

Unit 1

The Important Components of a Thesis

This thesis writing manual is used to guide you to effectively write a thesis, independent study project and for the research completion. There are 3 essential parts required for major components of your thesis or dissertation as shown below;

1. Cover leading
2. Contents
3. Formatting endnotes

1. Cover Leading

The cover leading is covered from the front cover to the contents of the thesis. Details are as follows;

1.1 Front cover

The front cover needs to be a hardcover book size A4. Black colour is for master degree students and the blue colour is for philosophy of doctorate degree. Besides, the project and an independent study need to be used with chestnut colour. The letter on the cover must be typed in the golden pumping colour on the whole space of the front cover page and researcher has to follow the vital thesis's patterns and regulations as stated below;

A. University badge (19 mm in width, 33 mm in height)

At the middle of the paper should be set distantly from the paper's edge approximately 1.5 inches.

B. The thesis's title

Specify the name of the thesis in both Thai and English. For the English title, always capitalize the first letter of the first word and every word in the name, except preposition and conjunction. *Note...if those prep. or conj. begin the sentence, it is necessary to make them capitalized. The title of thesis needs to be typed on the middle of the paper distantly from a university badge around 1 line. In case, there is more than 1 sentence of your thesis's title, you have to type in the form of inverted gables ; furthermore, consider shortening the words for an appropriate use.

C. Thesis author's name

Specify the names in both Thai and English. Nevertheless, name titles should not be identified but if there are any ranks of titles or positions, indicate them as an abbreviation on the middle of the paper.

D. Name of degrees, branches of study and faculty

Indicate and type them in both Thai and English respectively, on the middle of the paper

E. University's name

Specify a university name in both Thai and English on the middle of the paper

F. Year of graduation

Specify the year of graduation by not indicating the year B.E. Type it on the middle of the paper, distantly 1.5 inches from the edge below.

The spine of a thesis must be typed with golden colour, composing of author's first name and surname. There is no need to indicate the name title or any title ranks, followed by the thesis title and the year of graduation from the horizontal order of the spine. The first letter of author's name should be distant from vertical edge of the spine 1 inch, followed by the name and year's graduation. Also, the researcher has to appropriately manage the space to be distant from the edge below 1 inch. In case, the thesis's title has more than 1 line, make it 2 lines for typing. Moreover, the patterns process of English dissertation is exactly the same way as Thai.

1.2 Blank page

Put the blank page before the title page and it should be at least 100 lb pound paper.

1.3 Title page

The title page of a thesis is the same as the front page.

1.4 Approval page

This page consists of thesis's title, author's first name and surname (no title name or ranking titles), branches of study, advisory committees of the thesis and committees of thesis testing. All of these components of this page are compulsory for complying with Walailak University Graduates Studies regulations, 2549, 2560 and 2563 B.E.

1.5 Abstract

An abstract is a concise and brief summary of a thesis. This allows all readers to easily and accurately understand the contents of the thesis quite well. A good

abstract needs to be demonstrated with the constant and unambiguous details as a well-organized composition, including clear objectives, scope of a study, research methods, such as data gathering, research instruments, numbers and the characteristics of the sample group and short research results. The writing language of the abstract should be concise, accurate and unambiguous., not more than 2 pages of A4 paper. The correct abstract form has both Thai and English versions. Importantly, researcher needs to sequence Thai abstract before English abstract but if it is the English version, Thai abstract must be ordered after English.

1.6 Acknowledgements

This message is written to thank all assistants for supporting and cooperating with beneficial information to complete the dissertation. It is about showing the author's academic ethical expressions, which is essential for researchers to perform through this page. The word "Acknowledgement" is typed on the middle of the paper, no more than 1 page. At the bottom, the full name of an author should be typed and indented to the right of the paper.

1.7 Table of contents

This page indicates the page number of each content in the thesis, separated into a unit. The word "Table of Contents" is on the center of the paper with each page number and its title of each of contents that are in the thesis. It is required that you have to write the table of contents in Thai if that is the Thai thesis and you have to write in English if that is the English thesis. More importantly, the dashed lines behind each title should be 3.5 letters distantly from the page number that must be typed on the right hand side and the title must be typed just only 2 levels.

1.8 List of table (if any)

This page shows the page order of all tables in the thesis. The word "List of Tables" is on the middle of the paper. In case, there is a table in an appendix. Researchers should also include the lists of appendix table in the list of tables.

1.9 List of figures (if any)

This page shows the page order of all figures in the thesis. The word "List of Figures" is on the middle of the paper. The titles or the descriptions of all figures in this list need to go together with the details of the contents in the thesis. In case, there are any figures in an appendix. Researchers should also include the lists of appendix figures in the list of figures.

1.10 List of Symbols, Abbreviations and Technical Vocabularies

This page describes the meanings of all symbols in the thesis. The word “List of Symbols and Abbreviations” is on the middle of the paper. With or without the symbols and abbreviations in your dissertation, all are accepted. It depends on necessity. This page can allow readers to understand the meanings of each symbol and abbreviation used in the dissertation better.

2. Contents

Generally, the content of the thesis composes of around 5 units. However, some branches of other studies may have different numbers or units, dependent on the advisory committee's consideration that is accepted in faculty.

Unit 1 Introduction

This is the first unit of the thesis telling about the background and the importance of problems, objectives, research hypothesis, scope of study, brief research methods, and practical application. In this unit, the author will describe all used definitions and symbols of the research, affecting the ways of scope of study, methods and the results of the study.

Unit 2 Literature Review

In the process of good research, researcher needs to find much information of other researcher's researches in order to acknowledge the details and the scopes of the best thesis. There are 2 important steps to educate the formation as stated below.

1) Exploration and analysis

It is to search for the related researches from the review articles, references and brief details to help the researchers cite the source of the thesis when discussing the outcome next time.

2) Research synthesis

All collected data will be analyzed by the researcher and they will think of next steps for the harmony of writing presentation. In this process, the researcher will concisely and clearly summarize each hypothesis for presenting research proposal and finally focusing on the specific issue they have studied. Importantly, sufficient references can be the good and beneficial fundamentals for the researchers.

Unit 3 Materials and Methods

In this unit, the researcher thoroughly identifies important details of the research backgrounds, including procedures, research materials, methods, instruments, period of time and essential statistics so as to analyze and synthesize the data to complete the research. All information and details must be explained since the time the thesis is not done to be done. Consequently, important things of this unit are below;

- 1) Population and sample group
- 2) Variable (if any)
- 3) Research instruments
- 4) Research tools quality testing
- 5) Data collection
- 6) Analysis

Unit 4 Results and Discussion

In this unit, it is about the results of the discussion of a thesis that researcher has studied. There are 2 ways of results discussion as stated below ;

1) Reporting research results

The report of research results needs to be presented with any kinds of good illustrations such as essay that composes of table, graph or diagram with clear pictures to make your report more interesting to follow. Moreover, each issue should be appropriately ordered and arranged.

2) Results discussion

After reporting the research results, immediately discuss the results and try to answer “Why or Why not” if the results do not respond to the hypotheses. It is important to make the discussion involve in other researches for good trust and credit from the readers.

Unit 5 Conclusion

1) Summarize the research results with brief and concise details of the research issue, objectives, hypotheses (If any) , research instruments or methods of data collection. In this unit, the researcher can separate the conclusions for each item to make the readers easily understand the contents.

2) Research limitation (If any) After the thesis is completed, the researcher will be able to observe that sometimes the research has the limitation of information such as population, sample group or data collection. The researcher should clearly identify them for applying the benefits for doing later dissertation.

3) Research application. The results of research should be conveyed to the practical ways, associated with the research results.

4) Research suggestions. The researcher will find how and what issue is interesting to study for the next time to make related researches more complete.

3. Formatting endnotes

There are 3 important components as stated below;

3.1 References or bibliography

The references or bibliography are kind of one document or journal that shares the details and sources of how information has been got. This page is next to the contents but not before the appendix. The word “Appendix or Bibliography” is on the center of the paper.

3.2 Appendix

Appendix is the supportive part of the thesis for a better understanding of illustrations of all glossaries, abbreviations, questionnaires or interviews that are used to collect the data. Also, arrange orderly appendix A, B the same as Thai appendix and the word “Appendix” is on the middle center of the paper.

3.3 Curriculum vitae

The curriculum vitae of an author needs to be about his/her background of education or work experience , not more than 1 page composing of all things as stated below.

1. Full name with any name titles or position ranks (If any)
2. Degrees of educational branches of study, institutions and year of graduation
3. Position and current workplace
4. Any success, accomplishments, renowned published research or excellent academic performance (If any)
5. Honors or scholarships (Only necessary)

4. The patterns and samples of thesis

In order to allow graduate students of Walailak University or other people interested in academic writing to correctly and suitably apply the patterns of the thesis writing or independent study project to use in the thesis design, below parts thus are the pattern samples of how to construct the thesis or project as follows;

1. Thesis of doctorate degree Type 1 , master degree Pattern A Type A1
2. Thesis of doctorate degree Type 2 , master degree Pattern A Type A2

Each type will be identified by all these components that are as follows.

Pattern : Front cover and title
page of thesis of Ph.D Type1,
Pattern A Type A1

1.5 inches



1 line distancing

Thesis Title (English)

Author (Name Surname)

**A Thesis Submitted in Fulfillment of the Requirements
for the Degree of (Program Title).....**

Walailak University

1 line distancing

Academic year

1.5 inches

Sample



**A Study of an Air Pycnometer and Characterization of Sound
Absorption Measurements**

Thammarong Eadkhong

**A Thesis Submitted in Fulfillment of the Requirements
for the Degree of Doctor of Philosophy Program
in Physics
Walailak University**

2021

Pattern: Front cover and title page
of thesis of Ph.D Type2 , Pattern
A Type A2

1.5 inches



1 line distancing

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Author (Name Surname)

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for the Degree of (Program Title).....**

Walailak University

1 line distancing

Academic year

1.5 inches

Sample



**The Development of Essential Oil Absorbent Material from Coconut
Fiber to Control Psychrophilic Pathogens and
Extend Shelf Life of Food During Cold Storage**

Prangthip Parichanon

**A Thesis Submitted in Fulfillment of the Requirements
for the Degree of Doctor of Philosophy Program
in Agro-Industry
Walailak University**

2021

Approval page: Pattern Ph.D Type1, Pattern A Type A1

Thesis

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The graduate committee,(program Title)
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fulfillment of the requirements for ther..... (Program Title).....

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Thesis Title A Study of an Air Pycnometer and Characterization of Sound
Absorption Measurements

Author Thammarong Eadkhong

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Approval page: Pattern Ph.D Type2, Pattern A Type A2

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Thesis Title	The Development of Essential Oil Absorbent Material from Coconut Fiber to Control Psychrophilic Pathogens and Extend Shelf Life of Food During Cold Storage
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Prangthip Parichanon The Development of Essential Oil Absorbent Material from Coconut 2021
Fiber to Control Psychrophilic Pathogens and Extend Shelf Life
of Food During Cold Storage

Spine (Sample)

Abstract (Sample)

Thesis Title	The Development of Essential Oil Absorbent Material from Coconut Fiber to Control Psychrophilic Pathogens and Extend Shelf Life of Food During Cold Storage
Author	Prangthip Parichanon
Major Program	Agro-Industry

Abstract

Ready-to-eat (RTE) vegetables are increasingly gaining demand as they are a healthier choice. Lettuce, the basis for salad, tends to be at the risk of contamination by psychrophilic pathogens, *Listeria monocytogenes* and *Escherichia coli*. It can also be easily spoiled by microorganisms, even under cold conditions. Application of essential oil (EO) vapour, mostly of citrus groups, i.e., lime oil (LO), *Litsea*, and citronella oil, as an antimicrobial has been extensively implemented, but information regarding the use of EO vapour during cold storage is scarce. This research aimed to investigate the EOs' volatilization release mechanism during cold storage. EO application in food packaging systems usually absorbs in the absorbents to retard the release. To find the best antimicrobial absorbent material in food packaging systems, lignocellulosic agricultural wastes such as coconut, palm, and rubberwood were studied. Additionally, LO emulsion was applied as a bio-control agent on green oak lettuce in hydroponic systems.

In this research, LO was used in amounts of 50, 100, and 200 μL in absorbed paper bags to evaluate its antimicrobial efficacy in reducing contamination with *L. monocytogenes* in RTE salad and increasing shelf life of salad during cold storage (4 $^{\circ}\text{C}$). At 200 μL , LO showed a good potential to inhibit the microbial growth. The latter was investigated by cell molecular biology assays, cell constituent release, crystal violet, relative gene expression, and SEM, respectively. The results showed that LO had a significant effect on bacterial cell permeability, cell membrane integrity, and cold shock protein genes (*cspB*) and caused serious detrimental defects on membrane

morphology. Moreover, using a GC-MS, it was found that α -terpineol, terpineol, and limonene are the major substances relating to bacterial growth inhibition in RTE salads during cold storage.

In this study, coconut fibre showed the best water and EO emulsion absorption capacity among the lignocellulosic materials. The coconut fibre used in this work contained 31.2% hemicellulose (which is hydrophilic and influences the fibre water absorption), 34.5% lignin (which provides the rigidity of the fibre), and 37.6% cellulose (which provides the strength of the fibre). The relatively high porosity of 3.30% and high specific surface area of $1.9 \text{ m}^2 \text{ g}^{-1}$ also had a major role in its high absorption capacity.

The antimicrobial absorbent pad was developed using coconut fibre. The microbiological quality of RTE salad, which was packed with absorbent, was investigated following Thai food standards. Based on the findings, the proposed system could extend the shelf life of RTE salad from 3 to 7 days. This behaviour can be attributed to the decrease in mesophilic bacteria, psychrophilic bacteria, yeast, and mould in food. Furthermore, consumers accepted the salad with a hedonic score of $\sim 6.1 \pm 0.7$ (like slightly).

Acknowledgements
(Sample)**Acknowledgements**

This work would not have been possible without the financial support of the Thailand Research Fund (TRF) through the Royal Golden Jubilee Ph.D. Program (Grant No. PHD/0093/2016), the Research Center of Excellent in Innovation of Essential oil, Walailak University, and Walailak University School of Agricultural Technology and Food Industry.

Throughout the writing of this dissertation, I have received a great deal of support and assistance. First and foremost, I have to thank my main supervisor, Professor Narumol Matan, whose expertise and guidelines were invaluable in carrying out the research. Without her assistance and dedicated involvement in every step throughout the process, this dissertation would have never been accomplished. Your insightful feedback pushed me to sharpen my thinking and brought my work to a higher level. I would like to thank you very much for your support and understanding over these past five years.

I am grateful to all of my colleagues whom I have had the pleasure of working with during my PhD program. I would especially like to thank Professor Nirundorn Matan, the co-advisor, and Professor Apsorn Sattayakhom, as my teacher and mentor in the cell biology part. In April 2019, I went to University of Milan for 9 months to work with Professor Sara Limbo. My time at University of Milan has been highly productive and working with Professor Manuela Rollini, Professor Stefania Arioli, and Dr. Paolo D'Incecco was an extraordinary experience.

I would like to give my deepest thanks to all the external examiners, Assoc. Prof. Dr. Yuthana Phimolsiripol, and Assoc. Prof. Dr. Monthon Lertcanawanichakul for their encouragement, insightful comments and valuable suggestions.

Last but not least, I would like to thank my family for their encouragement and endless support. You are always in my thought and prayers. Furthermore, I could not have completed this dissertation without the support of my friends, who provided stimulating discussions as well as happy environment at work.

Prangthip Parichanon

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Vitae (Sample)**Curriculum Vitae****Name****Educational Attainment**

Degree	Name of Institution	Year of Graduation
.....

Work, Position and Address

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Lists of Publications, Proceedings and Academic Awards (If any)

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Scholarships Awarded (If any)

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