Guidelines for Composing and Submission of the Animal Production & Health Research Project Report

Prepared by Drs. R. A. C. Rabel, H. M. S. Wijekoon, and M. L. De Silva

Report length:
The project report shall consist of a minimum of 20, A4 sized type written pages (excluding appendix).

Font style:
All text should be typed using Times New Roman font style. The font sizes to be used are given on the **Animal Production & Health Research Project Report Template**.

Line-spacing:
Manuscript text should be 1 ½ line-spaced.

Cover page: The front cover page should contain the following:

- Title of the project
- Name of the student
- Student registration number
- Name of the faculty and university
- Month and year the report is submitted

First page:

- should only have © YEAR and Name of the student at the center of the page.
- page number should be "i" (roman numerals)

Second page:

- should contain the declaration.
- should have the name(s) and space for signature(s) of the supervisor(s) and date.
- page number should be "ii" (roman numerals)

Third Page:

- should contain the acknowledgements.

Table of contents:
The acknowledgement should be followed by a table of contents, including their page numbers.

List of tables:
The table of contents should be followed by list of tables, if any including their page numbers.

List of figures:
The list of tables should be followed by list of figures, if any including their page numbers.

List of abbreviations:

The list of figures should be followed by list of abbreviations, if any (additionally, you also need to define abbreviations upon first appearance in the text).

List of appendices:
The list of abbreviations should be followed by list of appendices, if any including their page numbers.

Main text of the report: should be organized as follows:

1. Abstract
2. Introduction
3. Literature Review
4. Objectives
5. Materials and Methods
6. Results
7. Discussion
8. Conclusion
9. Bibliography

Formatting style for the text:
Different formatting styles are to be used for headings and paragraphs.

- **Section headings:** e.g. 1. Introduction (capital letters, bold, 12 font size, center aligned)
- **First level subheadings:** 1.1 First Level Subheading (title case, bold, 12 font size, left aligned)
- **Second level subheadings:** 1.1.1 Second Level Subheading (title case, bold, 12 font size, left aligned)
- **Third level subheadings:** 1.1.1.1 Third level subheading (sentence case, bold, 12 font size, left aligned)

Tables and figures:
All tables should have concise titles. The figures should be clearly labeled and should contain appropriate legends. Further details on tables and figures are given in the template.

Citations: References should be cited in the text with name(s) of author(s) and year:
Eg.

- Single author Chandrasena (1995)
- Two authors: Chandrasena and Kumar (1995)
- Multiple authors: Kumar *et al*. (1995)

Bibliography:
The list of references should be arranged alphabetically using the author, year system. Recommended format for author- year system is given in the attached template.

Pagination:
All pages except the cover page should be numbered on the bottom-center of the footer area.

- Cover page shall NOT be numbered
- Page numbering should be in roman numerals ("i, ii, iii…") starting from the copyright page until the 'Abstract'

- Page numbering should restart in Arabic numerals ("1, 2, 3…") on the 'Introduction' and continue till the end of the report

Margins:

- Left--hand margin should be 1 ½" throughout to accommodate binding.
- Top, bottom, and right-hand margins should be 1" throughout the report.

Binding:

The report should have a transparent front cover and a back cover of light blue Bristol board.

Submission of the Report
In the first instance, one copy (softcopy or hardcopy, as informed by the VMEU for the given year) should be submitted to the VMEU. If any corrections/amendments are recommended by the examiners, the report should be re-submitted within one week after the oral presentation after incorporating the suggested corrections/amendments. If a candidate has two supervisors, four copies (a student copy, a library copy and two copies for supervisors) of the report should be finally submitted, after implementing the corrections.

Regular binding with a dark blue spine should be used. Spiral binding should not be used.

Detailed Guidelines on Composing Different Sections of the Research Proposal

Please note that it is ESSENTIAL that you follow the detailed guidelines provided below on each of the above sections.

1. Title

- Needs to accurately indicate the subject and scope of the study
- Should use words that create a positive impression and stimulate reader interest
- Should give an idea about the findings/results of the study
- Should be concise
- Should avoid abbreviations and formulae where possible
- You will likely have to refine the title after the project is completed because, it is not uncommon to get different results than the originally anticipated

Here are a few good and bad examples:

- "A study of dairy farms in the east coast of Sri Lanka" (an actual example I have come across in the past)
  - ➢ This is a poor title that is likely to be inaccurate. If above title is accurate, it should study all aspects of dairy farming (nutrition, management, milking practices, housing management, farm economics, labour force, animal welfare etc. etc.) in farms across the whole of east coast of Sri Lanka. Also, the study would need to be conducted through different seasons of the year. They would also have to analyze both small

scale and large-scale farms to come up with an unbiased conclusion. This would be a mammoth study that is very difficult to carry out.

- The above title gives no clues about the findings of the study

- "Dairy Cows in the Akkaraipattu Divisional Secretariat Have Sub-optimal Body Condition Scores During the Dry Season"
  - In contrast to the previous title, this one specifies the location, tells the reader that the study looked at BCS and informs the reader that the BCS was poor specifically during the dry season of the year

2. Abstract

Simply put, an abstract is a condensed version of your full report. It should answer the following questions:

- "Why did you start?" (corresponds to the 'introduction/ background' section of the report)
- "What did you want to test or prove?" (corresponds to the 'objectives' section of the report)
- "What did you do?" (corresponds to the 'materials & methods' section of the report)
- "What did you find?" and (corresponds to the 'results' section of the report)
- "What does it mean?" (corresponds to the 'discussion' section of the report)

Abstracts **should not**:

- Include citations
- Include abbreviations whenever possible
- Exceed 400 words
- Exceed one page

3. Introduction

The introduction should be designed to create interest in the reader about the topic and proposal. It should convey to the reader, what you want to do, what necessitates the study and your passion for the topic. It should cover the following 3 areas; however, DO NOT organize under sub-headings as given below.

3.1. Background

- Briefly, what is already known about the topic and what needs to be explored further
- Importance of carrying out this research - consider discussing importance on health, livestock, economics, zoonotic aspect etc. etc. depending on your topic

3.2. Problem Statement

- What is the question/problem you're trying to answer/study/solve? OR
- What hypotheses do you want to test? OR
- What is the knowledge gap/void you're trying to fill?
- Why should this be studied/solved/tested? What benefits does it have?

3.3. Conclusion

- Conclude by highlighting how your research will contribute to the existing knowledge and to overall scientific development

4. Literature Review

What information is already known about this problem? Your Lit. Review should have the following characteristics:

4.1. What has been published in different locations – Globally, Nationally and Locally (depending on the nature of your research, you need to present known data from temperate countries, tropical countries, and different regions of Sri Lanka such as Jaffna, Kandy, Matara, West, East etc. if data are available). For example, if the research project is a "Survey on gastrointestinal parasitism of goats in the Peradeniya veterinary range", your Literature Review should include data available from western/temperate countries, eastern countries (Tropical countries like India, Pakistan etc.) and then data from previous studies done in different parts of Sri Lanka.

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How to Search for Relevant Publications for your Lit. Review

Step 1 – Search on Google

A simple Google search for the following phrase ["Survey on gastrointestinal parasitism of goats" PDF] gave me the following references:

- https://link.springer.com/article/10.1186/s42269-019-0151-5 (Egypt)
- http://www.veterinaryworld.org/Vol.13/January-2020/4.pdf (South Africa)
- https://www.researchgate.net/publication/303378126_Prevalence_of_gastrointestinal_parasites_in_goats_at_Adhartal_Jabalpur (India)

A Google search for the following phrase ["survey on gastrointestinal parasitism of goats" Sri Lanka] gave me the following references:

- https://www.researchgate.net/publication/259451386_Gastrointestinal_and_blood_parasites_of_a_free_grazing_flock_of_sheep_in_Kaithady_farm_in_the_Jaffna_District
- https://cyberleninka.org/article/n/865283
- https://link.springer.com/article/10.1007/BF02240405
- http://dlib.pdn.ac.lk/bitstream/123456789/2428/1/W.D.%20Paranagama%201997.pdf

Step 2 – Search on PubMed - https://www.ncbi.nlm.nih.gov/pmc/

I went to the above link and searched for [goat gastrointestinal parasites]. I got over 5000 references => https://www.ncbi.nlm.nih.gov/pmc/?term=goat+gastrointestinal+parasites

However, not all of them will be super-focused on your topic. You'll need to comb through the topics and narrow down on the most suitable papers for your topic.

Finding above references took me less than 5 minutes and reading them will give me plenty of ideas about not only what has been studied about this topic in the past, but also about how to design your planned study. However, be prepared to spend several hours or even a full day for literature search. It is a vital step to understand the history and current status of your field of research and to design a suitable experimental design for your research project.

Step 3 – Search for 'Review' papers

You should also look for 'Review Papers' on your topic: these are basically papers written by experts in a particular field. They have written these papers by reviewing 'all', if not, 'a lot of' data on the topic. These papers will give you plenty of data / ideas to include in your Literature review.

Here's an excellent example for such a review:
https://www.sciencedirect.com/science/article/pii/S0022030217310366

"A 100-Year Review: Reproductive technologies in dairy science"

The above review talks about developments starting as early as the year 1900 and discusses everything up to the year 2017. Spend a couple of hours searching for a paper like this in your area of research.

Tip: Go through the list of references of above papers to find even more relevant publications to your study

Here's how to search for 'Review Papers'.

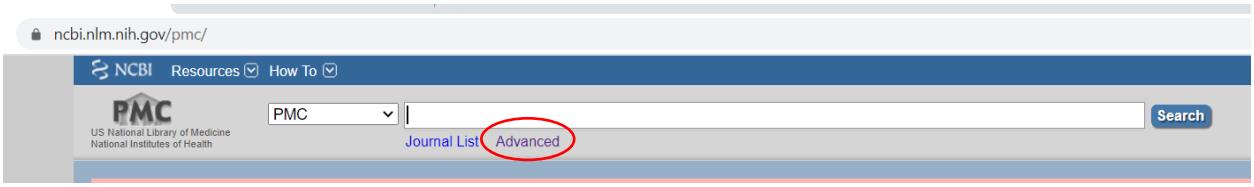

Figure 1: Screenshot of the search tool of PubMed

Click the above "Advanced" link on https://www.ncbi.nlm.nih.gov/pmc/ and you will be taken to the following page:

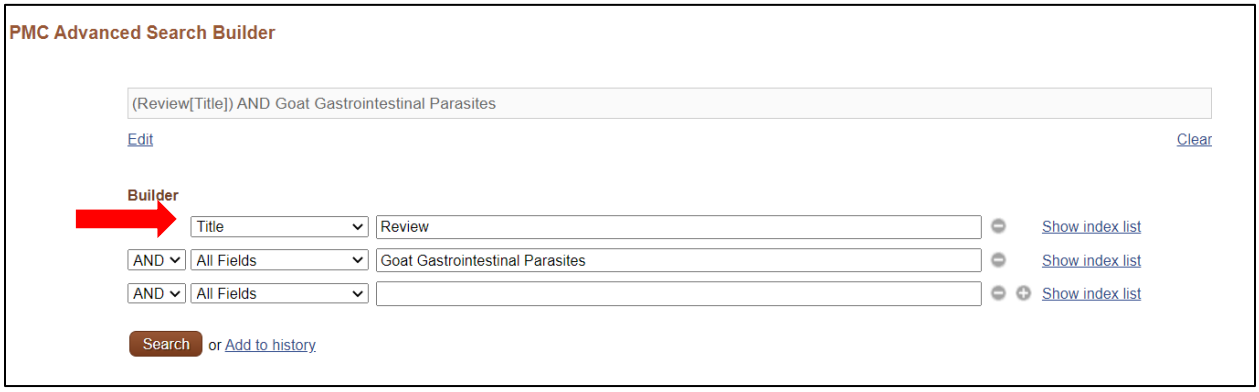

Figure 2: Screenshot showing how to conduct an 'Advanced Search' on PubMed

1. On this page, select 'Title' on the drop-down menu as shown by the Red Arrow. Type "Review" on the adjoining search field; this function will search for the word "Review" on the title of the publication.
2. Secondly, type some keywords from your topic on the 2nd field (on the above example, I have typed in "Goat Gastrointestinal Parasites". Note that "All Fields" have been selected from the drop-down menu.
3. Thirdly, click "Search"

Unfortunately, I did not get any review papers on the above topic. That generally means that a review paper has not been published on the topic of gastrointestinal parasites of goats. In such cases, you will have to be content without a Review paper. But in most cases, you will get excellent review papers such as "A 100-Year Review: Reproductive technologies in dairy science" on https://www.sciencedirect.com/science/article/pii/S0022030217310366

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4.2. The chronology of the development of your topic from date of discovery (first publication) until today –You need to cite (i) 'Landmark' papers (publications that discovered something for the first time) and (ii) then how things evolved over time and the (iii) latest known information about your topic from no older than the last couple of years. We often see students referencing / citing 20-30 year old publications only. That is not correct; you should have these 'old' publications as well as the latest publications included in your literature review. Sometimes, your research methodology may involve outdated methods practiced in 1980s (e.g. a simple morphological/phenotypic analysis). Even in such a scenario, if new experimental methods are available, you have to cite the new papers and technologies available elsewhere in the world and justify to the reader why you're using the outdated methods for this study e.g. could be because you don't have access to those methods/equipment/expertise/reagents etc. etc. or new methods are expensive and you don't have funds for that or simply the so-called outdated methods are still effective.

4.3. Cite supporting as well as opposing papers – Remember that it is ESSENTIAL to be unbiased in 'Scientific Research'. As such, it is essential that you cite publications that not only support your hypotheses, but also oppose them. In the discussion section of your paper/report, you can discuss why there are two opposing theories and give your own point of view about it or which theory your line of work supported.

4.4. DO NOT include your opinion or your results from the current study – Remember, this is purely a review of the literature available before you begin the study!! Don't comment on any of the findings; your job here is simply to report others' findings. Nothing less, nothing more!!

4.5. Summarize, Synthesize and Prioritize Analysis over Description – Don't just report mechanically. Report in an analytical manner. For example, 'mechanical reporting' is to say "X worm is the most commonly reported in the Northern Hemisphere (Kim et. al. 2017) and Y worm is the most commonly reported in the Southern Hemisphere (Bar et. al. 2017)". 'Analytical reporting' would be to say "X worm is the most commonly reported in

the Northern Hemisphere (Kim et. al. 2017) and Y worm is the most commonly reported in the Southern Hemisphere (Bar et. al. 2017). Lewin et. al 2018 suggest that this difference is likely due to ……". Hope you can appreciate the difference between the two writing/reporting styles!

4.6. DO NOT copy tables or figures from published studies without their permission – if you must include a table or figure from a certain paper, you have to ask for the authors' permission to do that. However, you CAN produce your own table combining data from multiple papers. This is highly encouraged and is what is exactly expected from a Lit. review.

Source	LTD Format	TC Form (Defined in Section 1.2)	Using π or π'	Cost Differential Tabulated	Is the Normal-LTD Approximation Robust?
Naddor [12]	Convolution of daily demand distribution, which can be either Poisson, beta, uniform or "2-point"	$TC^{sS}(i, s, S)$	π'	Naddor	Yes if c_ω is small
Lau and Zaki [9]	Schmeiser-Deutsch, $c_\omega = 0.3$	$TC^{HW}(i, Q, R)$	π	Naddor	Yes if SOR is small
Tadikamalla [18]	Normal, logistic, lognormal, gamma or Weibull	$TC^{HW}(i, Q, R)$	π	Naddor	Yes if c_ω is small
Heuts, van Lieshout, and Baker [6]	Schmeiser-Deutsch, $c_\omega = 0.2$	$TC^{\pi'}(i, Q, R)$	π	HLB	No; large error can arise even when $c_\omega = 0.2$

Figure 3: Table from https://onlinelibrary.wiley.com/doi/abs/10.1002/nav.10053 that compares data from previous studies

4.7. Organize with sub-headings by theme – not only does it make it easier for you to write your Lit. review, but it also makes it easier for the reader/ examiner to consume the content. Here are some sample sub-headings for the Lit. review of the study "Survey on gastrointestinal parasitism of goats in the Peradeniya veterinary range"

1. Parasitism
2. GI Parasitism
   2.1. Evolution of Parasitism
   2.2. Benefits of GI Parasitism – if any
   2.3. Negative impact of GI Parasitism on Animal Health
   2.4. Negative impact of GI Parasitism on Livestock Economics
3. Anti-helminthics
4. Anti-protozoals
5. GI Parasites of Goats
   5.1. In Temperate Countries
   5.2. In Tropical Countries
   5.3. In SL
      5.3.1. Differences reported between different regions of SL
6. Tools available for Survey
   6.1. Traditional tools

6.2. Modern tools
7. Summary and Conclusion

4.8. Conclude the Lit. review by highlighting the major observations from your review (relevant to your study) and directing it towards your 'Problem Statement/ Objectives of your research project'.

4.9. Check to make sure that you have not plagiarized either by failing to cite a source of information, or by using words quoted directly from a source. (Usually if you take three or more words directly from another source, you should put those words within quotation marks, and cite the page.)

4.10. Remember to record all your references on using a Reference Manager such as https://www.mendeley.com/reference-management/mendeley-desktop

4.11. You should refer and cite a minimum of 20 references in your Lit. review. When you write the discussion, you will need to cite more references. You should cite a mixture of journal articles and textbook chapters.

4.12. Text should be written in a clear and concise academic style; it should not be descriptive in nature or use the language of everyday speech.

4.13. Double check to make sure that you have covered all of the important, up-to-date, and pertinent texts

5. Objectives

Try to write both of the below:

5.1. Overall Objective/s – e.g. To improve dairy cow fertility
5.2. Specific Aims – To use serum progesterone levels for accurate heat/estrus detection

6. Materials and Methods

One of the main ideas of documenting Materials & Methods (M&M) is that someone could follow your directions and duplicate the experiment. Therefore, it's extremely important that you note down all the fine details where necessary.

You should write down your M&M Plan based on the following sub-headings, as applicable to your project specificities:

6.1. Ethical Considerations – approval by relevant authorities/committees
6.2. Population and Samples – species, breeds, sample size/statistical power, locations/ farms where applicable
6.3. Experimental Design – including but not limited to treatments, positive and negative controls, technical replicates, biological replicates, dose rates of drugs, generic names etc. etc.
6.4. Sample/ Data collection
6.5. Materials – consumables, reagents, equipment (companies and manufacturers should be mentioned where applicable)

6.6. Methodology - laboratory methods/protocols with specific conditions (Do not over-explain common procedures. For example, you do not need to explain how PCR or cell culture works. Just state that you used the techniques. Where possible, you should cite a landmark publication that explained the technique in detail. You need to explain the steps in detail only if you used a novel technique).

6.7. Data Analysis – statistical methods and software (with versions) you used to evaluate the hypothesis should be stated

Whenever possible, third person passive tense should be used throughout the M&M; e.g. "*10 ml of colostrum was collected from each cow*"

7. Results

- The 'take home message' should be conveyed to the reader with a handful graphs, tables & figures. The examiner or any other reader should be able to understand your main findings simply by skimming over your graphs, tables etc.
- Take advantage of colours to communicate your results effectively.
- Make sure the legends of your charts, tables, figures etc. comprehensive
- Remember that you're expected to present the results and RESULTS ONLY. You should NOT state your opinions, reasons, justifications etc. etc. The 'Discussion' is the place for that. Your job here is to state the results as facts. No less, no more!
- You should point out and emphasize the key findings in words, in the text paragraphs. However, the text/ paragraphs should not repeat everything that was conveyed by the tables and graphs.
- Make sure that your graphs, tables and illustrations are clear and concise. Do not overload them with data. Remember, 'less is more' more often than not.

8. Discussion

- Restating the results is NOT what is expected. Instead, address the following in your discussion:
  - State the study's major findings
  - Interpret your findings - explain the meaning and importance of the findings
  - Did you or did you not get the anticipated results? Why or why not?
  - Implications of your findings - why your results are important; practical/ clinical/ real-world applications of the findings; the advancement it brings to the field
  - Compare your findings to what is already known – does your results compliment or contradict present knowledge, and why that is so. If there are any studies that with conflicting results, report them and state and possible reasons for such conflict
  - Were you able to prove your hypotheses? Were your objectives achieved?
  - Were you able to answer all the questions? If not, which ones could you not answer? Why was that?
  - Were there any limitations/ challenges? How did you overcome them? Or why you couldn't overcome them.
- What new questions arose from your study? Do they pave the path for future experiments? Make suggestions for further research. Understand that your results may not be decisive. Sometimes, results are suggestive or supportive rather than decisive. Use the appropriate terms. DO NOT JUMP TO CONCLUSIONS with your findings. It's only natural that we

are tempted to 'overstate the importance of our research findings'. Remove your emotions and stick with the true significance of your results.

- It is extremely important to highlight whether your research findings are consistent or contradict current knowledge both LOCALLY and GLOBALLY. Then explain why your results complement or contradict findings of previous publications. Make sure you give the appropriate citations.
- Here are somethings you should AVOID in the discussion
    - Over-presentation of the results
    - Unwarranted speculation
    - Inflation of the importance of the findings
    - Make conclusions that are not supported by the data
    - Criticize other studies
    - Deviate from the hypotheses/ objectives of the study

9. Conclusion

- This should clearly and concisely convey the major findings and the real-world applications of the study (in 3-5 sentences).

10. Bibliography

Refer pages 8-10 of the **Animal Production & Health Research Project Report Template** for specific instructions.

References:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5037942/
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4548564/
https://pubmed.ncbi.nlm.nih.gov/15447810/
https://pubmed.ncbi.nlm.nih.gov/15447804/
https://www.iedunote.com/components-of-research-proposal
https://www.umass.edu/cfr/grant-writing/basic-components-proposal
https://www.stlawu.edu/cstep-and-mcnair/basic-research-proposal-components
https://pubmed.ncbi.nlm.nih.gov/29979216/