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

Guidelines for Bachelor's thesis Development and Defence

For students of the academic bachelor's study program
"Food Quality and Innovations"

Jelgava
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INTRODUCTION

The aim of the bachelor's thesis is to apply the theoretical knowledge acquired during the study process to solving scientific problems. The bachelor's degree candidate must be oriented towards the development directions of the food science sector, understand the importance of new product development in the development of food production companies, and be familiar with the food product quality criteria for ensuring safe food products for consumers.

A bachelor's thesis can be developed and defended by a 4th-year student who has passed all theoretical and practical tests provided for in the study program and fulfilled all the requirements of the academic bachelor's study program "Food Quality and Innovations".

A candidate for a bachelor's degree must be prepared for independent work in one of the subfields of engineering; therefore, he or she must demonstrate:

- **knowledge** and understanding of the planning and development of research work and the interrelationships of the results obtained.
- **skills** to conduct research, formulate and analytically describe information, problems and solutions in the food industry. Explain and argue about the results obtained and find creative solutions.
- **competence** to independently obtain, select and analyse the information necessary for a bachelor's thesis research. Make decisions and solve problems encountered in production using the results obtained from the research.

The supervisor of the bachelor's thesis can be the academic staff of the Latvia University of Life Sciences and Technologies (LBTU), who have participated in the implementation of the study process. For the successful completion of the thesis, consultants (academic staff from LBTU or researchers from scientific institutes or industry representatives) may also be selected to resolve individual issues.

The student selects the supervisor and topic of the bachelor's thesis independently or in consultation with the program director. The topic of the bachelor's thesis and the work/research plan must be coordinated with the supervisor.

The reviewer of the bachelor's thesis is selected by the thesis supervisor according to the topic of the bachelor's thesis from manufacturing companies, scientific research institutes or state administrative institutions.

The student, in coordination with the thesis supervisor, by the specified date, but no later than three weeks before the submission of the thesis, submits the following information electronically to the director of the study program:

1) the title of the topic in Latvian and English;
2) supervisor and consultants;
3) reviewer.

The final topic of the bachelor's thesis will be approved by the Dean's Order not later than three weeks before bachelor's thesis submission. After approval of the bachelor's thesis topic, its changes are not accepted.

GENERAL REQUIREMENTS FOR A BACHELOR'S THESIS

The topic of the bachelor's thesis must be relevant and related to food science. The topic must have a scientific orientation and must demonstrate the student's scientific research and practical skills acquired during the study process. The following thematic directions are recommended for bachelor's theses, in accordance with the strategic directions of engineering sciences:

- Quality and safety aspects of food raw materials and products in the production process and in the development of new products.
- Sustainable technological solutions for the production of value-added food products.
- Food production and packaging based on circular economy principles.

The length of the bachelor's thesis is no more than **50 pages**. A sample of the title page of the bachelor's thesis is attached in Appendix 1. At the end of the descriptive part of the bachelor's thesis, the student adds a statement that the work does not violate the intellectual property rights of other persons or plagiarism, including the use of artificial intelligence to interpret the results (Appendix 2).

For general guidelines for the design of works, see:
https://www.lptf.lbtu.lv/sites/lptf/files/2025-02/noformesanas%20noteikumi_2025.pdf

BACHELOR'S THESIS STRUCTURE

Recommended bachelor's thesis structure:

Title page

Annotation in Latvian and a foreign language (English) – 2%.

Introduction with a clearly formulated aim and objectives of the bachelor's thesis, which will ensure the achievement of the aim - up to 3%.

The main part with the theoretical basis of the chosen topic, description of the materials and methods used to carry out the work, summary and analysis of the experimental results:
Theoretical section – **Literature review** – 30%;
Methodological section – **Materials and methods** – 10%;
Resulting chapter – **Results and discussion** – 52%.

Conclusions and proposals
Conclusions and proposals resulting from the development of the work – up to 3%.

References
Attachments

The contents of the title page and named chapters are explained in more detail.

Title page
It is created according to a unified template (see Appendix 1). Before designing the title page, **the topic of the work is checked again in the LBTU IS system**, in each student's account.

Annotation
A brief description of the content of the work in English and Latvian. The annotation includes scientific findings about the relevance of the work/research, the aim and objectives of the work, a brief description of the methods used in the study, the results obtained in the research and the main conclusions. The length of the annotation does not exceed one page (see Appendix 4).

Table of contents
Includes the titles of the work in progress and the pages on which they are located.

Introduction
The introduction should include a justification for the relevance of the chosen topic and define the aim of the work and the objectives set to achieve this goal, which would reflect the main content of the developed bachelor's thesis.

Main part

Literature review justification of the work, based on a review and analysis of scientific research, characterisation of the problem.
The scientific and popular science literature used in the literature review should be critically evaluated. At least 80% of the literature sources (scientific studies) used should be **no older than ten years**.
For the development of the theoretical part of the bachelor's thesis, the minimum number of sources of scientific literature (scientific studies published in various scientific journals, for example, https://www.sciencedirect.com/ , https://link.springer.com/ , etc.) must be at least **20**.

The Materials and Methods - section includes the research time and place, research scheme, the materials and methods used, and the methods used for analysis and mathematical processing of data.

Results and discussion - presentation, evaluation and analysis of the results obtained in the research experiments. The obtained data are grouped into thematic subsections according to the tasks set.

The obtained research results can be presented graphically or in tables, and data processing should be performed using mathematical statistical methods.

The titles of the subsections are created in accordance with the content of the work to be developed, and are developed in more detail and specifically by the student together with the supervisor.

Conclusions and proposals

The conclusions provide a specific answer to the formulated work objectives. They must be justified and related to the results of the work performed. They cannot be subjective judgments or literature references. Based on the conclusions, the author can give proposals for the application of the results of the developed scientific work in practice.

List of references

1. **The list of references is arranged in alphabetical order**. When creating a list of references, the alphabet of the language in which the work is written is used first. For example, if the work is written in Latvian, English or German, then all literary sources that belong to the Latin script are arranged in alphabetical order first, regardless of the language in which they are written. This is followed by literary sources used in the Cyrillic (Slavic) script.
2. *Mendeley* or another reference creation tool to create a bibliography, choosing *the American Psychological Association 7th edition style*.

Table 1.1

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

Source type	Formatting a list of sources in a bibliography	Sample in-text citation
A book by one author	Wallace R.S. (2025) *Integrating Nutrition Into Mental Health Care. 1st Edition*. CRC Press. 162 p.	(Wallace, 2025)
Two book authors	Moini J., Ferdowsi K. (2025) *Handbook of Nutritional Disorders. 1st Edition*. CRC Press. 539 pp.	(Moini, Ferdowsi, 2025)
A book by three or more authors	Kārkliņa D., Muižnieks I., Rostoks N. (2014) *Novel foods and genetically modified organisms*. Riga: LU Academic Press. 172 p.	(Kārkliņa et al., 2014)
A book by a collective of authors	*Characteristics of air, water and various food products: tables for the course of engineering studies* (2009) Compiled by R.Galoburda, T.Rakčejeva. Jelgava: LLU. 40 pages. *Safety evaluation of certain food additives and contaminants* (2011) Prepared by the 23rd meeting of the Joint FAO/WHO Expert Committee on Food Additives (JECFA). Geneva: World Health Organisation. 543 p.	(Air, water and various..., 2009) (Safety evaluation of certain..., 2011)

Table 1.1 continued

Source type	Formatting a list of sources in a bibliography	Sample in-text citation
Chapter from a book	Antoniadou M., Varzakas T. (2023) Probiotics and Prebiotics and Their Effect on Food and Human Health: New Perspectives **In**: *Probiotics, the Natural Microbiota in Living Organisms: Fundamentals and Applications,* 1st ed. HA El-Enshasy, ST Yang (eds). Boca Raton: CRC Press, p. 1–29. Liceaga AM (2022) Edible insects, a valuable protein source from ancient to modern times. **In**: *Advances in Food and Nutrition Research*. Academic Press Inc., Vol. 101, p. 129–152.	(Antoniadou, Varzakas, 2023) (Liceaga, 2022)
Article in a scientific journal	Aumeistere L., Ķibilds J., Siksna I., Neimane LV, Kampara M., Įbina O., Ciproviča I. (2022) The Gut Microbiome among Postmenopausal Latvian Women in Relation to Dietary Habits. *Nutrient*. Vol 14(17), Article Number 3568. Tlevlessova, D., Ospanov, A., Zagorska, J., Makeeva, R., Nurmukhanbetova, D., Mambeshova, A. (2024) Development of curd for children from sheep milk with berries: improvement of nutritional and functional properties. *Eastern-European Journal of Enterprise Technologies* , Vol. 131, p. 24–32.	(Aumeister et al., 2022) (Tlevlessova et al., 2024)
Article in 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)
Regulatory acts (EP regulations, Cabinet regulations, etc.)	Regulation (EC) No 1924/2006 of the European Parliament and of the Council of 20 December 2006 on nutrition and health claims made on foods. [online] [accessed 21.11.2025]. Available: https://eur-lex.europa.eu/legal-content/LV/TXT/HTML/?uri=CELEX:32006R1924 Commission Regulation (EU) No 432/2012 of 16 May 2012 establishing a list of permitted health claims made on foods, other than those referring to the reduction of disease risk and to children's development and health, text with EEA relevance. 25.05.2012. *Official Journal of the European Union*. 136.	(EC Regulation No. 1924/2006, 2006) (EU Regulation No. 432/2012, 2012)
Internet source	Katz D., Ming-Chin Y., Levitt J., Essel KD, Joshi S., Friedman RSC (2022) *Nutrition in Clinical Practice*. *4th Edition*. Wolters Kluwer. 770 p. [online] [accessed 21.11.2025.]. Available: https://research.ebsco.com/linkprocessor/plink?id=c4aa7979-8c07-325c-aafa-27dd98fda62c Fineli Food Composition Database Release 20. [online] [accessed 21.11.2025]. Available: https://fineli.fi/fineli/en/index	(Katz et al., 2022) (Finelli Food Composition...) *or notes in a footnote reference*

Artificial Internet tools

An AI tool used to generate a text snippet

If the work uses text generated by an AI tool, it must be highlighted (e.g. in quotation marks or italics), and the name of the tool used must be indicated.

Example with reference in the text:

> *"The impact of artificial intelligence on the labor market is becoming increasingly significant, as it is able to automate various processes and reduce human workload" (text generated using ChatGPT4o, access date: 15.03.2025).*

Example with a reference in a footnote:

> *"The impact of artificial intelligence on the labor market is becoming increasingly significant, as it can automate various processes and reduce human workloads."*[1]
>
> *Footnote Reference:*
>
> [1]*OpenAI (2025). ChatGPT-4o (Dec 17 version) [Large language model]. Accessed: 2025-03-15. https://chatgpt.com.*

Example with reference in the bibliography:

> *"The impact of artificial intelligence on the labor market is becoming increasingly significant, as it can automate various processes and reduce human workload" (OpenAI, 2025).*
>
> *List of sources:*
>
> *OpenAI (2025). ChatGPT-4o (Dec 17 version) [Large language model]. Accessed: 2025-03-15. https://chatgpt.com.*

The AI tool was only used to structure the work or correct grammar

The use of AI tools in the development of the work is described in the methodology section of the work, in the introduction or in another appropriate place, indicating:

- what AI tools have been used, for example, *ChatGPT*, *Microsoft Copilot*, *DALL-E*, etc.;
- for what purpose the tools were used, for example, for text generation, data processing, idea generation, image creation, programming, etc., clearly separating the AI contribution from the work performed independently.

Example:

> *In the development of this work, ChatGPT (version ChatGPT-4o, access date: 15.03.2025) was used for text editing and idea structuring. DALL E (version 3, access date: 15.03.2025) was used for image generation. All analytical conclusions and interpretations of the work were made independently, based on the information obtained.*

An AI tool used to generate an image or table

If a figure or table was created with an AI tool, the reference must be provided in the text where the figure or table is mentioned or in the title of the figure/table.

Examples:

Fig. 1. A science fiction-style visual representation of the future development of AI (image generated using DALL-E, version 3, access date: 15.03.2025.)

Table 1. Pesticide sales in EU Member States in 2024 (table generated using ChatGPT-4o, access date: 15.03.2025)

An AI tool used in programming or data processing, and analysis

In programming – the role of AI in the development of the program code must be noted in the text of the work, the use of the AI tool must be indicated in the code comments, and the role of the AI tool must be described in the documentation, indicating both the original AI source and the changes made.

In data processing and analysis – the use of AI should be described in the methodology description, including information about the AI tool used, its version and its role in data processing, indicating possible limitations. Example in data processing and analysis:

In the text:

Data preprocessing and analysis used AutoML (Microsoft, 2025a; Microsoft, 2025b) for automatic model selection and configuration. This approach identified optimal parameters, but it should be noted that automatically selected models can be sensitive to outliers.

In the list of information sources:

Microsoft (2025a). GitHub Copilot (version 1.x) [Code generation model]. Accessed: 15.03.2025. https://github.com/features/copilot

Microsoft (2025b). Azure Machine Learning AutoML (version 2.0) [Automated machine learning service]. Accessed: 15.03.2025. https://azure.microsoft.com/products/

Unpublished materials

Bibliographic references for unpublished materials are created according to the principles of references for monographic publications. The most commonly used unpublished materials are bachelor's and master's theses. Copies of these publications are kept in the institutions where the relevant work was developed and/or defended; they may also be available in online databases. They can be included in the general list of used literature. Other unpublished materials are reports of various institutes, reference materials, collections of documents, etc. The bibliographical description of these publications is not included in the general list of used literature sources, but is indicated in a footnote.

Description examples:

Aumeister L. (2021) *The Study of Human Milk Composition*: Ph.D. thesis for the acquisition of a doctoral degree doctor of science (Ph.D.) in food and beverage technologies. Jelgava: Latvia University of Life Sciences and Technology. 201 p.

Ozola L. (2021) *Development of food for special medical purposes*: doctoral thesis for the degree of Doctor of Science (Ph.D.) in Food and Beverage Technology. Jelgava: Latvian University of Agriculture. 120 p.

Attachments

The appendices should include various data, calculation methodologies and other materials that are not included in the work, but are important for the characterisation and development of the work. The appendices should include various initial data and calculations, and other materials that are important for the characterisation or supplementation of what is included in the main part, but are not included in it, for example, **permission from the research ethics committee**, a sample questionnaire form for research participants**, and certificates of participation in conferences**. The work must include references to the appendices. The appendices are separated from the main part of the work by a separate page, on which, in the middle, there is the inscription "Appendices". The appendices consist of separate parts. Each separate appendix begins on a new page and is numbered in the upper right corner - Appendix 1, Appendix 2, etc. Tables and figures in this section should be numbered as appendices. It is preferable to place one table or figure on one page. The titles of individual appendices are not indicated in the table of contents.

If tables or calculations are included in the appendix that do not fit on one page, they are moved to the next page and in the upper corner of the next page, write “Continuation of Appendix 1”. If the table or other material does not end on this page, then on the final page, write “End of Appendix 1”.

SUBMISSION AND DEFENCE OF THE BACHELOR'S THESIS

1. A pre-defence of the bachelor's thesis is organised no later than one month before the submission of the thesis to assess the student's work.
2. A student may defend his/her work to the State Examinations Commission (SEC) if, within a certain period of time, a fully developed bachelor's thesis is accepted by the supervisor and consultants. Supervisors and teaching staff of the Institute of Food participate in the pre-defence. During the pre-defence, the student gives a report (up to 7 minutes) on the research and results of the bachelor's thesis, as well as answers questions. The work cannot be forwarded for defence if the content of the work does not correspond to the topic, the work is not developed in sufficient volume and content, the methodology has been used incorrectly, signs of plagiarism and/or compilation have been noticed in the work, or artificial intelligence has been used to write the work.
3. After a successful pre-defence, the student submits information about the title of the thesis, supervisor, advisors, and reviewer to the director of the study program electronically.
4. The student, supervisor and consultants sign the completed and appropriately formatted bachelor's thesis **within the specified deadline** with a secure electronic signature:
    1.1. The bachelor's thesis (title page, annotations/abstracts, table of contents, introduction, main text with images and tables, conclusions and proposals, bibliography and appendices) is saved as a PDF file (*.pdf) in one file and the text "DOCUMENT SIGNED WITH A SECURE ELECTRONIC SIGNATURE AND CONTAINS A TIME STAMP" is inserted at the bottom of the title page, font Times New Roman, size 12 pt;
    1.2. Conversion program watermarks and advertising texts are not allowed in the PDF file;
    1.3. The text in the file cannot be a scanned image;
    1.4. The file is not protected (closed) with a password;
    1.5. The file name must use Latin letters without diacritical marks (longitude marks, softening marks) and punctuation marks;
    1.6. The file name is formed according to the scheme - the student's last name, first name and matriculation number, for example, Ozolins_Janis_LPTF13094.pdf;
    1.7. The bachelor's thesis is signed with a secure electronic signature in PDF format (*.pdf) by everyone whose First and Last Name is indicated on the title page of the thesis - the scientific supervisor and consultant(s) of the thesis certify with their signature that the submitted thesis has complied with the formal requirements for the presentation of the bachelor's thesis, as well as taken into account the recommendations and improvements that arose during the pre-defense;
    1.8. Upload the signed bachelor's thesis (*.pdf) file to the LLU IS using your user account and password. Additionally, enter the bachelor's thesis annotation in Latvian and English in the LLU IS input fields provided for this purpose. The permissible length of each annotation (including spaces) is limited to 850 characters. The annotation text entered in the LLU IS may differ from the bachelor's thesis annotation text;
    1.9. The uploaded bachelor's thesis is checked in the plagiarism control system, in accordance with the order of the Vice-Rector for Studies " *On the procedure for submitting electronic copies of final theses and their checking in the plagiarism control system* ";
5. After registering in the LBTU IS, the student sends a request to review the bachelor’s work to the reviewer approved by the Dean's order by e-mail, attaching the electronic version of the bachelor's thesis, a cover letter to the reviewer and a review form. The reviewer's obligation is to review the work by the time specified in the cover letter. The reviewer reflects his assessment and conclusion in a review, which is prepared in computer form and signed with a secure electronic signature. See Appendix 4 for a sample review form.
6. The reviewer discusses the content of the work with the author of the thesis and sends the review electronically to the author of the thesis and the secretary of the State Examination

Commission (SEC) no later than 48 hours before the defence of the thesis. If the student and his/her supervisor disagree with the reviewer's assessment and conclusion, seeing an unbiased evaluation of the work as a violation of the procedure, or raise other claims, then the author of the thesis must submit a written application to the LPTF Methodological Commission within 1 day of receiving the review, substantiating the reasons for the claims. The Methodological Commission is obliged to organise a repeated examination of the bachelor's thesis and appoint a new reviewer. In such a situation, both reviews are submitted to the SEC, and the reviewers must attend the commission meeting in person.

7. A bachelor's thesis can be submitted for defence if the reviewer's opinion is positive and no plagiarism is found. The author and supervisor are responsible for the consequences of rejecting the thesis.
8. The director of study programs compiles a list of thesis defences, indicating the order and time of the defence of the candidates' theses.
9. The student defends the bachelor's thesis at an open meeting of the State Examination Commission, with the participation of the bachelor's thesis supervisors, reviewers and invited representatives from industry. The chairman and composition of the State Examination Commission are approved by order of the rector no later than a month before the meeting of the State Examination Commission.
10. The duration of the defence speech should be no longer than 7 minutes. The report should be concise, justifying the relevance of the chosen work topic, the tasks to be solved, the results obtained, the conclusions and proposals. Before the defence, the presentation must be coordinated with the supervisor. During the defence of the bachelor's thesis, the student may use a previously prepared speech report (synopsis), as well as materials prepared for demonstration: drawings, graphic materials, tables, diagrams, images, etc.
11. After the defence, the secretary of the SEC reads a review of the bachelor's thesis, after which the author responds to the reviewer's notes or questions.
12. Then, the members of the SEC and other attendees ask the author questions about the topic addressed in the study, and the student provides brief answers to them.
13. After listening to the reports of all bachelor's degree applicants, the SEC evaluates the work in a closed session with a grade. The defended works are evaluated on a ten-point scale. The work is defended if the SEC evaluates it with at least 4 (four) points.
14. The decision of the Academic Committee on the assessment of the bachelor's thesis is based on the student's ability to defend the topic of their thesis, its theoretical and practical significance, the knowledge demonstrated during the defence, responding to questions and comments expressed in the review, and the reviewer's assessment.
15. The decision on the evaluation of the work is made by the VEC based on the individual assessment of the reviewer and each VEC member. If the evaluation of the commission members is divided, the decisive assessment is made by the VEC chair.
16. The evaluation of the work is announced at the end of each day of the defence, if the defence is organized over several days.
17. A student who has unsuccessfully defended their bachelor's thesis retains the right to defend it in the next academic year. The SEC recommends that the student defend the same thesis, reworking it or developing another thesis on a different topic.
18. If the applicant has justified claims regarding the evaluation of the work, he or she has the right to express a protest within 24 hours after the defence of the work by addressing a written application to the Rector of LBTU.
19. The bachelor's thesis is stored for 5 years in the LBTU IS system.

INSTRUCTIONS FOR THE PRESENTATION OF THE BACHELOR 'S THESIS

During the study process, it is important to acquire good communication skills, to express one's opinion both orally and in writing. The acquisition of oral communication skills is also essential in professional activity, for the ability to present one's opinion in a reasoned manner, to justify and defend it. It is necessary to prepare especially carefully for the presentation of the bachelor's thesis in order to reflect the scope of the work done, to confirm the applicant's knowledge in the relevant field. When preparing a presentation, it is preferable to use the computer program *Microsoft Office PowerPoint* or another presentation program.

FORMATTING OF BACHELOR THESIS

The work should be formatted on A4 format (210 x 297 mm) pages in computer typesetting, using Times New Roman font. The text should be placed on the page with 20 mm indents from the top, bottom and right edges of the page and 25 mm from the left edge.

The edges of the text should be aligned from the left and right edges *(Justify)*. The beginning of paragraphs should be marked with a **1.0 cm indent**.

The **font size in the text is 12 points**, for the text in footnotes 10 points. **Chapters should** start on a new page, the font size of the **headings should be 14 points**, bold, capital letters. The space before the heading should be 6 points, after the heading should be 12 points, if it is followed by the text of the chapter, but 6 points if it is followed by the heading of a subsection. The **font size of the headings of subsections should be 12 points**, **bold**, written in small letters. When starting a subsection, the space before the title is 12 points, after the title is 6 points.

In the text and tables, 1.0 line spacing (Line spacing – Single) is used, without spaces between paragraphs.

Page numbers are written on a 20 mm wide strip in the lower right-hand side of the page without periods and other punctuation marks and no closer than 10 mm from the edge of the page. **The title page is not numbered**, but is included in the total numbering.

The text is divided into chapters and subsections, observing their subordinate numbering sequence. The division of subsections occurs no lower than the third level. The titles of chapters and subsections should be short and specific. Titles and subtitles should not be written on separate pages, but together with the text, centred horizontally on the page. Exceptions are the headings “CONCLUSIONS” and “REFERENCES”, which should be written on a separate page, as well as “ANNEXES” before all annexes.

No periods should be placed after headings and headings should not be underlined. Headings should be numbered with Arabic numerals (1.; 2.; 3., etc.) and written in the same way as in the table of contents; placing the heading at the bottom of the page is not allowed if the text of the chapter begins on the next page, as well as dividing the heading into two pages. If subsections are created, there should be at least two of them.

Abbreviations and symbols used in the text should be explained the first time they are used or the explanation should be placed in the references. For example, polyvinyl chloride (PVC). The same type of fractional notation should be used throughout the work to record numerical values, for example, 0.5 or ½. In fractions, a period (.) is used as a decimal point. Words in the text are not transferred to a new line (they are not divided by a transfer sign).

Explanations are placed in references, using the automatic order of their insertion and numbering (Insert Footnote).

Scientific names of microorganisms, plants and animals in Latin are always written in italics (Italic), but other designations in their composition are in regular text. For example, *Lactobacillus acidophilus*, L. *paracasei subsp*. *paracasei* strain JCM 8133 or *Lactobacillus reuteri* LB 121. Tables, images and formulas are placed in the text where they are mentioned, if this is not possible – after the next paragraph.

Pages should be filled to the maximum. A subsection should be written on the next page only if it is not possible to place three lines of text after its title.

The text must be in good English, without grammatical errors. Appropriate professional

terminology must be used.

Tables

Examples of table design Tables 1.2 and 1.3.

Table 1.2

Enterobacteriaceae log10 CFU g^{-1} in dry seeds and sprouts both treated with ozone and untreated (Bernate & Sabovics, 2024)

Seeds type	Untreated dry seeds	Untreated soaked seeds	Untreated sprouts 72 h	Untreated sprouts stored for 7 days	Treated dry seeds	Treated soaked seeds	Treated sprouts 72 h	Treated sprouts stored for 7 days
Broccoli	n.d.*	n.d.	7.5±0.1	7.2±0.2	n.d.	n.d.	5.5±0.3	6.2±0.3
Wheat	0.8±0.2	4.8±0.2	7.8±0.1	7.8±0.1	0.2±0.1	5.2±0.2	7.8±0.2	7.6±0.2
Alfalfa	n.d.	2.3±0.2	8.1±0.1	7.6±0.3	0.0±0.0	4.3±0.3	7.2±0.3	7.4±0.3
Radish	0.2±0.1	5.4±0.2	6.8±0.1	7.2±0.2	2.5±0.2	4.9±0.4	7.9±0.3	7.1±0.1

*n.d. – not detected

Table 1.3

Number of mesophilic aerobic and facultatively anaerobic microorganisms (MAFAM) log_{10} CFU g^{-1} in untreated, treated dry seeds and sprouts (Bernate & Sabovics, 2024)

Seeds type	Untreated dry seeds	Untreated soaked seeds	Untreated sprouts 72 h	Untreated sprouts stored for 7 days	Treated dry seeds	Treated soaked seeds	Treated sprouts 72 h	Treated sprouts stored for 7 days
Broccoli	2.4 ± 0.20^{d}	2.4 ± 0.10^{d}	8.3 ± 0.20^{a}	8.3 ± 0.05^{a}	2.4 ± 0.05^{d}	2.9 ± 0.15^{d}	8.3 ± 0.10^{a}	8.3 ± 0.05^{a}
Wheat	4.1 ± 0.10^{b}	5.2 ± 0.15^{b}	8.3 ± 0.10^{a}	8.4 ± 0.20^{a}	3.5 ± 0.20^{d}	5.3 ± 0.15^{b}	8.4 ± 0.15^{a}	8.6 ± 0.05^{a}
Alfalfa	1.2 ± 0.15^{c}	3.6 ± 0.15^{d}	8.3 ± 0.10^{a}	8.3 ± 0.15^{a}	1.3 ± 0.10^{c}	4.6 ± 0.10^{b}	8.3 ± 0.05^{a}	8.3 ± 0.01^{a}
Radish	3.5 ± 0.05^{d}	5.5 ± 0.25^{b}	8.2 ± 0.10^{a}	8.1 ± 0.05^{a}	4.2 ± 0.20^{b}	5.4 ± 0.10^{b}	8.2 ± 0.10^{a}	8.2 ± 0.10^{a}

Note. Data are shown as mean values (n = 3) ± standard error (SE). Different letters indicate significant differences at $p < 0.05$ one-way ANOVA

1) All tables must be numbered with Arabic numerals. The numbers must be written above the table title on the right side in the font of the main text. The numbering of tables is separate for each chapter of the work; therefore, the order of tables is indicated throughout the chapter (regardless of the numbering of subsections). For example, the notation 2.3. table means that it is table 3 of chapter 2.2.
2) Table titles are centred horizontally and written in bold, the font size is 12 points, they are not underlined and there is no period at the end. The space between the preceding text and the table number must be 6 points, but a space of 6 points must be left after the table title.
3) The size of characters in tables is the same as in the main text – 12 points. If the table is large, a 10-point character size can be used, using it both in the table header and in the cells. The size of characters in the table must be the same.
4) When inserting a table into a work that is not created by the author himself, a reference must be made to its author and the work from which it was taken, all inscriptions and explanations in the table must be in Latvian.
5) References to tables must be in the descriptive part of the text. For example, “As shown in Table 1.3., the information gathered …” or “The intensity of the yellow colour of sample A is greater than that of sample B... (see Fig. 1.)”.
6) The width of the table must not exceed the boundaries of the main text and they must be aligned within the boundaries of the main text (AutoFit to Window). The table can also be continued

on subsequent pages, without a heading – the "head" (first row) of the table must be repeated on each page (Repeat as header row at the top of each page).

7) The column "No. p. k." is not inserted in the table.
8) It is not recommended to create tables in which the number of rows and columns is 1 or 2.
9) Numbers of equal significance must have the same precision at least within each column (the same number of digits after the decimal separator). A period is used as a decimal separator (for example, 4.2 °C).
10) No cells may be left blank in the table. If an indicator is not specified, a dash (-) is used.
11) If all indicators included in the table have the same unit of measurement, then the abbreviated unit of measurement designation should be given at the end of the table title after a comma. In other cases, the units of measurement should be indicated in the column or row headings of the table. It is not desirable to create a column "Units of measurement".
12) A chapter must not begin and end with a table.
13) Information in tables must be clear and easy to understand, avoiding misunderstandings.

Figures

All types of illustrative materials – drawings, diagrams, charts, photographs, etc. are images. The illustrative material inserted into the images should complement the text, facilitate its understanding and promote the perception of the material presented in the work. The images should correspond to the text, be in context with it.

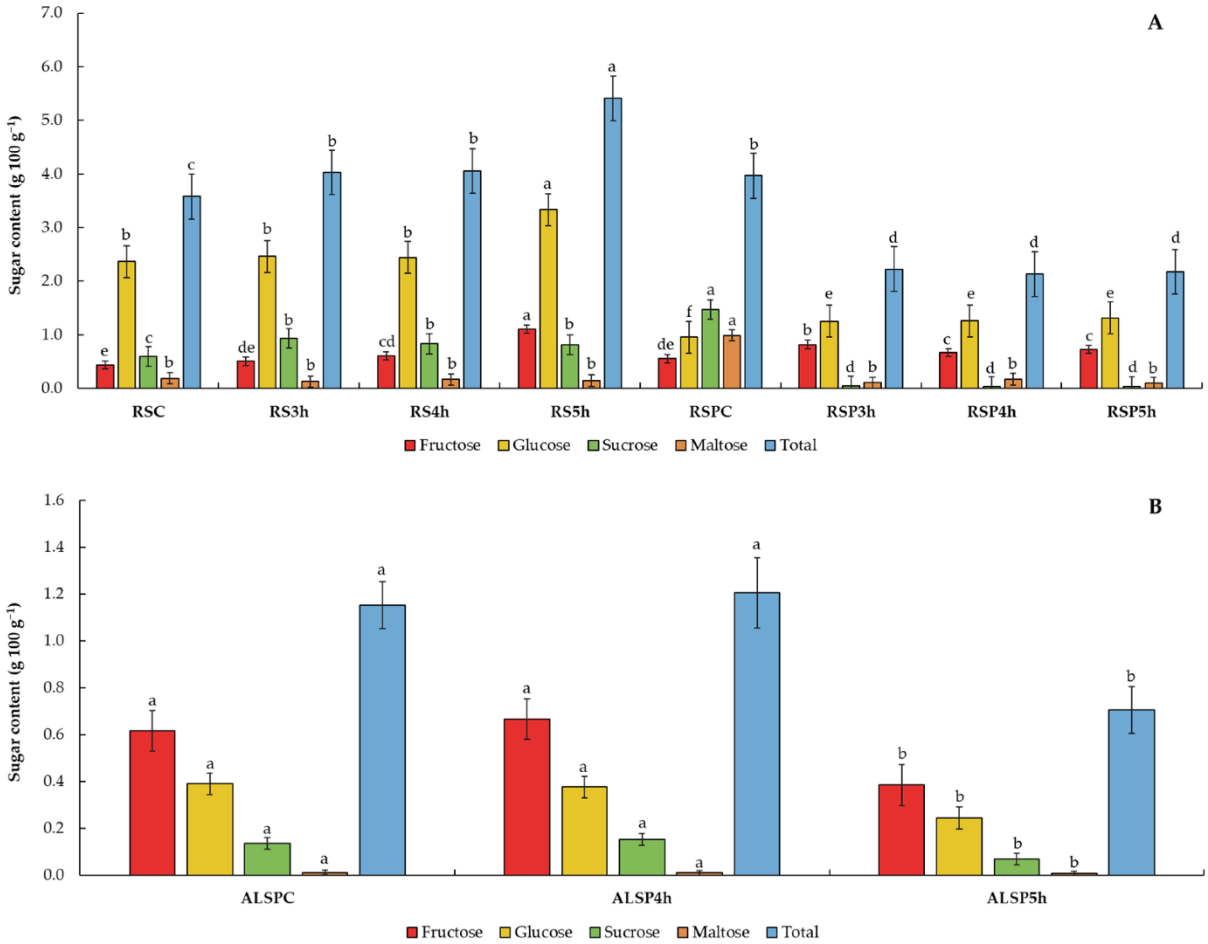

Figure 1. The content of individual sugars in radish seeds and sprouts (A) and alfalfa seeds and sprouts (B). (Bernate et al., 2024)

Note: RSC—control radish seeds; RS3h—radish seeds treated with ozone for 1 h; RS4h—radish seeds treated with ozone for 4 h; RS5h—radish seeds treated with ozone for 5 h; RSPC—radish sprouts from control seeds; RSP3h—radish sprouts from seeds treated with ozone for 3 h; RSP4h—radish sprouts from seeds treated with ozone for 4 h; RSP5h—radish sprouts from seeds treated with ozone for 5 h; ALSPC—control alfalfa sprouts; ALSP4h—alfalfa sprouts from seeds treated with ozone for 4 h; ALSP5h—alfalfa sprouts from seeds treated with ozone for 5 h. Different letters (a–f) in the same saccharide indicate significant differences ($p \leq 0.05$) between the samples.

1) All images in the work must be numbered with Arabic numerals. The image number and title must be written below the image. The numbering of figures is separate for each chapter of the work; therefore, the sequence of figures is indicated throughout the chapter (regardless of the numbering of subsections. The font size for the figure title is 12 points, the title is centred horizontally. The first number, followed by a dot, indicates the number of the relevant chapter, the second – the sequence number of the figure in this chapter.
2) The explanatory part of the figure (symbols and abbreviations) follows the figure title on the next line, the font size is 10 points. A 6-point space is placed after the figure title and the explanatory text.
3) The font size of the letters and signs in the figures is 10 points, Times New Roman. The font size of the letters and signs in the figure must be the same.
4) References to figures must be in the descriptive part of the text. For example, "As shown in Fig. 3.4. the information summarized …" or "The intensity of the yellow colour of sample A is greater than that of sample B... (see Fig. 2.4.)".
5) It is undesirable to use backgrounds in figures, or they must be inconspicuous.
6) Images may be coloured, without a special frame around the image.
7) When inserting an image that is not created by the author, a reference must be given to its author and the work from which it was taken. All captions and explanations in the image must be in Latvian.
8) Images must be placed in the work so that they can be viewed without turning the work.
9) Images must not directly duplicate the information contained in the tables.
10) A chapter must not begin and end with an image.

Formulas

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

Example:

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

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.

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^{-}

ANNEXES

Annex 1

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

Bachelor's thesis

MALT QUALITY IMPROVEMENT OPTIONS

Academic study program
"Food quality and innovation"

Author of the bachelor's thesis P. Bērziņš *(matriculation number)*

Bachelor's thesis supervisor Assoc. Prof. Dr. Eng. P. Siliņš *(position, scientific degree, first name, last name)*

Bachelor's thesis advisors Assoc. Prof., Dr.Econ. P.Egle *(position, scientific degree, first name, last name)*

JELGAVA
Year of development

Example of the author’s statement

BACHELOR'S THESIS AUTHOR
STATEMENT

I, Zane Saulīte, certify that the bachelor's thesis was developed independently, that artificial intelligence was not used to explain the results, and that no infringement of the intellectual property rights of other persons or plagiarism was allowed. The works of other authors and data sources used are indicated in the references.

Sample annotation

Anotācija

Freimane L.E. (2024).” Pienskābes baktēriju attīstības dinamika eko jogurtā”. Bakalaura darbs. Latvijas Biozinātņu un tehnoloģiju universitāte. Jelgava: LBTU, 45 lpp.

Darbs satur 45 lapaspuses, 14 tabulas, 26 attēlus, 58 literatūras avotus.

Bakalaura darba literatūras apskatā tika aprakstītas bioloģiskās saimniecības pamatprincipi un regulējums ES, salīdzināta bioloģiskās un konvencionālās saimniecības svaigpiena kvalitāte un sastāvs, aprakstīti piena kvalitāti ietekmējošie faktori, tāpat arī jogurta raksturojums, pienskābes baktēriju raksturojums un to atttīstības dinamiku ietekmējošo faktoru apkopojums.

Pētāmais objekts ir jogurts no bioloģiskās un konvencionālās lauksaimniecības, kas gatavots no pasterizēta govs piena no SIA “ Tukuma piens” (“Baltais” un “Baltais eko”), kam pievienots pienskābes baktēriju ieraugs 3 veidi: YoFlex – L811, YoFlex – L902 un TCC – 20 (CHR HANSEN), katrs paraugs tika ieraudzēts pienā no bioloģiskās un konvencionālās saimniecības ar ierauga daudzumu atbilstoši to aktivitātes vienībām, raudzēšanas temperatūra termostatā paraugiem ar YF-L811, YF-L902 bija 41±1 °C, taču paraugiem ar TCC-20 ieraugu 37±1 °C. Visiem iegūtajiem paraugiem ar standartmetodēm tika noteikti fizikāli – ķīmiskie rādītāji – pH; olbaltumvielu, tauku, ogļhidrātu saturs; kā arī mikrobioloģiskie rādītāji – pienskābes baktēriju KVV skaits (*Lactobaccilus ģints – delberuesckii* subsp.*bulgaricus* un *helveticus,* kā arī *Streptoccocus thermophilus*), un to attīstības dinamika.

Pētījuma rezultāti – konvencionālajā pienā ir lielāks olbaltumvielu saturs nekā pienā no bioloģiskās saimniecības, savukārt, bioloģiskajā pienā ir lielāks laktozes saturs, tāpat arī eko jogurtā tika novērots lielāks laktozes, glikozes un galaktozes saturs. Fermentācijas ātrums un pienskābes veidošanās ātrums starp dažādiem ieraugiem atšķīrās, YF – L811 uzrādīja visātrāko pH samazināšanos un vislielāko pienskābes veidošanos. *St.thermophilus* baktēriju skaits visos jogurta paraugos bija lielāks, diapazonā no 8.51 $\log_{10}$ KVV mL^{-1} līdz 8.79 $\log_{10}$ KVV mL^{-1}, salīdzinot ar *Lactobacillus*, kur baktēriju skaits jogurtā ir no 4.02 $\log_{10}$ KVV mL^{-1} līdz 6.86 $\log_{10}$ KVV mL^{-1} . Būtiska atšķirība pienskābes baktēriju attīstības dinamikā tika novērota paraugos atkarībā no pievienotā ierauga ($p < 0.05$), tomēr baktēriju attīstības dinamikā atkarībā no lauksaimniecības veida būtiska atšķirība netika novērota ($p > 0.05$).

Annotation

Freimane L.E. (2024)." Lactic acid bacteria growth dynamic in organic yogurt". Bachelor's thesis. Latvian University of Life Sciences and Technologies. Jelgava: LBTU, 45 p.

45 pages, 14 tables, 26 figures, 58 references.

The literature review of the bachelor thesis described the basic principles and regulations of organic farming in the EU, compared the quality and composition of raw milk from organic and conventional farms, described the factors affecting milk quality, as well as the characteristics of yogurt, lactic acid bacteria and a summary of the factors affecting their development dynamics.

The object of the study is organic and conventional yogurt made from pasteurized cow's milk from Tukuma piens Ltd ('Baltais' and 'Baltais eko'), to which 3 types of lactic acid bacteria starter have been added: YoFlex - L811, YoFlex - L902 and TCC - 20 (CHR HANSEN), each sample was fermented in organic and conventional milk with the amount of starter according to their activity units, the fermentation temperature in the thermostat for samples with YF-L811, YF-L902 was 41±1 °C, but for samples with TCC-20 starter 37±1 °C. Physico-chemical parameters - pH, protein, fat, carbohydrate content; and microbiological parameters - number of lactic acid bacteria CFU (*Lactobacillus* genus - *delberuesckii subsp. bulgaricus* and *helveticus*, and *Streptococcus thermophilus*) and their dynamics were determined for all the samples obtained using standard methods.

The results of the study showed a higher protein content in conventional milk than in milk from organic farms, while organic milk had a higher lactose content and organic yogurt had a higher lactose, glucose and galactose content. The fermentation rate and lactic acid production rate differed between the different strains, with YF - L811 showing the fastest pH decrease and the highest lactic acid production. *St. thermophilus* had a higher bacterial count in all yogurt samples, ranging from 8.51 log10 CFU mL^{-1} to 8.79 log10 CFU mL^{-1}, compared to *Lactobacillus spp.*, where the bacterial count ranged from 4.02 log10 CFU $mL^{-1}$to 6.86 log10 CFU mL^{-1}. A significant difference in lactic acid bacterial dynamics was observed in the samples depending on the added starter ($p < 0.05$), but no significant difference in bacterial dynamics was observed depending on the type of farming ($p > 0.05$).

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

BACHELOR'S THESIS REVIEW

Author of the bachelor's thesis _____
(*first name, last name)*
Bachelor's thesis topic_____

Amount of work _____ pages,_____tables, _____figures, ____annexes, ___bibliographic titles

Reviewer _____
(position held, academic degree, first name, last name)

Topic selection

Relevance of the topic to current trends in the food industry	Fully complies	Partially complies	Does not comply
Scientific originality of the selected topic	Present	Partial	Absent
Practical applicability of the research	High	Moderate	Low

The aim and objectives of the work are formulated in accordance with the chosen topic.	Fully complies	Partially compliant	Does not comply

Literature review:

The literature review is consistent with the stated research objective.	Fully complies	Partially compliant	Does not comply
The presentation of the literature is logical and understandable.	Fully complies	Partially compliant	Does not comply
The latest scientific literature was used	Used	Partially	Not used
Evaluation of the literature review	Analyzed and evaluated	Systematized	Only cited

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Description of the research methodology:

The materials and methods used in the study are appropriate	Fully complies	Partially compliant	Does not comply
The materials and methods used in the study are sufficiently described.	Enough	Partially	Insufficient
The study used appropriate mathematical data processing	Used	Partially	Not used

Analysis of results and conclusions:

The results are described and interpreted in a clear manner, in accordance with the objectives set.	Fully complies	Partially compliant	Does not comply
The results are sufficiently analysed and reliable.	Enough	Partially	Insufficient
The obtained results are discussed and compared with the findings of the literature.	Fully complies	Partially compliant	Does not comply
The conclusions are in accordance with the objectives and result from the research conducted.	Fully complies	Partially compliant	Does not comply

Identified shortcomings, inaccuracies, and other remarks in the paper:

Evaluation of the work (with a mark on a 10-point scale):

Bachelor's thesis _____the requirements set for the bachelor's thesis
corresponds / does not correspond

rated with _____ to the ball and I propose _____
with a mark on a 10-point scale to assign / not assign

Bachelor's degree in engineering in food and beverage technology.

I, , hereby certify that I will maintain confidentiality with use and distribution of the content of the peer-reviewed bachelor's thesis.

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