Study Guide
MSc Thesis Adaptation Physiology Group

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Adaptation Physiology Group

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1. Introduction

At the Adaptation Physiology Group (ADP), you can conduct research for a thesis with a workload of 18, 21, 24, 27, 30, 33 (Minor thesis), 36 or 39 ECTS (Major thesis). An ADP study track (including a major thesis in ADP and either an internship ADP or a minor thesis elsewhere) is part of the MAS-specialisations Adaptation, Health and Welfare and Nutrition and Metabolism. The aim of thesis research is to train your academic skills by means of an in-depth, scientific study on a subject of interest. With completion of the thesis, you will have demonstrated that you can conduct a research-based project individually and independently.

1.1 Learning outcomes

After successful completion of your thesis, you are expected to be able to:

→ demonstrate commitment, perseverance, initiative and creativity when investigating a research question
→ work independently and efficiently
→ demonstrate that you know when to ask help from your supervisor and how to handle any comments
→ plan and keep to the time schedule
→ delineate and define your research
→ build a sound theoretical and methodological framework
→ collect data in a systematic and verifiable manner
→ analyse the data critically and correctly
→ present the major finding(s) in a comprehensible manner for a specific audience, both orally and in writing
→ formulate sound conclusions based on a comprehensive discussion of the results
→ evaluate and discuss the contribution of your results to the knowledge in this research area
→ write a comprehensive, consistent and concise thesis report
→ the thesis content should be clear to people with a different disciplinary background (so, e.g. for ADP staff and ADP students

1.2 Prerequisites

You should be officially registered as a Wageningen University MSc student. Compulsory courses for a Major thesis in the ADP group are ‘Health, Welfare and Management’ (ADP-30306) and ‘Adaptation Physiology’ (ADP-30306). For a Minor thesis, sufficient background knowledge in Adaptation Physiology is required (to be judged by the thesis contact person of ADP or the thesis coach, see point 6), and for example one of the above MSc courses.

1.3 How to find a thesis topic?

You need to make an appointment with the thesis contact person of ADP (Dr Nicoline Soede) to discuss your wishes for a thesis through office.adp@wur.nl. Do this approximately 6 months in advance. Please do not go to other ADP staff members before this meeting with the Dr Nicoline Soede.

Before the appointment, think about your wishes and ideas for a thesis, try to remember the topics and teachers that inspired you during the ADP MSc courses, visit the ADP website to look at research topics, and ‘google’ research topics, institutes and/or universities of your interest. Also, in the hallway in front of the ADP secretariat (C0061), you find a board with current MSc thesis students and their topics.

After this initial appointment, and based on your wishes, you will be directed to the most suitable staff member of ADP. Usually such a meeting results in agreeing on a thesis subject. If you fail to agree on a thesis subject, you can make another appointment with the thesis contact person of ADP to find another thesis topic/supervisor. After agreeing about a topic, that staff member will usually be the main supervisor of your thesis, but a second or even a third chair group or external group may be involved.
1.4 This guide

This study guide informs you about the general planning and execution of your research. Together with your supervisor you will make detailed agreements about your thesis, activities, and documentation. We advise you to make good use of the information and suggestions in this thesis guide; they should help you to be prepared. Remember: whether or not you have a good thesis period, in which you can/should learn a lot, both 'knowledge' and 'skills', depends mostly on you! If you have any questions/suggestions to improve this learning process, discuss it with your supervisor, or with the education contact person of ADP.

2. Process

2.1 At the start

At the latest 2 weeks before the start of your thesis, you arrange an appointment with your supervisor for a first meeting at/around the starting date of your thesis. In this first meeting, you will normally further discuss e.g. the content, planning and supervision of your thesis. These arrangements are written down in a thesis contract which needs to be signed and sent to the ADP secretariat within 3 weeks from the start of the thesis. You also need to formulate 2 to 3 learning objectives at start of the thesis, which may include academic skills, discuss these with the supervisor and add them to the contract. After the first meeting with the supervisor, you need to make an appointment with the ADP secretariat to be informed about regulations concerning ADP-thesis students (e.g. arranging required permissions for access to labs and/or experimental facilities (CARUS)) and addition to the mailing list for ADP-thesis students (to receive invitations for ADP student meetings and colloquia). Workspaces are available at Zodiac, at the second floor above BHE (wing A) and at the fourth floor above APS (wing E). These are especially reserved for MSc thesis-students and you are most welcome to join our tea and coffee breaks (approximately at 10:15 h and at 15:15 h).

2.2 Communication with your supervisor(s)

Students usually have contact with their primary supervisor once every 2-4 weeks, but the actual frequency of meetings will vary depending on the nature and stage of the thesis project. This is something to be discussed with your supervisor. Although the thesis project is a learning experience, students are encouraged to act independently as much as possible when resolving problems and in difficult situations. Students are responsible for progress of the thesis, time planning, making appointments with the supervisor and of course the quality of the (draft) thesis reports. The role of the supervisor is coach, advisor and expert and will be available for feedback and support. To smoothen the communication with your supervisor(s), the student is advised to:

→ Make appointments with the supervisor at least 1 to 2 weeks in advance;
→ Be clear about the aim of the meeting: What do you want to discuss? Do you like feedback from the supervisor? When do you send information to be read/discussed? It helps to make an agenda before each meeting and a short report after each meeting!
→ Use supervision-time as efficiently as possible. Allow supervisors sufficient reading time, so send documents to be read well in advance and be clear about your wishes concerning feedback. E.g. which specific questions do you have or which sections of the report do you wish to have feedback on.
→ Discuss timely with your supervisor and ADP thesis coordinator when the supervision or the project does not meet your expectations.

2.3 General outline

A thesis will take approximately 13 to 27 fulltime workweeks, depending on the number of ECTS of your thesis. NB Remember, as 1 ECTS = 28h, 'full time' means you are expected to work 40-42 hours per week. In case you would like to combine your thesis work with other activities (e.g. other courses), you should discuss that with your supervisor and include it in the detailed planning of your thesis (see point 3.1). A thesis can be divided in stages. Please note that the timespan, order, and activities of these stages depend on: the number of ECTS of your thesis, experimental work, availability of your supervisor, etc. Discuss with your supervisor how the activities can be planned in your project and add the planning
to the research proposal (see point 3.1). Halfway through the project, a midterm evaluation takes place with the supervisor (which can already be planned at the start, see Thesis Contract). This evaluation preferably gives feedback from the supervisor to the student based on the scored elements in the Thesis Evaluation form and preferably also from the student to the supervisor, based on the form ‘Student Evaluation of MSc Thesis’. This latter form is similar to the evaluation form MSc students receive from the Staff Department Education & Student Affairs after their thesis exam.

**The initiation stage:** In this stage you start reading background information about your thesis subject and reviewing relevant literature. You make a planning and write a research proposal (see point 3.1) to be approved by your supervisor and presented at the monthly student meetings (see point 4.1).

**The execution stage:** During the execution stage you perform the experiment and/or lab analyses and analyse the data. Make sure that you properly store samples and document the data (discuss with your supervisor).

**The completion stage:** In the last stage, you finalise your thesis. You summarize the results, including relevant Tables and Figures, you interpret and discuss your data with the help of literature, and you draw conclusions. You complete the different sections of your report and present your colloquium. You present your colloquium before you complete your thesis report. Finally, after completion of your thesis, you have your oral exam and hand in all original data sheets and other relevant materials (see 2.4).

### 2.4 Oral exam

At least two weeks before the exam, you need to send the thesis by e-mail (Word version) to the supervisor and ADP secretariat (office.adp@wur.nl), accompanied by a list of the colloquia you followed. The secretariat will print the necessary copies of your thesis. You can pick up your copy at the secretariat, the other(s) will be submitted to your supervisor(s). We expect you to bring your own copy of the thesis to the exam.

The exam is scheduled after you have held your colloquium. The oral exam takes approximately one hour and will be held by the supervisor and a staff member of ADP, but may also be held by two supervisors. During the exam, you are questioned about the content of the whole thesis (including the cited references) and the field you have been working on, and also includes the colloquia you followed. Knowledge, understanding, insight, but also creativity and scientific attitude are evaluated.

**Note:** In principle, the oral exam only takes place when the thesis report has been finalized. In some cases, you may be requested to adjust the thesis according to remarks of supervisor or examiner.

### 2.5 Data storage

At the end of your thesis period, you need to hand in all original data sheets and final versions of all protocols, data files and SAS-files in the appropriate form to be stored in the ADP - data management system (discuss with your supervisor).

### 2.6 Grading

At the end of the oral exam, the thesis project is graded, based on the Thesis evaluation form of ADP. Marks are given for process (Research competence; 40%), end product (Thesis report; 40%), colloquium (10%) and the final oral exam (10%). You need to achieve a grade of at least 5.5 for the categories ‘Research competence’ and ‘Thesis report’ in order to pass an MSc thesis project.

The individual grades for these items are based on a Rubrics scoring system and the Thesis evaluation form ADP which can both be found at the ADP website (see point 7). Immediately after the oral exam, the mark will be fed into the system by the secretariat (unless the thesis still needs some changes).

### 3. Reports

The research proposal and thesis report should be written in English, with proper spelling and grammar; correcting English is not a task of your supervisor.

Write clearly and accurately, but as simple and concise as possible, similar to the scientific papers that you use for your literature background and/or papers from your supervisor. It might help to ask a fellow
student to read your text before submission to your supervisor, to check clarity and logic. For more information, you can consult literature on scientific writing (e.g., Hengl and Gould, 2002). For formatting of the research proposal and thesis report, you are advised to use the formatting tools in Word (check online manuals) and Endnote or equivalent for cited literature.

**Format:** Students can choose their own format for their reports (e.g. font size and font type), but the report should be clearly readable. A suggestion is to use the following (or similar) format: font size 11 p, margins 2 - 2.5 cm, line spacing 1.2, font e.g. Arial.

**Feedback:** Supervisors will give feedback on draft versions of your reports (research proposal and thesis report). As a rule of thumb, feedback on a specific part of the report is given only twice. It is therefore wise to first discuss and agree on the outline and setup of (parts of) the report before you actually start writing a first draft. Discuss the method of feedback with your supervisor. Moreover, be aware that also the quality of your first draft, and the way you handle feedback on this draft, contribute to the final grading.

**Note:** If you have problems with the writing process, you can get help from the Wageningen Writing lab.

### 3.1 Research proposal (<3 weeks from start)

The thesis research starts with the preparation of a research proposal. It is important that you write your proposal in your own words and focusing on your (sub)topic, even when your research is part of a larger research proposal prepared by a staff member/PhD candidate. The proposal should contain the following elements:

**Administrative information:** Name and registration number, supervisor(s), course reference (code) and number of ECTS, date.

**Title:** Should describe the contents of the thesis work, but be as brief as possible. If applicable, indicate if it is a pilot study.

**Introduction:** Introduction should cover the following questions "What will be studied? Why is it an important question? What do we know about it? How will this study advance our knowledge?". The introduction should also address the following points and in it you will refer to relevant literature sources: Motivation – formulate the problem

Theory – summarize the current understanding of the problem you are investigating

Current gap(s) in knowledge

Objective, research questions and hypotheses – what are the objectives of your research, the research questions and hypotheses (related to the theory)

**Materials and methods:** Give a clear description of the main methods used for this thesis (including e.g. housing conditions of animals) and some information on the proposed statistical analyses (discuss with your supervisor). A flow chart illustrating your study design may help.

**Time schedule:** Report all activities, including all relevant periods and dates up to handing in the final thesis.

**References**

The proposal should not exceed 3 A4 excluding references (using the suggested format). When your proposal has been approved by your supervisor (at most 2 months after the start of your thesis), you should send the proposal as a PDF file to office.adp@wur.nl, titled: Lastname-Firstname-Proposal-date.

### 3.2 Thesis report

The thesis report should, as a rule of thumb, not exceed 40-50 pages (using the suggested format, see above) and should contain the following sections:

**Cover:** Including title and administrative information. Title should be clear, descriptive and short. Name of the author, course reference (code) and number of ECTS, supervisor(s), and date are all included on the cover page. The second page contains the following message on copyright:

**Copyright:** No part of this publication may be reproduced or published in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior written permission of the head of the Adaptation Physiology Group of Wageningen University & Research, The Netherlands Niets uit dit verslag mag worden verveelvoudigd en/of openbaar gemaakt door middel van druk, fotokopie, microfilm of welke andere wijze ook, zonder voorafgaande schriftelijke toestemming van de hoogleraar van de leerstoelgroep Adaptatiefysiologie van Wageningen University & Research.
Preface: It is up to the student if he/she wishes to include a preface.

Table of contents: With maximal 3 levels of the headings.

List of Abbreviations: Only needed when many abbreviations are used in the report.

Abstract: Should be clear, descriptive and not longer than 600 words.

Introduction: See above (point 3.1).

Literature review: A literature review considering the scientific background of the thesis subject should be included, either as a part of an –extended- introduction or as a separate chapter (discuss with your supervisor). As a rule of thumb, this section should be approx. 10-15 pages, including appropriate tables and figures pages, but the size will depend on the amount of experimental work and/or data-analyses included in the thesis work.

Materials and methods: Should contain a detailed description of the materials, research methodology, techniques and way of (data) processing, including statistics.

Results: Report your data. Do not include any interpretations, preliminary conclusions, and references to literature in this section. Check related scientific papers for common practice in formatting tables and figures.

Discussion: This section includes your interpretation of the results, including explicit reference to the research question and literature as mentioned in the introduction. Be clear in your conclusions whether, based on your findings, the hypothesis (if you had one) is accepted or rejected. Discuss in retrospect if the methods used in the project were adequate in relation to the research question. Analyse the strengths and the weaknesses of the methods and the results and discuss the results in relation to relevant literature. Incorporate recommendations for further research.

Conclusions: In the conclusion section you link the outcomes of your research to the objective(s) described in the introduction. A thesis will generally have not more than five substantial conclusions. Do not introduce new results or insights at this point.

References: Make a reference list according to the guidelines of a journal in your scientific discipline. The entire report must be carefully cross-checked to ensure that the spelling of author names and year of publication are correct and correctly referenced in the text.

Appendices: Optional

Note: The structure of your thesis report may differ from the outline below, depending on your project. Several supervisors prefer the option of having a thesis consisting of: introduction, literature review and draft publication. Discuss the preferred structure with your supervisor

Note: The materials and methods and results section are generally written in the past tense. In the introduction and discussion, facts are usually presented in present tense and findings in past tense (see scientific papers for examples).

Note: Plagiarism is considered a serious form of fraud. On the internet you can find numerous definitions and examples of plagiarism and also free plagiarism checks. Check them if you are uncertain about the rules. Examiners and supervisors may do plagiarism checks of your work.

4. Presentations

4.1 Student meeting

Every 3rd Thursday of the month (starting at 13.30h) there is a monthly thesis student meeting within the Adaptation Physiology Group. The aim of the student meeting is to acquire an understanding of other ADP-related research projects (topics, problems, insights, ..) and can only function well if students come well prepared (thinking about things to share or to ask) and actively attend the meetings. Also the student research proposals will be presented and discussed during this meeting in a pitch format. For this, a summary of the new research proposals will be sent before each meeting and should be read before the meeting.

You should attend the meetings while doing a thesis. However, depending on research activities or thesis work elsewhere, you can ask permission from your supervisor to skip a meeting. Attendance is recorded by the chairman of the student meeting.
4.2 Colloquium

Every 2nd Tuesday of the month, colloquia are scheduled (starting at 13.15h), in which MSc thesis (and BSc-project) students present their work at the end of their thesis period. You should attend at least 10 MSc-colloquia during a major thesis (36-39 ECTS) and MSc-5 colloquia during a minor thesis (18-33 ECTS) and attendance is recorded. Attending students are expected to play an active role to read the colloquium summaries in advance (will be sent to you by email the day before), and asking questions to the presenters after the presentations. The colloquia you follow are part of the oral exam (see also point 2.3), so you need to keep a list. See below for additional guidelines.

**Note:** When presenting, be aware that ADP topics are diverse. It is up to the presenter to have a clear presentation, so e.g. avoid too much jargon and sufficiently explain/clarify.

**Note:** When you perform your thesis in a company, your colloquium may be confidential. In that case, the colloquium preferably takes place at the company, in which case your ADP supervisor will join that colloquium or the colloquium will be held in Wageningen, but with only your supervisor being present.

### 4.2.1 Colloquium planning

After consultation with your supervisor, contact the ADP secretary by e-mail at least 3 weeks before the colloquium date, to inform about your preferred colloquium date and provide the name of your supervisor and a provisional title.

In the week before the colloquium you receive the following questions:

- Is your registration for the colloquium session this month definite?
- If yes, what is the title of your colloquium? (needs to be approved by your supervisor)
- Is the colloquium confidential, yes or no? If yes, for what reason?

### 4.2.2 Guidelines for presentation and summary

The colloquium is part of your thesis evaluation and will be graded. Guidelines for the presentation and summary can be found at the ADP website (see point 7).

**Summary**

- The one-page summary of your colloquium should be a self-supporting document; as such the summary should have a clear introduction to the subject to inform people who are not specialist in the field.
- The summary has to be approved by your supervisor(s).
- The approved summary needs to be sent to the ADP-secretariat by email the Friday before the colloquium, titled: Lastname-Firstname-Colloquium-date. Copies will be sent to all ADP MSc students, unless they are confidential.

**Facilities**

- Laptop and beamer facilities are arranged.
- We assume you will be using MS PowerPoint to give your presentation. Bring your own USB stick with your presentation on it to the colloquium. Be in time to put your presentation on the computer before the start of the session.

**Presentation**

- Each speaker has 30 min (20 min for the presentation, plus 10 min for discussion).

**Evaluation**

- The presentation is evaluated by 3 staff members. The evaluation form can be found at ADP website (see point 7).

5. Facilities

5.1 Working at Zodiac

Zodiac is only open during weekdays from 7:00 h until 18:00 h. For working in the evening or weekend, use the facilities at the Forum building (Monday till Friday 8:00 until 23:00 h; Saturday and Sunday 10:00 until 17:00 h).
5.2 Working in the laboratory

To be able to carry out work in the ADP laboratory, strict laboratory rules have been established ensuring the safety of yourself and your colleagues. Your supervisor informs the laboratory staff members about your work. The secretary will bring you into contact with one of the laboratory staff members to discuss your work and give you the laboratory instructions. You are not allowed to work in the lab without supervision and preferably not alone, so discuss with your supervisor and your laboratory supervisor when you can work in the lab.

**Note:** You are not allowed to work in the laboratories outside opening hours. Only in special circumstances, under very strict conditions an exception can be made. If necessary, discuss this with your supervisor and with the lab technician involved.

5.3 Working at the animal experimental facilities

The experimental facilities ‘CARUS’ can only be entered when your WUR card has been activated. If you need access to these facilities you should contact the secretariat (see point 2.1). You are not allowed to work in the experimental facilities without supervision.

Animal experiments can only be carried out once approval has been obtained from the Ethical Committee for Animal Experiments. Discuss with your supervisor whether there is approval of the committee and whether the management of the experimental facilities has been informed.

**Note:** You are not allowed to work at CARUS alone.

5.4 Data analyses

Your supervisors will help you order your data for statistical analyses and will also help you with the correct statistical analyses of your data. However, you should make yourself acquainted with both the appropriate way of ordering your data for analyses and the most relevant procedures in SAS (the most used statistical package at ADP), using the available self-learning SAS course (ask your supervisor).

6. Contact

Questions can be addressed to the ADP Education contact person: Dr Nicoline Soede (Nicoline.Soede@wur.nl).

7. Links

All the documents you can find at our website.

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