GUIDELINE BOOK
OF WRITING
THESES

VETERINARY MEDICINE STUDY PROGRAMME
VETERINARY PROGRAMME
UNIVERSITAS BRAWIJAYA
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FOREWORD

This final assignment, in the form of a thesis, is a scholarly work required to fulfil the requirements for a Bachelor of Veterinary Medicine (SKH) at the Veterinary Medicine Programme (PKH) of Universitas Brawijaya.

This Thesis Writing Guidebook is essential to achieve uniformity in writing. It is hoped that understanding the contents of this book will support the smooth preparation and writing of theses for students of the Veterinary Medicine Programme (PSKH).

This guidebook outlines the general guidelines for writing and compiling a thesis. The contents of the book are divided into four main sections: (1) General Instructions, (2) Writing Guidelines, (3) Compilation Guidelines, and (4) Appendices containing examples.

The preparation of this Thesis Writing Guidebook marks the first such effort in the Veterinary Medicine Programme at Universitas Brawijaya. It serves as a general guideline applicable to various topics within the field of veterinary medicine. Feedback and suggestions are highly valued for the improvement of this book. It is hoped that this guidebook will be beneficial as anticipated.

Malang, January 2014
Writer

GENERAL GUIDELINES

The undergraduate programme at Universitas Brawijaya operates on a credit semester system and concludes with a final project examination. To sit for the final project examination, a student is required to complete a final project in the form of a thesis, which is a scholarly work in their field of study, written based on research, literature review, fieldwork, internships, or other tasks as determined by the faculty/program.

A. Requirements for Writing a Thesis

A student is permitted to write a thesis if they meet the following requirements:

1. Enrolled as a student in the relevant academic year.
2. Accumulated at least 120 credits.
3. Achieved a Grade Point Average (GPA) of at least 2.00.
4. No final grade of E.
5. Grades of D/D+ must not exceed 10% of the total credit load.
6. Fulfilled other requirements as specified by the Veterinary Medicine Programme (PKH) at UB.

B. Procedures and Methods for Writing a Thesis

The procedures and methods for writing a thesis are outlined in the Thesis Writing Guidelines Book of the Veterinary Medicine Programme (PKH) at UB.

C. Credit Value of the Thesis

The credit value for the undergraduate final project is a minimum of 6 (six) credits.

D. Completion Time for the Thesis

1. SkripThe thesis must be completed within 6 (six) months from the time it is registered in the Course Registration Form (KRS).
2. Extensions may be granted with the approval of the Head of the Programme, following the procedures established by PKH UB.

E. Thesis Supervisors

During the thesis writing process, a student is supervised by 2 or 3 individuals, including a Main Supervisor and one or two Assistant Supervisors. Deviations from these requirements are determined by the Head of the Programme upon the recommendation of the Head of the Study Programme. The qualifications, appointment, and duties of the supervisors are regulated in the Academic Guidelines Book of UB.

F. Thesis Proposal Seminar

The thesis proposal seminar is a mandatory seminar that students must attend as a requirement for conducting their thesis research. The seminar is conducted orally and aims to evaluate the feasibility of the thesis proposal.

A student is eligible to submit their thesis proposal seminar if they have met the following requirements:

1. Registered for the proposal examination in the relevant academic year.
2. Completed at least 120 credits.
3. Achieved a minimum GPA of 2.00.
4. No final grade of E.
5. Fulfilled any additional requirements set by the Veterinary Medicine Programme (PKH) at

UB.

G. Procedure for Requesting a Thesis Proposal Seminar

The procedure for requesting a thesis proposal seminar must follow the Manual Procedures (MP) and Work Instructions (IK) relevant and applicable at PKH UB, considering both administrative and academic requirements.

H. Thesis Results Seminar

The thesis results seminar is a mandatory seminar that students must attend as a requirement for their final undergraduate examination (comprehensive examination). The seminar is conducted orally and aims to evaluate the results of the thesis research and the student's understanding of the material.

A student is eligible to present their thesis results seminar if they have met the following requirements:

1. Registered for the thesis results examination in the relevant academic year.
2. Completed the thesis proposal seminar.
3. Attended at least 10 open seminars.
4. Completed the thesis research.
5. Accumulated at least 120 credits.
6. Achieved a minimum GPA of 2.00.
7. No final grade of E.
8. Fulfilled any additional requirements set by the Veterinary Medicine Programme (PKH) at UB..

I. Procedure for Requesting a Thesis Results Seminar

The procedure for requesting a thesis results seminar must follow the Manual Procedures (MP) and Work Instructions (IK) that are relevant and applicable at PKH UB, taking into account both administrative and academic requirements.

J. Final Undergraduate Examination (Comprehensive Examination)

The final undergraduate examination (comprehensive examination) is the last exam that students must undertake as a requirement for obtaining a Bachelor of Veterinary Medicine degree. The examination is comprehensive, conducted orally, and aims to evaluate students' mastery of knowledge and application of technology relevant to the field of veterinary medicine. It also aims to address any areas where the student is considered weak.

A student is eligible to sit for the final undergraduate examination if they meet the following requirements:

1. Registered as a student in the relevant academic year.
2. Accumulated at least 143 credits.
3. Achieved a minimum GPA of 2.00.
4. No final grade of E.
5. Completed the thesis.
6. Submitted an abstract and summary of the thesis in soft copy to the central library for inclusion on the UB central library website.
7. Fulfilled any additional requirements set by the Veterinary Medicine Programme (PKH) at UB.

K. Procedure for Requesting the Final Undergraduate Examination (Comprehensive Examination)

The procedure for requesting the final undergraduate examination must follow the Manual Procedures (MP) and Work Instructions (IK) that are relevant and applicable at FVM UB, considering both administrative and academic requirements.

L. Examination Committee

The regulations regarding the examination committee, requirements, and duties are outlined in the UB Education Guidelines and follow the Manual Procedures (MP) applicable at FVM UB.

M. Examination Duration

The allotted time for the examination is a maximum of 2 (two) hours.

N. Assessment

1. The assessment in the examination includes:
   a) The quality of the scientific work (thesis), covering academic weight and writing style.
   b) Performance during the examination.
   c) Mastery of the material demonstrated through responses to questions from the examination committee.
2. Determination of Final Grade
   The chairperson of the examination committee leads the deliberation to determine the examination grade, which is expressed as A, B+, B, C+, C, D+, D, or E. The final grade also includes the thesis performance and seminar grade, with weights determined by PKH UB.
3. A student is declared to have passed the examination if they achieve at least a grade of C.
4. Students who do not pass the examination must comply with the examination committee's decision.

O. Yudisium

1. Yudisium is determined based on the date the student has completed all academic requirements and is marked as the end of their study period.
2. A student can be declared to have passed the final examination if they meet the minimum credit requirement (149 credits) and do not exceed the maximum study period of 7 (seven) years
3. Graduation Classification
   The graduation classification consists of three levels: Satisfactory, Very Satisfactory, and With Honours, as stated on the academic transcript. The Cumulative Grade Point Average (GPA) serves as the basis for determining the graduation classification:
   GPA 2.00–2.75: Satisfactory
   GPA 2.75–3.50: Very Satisfactory
   GPA 3.51–4.00: Cum Laude (With Honours)
   The classification of With Honours is also determined by considering the maximum study period: a maximum of 5 years for the undergraduate programme, with an additional 0.25 years for programme transfers.

GUIDELINES FOR WRITING THESES

1. MATERIALS AND PAPER SIZE

The thesis should be typed on A4-sized HVS paper (21 x 29.7 cm) with a minimum weight of 80 grams.

The front cover page should be made from lilac-coloured hard cover paper, with additional text along the edge that includes the author's name, title, and year of the thesis

2. LANGUAGE

The language used should be standard Indonesian with correct grammar. Sentences should be in the passive voice, avoiding first and second person subjects, e.g., "I", "we", "you"..

Foreign terms are permitted and can be written in their original language if necessary and if there is no accurate translation in Indonesian. However, the foreign terms should be italicised. The use of conjunctions such as “so, and, whereas, from, thus, for, in, with” is not allowed at the beginning of sentences. Prepositions such as “di, ke, dari” when followed by a word indicating location should be written separately, e.g., “where, at the office, to the market, from there, and to where”. However, “daripada, kepada, and kemari” should be written as a single phrase.

The use of numbers or numerical symbols at the beginning of a sentence is not permitted. Numbers for dates, page numbers, and times should be written as follows: 14 October 2011, page 450, and 10:00 WIB. When numbers represent units, metric units should be used, and non-metric systems should be avoided. Measurement units following numbers should be abbreviated and not followed by a period, e.g., 15 cm, 10 g, and 10°C. Numbers smaller than ten should be written in words, while numbers ten or larger can be written numerically, e.g., six parts, 15 cows. However, in a series of numbers below and above ten, numerals should be used. When a measurement unit is not preceded by a number, it should be written out in full, e.g., “kilogram is used to denote weight” rather than “Kg is used to denote weight”.

3. TYPING MODEL

A. Font Style, Size, Spacing, and Paragraphs

The typing margins are 4 cm from the left and top edges, and 3 cm from the right and bottom edges. The thesis text, from the cover page to the appendices, should be typed in Times New Roman, size 12, except for the title on the front cover, which should be in bold capital letters, size 16. The general format should be right-aligned with 2 (two) line spacing, and double-sided printing is not permitted

New paragraphs should start on the fifth line from the edge of the paper. Paragraphs should not leave a single line at the bottom of a page; each page should contain at least two lines of the paragraph.

B. Numbering, Figures, and Tables.

Page numbering for the preliminary sections of the thesis should use lowercase Roman numerals, except for the front cover page. Page numbering starts from the title page with “i,” but this number is not displayed on that page. The subsequent pages should use Roman numerals centred at the bottom of the page.

Page numbering for the main and final sections of the thesis should use Arabic numerals without dots. Each chapter should begin on a new page, and page numbers should be placed at the bottom centre. On the following pages, page numbers should be placed in the top right corner, 2 cm from the top of the paper and 3 cm from the right edge. Titles or subsequent sentences should be typed two spaces below the page number.

Figure captions should be in bold. The caption should be typed below the figure, with capital letters used only at the start of the sentence, and should not be in bold. If the caption is more than one line, it should be spaced one line below the previous line and start directly below the first letter of the caption.

Table numbers should be in bold. The table title should be typed above the table, with capital letters used only at the start of the sentence, and should not be in bold. If the title spans more than one line, it should be spaced one line below the preceding line and start directly below the first letter of the title. Tables that are too wide should be simplified. It is not allowed to cut or move parts of a table to another page. If necessary, the table may be reduced in size by up to 50% from its original size. Alternatively, besides simplified tables, an initial data table can be included as an appendix if deemed necessary.

Secondary data, including tables or figures from a single source, should mention the source below the table or figure. If the secondary data is compiled from various sources, each source should be indicated with a superscript, and the superscripts should be explained below the table or in a special column that details the data sources.

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C. Heading Levels

Refer to Appendix 14.

4. CITATIONS

Citations should include the author's name or other sources used, with the following guidelines:

- The author's name in the text should be written as the last name only. For more than two authors, use “et al.” or “dkk.” (if using foreign literature).
- If the author or writer is only one or two people, use the following example: According to Aulanni’am in Wuragil and Damayanthi (2006), exposure to multi low dosage streptozotocin (MLD-STZ) can trigger Type 1 Diabetes Mellitus

- If the Author or Writer is More than Two People
  Example: Aulanni'am et al. (2004).
- Citation Formats in the Literature Review:
  a. At the beginning or start of a sentence:
     Untari (2010) states that.....
  b. In the middle of a sentence:
     This situation appears to be in line with Pratama's (2010) statement that……
  c. At the end of a sentence:
     ……. is found in the extract of Sambiloto (Wuragil, 2006).
  d. Citing two authors::
     Aulanni'am and Akmal (2011) found that……
  e. Citing more than two authors:
     Yogurt can reduce small intestinal damage due to formalin exposure (Mahdi et al., 2009).
  f. Citing from more than two sources:
     According to Surareungchai and Somasundrum (2006) and Oaew and Karoonuthaisiri (2010) in Wuragil et al. (2011), carbon nanotubes can carry more biomolecules on their surface.
  g. Citation from a secondary source:
     When citing from a secondary source, you must mention the original author's name, as well as the name of the book or magazine author you have read. It is recommended to refer to the original source when possible.
     Example:
     The same results are also shown by Firmawati et al. (Muller et al., 2006). According to this example, only Muller et al. (2006) should be listed in the bibliography, not Firmawati et al..

5. BIBLIOGRAPHY FORMATTING

The bibliography should ideally consist of 40% scientific journals and 60% textbooks, research reports, theses, or dissertations. References cited should be from the last ten years to ensure relevance.

Formatting References in the Bibliography:

a. Author or Article Writer

The author's surname should be written first, followed by a comma and the initials of the first and second names (if applicable). This applies to all authors, with the initials placed at the beginning. If an article has two authors, they are connected by the word "and" (or "et al." in French, "und" in German, etc.). For more than two authors, use commas between the first and second authors and before the last author, connecting them with "and." This method ensures that all authors are included in the bibliography. Details to consider in author name formatting:

a.1. For Articles or Works with Unknown Authors.
If the actual author's name is unknown, list the name of the institution or organisation that published the work in the bibliography.

Example: Department of Agriculture, 2006. *Guidelines for the Prevention and Control of Avian Influenza in Small-Scale Poultry Farms*. Bureau of Law and Public Relations, Department of Agriculture. Jakarta..

a.2. Formatting Names:

a. Indonesian Names

For authors with a single name, write it in full, e.g., Sardjono. For authors with two or more names, the last name is considered as the family name, e.g., Herlina Pratiwi becomes Pratiwi, H or Handayu Untari becomes Untari, A

b. Chinese Names

Lie Hok Sin becomes Lie, H.S.
Tan Bing San becomes Tan, B.S

c. Arabic Names

Fairuz Faizal becomes Faizal, F.
Ali Ibnu-Saud becomes Ibnu-Saud, A.

d. Dutch Names

Kees de Vries becomes De Vries, K.
Rudd Van Nistelrooy becomes Van Nistelrooy, R.

e. German Names

H. Zur Florst-Meyer becomes Zur Horst-Meyer.
H. Carl von Schmidt becomes Von Schmidt, C..

f. Brazilian or Portuguese Names:

Mario dos Kempes becomes Dos Kempes, M.
S. do Silva becomes Do Silva, S.

g. Hungarian Names

Since the family name is already at the beginning, there is no need to reverse it.
Farkas Karoly becomes Farkas, K.
Szent-Giorgy Albert becomes Szent-Giorgy, A.

h. Indian Names

Words like Sen or Das are combined with the family name.
B. C. Sen Gupta becomes Sen Gupta, B. C.
A. D. Das Gupta becomes Das Gupta, A. D.

i. French Names

Words like le, la, les, du, de la, and des are placed before the family name, while de is placed after it.
J. Le Bean becomes Le Bearu, J.
V. du Barry becomes Du Barry, V.
A de Barry becomes Barry, A. de..

j. Vietnamese or Thai Names

Vietnamese names, e.g., Nguyen-cao-Ky Dau-hung-Anh (where the middle name is in lowercase and hyphenated), should be written as Dauhung-Anh.
Werasak Surareungchai becomes Surareungchai, W.
Oaew's surname becomes Oaew, S.

b. Publication Year

The year of publication for a book or article should be written after the author's name, separated by a dot.

1) If an author writes more than one article or work in the same year, use notations a, b, or c (depending on the number of articles in that year) immediately following the year of publication, without any spaces..
2) If the same author writes several articles in different years, list the references in chronological order, starting with the earliest year. Additionally, all author

names should be written in full.

c. Abbreviations

Abbreviations are typically used for journals, except for journal names consisting of only one word. Each journal usually has an established abbreviation in scientific articles. The abbreviation should follow the guidelines of the American National Standards Institute, which include:

1) Do not abbreviate the name of journals that consist of a single word. Example: Anatomy, Geosweek.
2) Do not abbreviate names of people that appear before the journal name. Example: Hoppe-Seyler's Z. Physiol. Chem.
3) When creating abbreviations by removing a series of letters, end with a consonant. Example: Biol. rather than Bio. for Biology.
4) Remove prepositions, conjunctions, and articles. The first letter of the abbreviation should be uppercase. Example: Can. J. Microbiol.
5) For compound words such as Dutch and German names, only the last part should be abbreviated. Example: Landbouwhogeschool becomes Landbouwhoge. Bodenforschung becomes Bodenorsch.

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d. Examples of Bibliography Formatting

For journals or magazines, the format is as follows: author(s), year of publication, article title, journal name, volume number (and issue number if applicable), and page numbers. Each component is followed by a period, and all words in the article title are in lowercase except for the first word which is capitalised. For online sources, provide the full website address and the access date.

Volume numbers, starting and ending page numbers are written in Arabic numerals following the journal name or its abbreviation. If the journal includes issue numbers within a volume, the issue number should be placed in parentheses following the volume number. Example:

a. For a journal with volume but no issue number: Geosweek 4:1-12
b. For a journal with volume and issue number: Natural 4 (2):1-12

For books, the format is: author(s), year of publication, book title, edition number, publisher, place of publication, and reference pages. Each component is followed by a period, and all words in the book title are capitalised.

Examples of Bibliographic Entries: :

Text Books

Bell, C., and A. Kyriakides. 2002. *Salmonella*: A Practical Approach to The Organism and Its Control in Foods". Blackwell Science Ltd., London. 1-25, 282-298.

Journal Article

Chunglok, W., D.K.Wuragil, S. Oaew, M. Somasundrum, and W. Surareungchai. 2010. Immunoassay Based on Carbon Nanotubes-Enhanced ELISA for *Salmonella enterica* serovars Typhimurium. *Biosensors and Bioelectronics* 6(2): 264-269.

Aulanni'am. 2007. Efek Antifertilitas Fraksi Air Biji Pinang (*Areca catechu*) Sebagai Agen Apoptosis pada Sel-Sel Jaringan Testis *Rattus norvegicus*. *Jurnal Media Kedokteran Hewan*, 23(3) : 179-183.

Abstract

Aulanni'am. 2007. Evaluation of Immunocontraceptive Potential of Deglycosylated Peptides of bZP3 and its Immunogenicity. *Anat. Rec. i00 (Abstr.): 624.*

Online Articles/Papers

P.J. Quinn, B.K. Markey, M.E. Carter, W.J.Donnelv and F.C. Leonard.2004. Veterinary Microbiology and Microbial Disease.//http.www.nebi.nlm. gov/Pubmed/biomed.net.com. [15 Pebruari 2006]

Reports

Mc. Clellar, R.O., J.R. Kenne and C.K. Bustad. 2007. Metabolism and Dosimetry

of Cesium in Rams. *In: Anford Biology Research Animals Report for 2002*. Hanford Lab., Richland.

Conference Proceedings

Aulanni'am. 2007. Optimation *Invitro* Sertoli cells Culture Of Rat (*Rattus norvegicus*) as Source of Inhibin B as candidate Materials of ormonal Male Antifertility. Internatinal Conference On Molecular Biology of Life Sciences. Malang. 19-21.

Pratama, D.A.O.A., Sumartono, and W.T. Artama. 2011. Genetic Lineage Analysis of *Toxoplasma gondii* Local Isolate Based on 529-bp Repeat Element. International Seminar and the 2nd Congress of SEAVSA, "Increasing Animal Production through Zoonoses and Reproductive Disorder Handling, and Implementation of Biotechnology. Surabaya. 261-264.

News Articles

Hinkle, D.A. and J. D. Garrett. 2004. Corn Fertilizer and spacing Experiments. Arkansas Agric. Exp. Sta. Bull.

Newspapers

Sudarmadji, C.2004. Bahasa statistika di Indonesia sangat beragam. Kompas.8 Maret. No.321. Th.32. Hal.17

Theses/Dissertationsi

Untari, H. 2009. Pengaruh Pemberian Ekstrak Ethanol Rimpang Temu Hitam (*Curcuma aeruginosa* Roxb.) terhadap Jumlah Limfosit Usus Halus Ayam Petelur yang Diinfeksi Cacing *Ascaridia gali* [Skripsi]. Fakultas Kedokteran Hewan. Universitas Airlangga.

Wuragil, D.K. 2009. Application of Carbon Nanotubes for *Salmonella* Detection Based on Immunoassay [M.Sc. Thesis]. School of Bioresorces and Technology. King Mongkut's University of Technology Thonburi.

GUIDELINES FOR THESIS PREPARATION

The thesis consists of three main sections: the preliminary section, the main body, and the concluding section.

A. Preliminary Section

The preliminary section includes:

1. Cover page
2. Title page
3. Approval page
4. Statement page
5. Abstract and English Abstract
6. Acknowledgements
7. Table of contents
8. List of tables
9. List of figures
10. List of appendices
11. List of abbreviations and symbols

B. Main Body

The main body includes:

1. Introduction
2. Literature review
3. Conceptual framework and research hypotheses
4. Research methodology
5. Results and discussion
6. Conclusion and recommendations

C. Concluding Section

The concluding section includes:

1. References
2. Appendices

A. PRELIMINARY SECTION

The preliminary section consists of 11 components arranged as follows.

1. Cover Page

The cover page includes text centred and printed in black ink from top to bottom in the following order:

a. ***Thesis title,*** written in uppercase Times New Roman 16, single-spaced, and without punctuation. If the title extends over more than one line, it should be arranged in an inverted pyramid shape. The title should be concise, clear, and informative, avoiding any potential for ambiguous interpretation.
b. The word ***Thesis***, written in uppercase.
c. ***Written by*** should be in uppercase at the beginning of the phrase.
d. ***The student's full name*** (without abbreviations) should be listed. Below the name, include the student's identification number without the prefix Student ID.

e. ***The Universitas Brawijaya emblem*** should be printed on a black background, with a diameter of approximately 5 cm, and the word "**Malang**" should appear beneath the logo.
f. ***The text "Programme of Veterinary Medicine, Universitas Brawijaya, Malang, and year of thesis completion"*** should be typed sequentially from top to bottom.

2. Title Page

This page contains the same information as the cover page, plus a statement regarding the purpose of the thesis, placed above the student's name (as per Appendix 2).

3. Approval Page

The approval page includes the thesis title, the student's name and ID number, the approval statement, date, and the signatures of Supervisor I, Supervisor II, and the Head of the Study Programme. An example of the approval page can be found in Appendix 3.

4. Statement Page

This page contains a statement filled out by the thesis author. The statement is binding and affirms the author's ownership of the thesis work. This can be found in Appendix 4.

5. Abstract and "Abstract"

The abstract should be written in standard Indonesian, while the abstract should be in English (Academic English). Both the abstract and the abstract provide a concise yet comprehensive summary, including the main issues, research objectives, research methods, results, and conclusions. There should be no citations from sources, and it should reflect the author's own thoughts. The research objectives are derived from the introduction, the methods from the research methodology, and the results from the conclusions. The abstract should be written in a single paragraph. At the end, include keywords, with a maximum of five words (Appendix 5).

6. Preface

The preface page should feature the title "PREFACE" written in capital letters without a full stop and centred on the page. The preface should include a brief explanation of the purpose of the thesis, important clarifications, and acknowledgements (maximum of 2 pages).

7. Table of Contents

The title "TABLE OF CONTENTS" should be written on a new page in capital letters without a full stop, centred at the top of the page. The table of contents should be arranged systematically according to the page numbers. Page numbering starts from the title page using lowercase Roman numerals (i, ii, iii, etc.), while from Chapter 1 to the end of the appendices, Arabic numerals (1, 2, 3, etc.) should be used.

The table of contents should be placed two spaces below the title. If the table of contents extends to more than one page, it should continue on the following page. The spacing between the lines for sub-chapter titles should be one space. Appendices titles should also be included in the table of contents. The format in the table of contents should match that used in the text (Appendix 6).

8. List of Tables

The list of tables should be created in the same manner as the table of contents. It

should be on a new page and typed in capital letters. Table numbers should use Arabic numerals. The space between the title of the list of tables and the first table should be four spaces. The table titles in the list must match the titles in the document. Each table title should be connected by dots to the page number of the table in the thesis. The space between two table titles should be two spaces (Appendix 7).

9. List of Figures

The list of figures should be typed on a new page and arranged similarly to the list of tables. There should be no distinction between graphs, maps, or photos; all should be numbered sequentially with Arabic numerals (Appendix 8).

10. List of Appendices

The list of appendices should be typed on a new page and arranged similarly to the list of tables (Appendix 9).

11. List of Symbols and Abbreviations

The page for symbols and abbreviations should include symbols/quantities and abbreviations with their meanings. The explanations of symbols or abbreviations aim to ensure that the research results can be communicated clearly and without ambiguity (Appendix 10).

B. MAIN SECTIONS

The main sections are sequentially composed of the following five components:

l. Introduction

The introduction is the first section of the thesis, starting with CHAPTER 1: INTRODUCTION. This section provides a brief overview to the reader about the research background, relating to previous studies conducted by other researchers. It includes a succinct explanation of the problem statement, research objectives, and the anticipated benefits of the research.

a. Research Background

This provides a general explanation of the scientific reasons why the problem presented is considered interesting, important, and worth investigating. It outlines the position of the problem within a broader context by explaining the development of existing research on the same topic. It also describes the relationship between the current research and other studies previously conducted on the same issue

b. Problem Statement

The problem statement clearly articulates the research problem and is framed in the form of research questions. The problem statement aligns with the title of the thesis and explains why the problem remains unresolved. It includes the parameters used in the research and the variables to be studied.

c. Research Objectives

This section presents the general and specific objectives that the research aims to achieve. The objectives should align with the problem statement..

d. Research Benefits

This section clearly outlines the expected benefits of the research. It specifies the target groups who will benefit from the findings, such as theoretical, productive, and practical benefits. The benefits should be relevant to the research objectives.

2. Literature Review

This chapter starts with the title CHAPTER 2: LITERATURE REVIEW written in capital letters and centred at the top of the page. The literature review should be organised according to the development of scientific knowledge that supports or is related to the research. This chapter discusses theories and previous research findings relevant to the chosen experimental methods.

The literature review can be considered a summary of citations reviewed and aimed at addressing a specific issue. It presents viewpoints that align with or contradict the opinions used to solve the research problem. The substance of the literature citations should be relevant to the research. Citations from practical handbooks or non-journal websites are not acceptable. All citations should be listed in the bibliography, and all sources used must be mentioned by including the author's name and publication year as listed in the bibliography. The referencing style must comply with the guidelines provided. Ideally, the references used should be recent, not exceeding ten years old.

3. Conceptual Framework and Research Hypothesis

This chapter should start with the title *Chapter 3: Research Methodology* written in capital letters and centred at the top of the page. This chapter details the conceptual framework of the research and the research hypothesis. An example of the conceptual framework and research hypothesis can be found in Appendix 12.

4. Research Methodology

This chapter should start with the title CHAPTER 4: RESEARCH METHODOLOGY written in capital letters and centred at the top of the page. This chapter provides a detailed account of several aspects, including:

a. Research Location and Duration

   The research location must be described in detail (where the research was conducted) and the duration of the research (in months).

b. Tools and Materials

   The tools and materials used should be listed, including samples and instruments. Instruments/tools used in the research should be clearly described, including their names and manufacturers (e.g., refrigerated microcentrifuge - Amersham Biochem, Germany). Similarly, chemicals should include their names and manufacturers (e.g., rabbit anti-mouse alkaline phosphatase conjugated - Sigma, Singapore).

c. Research Stages

   This subsection should describe the research stages generally in a sequential bullet-point format.

d. Work Procedure The work procedure should be written in paragraph form, detailing the steps taken systematically and sequentially during the research, including how the results are analysed

Several additional considerations for writing this chapter include::

1. Specification of Research Materials: Provide comprehensive details about the research materials, including the quality of materials (analytical or technical grade), purity (if not pure substances), physical properties (solid or liquid), and the chemical name/formula of the materials used. This information is necessary to ensure that other researchers who wish to replicate the study use the correct materials.
2. Glassware and Equipment: Specify the types and sizes of glassware and equipment used for the research. For larger equipment or instrumentation, include the brand or model and its specifications.
3. Design and Validation of Equipment: If any equipment was designed, describe the design process and the methods used for testing or validating the equipment.
4. Flow Diagrams: For certain research fields, in addition to the description, important workflows may be presented using flow diagrams.
5. Data Analysis: The data analysis, particularly involving statistical tests, must be described in detail, including methods for data processing and interpretation.
6. Challenges and Solutions: Discuss any challenges that arose or significant factors that impacted the research, and describe the solutions or approaches used to address these issues. This will help other researchers who plan to conduct similar studies to better prepare for their own research.

5. Results and Discussion

This chapter should begin with the title CHAPTER 5: RESULTS AND DISCUSSION written in capital letters and centred at the top of the page

The Results and Discussion should be presented in a sequential and systematic manner, according to the stages of the research. The analysis procedures, which are crucial and affect the stages of the research, should be explained in this chapter. Research results, whether in the form of lists, tables, graphs, photos, or other formats, should be presented here. Raw data obtained from instrument readings that do not provide a clear picture of the results are recommended to be placed in the appendices. Routine and very common calculations should also be placed in the appendices. References should be made explicitly, for example: “The calculation to convert absorbance to concentration can be found in Appendix 2” or in parentheses “(Appendix 2)”.

Statistical analysis serves as a tool for discussion and drawing conclusions, but detailed statistical calculations do not need to be included in the results chapter; it is sufficient to state the significance levels.

Data presented as mean values should include standard deviation (SD) or standard error (SE), as these measures can be used to determine whether the presented data are reliable or not.

The results presented should ideally be observations or data processed descriptively or statistically, depending on the type of research (not raw or unprocessed data). If the author deems it necessary to include raw data, it should be placed in the appendices.

The description of research results should not discuss or provide reasons for the results but rather should be a descriptive presentation of what is shown in tables or figures. Tables or figures must have clear titles that describe the experimental treatments, along with explanations and special symbols used in the figures, such as superscripts. Research results should be compared with similar previous studies and may include solutions or suggestions regarding problems or limitations encountered in the research. The discussion should also avoid repeating citations from the literature already mentioned in the Literature Review chapter

6. Conclusions and Recommendations

This chapter should begin with the title "CHAPTER 6 CONCLUSIONS AND RECOMMENDATIONS" written in capital letters and centred at the top of the page.

Conclusions are a synthesis of the discussion and should include at least (1) answers to the research questions and objectives; (2) new findings and their potential prospects; (3) theoretical implications of the new findings. No further references should be included in this section.

Recommendations relate to the implications of the research findings for the advancement of knowledge and practical applications. At a minimum, recommendations should suggest directions for future research, based on the limitations identified in the study.

G. FINAL SECTIONS

The final sections include the following components:

1. References

The heading "REFERENCES" should be typed in capital letters, without underlining or punctuation, and centred at the top of the page. This heading does not need to be preceded by the word "chapter".

The writing of the references should ensure accuracy, readability, and ease for those who wish to trace the references. There are various referencing systems; however, two commonly used systems are the name-year system and the number system.

References should be listed starting three spaces below the "REFERENCES" heading, aligned to the left margin. Single line spacing should be used within each reference, and double line spacing should be used between references. Subsequent lines of each reference should be indented six spaces from the first line. The reference list must include all sources cited in the text, except unpublished and inaccessible materials, such as unpublished theses, dissertations, or theses that are usually available in libraries, and thus should be included (pages 11-13).

2. Appendices

Appendices contain supplementary information or data. They may include details of the research methodology, raw data from the research, examples of statistical calculations, and other material considered necessary to complement the thesis (Appendix 13).

APPENDICES

Appendix 1. Example of the Cover Page

Pengaruh Pemberian Ekstrak Daun Sambiloto terhadap Keberadaan *Tumor Necrosis Factor Alpha* (TNF-α) pada Tikus *(Rattus norvegicus)* yang Dikenai Paparan Streptozotocin

SKRIPSI

Oleh:
MUHAMMAD ADI SATRIA
105130101111043

PROGRAM STUDI KEDOKTERAN HEWAN
PROGRAM KEDOKTERAN HEWAN
UNIVERSITAS BRAWIJAYA
MALANG
2013

Appendix 2. Example of the Title Page

Pengaruh Pemberian Ekstrak Daun Sambiloto terhadap Keberadaan *Tumor Necrosis Factor Alpha* (TNF-α) pada Tikus *(Rattus norvegicus)* yang Dikenai Paparan Streptozotocin

SKRIPSI

Sebagai salah satu syarat untuk memperoleh gelar
Sarjana Kedokteran Hewan

Oleh:
MUHAMMAD ADI SATRIA
105130101111043

PROGRAM STUDI KEDOKTERAN HEWAN
PROGRAM KEDOKTERAN HEWAN
UNIVERSITAS BRAWIJAYA
MALANG
2013

Appendix 3. Example of the Approval Sheet

LEMBAR PENGESAHAN SKRIPSI

Pengaruh Pemberian Ekstrak Daun Sambiloto terhadap Keberadaan *Tumor Necrosis Factor Alpha* (TNF-α) pada Tikus *(Rattus norvegicus)* yang Dikenai Paparan Streptozotocin

Oleh:
MUHAMMAD ADI SATRIA
105130101111043

Setelah dipertahankan di depan Majelis
Penguji pada tanggal.....
dan dinyatakan memenuhi syarat untuk memperoleh gelar
Sarjana Kedokteran Hewan

Pembimbing I	Pembimbing II
.....	**.....**
NIP.	NIP.

Mengetahui,
Ketua Program Studi Kedokteran Hewan
Program Kedokteran Hewan Universitas
Brawijaya

Prof. Dr. Aulanni'am, drh., DES
NIP. 19600903 1898802 2 001

Appendix 4. Example of the Thesis Declaration Page

LEMBAR PERNYATAAN

Saya yang bertanda tangan di bawah ini:

Nama :.....
NIM :.....
Program Studi : .....
Penulis Skripsi berjudul:
.....
.....
.....

Dengan ini menyatakan bahwa:

1. Isi dari skripsi yang saya buat adalah benar-benar karya saya sendiri dan tidak menjiplak karya orang lain, selain nama-nama yang termaktub di isi dan tertulis di daftar pustaka dalam skripsi ini.
2. Apabila dikemudian hari ternyata skripsi yang saya tulis terbukti hasil jiplakan, maka saya akan bersedia menanggung segala resiko yang akan saya terima.

Demikian pernyataan ini dibuat dengan segala kesadaran.

Malang,.....
Yang menyatakan,

(.....)
NIM.

Appendix 5. Example of Writing an Abstract

Potensi Ekstrak Sambiloto ***(Andrographis paniculata)*** terhadap Kadar Glukosa Darah dan Keberadaan ***Tumor Necrosis Factor-alpha*** (TNFα) pada Pankreas Tikus ***(Rattus norvegicus)*** Diabetes Hasil Paparan ***Multiple Low Dose*** Streptozotocin (MLD-STZ)

ABSTRAK

Diabetes Mellitus (DM) merupakan penyakit metabolik yang menyebabkan gangguan produksi insulin sebagai pengendali glukosa ke otot dan jaringan lemak. DM tipe 1 merupakan tipe penyakit DM yang bersifat autoimun, ditandai dengan adanya destruksi sel β pankreas yang akan mengarah pada defisiensi insulin yang absolut. Beberapa pengalaman diabetisi menunjukkan bahwa air perasan daun sambiloto (*Andrographis paniculata*), dapat digunakan sebagai bahan pengobatan DM. Penelitian ini bertujuan untuk mengetahui perubahan kadar glukosa darah serta keberadaan TNFα pada irisan pankreas. Tikus yang dipakai dalam penelitian ini adalah tikus *(Rattus norvegicus)* jantan berumur 1,5-2 bulan yang dibagi dalam 3 kelompok masing-masing 3 ekor. Kelompok 1 adalah kelompok kontrol yang tidak diijeksi *MLD-STZ* dengan dosis 15 mg/KgBB sebanyak 5 kali, kelompok 2 adalah tikus DM tanpa terapi ekstrak daun Sambiloto. Sedangkan Kelompok 3 adalah tikus DM dengan terapi ekstrak daun Sambiloto sebanyak 3-5 ml setiap pagi selama 7 hari. Pengamatan histologis dan pengukuran kadar glukosa darah dilakukan pada tikus sebelum mengalami paparan *MLD-STZ*, tikus diabetes, dan setelah pengobatan dengan ekstrak daun sambiloto. Hasil penelitian menunjukkan, Kadar glukosa darah tikus yang diinjeksi *MLD-STZ* mengalami kenaikan hingga mencapai 245-294 mg/dL pada hari ke-30 pasca injeksi terakhir. Kadar glukosa darah turun bertahap hingga mencapai 102-120 mg/dL setelah terapi dengan ekstrak daun Sambiloto serta adanya overproduksi TNFα pada pankreas tikus DM memicu pada kondisi radang.

Kata kunci : Diabetes Mellitus, *Rattus norvegicus*, Streptozotocin, Sambiloto, Sel β pancreas, TNFα

Potency of Sambiloto *(Andrographis paniculata)* as a Theurapeutic in Rat Diabetic models after Multiple Low Dose Streptozotocin (MLD-STZ) Injection

ABSTRACT

Diabetes Mellitus (DM) is a metabolic disease caused by perturbants of insulin produce which has function to maintain of glucose to muscle and fatty tissue. Type 1 DM or Insulin Dependent Diabetes Mellitus (IDDM) result from chronic autoimmune destruction of pancreatic β cells and cause insulin deficiency. According by experimental of many diabetisian show that extract Sambiloto's leaves, can use to treat of DM. The aim of this research are to know the prospect of Sambiloto for declining of blood glucose levels, also the presenting of TNFα in pancreas sectioning. Induction of DM in rat (Rattus norvegicus Srain Winstar) 1,5-2 months age doing by injecting Multiple Low Dosage Streptozotocin (MLD- STZ) in intraperitonially (i.p) at dosage of 15 mg/Kg BW in 5 days. The treatment divide in 3 groups are (I): negative control, (II): positive control, that consist of diabet rats, and (III): Consist of diabet rats which treat with 3-5 ml Sambiloto's extract everyday in a week. Histological observe and measurement of blood glucose level doing in preimmune, after STZ injection and after treatment of Sambiloto. These result provide that Sambiloto's extract have the effect declining of blood glucose level and the presenting of TNFα in pancreas showed overproducting of TNFα cause inflamatoty in diabetic rats.

Key words : Diabetes Mellitus, Rattus norvegicus Strain Winstar, Streptozotocin, Sambiloto, Pancreatic β cells,TNFα

Appendix 6. Example of Table of Contents

DAFTAR ISI

Halaman

Appendix 7. Example of List of Tables

DAFTAR TABEL

Lampiran 8. Contoh Daftar Gambar

DAFTAR GAMBAR

Lampiran 9. Contoh Daftar Lampiran

DAFTAR LAMPIRAN

Appendix 10.Example of List of Terms and Symbols

DAFTAR ISTILAH DAN LAMBANG

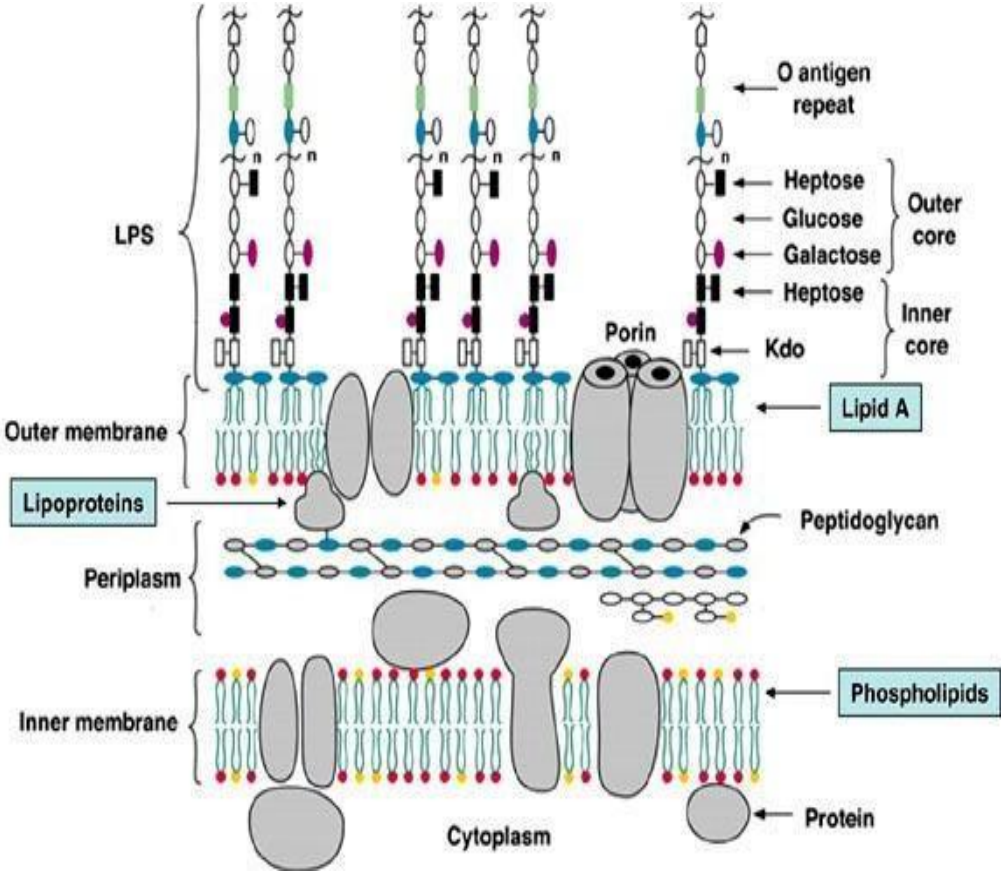
Simbol/singkatan	Keterangan
ANOVA	*analisis of variant*
APC	*antigen presenting cell*
BSA	*bovine serum albumin*
FAE	*Follicle Associated Epithelial*
GALT	*Gut Associated Lymphoid Tissues*
IEL	*Intra Epithelia Lymphocyte*
Ig A	*immunoglobulin A*
Ig M	*immunoglobulin M*
IL-1β	*interleukin-1β*
IL-2	*interleukin-2*
INF-γ	*interferon-γ*
LPL	*Lamina Propria Lymphocyte*
MPS	*muco polysaccarida*
NO	*nitric oxyde*
PMN	*polymorphonuclear*
RAL	rancangan acak lengkap

Appendix 11. Example of Table/Figure Titles

Tabel 4.1. Topografi daerah penelitian

Daerah	Ketinggian[1] m/dpl	Curah Hujan[2] Mm/tahun	Luas Daerah Ha
Dinoyo	12	1890,76	123,90
Tidar	10	1456,89	234,57
Karang ploso	15	1586,99	345,86
Batu	19	2546,25	457,65

Keteranqan:
[1]dpl : Di atas permukaan laui
[2]Sumber : Data dari tahun 1981-1984 lJemerintah Daerah Tingkat Kecamatan



Gambar 2.1. Struktur membran sel bakteri Gram negatif (Muller-Leonnies, 2007)

Appendix 12. Example of Conceptual Framework and Research Hypothesis Writing

BAB 3 KERANGKA KONSEP DAN HIPOTESIS PENELITIAN

3.1 Kerangka Konseptual

Masuknya sel endometrium ke dalam kavum peritoneum dan kemudian pada akhirnya menempel pada kavum peritonium sebagai akibat adanya aliran darah balik menstruasi (*retrograde menstruation*) menyebabkan terjadinya endometriosis. Sel-sel endometrium yang menempel pada kavum peritonium tersebut menyebabkan terjadinya reaksi inflamasi di zalir peritoneum dan debris melalui tuba fallopii ke kavum peritoneum dan mengaktifkan makrofag peritoneum. Makrofag peritoneum yang aktif mensekresikan berbagai sitokin pro inflamatori yang mengalami peningkatan antara lain TNF-α, IL-1β, IL-6, IL-8, IL-12, dan IL-13. Melalui mekanisme difusi atau interaksi parakrin sitokin inflamatori terutaman TNF-α dalam jumlah yang tinggi pada penderita endometriosis akan masuk ke dalam folikel dan berikatan dengan *death receptor* di sel granulosa dan akan mengaktifkan inisiator *caspase cascade*. Kemudian pada akhirnya *caspase cascade* akan teraktifasi untuk melakukan transduksi intraseluler sinyal apoptosis pada granulosa.

GDF-9 (*Growth Differential Factor*-9) yang diproduksi oleh oosit akan menstimuli proliferasi dan diferensiasi sel granulosa. Pada penderita endometriosis terjadi apoptosis sel granulosa atau *Cumulus Oophorus Complex* (COC), hal ini menyebabkan terjadi gangguan pertumbuhan oosit yang ditandai dengan gangguan pertumbuhan folikel, proliferasi dan deferensiasi oosit. Secara tidak langsung hal ini berakibat pada terjadinya penurunan kadar GDF-9. Penurunan kadar GDF-9 menyebabkan proliferasi sel teka terganggu, sehingga menyebabkan terjadinya hambatan proses steroidogenesis melalui mekanisme hambatan aromatisasi androgen menjadi estrogen dan penurunan sensitifitas estrogen untuk memberi

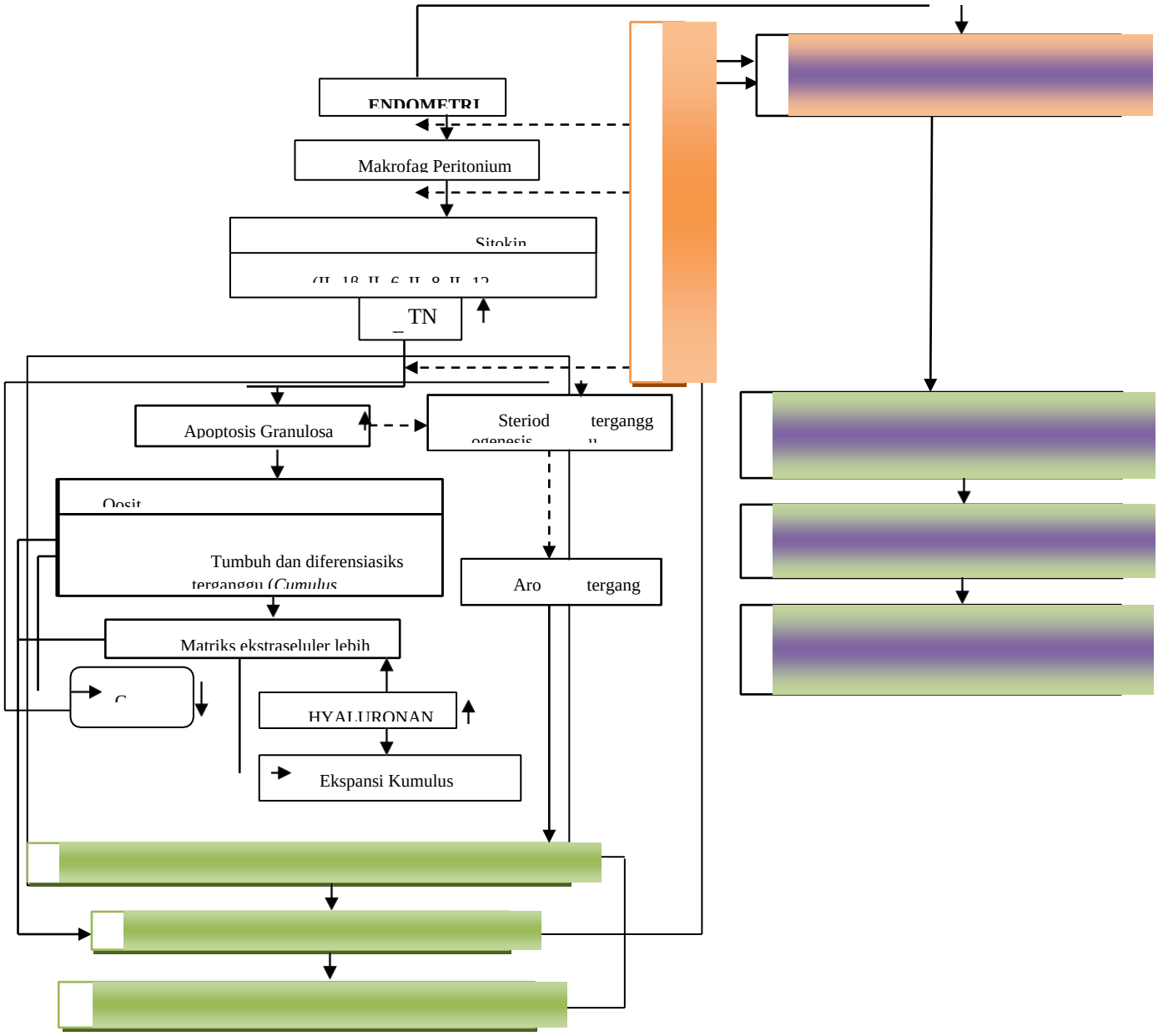
umpan balik ke hipofisa anterior agar GnRH memproduksi LH. Hal tersebut akan mempengaruhi maturasi oosit karena terjadi pemanjangan masa folikular yang mengakibatkan terjadinya gangguan folikulogenesis.

Selain itu turunnya kadar sekresi GDF-9 pada kasus endometriosis ini menyebabkan oosit melakukan suatu respon adaptasi atau homeostatis terhadap kondisi tersebut dengan cara meningkatkan stimulasi produksi hyaluronant, yang selanjutnya dapat berakibat menjadi lebih banyak dan tebal ikatan matrik ekstraseluler pada kumulus dan zona pelusida sebagai kompensasi oosit untuk tetap mempertahankan diri dari stres mekanik. Hal ini akan mengganggu terjadinya ekspansi kumulus terutama penetrasi spermatozoa dengan oosit dan fertilisasi.

Terganggunya ekspansi kumulus yang merupakan salah satu proses penting dalam folikulogenesis. Ekspansi kumulus yang kaya hyaluronan (asam hyaluronan) berfungsi untuk : 1). Mengikat erat oosit dengan sel granulosa, sehingga aliran berbagai bahan untuk *meiotic competence* masuk ke oosit. 2).Melindungi oosit dari stress mekanik dan enzim proteolitik pada saat ovulasi. 3). Penetrasi sperma dan fertilisasi. Pada dasarnya semua proses abnormal yang terjadi pada sel granulosa, sel teka dan oosit tersebut diatas akan berdampak pada gangguan folikulogenesis, ovulasi dan fertilisasi sehingga berakibat pada turunya kualitas oosit yang berhubungan dengan tebalnya matriks ekstraseluler pada kumulus dan zona pelusida juga lebarnya ooplasma, dan secara langsung berakibat terhadap rendahnya angka fertilitisasi pada pasien endometriosis.

Fungsi *curcumin* pada kasus endometriosis adalah sebagai anti inflamasi dan anti oksidan. *Curcumin* sebagai anti inflamasi akan menghambat induksi sitokin-sitokin *pro-inflamatory* seperti IL-1β, IL-6, IL-8, IL-12, IL-13 dan terutama TNF-α pada penderita endometriosis yang mempunyai efek toksik pada oosit, motilitas spermatozoa, interaksi spermatozoa-oosit dan juga perkembangan embrio melalui jalur penekanan aktivasi *Nuclear*

Factor- κβ (NF- κβ). *Curcumin* mempunyai efek modulasi terhadap beberapa target molekul penting yang terdapat pada penderita endometriosis seperti : TNF-α, IL-6, 1L-8, IL-12 dan enzim *cyclooxygenase*-2 (COX-2) dan *xanthine oxidase*. *Curcumin* sebagai anti oksidan akan menurunkan kadar enzim *xanthine oxidase* yang berlebih dengan harapan dapat menurunkan terjadinya degenerasi maupun apoptosis oosit yang dapat menyebabkan terjadinya penurunan perkembangan folikel atau profil folikulogenesis, kualitas oosit yang berpengaruh pada angka fertilisasi. Pada akhirnya dengan menggunakan pemberian *curcumin* pada penderita endometriosis atau hewan coba model endometriosis diharapkan dapat memperbaiki folikulogenesis, meningkatkan kualitas oosit dengan melihat keliling *cumulus oophorus* dan lebar zona pleusida dan meningkatkan angka fertilisasi pada proses fertilisasi *in vitro*. Adapun kerangka konseptual ini dapat dilihat pada bagan dibawah ini :



Gambar 3.1. Kerangka Konseptual

Keterangan :

: Variabel bebas

: Variabel tergantung

: Menghambat

: Menstimuli

3.2. Hipotesis Peenelitian

Berdasarkan rumusan masalah yang telah ada, maka hipotesis yang dapat diajukan adalah sebagai berikut ini : Pemberian *curcumin* terhadap mencit sebagai model endometriosis dapat memperbaiki profil folikulogenesis dengan mengamati jumlah folikel primer, *growing follicle* dan de Graaf, meningkatkan kualitas oosit yang dilihat berdasarkan keliling *cumulus oophorus* dan lebar zona pelusida,dan meningkatkan angka fertilisasi pada proses fertilisasi *in vitro*.

Appendix 13. Example of Appendix Writing

Lampiran 1. Ringkasan analisis hasil pemeriksaan konsentrasi hemoglobin menurut dosis kalsium dan fosfor yang diberikan pada kelompok sapi kering dalam rancangan petak terbagi dalam waktu.

Tabel L.1. (judul)

Sumber Variasi	Derajat Kebebasan	Jumlah Kuadrat	Rataan Jumlah Kuadrat	F-Hitung	F-Tabel	
					5%	1%
Kabupaten	5	46,90	-	-	-	-
Dataran Kekeliruan	1	1,264	1,26	0,11	4,07	7,89
Ekperimen Kekeliruan	4	45,78	11,43	-	7,90	2,56
Sampling	24	8,10	0,43	-	5,6	6,7
Total	29	55,08	-	-	-	-

Appendix 2. Research Documentation

Gambar L.2.1. Penyimpanan usus halus ayam dalam pot salep yang berisi formalin 10%.

Appendix 14. Example of Title Levels

TITLE LEVEL OR OUTLINE NUMBER

a. _____
_____
_____
i. _____
_____
_____
_____
a. _____
_____
b. _____
_____
c. _____
_____
ii. _____
_____
b. _____
_____
_____
i. _____
_____
_____
ii. _____
_____
_____
a. _____
b. _____
1.1 _____
_____
1.2 _____
_____