LATVIA UNIVERSITY OF LIFE SCIENCES AND TECHNOLOGIES
FACULTY OF AGRICULTURE AND FOOD TECHNOLOGY
FOOD INSTITUTE

GUIDELINES FOR MASTER THESIS DEVELOPMENT AND DEFENCE

Academic master study programme „FOOD SCIENCE”

JELGAVA 2023

Guidelines were approved on the academic staff meeting of Food Institute in September, 2023.

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CONTENT

INTRODUCTION

The aim of the academic Master's study programme "Food Science" To educate creatively thinking, decisive higher-level specialists for the development and competitiveness of food science and production in Latvia and the European Union, providing them with comprehensive knowledge in food production and research skills for scientific and academic work.

Main tasks of Master's study programme are:

- ✓ to promote students' interest in solving problems related to the food industry by educating them about a modern, responsible and capable personality who is able to act and make decisions independently;
- ✓ to give an understanding of the theoretical foundations of the field of food science, being able to analyse and evaluate the results of scientific work and substantiate their significance in the improvement of production processes and / or development of new products;
- ✓ to prepare specialists for the food industry and scientific-research, education, state supervision and administration institutions;
- ✓ to develop preconditions for students to perform independent research and motivation for doctoral studies or promotion of self-education.

Acquired **knowledge**:

- ✓ is able to demonstrate in-depth knowledge and understanding of the latest trends in food science, which is the basis for creative thinking and research;
- ✓ demonstrates an understanding of food design and quality assurance conditions in product development;
- ✓ is able to demonstrate knowledge in the field of food science, analysing and evaluating the results of scientific research, substantiating their significance in the development of production technologies or products;
- ✓ is able to demonstrate the acquired theoretical and practical knowledge by choosing and applying various scientific research methods in solving specific issues.

Skills:

- ✓ is able to independently use theory, methods and skills in solving problems, to substantiate the parameters characterizing the quality of food products;
- ✓ is able to choose and apply various scientific research methods in solving issues relevant to the field;
- ✓ is able to analyse and creatively evaluate the results of the performed research work, substantiating their significance in the development of production technologies or products;
- ✓ is able to take responsibility for the results of the work of scientific groups and their analysis, to do business, to implement innovations in the food industry.

Competencies:

- ✓ is able to independently formulate and critically analyse complex scientific and professional problems in food science, substantiate the decisions made;
- ✓ is able to integrate knowledge from different fields, contribute to the creation of new knowledge and the development of research methods;
- ✓ is able to develop scientifically based food production technologies, improve the food quality system and operation for the production of consumer safe products.

Students develop a Master Thesis under the guidance of a selected supervisor on a topic that is related to current food science findings; perform a comprehensive compilation of scientific literature, substantiating the defined aim and tasks of the work; select the methods and equipment to be used for research; perform the necessary experimental research in scientific research or certified laboratories of food production companies, obtaining reliable results, in order to achieve the defined goal of the Master Thesis.

1. DEVELOPMENT OF MASTER THESIS

1.1. Aim of the Master Thesis

The main **purpose** of the Master Thesis development is to introduce abilities of Master student for solving an actual scientific problems in food sector.

Master degree applicant will acquire:

Knowledge:

- ✓ is able to critically evaluate the findings gained from the scientific literature on the topics related to the Master Thesis (Master Thesis, Master Thesis review, pre-defence, defence)
- ✓ able to analyse and evaluate the results of scientific work, substantiating their relevance (Master Thesis, Master Thesis review, defence)
- ✓ able to choose and apply various scientific research methods in solving the tasks set in the Master Thesis (Master Thesis, defence)

Skills:

- ✓ able to independently use theory, methods and skills for the performance of Master Thesis tasks (Master Thesis, Master Thesis review, pre-defence, defence)
- ✓ able to use and methodologically substantiate the acquired theoretical knowledge in the development of a Master Thesis (Master Thesis, defence)
- ✓ able to explain and discuss the results obtained within the Master Thesis in an argumentative way (Master Thesis, pre-defence, defence)
- ✓ able to analyse and creatively evaluate the results of the Master Thesis (Master Thesis, Master Thesis review, pre-defence, defence)

Competencies:

- ✓ able to integrate knowledge from different fields, contribute to the creation of new knowledge (Master Thesis)
- ✓ able to develop research work in accordance with the 7th level of the European Higher Education Area qualification framework (Master Thesis, Master Thesis review, pre-defence, defence).

1.2. Selection and approval of the Master Thesis topic

Master Thesis should be based on acquiring and analysing the experimental data. Volume of Master Thesis is 20 KP (30 ECTS).

Master student together with Master Thesis supervisor choose a topic and methodology of the research. The topic of Master Thesis should be:

- o relevant, i.e. significant both scientifically and in practice;
- o original.

In Master Thesis data obtained solely by author can be used. Amount of experiment repetitions should be sufficient for statistically credible data acquiring. The application for the approval of Master Thesis provisional topic should be written according to the example in Annex 1 and submitted to the director of Master's study programme at the end of the second study semester.

Before the topic is formulated, it is necessary to clearly set the scope of the research. In each thesis, only a definite part of the broader problem may be studied, so that the topic can be properly understood and analysed.

Final topic of Master Thesis will be approved by the Dean's Order not later than one week before Master Thesis submission. After approval of Master Thesis topic, its changes are not accepted.

1.3. Content of Master Thesis

Master Thesis includes two parts – main part and annexes. The main part of Master Thesis includes the basic material, annexes – supplementary experimental data and calculations, published papers or copies of poster or oral presentations.

Total volume of Master Thesis should be not more than 60 pages of A4 format, but not less than 45 pages.

Master Thesis should include following obligatory parts: title page, reports in two languages, content, introduction, main part of Master Thesis - literature review, materials and methods; results and discussion, conclusions, references.

Sections content.

Title page: formatted according to the example presented in Annex 2.

Title page should be included in total Master Thesis page numeration, but number on this page should be omitted.

Report: gives short summary of the present research, see example in Annex 3.

Content of report should include bibliographical information on Master Thesis, aim and tasks of Master Thesis, methodology, main results and conclusions.

Report should be written in two languages, English and Latvian.

Length of the report should not exceed one A4 page.

Table of content: a detailed list of the thesis headings along with respective page numbers are presented in the contents.

Introduction, literature review, materials and methods, results and discussion, conclusions, list of references and annexes are listed in the contents.

Chapters and subchapters are numbered in Arabic numbers. For example – 1. Literature review; 1.1. Title of subchapter 1; 1.2. Title of subchapter 2; 2. Materials and Methods; 2.1. Title of subchapter 1, 2.2. Title of subchapter 2 etc.

Titles (headings) of the chapters and subchapters have to be short, clear and correspond to the essence of the problem.

It is not recommended to create a separate chapter, if it is shorter than one page.

Introduction: the reasoning for the analysis of the scientific problem is presented, clear formulations of the problem, object, the aim and tasks of Master Thesis are presented and practical and theoretical **relevance** of the intended research is justified.

Length of introduction should not exceed two A4 pages.

Literature review (outline of problem, data form scientific literature): contains a critical analysis and the integration of information from number of sources, as well as a consideration of any gaps in the literature and possibilities for future research.

It is necessary to indicate current situation of the research topic, partly investigated or not investigated topic is chosen for the investigation.

Literature review should provide a comprehensive picture of the state of research problem, reveal the directions for further research, help assess the benefits and limitations of existing solutions, and substantiate possible innovative solutions to the problem. The theoretical/analytical chapter should help answer the following questions:

- ✓ what scientific literature (of what field) explores thesis-related issues;
- ✓ what issues have already been partially solved, what are the methods, solutions etc.;
- ✓ what issues were not addressed by researchers or to what issues solution methods were not proposed;
- ✓ which scientists worked in this field and how they addressed the problem;
- ✓ what findings of research published in scientific literature describe the state of art, problems and solutions of the issues related to the thesis topic.

Literature review should be concentrated, including author personal attitude and critical view about found information.

For literature review, scientific journals, monographies, scientific manuscripts,

dissertations, other scientific literature resources, data bases may be used. **Textbooks, guides and encyclopaedias are not advisable.**

Proportion of **internet resources should be not more than 20%** from total amount of used literature. Acquiring information from *Google*, *Wikipedia* and from similar resources is not acceptable.

Literature review should be concluded with author's summary or short conclusions for substantiation and necessity of the current scientific work.

The length of literature review should not exceed 25% from total thesis volume.

Materials and methods: in this chapter Master student should include information about: research place and time, characteristics of research object, research scheme, technological scheme with technological regimes, summarise product recipes in table; describe analytical and other research methods.

It is not necessary to describe all details of well-established standard methods; it is enough to indicate standard number (LVS, ISO, AOAC, AACC and others). If method used in the present experiments is new or is modified its detailed description is necessary.

It is not necessary to include photos of the equipment used. However, specific information regarding models and producers of the equipment is required.

In this chapter, mathematical data processing methods used in the study should be summarised and described too.

The volume of material and methods should not exceed 10% of total Master Thesis volume.

Results and discussion of experimental research is carried out and described as follows:

- ✓ analysis of research results and their interpretation;
- ✓ data processing and analysis;
- ✓ verification of the suitability of findings.

Conclusions, proposals: the main results, achieved when reaching the aim of the thesis and carrying out the tasks are clearly presented in this part of the thesis.

The conclusions of a Master Thesis emphasise the following three main subjects: the work that has been carried out, the ways that the proposed solutions help to solve the researched problem.

The conclusions are drawn from the findings of current research.

Conclusions must not contain new information, which has not been described and analysed in previous parts of the thesis, as well as rules and axioms which have already been recognised in the scientific field.

The research findings provided in the conclusions are supported by the changes in the values of the criteria selected for the assessment of systems, conducted calculations and research.

The order of conclusions and recommendations may not reflect the order of the text.

The statements are grouped and arranged in order to highlight the most important research findings. Conclusions and recommendations have to be numbered.

Acknowledgment: gratitude can be expressed (if necessary) to the persons, or institutions, or laboratories, who gave significant methodological, consultative, financial or technical support.

References: provide a list of references in alphabetical order cited in this paper (see in chapter 2.5).

Annexes: guidelines for annexes formatting are available in Chapter 2.6.

Be careful with plagiarism. For more details please see "The Plague of Plagiarism: Academic Plagiarism Defined" (http://people.ucalgary.ca/~hexham/content/articles/plague-of-plagiarism.html).

One copy of the Master theses must be bound in a hard cover.

1.4. Submission and reviewing of Master Thesis

The data for submission of Master Thesis is regulated by the Dean's order.

Pre-defence of Master Thesis is hold one month before the final defence. Main participants are Master students and teaching staff of the Faculty of Food Technology. Students prepare draft of Master Thesis and upload it electronically in e-studies.

Students prepare presentation using *PowerPoint* or other presentation programme and present Master Thesis.

After presentation, Master students answer the questions from teaching staff and students.

The protocol of the meeting the decision gives recommendation on the suitability of the Master Thesis for final defence, as well as indicates the shortcomings that need to be eliminated in the final version of Master Thesis.

Master Thesis cannot be recommended for the defence if:

- ✓ the content of the Master Thesis does not correspond to the topic;
- ✓ there is not sufficient volume of the work;
- ✓ erroneously applied methodology;
- ✓ there are signs of plagiarism and / or compilation have been noticed in the Master Thesis draft.

After pre-defence, the Master student makes necessary improvements and submits one copy of the appropriately designed and bound work to the Department of Food Technology for registration within the specified term.

The supervisor of the Master Thesis confirms with his / her signature on the title page that the formal requirements for arranging, designing and submitting the paper in accordance with these instructions have been observed, as well as the improvements suggested during the pre-defence have been considered.

No later than the deadline set by the Dean of Faculty of Food Technology, fully completed and signed works shall be registered in a special journal. The registrant issues a specially prepared cover letter and a review form to the Master student.

Electronic review form is available in e-studies. The Master student submits the work to the reviewer approved by the Dean's Order.

Before Master Thesis printing, please upload it at your personal LLU IS account, please find section "orders", and check the correctness of the title of Master Thesis in Latvian and English. Please compare Master Thesis title in printed version and in the Order! Please save you Master Thesis in PDF format and upload it in your personal LAIS system.

Master Thesis of the Master study program "Food Science" are reviewed by one reviewer; the work is evaluated with admission for the defence or rejection and with a grade.

Master Thesis can be reviewed by a person holding doctor's degree.

The reviewer shall reflect his / her assessment and conclusions in a written review. Sample of review form is available in Annex 4.

After reviewing, the master student a review together with Master Thesis deliver to the secretary of the study program examination commission before previously fixed date and time.

Master Thesis can be submitted for the defence if the evaluation of the reviewer is positive. The author of the Master Thesis or jointly the author of the thesis and the scientific supervisor are responsible for the consequences of rejecting the thesis.

The director of the study program makes a schedule for the defence of works, indicating the sequence of applicants' presentations. Schedule should be available in e-studies two days before defence.

1.5. Defence of Master Thesis

The presentation time of the Master's degree candidate should not exceed 10–12 minutes. If the time limit is not followed, the head of the MEC (Master's Examination Commission) has

the right to stop presentation. During the presentation, the author concentrates on the use of visual materials (tables, pictures and so on), gives a report on his work.

After the applicant's presentation, the review(s) is read publicly. If the reviewer participates in the defence, he / she speak about the evaluated work. The applicant must provide answers to the shortcomings identified in the review, justifying whether he / she agrees or rejects them.

After the presentation of the reviews, the applicant is asked questions, first by the members of the MEC, then by other participants. The applicant must provide short, specific answers.

The members of the commission evaluate the performance of Master students, the ability to answer questions and critical remarks and conclusions of the reviewer, and record their evaluation in a form specially prepared. After the presentation of all applicants, the Master Thesis are evaluated in a closed session of the MEC and a decision is made on the awarding of the Master's degree to the applicants and the evaluation (grade).

If the decision of the MEC is negative, according to the LLU Study Regulations, only after one year the applicant can submit supplemented and revised work repeatedly. The decision of the MEC is final. If the candidate has substantiated claims related to biased assessment, restriction of his / her rights, violations of procedures, etc., he / she has the right to submit a written appeal to the Chairman of the MEC within 24 hours after the defence of the work.

Defended Master Thesis are property of the Faculty of Food Technology for ten years. After 10 years, the author has the right to receive the work back; a note is made in the record book. The author has only the right to make copies of his/her work.

2. FORMATTING OF MASTER THESIS

The work should be presented on pages of A4 format (210 x 297 mm) in computer typesetting, using *Times New Roman* font. The text should be placed on the page with 20 mm margins from the top, bottom and right and 30 mm margin on the left.

The text should be aligned from the left and right edges (*Justify*). Each paragraph start with a 1.0 cm indent.

The font size in the text should be 12 points, in footnotes 10 points.

Each **chapter** start on a new page, the **font size of the first level headings** is 14 points, **bold, capital letters**. Space before heading 12 points, after heading 12 points if followed by chapter text, and 6 points if followed by subchapter title.

The **font size of the subheadings** is 12 points, **bold, in lower case**. Starting with the subchapter, the space before the title is 12 points, after the title 6 points.

In the text and tables **line spacing should be 1.0** *(Line spacing – Single)*, without spaces between paragraphs.

The pages will be numbered, the numbers will be written on a 20 mm wide strip on the lower right side of the page without dots and other punctuation and not closer than 10 mm from the edge of the page.

The title page is not numbered, but it is included in the total numbering.

The text is divided into chapters and subchapters according to their subordinate numbering sequence. The division into subsections should not be lower than the third level. The titles of chapters and subsections should be short and specific. Headings and subheadings do not have to be written on separate pages, but should be together with the text, centred horizontally on the page. The exception is the title "ANNEXES", which must be written in a middle of a separate page before all annexes.

No full stops after the headings and headings, do not underline headings. Headings must be numbered in Arabic numerals (1; 2; 3, etc.) and written in the same way as in the table of contents. The title at the bottom of the page should not be separated from the text on the next page, as well as the division of the title into two pages is not allowed. If there are subchapters, the minimum is two subchapters.

Abbreviations, symbols used in the text must be explained the first time they are used, the list of abbreviations also can be included in the thesis.

Throughout the work, one type of fractional notation, such as 0.5 or ½, should be used to record numerical values.

A period is used as a decimal point (.) in fractions.

The scientific names of micro-organisms, plants and animals in Latin are always written in italics, but the other terms they contain - in text. For example, *Lactobacillus acidophilus*, L. *paracasei* subsp. *paracasei* JCM 8133 or *Lactobacillus reuteri* LB 121.

Tables, figures and formulas should be placed in the text where they are first mentioned, if this is not possible - after the next paragraph.

Pages should be fully filled.

Appropriate professional terminology must be used.

2.1. Tables

All tables must be numbered with Arabic numerals. The numbers should be written above the table title on the right side in the body text font. **The numbering of the tables is separate for each thesis chapter**; therefore, the order of the tables is indicated throughout the chapter (regardless of the numbering of the subchapter).

The table headings are centred horizontally and in bold, the font size is 12 points, they are not underlined and no full stops are entered at the end. The space between the previous text and the table number should be 6 points, also a space of 6 points should be left after the table

title.

Example, the text “Table 2.3” means, that it is Table 3 from Chapter 2.

Example:

Table 2.1

Antiradical activity of analysed red wine samples

Red wine code	Antiradical activity	
	DPPH, mM TE 100 mL^{-1}	**ABTS, mM TE 100 mL^{-1}**
AuCaS	19.29±0.25 c	33.95±1.81 b
FrMik	20.33±0.24 b	29.66±1.22 c
FrCar	19.63±0.06 bc	**39.35±1.06** a
ItNdA	18.77±0.11 d	34.18±1.93 b
ItPri	**20.79±0.31** ab	**42.96±1.09** a
LvUp1	11.21±0.25 g	28.98±1.54 c
LvUp2	16.83±0.28 e	30.06±1.47 bc
LvUp3	13.51±0.11 f	32.76±2.67 b
LvUp4	**9.61±0.05** h	25.69±0.96 d
LvAro	**21.27±0.63** a	12.15±0.83 e
SpCaS1	16.99±0.49 e	**6.79±0.93** f
SpMer	19.22±0.30 c	**7.61±1.54** f
SpCaS2	14.36±0.34 f	12.15±1.08 e
ArCaS	18.04±0.35 d	**8.02±0.69** f
SpTem	19.08±0.24 c	10.74±0.86 e

Note: different letters show that there is a significant difference between values ($p<0.05$)
TE – Trolox equivalent; AuCaS – Jacobs Creek, FrMik – Lavel Blanc, FrCar - J. P. Chenet, ItNdA – Barone Montalto, ItPri – Casa Charlize, LvUp1 – Dadzis, LvUp2 – Durbes Veltes, LvUp3 – Abavas vina daritava, LvUp4 – Aizputes vina daritava, LvAro – Zilver, SpCaS1 – Don Simon, SpMer – Don Simon, SpCaS2 – El Matador Tinto Tetra, ArCaS – La Chamiza, SpTem – Valdepalacios.

The size of the characters in the tables is the same as in the main text - 12 points. If the table is large, a 10-point character size can be used, both in the table head and in the cells. The size of the characters in the table must be the same.

If the author has inserted table that is not created by himself, a reference must be given to its author and the work from which it was taken.

Table 2.2

Temperature influence on degree of CO_2 solubility in cheeses (Ozola, 2002)

Temperature, °C	CO_2 solubility, g L^{-1} water
5	3.35
10	2.32
15	1.37
20	1.69

The width of the table must not exceed the body text and must be aligned within the body text (*AutoFit to Window*). The table can continue on the following pages, without a title, but with the reference "..... table continued". The "header" of the table (first row) must be repeated on each page (Repeat as header row at the top of each page).

A column with “No.” is not inserted in the table.

A table with 1 or 2 rows and columns is not recommended.

Numbers of the same meaning must have the same precision (at least the same number of digits after the decimal separator) within each column. A point (e.g. 4.2 °C) is used as a

decimal separator.

Do not leave blank cells in the table. If parameter is not specified, a dash (-) is added.

If all the parameters in the table have the same unit of measure, the abbreviated unit symbol is mentioned at the end of the table title after the comma. In other cases, the units of measurement must be indicated in the headings of the columns or rows of the table. It is not advisable to create a column "Units of measurement".

The chapter must not start and end with a table.

The information in the tables must be clear and easy to understand, avoiding misunderstandings.

2.2. Figures

All kinds of illustrative materials drawings, schemes, diagrams, photos, graphs etc. are figures. The illustrative material in the figures should complement the text, facilitate its understanding and facilitate the perception of the material presented in the work. Figures must match the text, be in context with it.

Example:

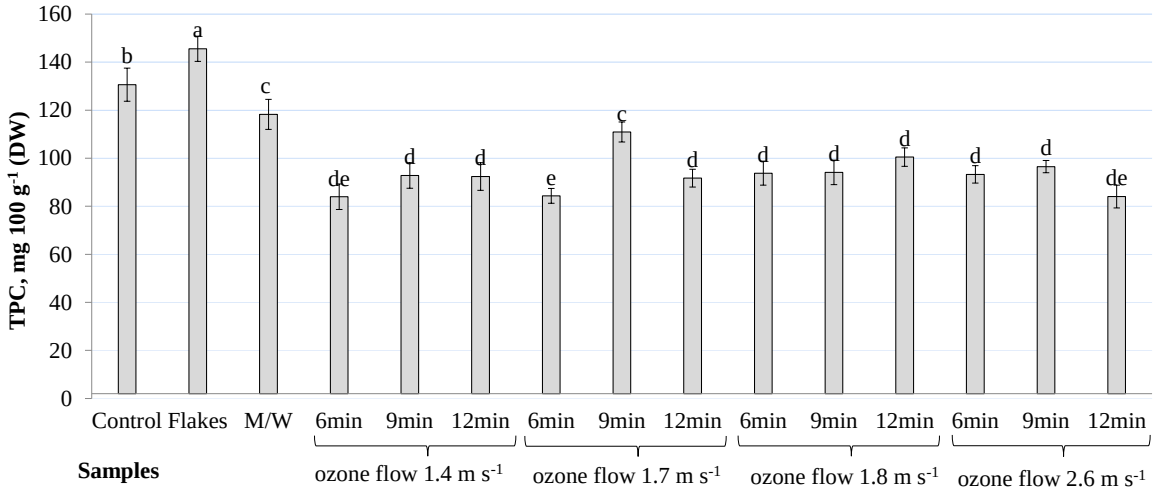

Fig. 2.1 Dynamics of TPC during ozonation of hull-less barley flakes

Note: the values marked with different letters represent significant differences between values (P < 0.05)

All figures in the work must be numbered in Arabic numerals.

The figure number and title must be written below the figure.

The numbering of the figures is separate for each chapter, so the sequence of figures is denoted throughout the chapter (regardless of the numbering of the subsections). Font size for figures title - 12 points, title centred horizontally. The first number followed by a full stop indicates the number of the relevant chapter, the second - the sequence number of the image in this chapter.

The explanatory part of the figure (symbols and abbreviations) follows the figure title in the next line, font size - 10 points. There is a 6 point space after the title of the image and the explanatory text.

The size of the letters and characters in the figures is 10 points, *Times New Roman*. The size of the letters and characters in the figures must be the same.

References to figures must be inserted in the descriptive part of the text. For example, “As shown in Fig. 3.4 aggregated information… ”, or “…the yellow colour intensity of sample A is higher than that of sample B ... (Fig. 2.4)”.

It is not advisable to use background colours or pictures in the figures.

Figures can be coloured, without a frame around the image.

When inserted figure is not created by the author himself, a reference must be made about its author and the work from which it was taken.

All legends and explanations in the figure must be in English.

Figures must not directly duplicate the information from the tables.

The chapter must not start and end with a figure.

2.3. Formulas

Formulas in the text should be written in a separate line in the middle, using the formula preparation program *Equation* or another.

Example:

$$x = \frac{0.00014 \cdot k \cdot (a - b) \cdot e \cdot 100}{c \cdot d}, \quad (1)$$

where: x – nitrogen content in the sample, %

0.00014 – g of nitrogen, equivalents 1 mL 0.01 M NaOH, used for the titration of the control sample;

b – amount of 0.01 M NaOH in mL, used for the titration of the analysed sample;

c – sample weight, g;

d – amount of sample in mL, taken from a graduated flask for the redistillation of nitrogen;

e – volumetric flask volume, mL.

All formulas in the Thesis must be numbered with Arabic numerals, not related to chapter numbering. Formula numbers are written in parentheses opposite the formula on the right side of the page.

Size of letters, numbers and symbols in formulas must be 12 points.

A reference to the formula is needed in the text.

The units of measurement of the quantities included in the formulas shall be written after their names or numerical values in the text and in the explanations of the formula, which shall be written below the formula each in its own line.

2.4. The use of measurement units

The units of physical parameters of the SI system and their derivatives, as well as notations in accordance with the valid normative documents must be used in the work.

Abbreviated unit designations are used after the numerical values of the parameters, in the column headings of the tables and in the explanations to the formulas.

In the text, the symbols of the units of measurement are written in one line with the numerical value of the quantity. There is one letter space between the numeric value and the unit symbol.

The designations of all composite units shall be written on a single line using a negative notation, such as, for example 5 mg kg^{-1} or 10 000 cfu g^{-1}.

2.5. References to sources of information

Works, ideas or insights of other authors used in the Master Thesis, must be indicated by giving a reference to the original source in the text. Presenting another author's work (in whole or in part) as one's own is called plagiarism and is considered a violation of academic ethics.

References to the literature source used must be accurate so that the source of information cited or otherwise used can be unambiguously identified.

All literature cited in the thesis should be included in the reference list. All sources of information mentioned in the reference list should be mentioned in the text.

A reference is a short form of reference that allows you to identify the publication, from

which an idea or citation was taken, as well as to determine its location (page) in that source. References to other authors' direct or paraphrased citations, images, formulas, numerical material, facts, as well as opinions and borrowed opinions should be made in any research work.

Quotes should be written in quotation marks.

The narration of other authors' thoughts does not have to be written in quotation marks, it must be objective. It is not allowed to rewrite the text from the books, as well as to repeat the other author's thoughts without referring to the cited work.

References are used in connection with a list of bibliographic references, using the first element and date method - at the end of the citation, the author or title of the document to be cited and the year of publication are indicated in brackets in the text - (Blair, 2002) or (Safety evaluation of certain..., 2011) or (Sabu et al., 2021).

Example:

Preparation of the list of literature and / or sources and references used in the text

Source type	Design of the list of sources in the bibliography	Sample reference in the text
A book written by one author	Blair R. (2002) *Organic production and food quality: a down to earth analysis*. Iowa: Wiley-Blackwell. 282 p.	(Blair, 2002)
A book written by two authors	Ray R.C., Rosell C. M. (2017) *Microbial Enzyme Technology in Food Applications.* CRC Press: Taylor&Francis Group. 520 p.	(Ray, Rossel, 2017)
A book written by three or more authors	Sabu T., Rajendran R., Anne G., Nandakumar K. (2021) *Innovative Food Science and Emerging Technologies.* Apple Academic Press. 658 p.	(Sabu et al., 2021)
Book of authors collective	*Safety evaluation of certain food additives and contaminants* (2011). Prepared by the 23th meeting of the Joint FAO/WHO Expert Committee on Food Additives (JECFA). Geneva: World Health Organisation. 543 p.	(Safety evaluation of certain..., 2011)
Chapter from the book	Curtin A. C., McSweeney P. L. H. (2004) Catabolism of amino acids in cheese during ripening. **In:** *Cheese: Chemistry, Physics and Microbiology*. Vol. 1. General Aspects. 3rd ed. P. F. Fox, P. L.H. McSweeney, T. M. Cogan, T. P. Guinee (eds). Amsterdam: Elsevier, p. 435–454.	(Curtin, McSweeney , 2004)
Article in a scientific journal	Akalin A.S., Kesenkas H., Dinkci G., Unal G., Ozer E., Kinik O. (2018) Enrichment of probiotic ice cream with different dietary fibers: Structural characteristic and culture viability. *Journal of Dairy Science*, Vol. 101, (1), p. 37–46.	(Akalin et al., 2018)
Conference proceedings (Proceedings)	Sterna V., Kunkulberga D., Straumite E., Bernande K. (2019) Naked barley influence on wheat bread quality. **In:** *FoodBalt 2019: 13th Baltic conference on food science and technology "Food. Nutrition. Well-Being": Conference proceedings*, Jelgava, Latvia, p. 98–102.	(Sterna et al., 2019)
Normative acts (EP regulations, laws,	EP Regulation (EC) No. 1924/2006 (20.12.2006) on nutrition and health claims made on foods. [online] [accessed on 17.10. 2021]. Available at: https://eur-lex.europa.eu/legal-	(EP Regula Nr. 1924/2006, 2006)

Source type	Design of the list of sources in the bibliography	Sample reference in the text
regulations of the Cabinet of Ministers, etc.)	content/EN/TXT/PDF/?uri=CELEX:32006R1924&from=EN	
Internet source	USDA National Nutrient Database for standard reference. Release 22. [online] [accessed on 20.10.2021]. Available at: http://www.nal.usda.gov/fnic/foodcomp/search/	(USDA National Nutrient...)

In case if reference manager Mendeley software is used, select the style American Psychological Association.

Reference to the information obtained from the Internet is displayed in a footnote and is not included in the reference list. If the information published on the Internet contains relevant bibliographic data (author, title of the article and publication, year of publication, etc.), then the bibliographic description is presented similar to other references and is not placed in the footnote, but placed in the reference list.

The web address must be complete; entering it in the web browser address box will open the specified document directly.

The bibliography is arranged in alphabetical order. When creating a reference list, first use the alphabet of the language in which the work is written. For example, if the work is written in Latvian, English or German, then all sources of literature belonging to the Latin script are first arranged in alphabetical order, regardless of the language in which they are written. This is followed by the literature sources published in Cyrillic (Slavic) writing.

Unpublished materials.

Bibliographic references for unpublished materials are based on the principles of monographic publication references. The most frequently used unpublished materials are Bachelor, Master, PhD thesis and dissertations. Copies of these publications are stored in the institutions, where the respective work has been developed and / or defended, dissertation and PhD thesis - also in the central libraries. They can be included in the common list of used literature. Other unpublished materials are reports of various institutes, reference materials, document collections, etc. The bibliographic description of these publications is not included in the common list of used literature sources, but is indicated in the footnote.

Examples of description

Semjonovs P. (2008) Prebiotic properties of fructans of different origins: doctoral thesis for obtaining a doctoral degree in the sub-sector of biotechnology. University of Latvia. Riga. 103 p.

Kozlinskis E. (2011) Development of microorganism populations in spontaneous rye bread yeast: Doctoral Thesis for the Engineering Doctor Degree in the Food Science. Latvia University of Agriculture. Faculty of Food Technology. Department of Food Technology. Jelgava: [b.i.]. 120 p.

2.6. Annexes

The annexes are presented as a continuation of the main part of the Master Thesis. The annexes summarize various inputs and calculations. Other materials that are relevant to the characterization or supplementation of the main body but are not included in it are also added. There is no need to summarize in the annexes information that does not significantly affect the understanding of the body of the work. These include printouts of intermediate results of mathematical data processing, intermediate results of analyses, booklets, etc.

In a separate annex, it is useful to provide a summary of the criteria for the mathematical processing of the data, which should be presented in a tabular form. Here the indicators generated by the applied computer program are summarized and the author considers them important for the interpretation of his results. The tables must be drawn up in accordance with generally accepted rules; the use of any names or terms in a foreign language is not permitted.

The annexes are separated from the main part of the work by a separate page with the title "Annexes" in the middle.

The annexes consist of separate sections. Each individual annex begins on a new page and is numbered in the upper right corner, Annex 1; Annex 2, etc.

If tables or calculations which do not appear on the same page are inserted in the annex and are continued to the next page, the words " Annex 1 continued".

Each individual annex should have a thematic title, and the annexes should be referenced in the main body of the work.

3. INSTRUCTIONS FOR THE MASTER THESIS PRESENTATION

In the study process it is important to acquire good communication skills, to express one's opinion both orally and in writing. Acquisition of oral communication skills is also essential in professional career, the ability to present one's opinion in an argumentative manner, to substantiate and defend it. They must be mastered and improved at the same time. This is the reason for the defence of reports included in study courses, other study papers, participation in scientific conferences and defence of Master Thesis. Their goal is to develop communication skills, as industry professionals will be able to formulate, develop and defend ideas at different levels.

The presentation of the Master Thesis must be prepared with special care, it reflects the large amount of work done, and it must certify the applicant's professional maturity and compliance with the Master's degree. The analysis must be applied, it must be based on criteria for mathematical data processing, economic calculations or other arguments that prove the efficiency of the development. The conclusions and proposals should be based solely on the results of the study carried out.

When defending a Master Thesis, the presentation time should be limited to 10–12 min. The time limit is determined by the Master's examination commission. When preparing a presentation using Microsoft Office PowerPoint or other presentation tools, you need to plan carefully so that you can:

- ✓ to acquaint the commission and other presenters with all aspects of the work: topicality of the work, aim, tasks, methods used, results obtained, conclusions, recommendations, etc.;
- ✓ to attract and keep the audience's attention to the report;
- ✓ to convince the audience about the significance of your work, the professionalism of its execution, correctness and the author's contribution;
- ✓ demonstrate your competence in all work-related matters.

The work must be presented fluently, in a logical order, in a loud, convincing voice. The information presented in visual aids (slides) should be demonstrated and commented at the right time. The text of the report should be prepared in advance, rehearsal should be provided if necessary.

It should be borne in mind that:

- ✓ listeners have not read entirely your thesis. Relying on it alone can lead to an error and "disappear" the right place in the text, which will cause confusion and ruin the defence. It is not recommended to read comments in visual aids; you have to rely on improvisation.
- ✓ the free message is much more pleasant, but the pre-composed speech can be broken down, something important can be omitted, the author will try to correct the situation, and the smooth narration may be interrupted.

This option is more useful. Prepare the full text of the presentation, but during the report use a concise version with a presentation plan, short theses, and the most important facts. By displaying the necessary information in visual aids, it will be much easier to comment on it by improvising freely.

The speech must not exceed the time limit.

The visuals are presented by the rapporteur during the presentation. These may be: multimedia projection, developed products, researched materials, videos, posters, booklets, etc. In any case, the author must make sure of the technical possibilities to demonstrate the intended visual aids before the performance. Common guidelines for the use of visual aids:

- ✓ they must be clearly visible;
- ✓ interested parties must be able to understand the information even without the rapporteur's explanations;
- ✓ they must be in close connection with the oral presentation and must be actively used;

- ✓ each of them must be exposed so that all the information in it can be received;
- ✓ be neatly designed.

The most commonly used visual material is multimedia projection *(PowerPoint).* Images (slides) must be carefully designed, considering the viewer's perceptual abilities. The main rules:

- ✓ do not overload with information, the size of the table - no more than 30 numbers;
- ✓ sufficient letters and symbols - at least 24 points for the main text;
- ✓ thoughtfully designed and neatly made, without spelling and style mistakes;
- ✓ each with a short and concise name;
- ✓ numbering so that listeners can be asked to replay a specific slide if necessary;
- ✓ include the necessary, relevant information, the results of the experiment, add also the criteria of materials;
- ✓ do not overdo it with bright or dotted fonts, excessive animation;
- ✓ balance the number of images with the expected duration of the performance.

An integral part of the presentation of the work is the questions of the evaluators and listeners, and the rapporteur's answers to them.

It is recommended to consider:

- ✓ the answers to the questions raised in the review, which are already known to the rapporteur, must be prepared in a timely and thorough manner;
- ✓ if the question asked is not fully understood, it may be asked to repeat or clarify it;
- ✓ in answering the question, if necessary, the information presented in the Master Thesis can be used, only the rapporteur should be oriented so that the audience does not have to wait long;
- ✓ both the questions indicated in the review and the questions asked during the defence cannot be left unanswered; if a specific answer cannot be given during the defence, then choose the answer: “I am sorry, but I did not pay attention to this question; I have made an inaccuracy; unfortunately, I will not be able to answer at this time; agree, it should have been done differently”;
- ✓ use professional terms, expressions, explanations when speaking and answering questions;
- ✓ the answer should be as short as possible;
- ✓ the answers must be given in the correct way; if your opinion differs, you have a different opinion, other data, other sources of information, justify it; avoid agitating emotions, express your argument in a convincing but correct form that does not offend the questioner.

Presenting is the acquisition of certain skills that can only be achieved through practice. Therefore, you need to train in front of a certain audience, while controlling your time.

LITERATURE USED FOR THE DEVELOPMENT OF THE GUIDELINES

1. Ciproviča I., Galoburda R., Kārkliņa, Rakčejeva T., Palma S. (2012) *Metodiskie norādījumi maģistra darbu izstrādei un aizstāvēšanai.* LLU, PTF. 44 lpp.
2. Guidelines for the Preparation of Your Master's Thesis. [online] [accessed on 20.06.2020]. Available at: https://www.unk.edu/academics/gradstudies/admissions/grad-files/Grad%20Files/ThesisGdlnsFinal08.pdf
3. Latvijas Lauksaimniecības universitātes Nolikums par studiju noslēguma pārbaudījumiem. [online] [accessed on 20.06.2020]. Available at: Pieejams: https://www.llu.lv/sites/default/files/2016-08/Nolikums%20par%20studiju%20nosl%C4%93guma%20p%C4%81rbaud%C4%ABjumiem_2014-1.pdf
4. Latvijas Lauksaimniecības universitātes Studiju nolikums. [online] [accessed on 20.06.2020]. Available at: http://www.tf.llu.lv/sites/tf/files/2016-10/Studiju_nolikums_2015.pdf
5. *The procedure for master's thesis preparation* (2017). Methodological guidelines. For the students of Business Informatics (62109P101) study programme at VU KnF Institute of Applied Informatics. Kaunas. 40 p.

ANNEXES

Annex 1

Application for the topic of a Master Thesis

Latvia University of Life Sciences and Technologies

Faculty of agriculture and food technology

Food institute

APPROVAL

Director of the institute

_____

(signature)

_____

(data)

THE TASK OF MASTER THESIS

Author:

Topic of the research:

Short annotation:

Thesis will be completed:

Scientific supervisor _____

(Name, Surname, scientific degree, signature)

Consultant (s):

Author of the Master Thesis _____

(signature, data)

Annex 2

Sample of Master Thesis title page

LATVIA UNIVERSITY OF LIFE SCIENCES AND TECHNOLOGIES
FACULTY OF AGRICULTURE AND FOOD TECHNOLOGY
Food Institute

Master Thesis

Investigation of factors influencing milk coagulation

for obtaining an academic
Master Degree of Engineering in Food and Beverage Technologies

Master student	Name Surname, matr. No.
Scientific supervisor	doc. Dr.sc.ing. Name Surname
Consultants	prof. Dr.sc.ing. Name Surname
	asoc. prof. Dr.chem. Name Surname

JELGAVA
20__

Annex 3

Report sample in English

REPORT

Bodniece K. (20__) *Allium sativum* flavour compounds as an indicator for garlic identity and quantity determination: Master Thesis. Latvia University of Life Sciences and Technologies. Jelgava: LBTU. 58 p.

The Master Thesis contains 7 tables, 20 figures and 1 annex, as well as 38 sources of literature.

The objective of this study was to investigate the aroma profile of volatile compounds in garlic subspecies originated from Latvia, to compare with aroma composition of garlic grown in the region of Midi-Pyrenees (France) and other countries.

Tasks of this study were to: 1) adapt solid phase microextraction (SPME) method for determination of volatiles composition (the technique of, holding time), 2) compare qualitative and quantitative composition of volatiles depending on garlic subspecies and varieties, 3) assess the suitability of volatiles analysis for quality control and identification of different garlic subspecies and varieties.

The Master Thesis suggests that SPME and gas chromatography (GC) methods are gentler than extraction of aromatics using steam distillation. This is testified with lesser contents of mono- and polysulphides, which usually are the transformation products of daily disulphide (DADS). SPME and GH methods are suitable for analysis of garlic flavour compounds.

It was established that hardneck garlic tends to contain more DADS, the main degradation product of allicin. Comparing to hardneck subspecies, the content of allyl mercaptan, one of the major compounds comprising „garlic breath", was significantly lower in softneck garlic clones. Amount of cyclic compound 3-vinyl-1,2-dithiin differed considerably with higher contents in softneck subspecies. The results demonstrate softneck garlic as more suitable subspecies for long-term storage.

In general, results show no significant difference in the content of DADS and total content of other flavour compounds between hardneck and softneck garlic grown in the region of Midi-Pyrenees and Latvia. However, comparing garlic subspecies originated from France and Latvia by the content of allyl mercaptan, 1,2-dithiocyclopenthane and 3-vinyl-1,2-dithiin, considerable proportional differences of these volatiles were determined. Also great difference in content of DADS among white garlic variety '*Blanc de Lomagne*' (France, region of Midi- Pyrenees) and white garlic grown in other countries was established. The results of this study suggest suitability of SPME and GC methods for quality control of garlic originated from France.

Report sample in Latvian

REFERĀTS

Bodniece K. (20__) *Allium sativum* aromātiskie savienojumi kā indikators ķiploku identitātes un kvalitātes noteikšanā: zinātniskais darbs maģistra grāda ieguvei. Latvijas Lauksaimniecības universitāte. Jelgava: LBTU. 58 lpp.

Darbs satur 7 tabulas, 20 attēlus un 1 pielikumu, kā arī izmantoti 38 literatūras avoti.

Darba mērķis – izpētīt Latvijā audzētu ziemas un vasaras ķiploku aromātvielu sastāva īpatnības, salīdzināt ar Francijas Vidus-Pireneju reģiona un citu valstu izcelsmes ķiploku aromātvielu sastāvu.

Darba uzdevumi: 1) adaptēt cietās fāzes mikroekstrakcijas metodi (CGME) gaistošo savienojumu sastāva noteikšanai ķiplokos (sasmalcināšanas veids, izturēšanas laiks), 2) salīdzināt dažādu pasugu un šķirņu ķiploku gaistošo savienojumu kvantitatīvo un kvalitatīvo sastāvu, 3) novērtēt gaistošo savienojumu analīzes piemērotību dažādu pasugu ķiploku noteikšanai un šķirņu kvalitātes kontrolei.

Maģistra darba rezultāti rāda, ka CFME un gāzu hromatogrāfijas (GH) metodes ir saudzējošākas nekā aromātvielu ekstrakcija, izmantojot tvaika destilāciju, par ko liecina nelielais mono- un polisulfīdu saturs, kas parasti ir dialildisulfīda (DADS) transformāciju produkti. Līdz ar to CFME un GH metodes ir piemērotas ķiploku aromāta noteikšanai. Noskaidrots, ka ziemas ķiploki tiecas saturēt lielāku allicīna galvenā sabrukšanas produkta dialildisulfīda daudzumu. Salīdzinājumā ar ziemas pasugu, vasaras ķiploki saturēja būtiski mazāk alilmerkaptāna jeb savienojumu, kas ir viens no galvenajiem ķiploku elpas veidošanā pēc garšaugu lietošanas uzturā. Vasaras pasugu no ziemas ķiplokiem atšķīra ievērojams cikliskā savienojuma 3-vinil-1,2-ditāna satura pārsvars. Darba rezultāti liecina par to, ka ievērojami mazāku DADS zudumu dēļ, vasaras ķiploki ir piemērotāki ilglaicīgai uzglabāšanai.

Francijas Vidus-Pireneju reģiona ķiploku analīžu rezultāti rāda, ka pēc ilgāka uzglabāšanas laika to DADS un pārējo aromātisko savienojumu kopējais saturs nav būtiski atšķirīgs no Latvijā audzētajiem ziemas un vasaras ķiplokiem, taču, salīdzinot Latvijā un Francijā audzētos ķiploku alilmerkaptāna, 1,2-ditio- ciklopentāna un 3-vinil-1,2-ditāna saturu atkarībā no ķiploku pasugas, noteiktas ievērojamas minēto savienojumu proporciju atšķirības. Savukārt Vidus-Pireneju reģiona baltās šķirnes ķiploku '*Blanc de Lomagne*' un citu valstu balto ķiploku starpā konstatētas būtiskas DADS satura atšķirības, kas, iespējams, ļautu izmantot CFME un GH-LJD metodes Francijas ķiploku kvalitātes kontrolei.

Annex 4

Review form

LATVIA UNIVERSITY OF LIFE SCIENCES AND TECHNOLOGIES

FACULTY OF AGRICULTURE AND FOOD TECHNOLOGY

FOOD INSTITUTE

Academic Master's study programme "Food science"

Review of Master Thesis

Author of Master Thesis _____
(Name and Surname)

Title of Master Thesis _____

Volume of master thesis is ___ pages, thesis includes __ tables, ___ figures, ___ annexes and _____ literature resources.

1. Actuality and importance of the research, author's contribution in problem exploration.
_____
_____
_____
_____

2. Formulation of the aim and tasks of the present Master Thesis.
_____
_____
_____
_____

3. Materials and methods: chosen objects and investigation methods of the present research – its conformity to aim of Master Thesis; methods for mathematical data processing.
_____
_____
_____
_____

4. Results – interpretation of achieved results according to aim and tasks of Master Thesis.
_____
_____
_____
_____

5. Analysis of scientific and practical contribution, conclusions and proposals.
_____
_____
_____
_____

6. Errors and shortages sighted in the present Master Thesis.

_____
_____
_____
_____

Conclusion. Volume and quality of the present Master Thesis confirm, that author of present Master Thesis has _____competences appropriate Master's level and chosen speciality.

(achieved / not achieved)

Master Thesis should be _____ for defence.

(recommended / not recommended)

The grade of Master Thesis is: _____

(grade in 10-point scale)

Reviewer _____

(position, scientific degree, name and surname)

_____ _____

(data) *(signature)*

Annex 5

Example of author's statement

MASTER THESIS AUTHOR'S
STATEMENT

Hereby I, *name, surname*, certify that my Master Thesis has been developed independently, it does not infringe intellectual property rights of other persons or plagiarism. The works of other authors and data sources used are indicated in the references.

Date .... / _____/

(signature and its transcript)

Annex 6

Last page of Master Thesis

DECISION
OF THE MASTER'S EXAMINATION COMMISSION

Date of Master Thesis defence _____

Evaluation grade of Master Thesis _____

Number of protocol _____

Secretary of Master's Examination Commission:

(signature)