 Sample Preparation.....	17

3.2.2 Antioxidant Capacity Research	20
3.2.3 Physicochemical Properties Measurement	21
3.3 Methods of Analysis	22
3.3.1 Moisture Content Analysis (AOAC, 2005)	22
3.3.2 Total Phenolic Content (Jothy <i>et al.</i> , 2011).....	22
3.3.3 Total Flavonoid Content (Ahmad and Youssef, 2015)	22
3.3.4 Total Carotenoid Content (Kalaikandhan <i>et al.</i> , 2014)	23
3.3.5 Radical Scavenging Ability (Garcia <i>et al.</i> , 2014; Tangkanakul <i>et al.</i> , 2009, with modification).....	23
3.3.6 Total and Reducing Sugar Content (AOAC in Sudarmadji, 1997, with modification).....	24
3.3.7 Total Titratable Acid (BSN, 2004).....	25
3.3.8 Color Analysis (Santoso <i>et al.</i> , 2013).....	25
3.4 Statistical Design	26
CHAPTER IV RESULT AND DISCUSSION	
4.1 Antioxidant Compounds and Activity	27
4.2 Comparison of Antioxidant Content to Foreign Cultivars	29
4.2.1 Total Phenolics Content	32
4.2.2 Total Flavonoids Content	32
4.2.3 Total Carotenoids Content.....	33
4.3 Total Titratable Acid and Sugar Content.....	34
4.4 Color Analysis	35
CHAPTER V CONCLUSIONS AND SUGGESTIONS	
5.1 Conclusions	37
5.2 Suggestions.....	37
BIBLIOGRAPHY	39
APPENDICES	44

LIST OF FIGURES

	page
Fig. 3.1 Harumanis mango (whole and cross-section).....	18
Fig. 3.2 Indramayu mango (whole and cross-section)	18
Fig. 3.3 Manalagi mango (whole and cross-section).....	18
Fig. 3.4 Madu mango (whole and cross-section)	19
Fig. 3.5 Golek mango (whole and cross-section).....	19
Fig. 3.6. Sample preparation flowchart.....	20



LIST OF TABLES

	page
Table 2.1 Nutrition fact of mango flesh	6
Table 2.2 Reactive Oxygen and Nitrogen Species.....	8
Table 3.1 °Hue interpretation.....	25
Table 3.2 Experimental design.....	26
Table 4.1 Antioxidant compounds and IC ₅₀ of local mango cultivars.....	27
Table 4.2 Physicochemical properties of local mango cultivars.....	27
Table 4.3 Pearson correlation of different compound group to IC ₅₀	28
Table 4.4 Color profile of local mango cultivars	33



LIST OF APPENDICES

	page
Appendix A	
Moisture content	A-1
Appendix B	
Antioxidant compound and activity measurement	B-1
Gallic acid standard curve	B-1
Total phenolics content measurement	B-2
Quercetin standard curve	B-3
Total flavonoids content measurement	B-4
Total carotenoids content measurement	B-6
DPPH IC ₅₀ value measurement	B-8
DPPH IC ₅₀ linear equations	B-10
Appendix C	
Correlation of various compounds present in mango with IC ₅₀ value	C-1
Appendix D	
Total titratable acid content.....	D-1
Appendix E	
Total and reducing sugar content	E-1
Appendix F	
Color analysis.....	F-1
Appendix G	
Mango cultivar identification.....	G-1