

APPROVED

in the meeting of the of the Council of the Faculty of Veterinary Medicine of the LSMU 02-09-2015, Minutes No. 02

AMENDMENTS APPROVED

in the meeting of the of the Council of the Faculty of Veterinary Medicine of the LSMU 16-01-2024, Minutes No VAF10-01

in the meeting of the of the Council of the Faculty of Veterinary Medicine of the LSMU 17-06-2025, Minutes No VAF10-11

in the meeting of the of the Council of the Faculty of Veterinary Medicine of the LSMU 16-06-2026, Minutes No VAF10-09

## **DESCRIPTION OF PROCEDURE OF PREPARATION, DEFENCE AND EVALUATION OF MASTER THESES OF THE STUDY PROGRAMME OF VETERINARY MEDICINE**

### **I. GENERAL PART**

1. These regulations define the preparation, defence and evaluation of Master Theses of the study programme of Veterinary Medicine (VM) at Veterinary Academy of the Lithuanian University of Health Sciences (hereinafter referred to as an Academy).
  - 1.1. At the beginning of the 8<sup>th</sup> semester, all 4<sup>th</sup>-year students are introduced to these regulations by the Dean's Office of the Faculty of Veterinary Medicine (FVM).
  - 1.2. These regulations are published in the *Master's Thesis* course on Moodle.
2. These regulations are based on the following legal acts:
  - 2.1. Law on Science and Education of the Republic of Lithuania. New version effective from 1 January 2017: No. XII-2534 (Consolidated version valid from 1 January 2025 to 31 August 2025).
  - 2.2. Order No. V-1168 of the ministry of Education and Science of the Republic of Lithuania "General Requirements for implementation of studies" of 30<sup>th</sup> December 2016 (New edition No 2023-14153 of 1<sup>st</sup> September 2023).
  - 2.3. Regulation of the Studies of the Lithuanian University of Health Sciences (approved by the Decree No. 190-03 of the LSMU Senate on 29 May 2025).
  - 2.4. The Guidelines on the Use of Artificial Intelligence in Studies, Scientific Research, Innovation, and Clinical Practice, approved by the LSMU Senate Resolution No. 178-06 of 18 April 2024.
  - 2.5. Description of the Study Field of Veterinary Medicine approved by the Order No. V-1687 of the Ministry of Education and Science of 04 November 2020.
  - 2.6. The Order of the Rector of LSMU "On the Approval of the Procedure Description for Uploading LSMU Documents and Their Metadata to the Information System DSPACE CRIS," dated 30 December 2021, No. 2021-V-0699. <https://lsmu.lt/biblioteka/studijoms/>
  - 2.7. By the Order of the Minister of Education, Science and Sport of the Republic of Lithuania "On the Approval of the Regulations for Doctoral Studies," dated 18 May 2020, No. V-739.
  - 2.8. Manual of Standard Operating Procedure (ESEVT SOP of 08 June, 2023).

## II. MAIN CONCEPTS, FUNCTIONS, DUTIES AND RESPONSIBILITY

3. **Master Thesis** (hereinafter – Thesis) – an independent, original, and qualifying scientific work aimed at demonstrating the student’s ability to creatively, comprehensively, and thoroughly examine relevant and important issues in practice and science, while considering limitations such as information availability, time, and other constraints. Through the Master's Thesis, the student must demonstrate the ability to analyze a chosen topic, evaluate prior research conducted by other scholars, engage in independent learning and research, analyze collected data, present interpretations of research results, and clearly and reasonably formulate research conclusions and recommendations. The MT must be based on independent scientific research or applied scientific investigations and may not be merely descriptive or of a review nature. The MT should reflect the student's intellectual maturity, theoretical scientific knowledge, practical skills, professional competence, and readiness for independent scientific and practical work.
4. **Author of the Master Thesis** – the student of the Veterinary Medicine programme at LSMU. The student shall prepare the MT according to the syllabus and the present document, while s/he shall have a right to defend the MT only upon completion of all the academic requirements of the study programme.
5. The student’s duties in the course of preparation and defence of the MT:
  - 5.1. To select the MT topic and supervisor of Master Thesis (hereinafter – Supervisor) in appropriate unit/clinic/institute (hereinafter – Department) at the set time.
  - 5.2. To prepare individual work plan and schedule (annex 9) for the MT, together with Supervisor, and follow them.
  - 5.3. To cooperate with the Supervisor in order to discuss the implementation course of the MT and the arising problems.
  - 5.4. To comply with general research ethics requirements and obtain the approval of the University Bioethics Center for a research performed by a student.
  - 5.5. To collect the research material and to carry out the research outlined in the work plan of the thesis, collect the data, and to report to the Supervisor within the designated time periods in order to receive intermedia credit.
  - 5.6. To submit timely report on the MT.
  - 5.7. To submit the primary text of the MT to the Supervisor on time and to correct it according to the Supervisor’s remarks and recommendations.
  - 5.8. To submit the completed MT to the Department within the established deadline and to present the MT orally at the Department meeting.
  - 5.9. To comply with the deadlines set by the Dean’s Office of the FVM when uploading the Master’s Thesis to the LSMU Research Information System repository (hereinafter – CRIS).
  - 5.10. To defend the MT during the public defense.
  - 5.11. To perform other functions specified in the resolutions of LSMU Senate.
6. **Supervisor of the Master Thesis** (hereinafter – Supervisor). The following persons may act as a Supervisor: a lecturer and/or researcher in the field of VM studies with at least 2 years of work experience at the university. The candidacies to the Supervisors are approved during the meeting of the Department.

## 7. **Functions of the Supervisor:**

- 7.1. To consult on the formulation of the topic, the objective and tasks of the MT, and the formation of an individual work plan.
- 7.2. To advise regarding relevance sources of literature.
- 7.3. To discuss the methodology of the MT.
- 7.4. Recommend the consultant of the adjacent research field (if needed).
- 7.5. To observe systematically the preparation process of the MT and to help solve the arising problems.
- 7.6. To offer remarks and suggestions to the student regarding preparation of the MT.
- 7.7. To discuss and interpret the research findings together with the student.
- 7.8. To discuss the presentation of the MT prepared by the student.
- 7.9. To take part in the discussion of the MT during the meeting of the Department.
- 7.10. To evaluate the student's final MT and submit the evaluation review to the Dean's Office of the FVM.
- 7.11. The MT supervisor should not act as a Commission member of defence of the MT, when the work of the student, who was under his supervision, is presented.

## 8. **Replacement of Supervisor, Department, and/or MT topic:**

- 8.1. If, for important reasons, it becomes necessary to replace the Supervisor within the same Department, a Department meeting shall be organized to discuss and justify the need for replacing the MT Supervisor. If the Department approves the replacement, an extract from the Department meeting protocols is submitted to the Dean, who makes the final decision based on it and confirms it by an order. Replacing the Supervisor is allowed no later than 6 months before the end of studies if the MT topic remains the same, or no later than 9 months before the end of studies if the MT topic is changed.
- 8.2. If, for important reasons, both the Department and the Supervisor need to be replaced, the replacement shall be coordinated with the Faculty Dean, the Heads of Departments, and the current and future Supervisors at least 1 year before the end of studies.
- 8.3. If the MT topic and its title are substantially changed, the change is allowed but must be made no later than 9 months before the end of studies. The new MT topic must receive approval from the University Bioethics Center. The final version of the MT title must be approved at the last Department meeting discussing the MT. An extract from the meeting protocols shall be submitted to the Dean's Office of the FVM.

## 9. **Master's Thesis Advisor-Consultant (hereinafter – Consultant)** is a competent specialist in veterinary practice or academia (e.g., a practicing veterinarian, veterinary pharmacist, specialist from the State Food and Veterinary Service (SFVS), specialist from the National Food and Veterinary Risk Assessment Institute (NMVRVI), researcher, lecturer, or another specialist representing a social partner of the FVM) who provides expert consultations to the master's student on specific issues related to the preparation of the MT within a narrowly defined area of expertise (e.g., research methodology, diagnostic or laboratory methods, data analysis, interpretation of clinical results, etc.).

- 9.1. In cooperation with the MT supervisor and the student, the Consultant contributes to ensuring the scientific quality and methodological soundness of the thesis. However, the Consultant is not the primary supervisor and does not assume responsibility for the overall planning, implementation, or final outcomes of the thesis.

- 9.2. Upon expressing their consent, a Consultant may be appointed by decision of the Department when the thesis topic requires specific knowledge or practical experience in a particular field, for example, in mastering new methodologies involving specialized equipment, interpreting newly obtained research results, or other similar activities.
  - 9.3. A lecturer or researcher from the same VA Department in which the student has chosen to conduct the MT may not be appointed as a Consultant. It is recommended that specialists from the FVM social partner organizations be appointed as Consultants, particularly when the student's MT topic is related to scientific collaboration between the academic unit and the social partner.
  - 9.4. The Consultant must be appointed at the same time as the approval of the MT topic, and the appointment shall be submitted to the Dean's Office of the FVM in the form of an extract from the Department's meeting minutes.
  - 9.5. The Consultant shall provide a written report on the MT student in free form and may be invited to attend the public defense of the MT. The Consultant's report shall be submitted to the Dean's Office together with the Supervisor's evaluation.
10. **Reviewer of the Master Thesis** (hereinafter – Reviewer) – the person who evaluates the MT in grades and writes a review (Annex 7). The lecturer of VM study programme, the scientist or veterinary doctor of the Animal Clinics of Faculty of Veterinary Medicine, who has work experience of at least 3 years, may act as a reviewer.
11. The MT shall be reviewed by one reviewer.
12. **Reviewer's functions:**
- 12.1. to assess the compliance of the MT with the set requirements in ten-grade system.
13. The list of Reviewers shall be appointed and approved by the Rector of LSMU or another authorized official by Rector's order, based on the Dean's proposal.
- 13.1. The Departments submit meeting protocols to the VM Study Program Committee (hereinafter – SPC), proposing candidates for reviewers of the MT prepared within the Department.
  - 13.2. The VM SPC reviews the proposed reviewer candidates for all MT prepared within the faculty and proposes the final list of reviewers, considering the MT topic and the reviewer's scientific and practical expertise.
  - 13.3. The list of MT topics along with the reviewers assigned by the Veterinary Medicine SPC is submitted to the Dean for approval.
14. Not later than within 3 working days from the issuance of the Rector's order on permission for the student to defend the MT, but not later than 3 working days before the date of defense of the MT. By the decision of the Rector or the Vice-Rector for Studies, the date of the defense of the MT is set not later than 10 working days before the Defense Commission of Master Theses and the Commission of Appeals are formed.
15. **Defence Commission of Master Theses (hereinafter – Commission)** – the Commission of at least 7 members from competent specialists in the field of veterinary medicine – lecturers, scientists, professional practitioners, representatives of social partners, and a secretary approved by the Rector following the suggestion of the dean of the FVM. MT may be defended if during defence participate the chairman and at least 5 members of commission.
16. The veterinary doctor with doctoral degree may act as a **Commission's chairman**.
17. **Commission's secretary** – a person, who completes the defence protocols of MT and statements. The employee of servicing staff, an administrator of studies or a laboratory assistant may be appointed as a secretary.

### 18. **Functions of the Commission:**

- 18.1. Each member of the Commission shall assess the MT and their presentation according to the evaluation form approved in the Council of the FVM using 10 grade scale.
  - 18.2. If the student's MT Supervisor, consultant, or Reviewer is a member or the chair of the Committee, they must recuse themselves from the MT evaluation process.
19. **Commission of Appeals** – commission approved by the Rector following the suggestion of the dean of the FVM. The Commission of Appeals shall consist of 3 representatives delegated by the Student Council and 6 representatives of the administration and/or lecturers. The Commission of Appeals shall act as provided in the LSMU Regulation of the Studies.

### III. PREPARATION PROCEDURE OF THE THESES

20. Each year by November 1, the VM SPC receives data from the Dean's Office of the FVM on the number of students who will be preparing MT, and from the Department's teaching subjects in the study field – a list of staff members who meet the criteria outlined in section 6 of these regulations. Based on this information, the VM SPC allocates a quota of MT topics to each Department of the FVM by December. The quotas are determined according to the number of students in the cohort and the number of full-time staff in the Department eligible to supervise MT.
21. Quotas are not allocated to other LSMU departments.
22. The Head of the Department may apply for an adjustment of the quota of thesis topics allocated to the Department by submitting a justified request to the Dean of the FVM. If the request is approved, the quotas allocated to other Departments shall remain unchanged.
23. Each year, by December 15 of the current academic year, lecturers and researchers who meet the criteria outlined in section 6 must submit their MT topics to the study administrator of the Department where the MT will be prepared. Students may also propose MT topics themselves. The MT topic must fall within the field of veterinary medicine and align with the learning outcomes of the veterinary medicine study program. The Department must submit a sufficient number of proposed topics in accordance with the allocated quotas. The head of the Department is responsible for ensuring that an adequate number of MT topics are submitted.
24. MT topics must be reviewed at a Department meeting to ensure their scientific quality, relevance, and alignment with the learning outcomes of the VM program. An extract from the Department meeting protocols with the approved MT topics must be submitted to the Dean's Office of the FVM and the VM SPC by January 15 of the current academic year.
25. The approved MT topics are published by the Dean's Office of the FVM on the LSMU electronic platform by February 1 of the current academic year.
26. Each student must choose a topic, a MT Supervisor, and the Department where the MT will be carried out by May 10 of the 8<sup>th</sup> semester.
27. If a student does not choose the Department in which the MT will be carried out, the Dean shall assign the student to an appropriate Department within 5 working days after the final deadline for student selections, taking into account the number of students conducting MT in each Department.
28. After students have selected the MT topic, Supervisor, and the Department where the MT will be carried out, the Dean issues an order at the beginning of the 9<sup>th</sup> semester, indicating the student's name and the Department in which the MT will be conducted..
29. MT are initiated according to the deadlines specified in the study plan. If the student wishes to start earlier and coordinates this with the intended Supervisor, the MT may be started in advance

(in accordance with LSMU regulations) by submitting a request to the Dean for an individual study schedule.

30. Within one calendar month from the start of the MT preparation (i.e., by September 30), the student, together with the Supervisor, prepares an individual MT work plan (Annex 9), which includes the MT topic, objectives, tasks, and all planned activities with preliminary deadlines.
  - 30.1. While preparing the individual MT plan, the student and Supervisor discuss the following:
    - 30.1.1. Selection of the MT topic and the problem to be addressed; formulation of the MT aim and objectives.
    - 30.1.2. MT structure and a calendar-based work plan; consultation schedule.
    - 30.1.3. Strategies for searching and selecting scientific and other relevant information.
    - 30.1.4. Selection and systematization of theoretical material.
    - 30.1.5. Development of research methodology or creation of the project concept.
    - 30.1.6. Implementation of the research.
    - 30.1.7. Participation in projects of the Research Council of Lithuania (LMT) or other initiatives.
  - 30.2. The individual MT plan must also include a scheduled monthly meeting plan with the Supervisor. Based on this schedule, the Department study administrator enters the consultation times into the LSMUSIS timetable. Additional consultations between the student and Supervisor may be arranged as needed. Individual MT work plans must be approved at the Department meeting during the 9<sup>th</sup> semester, no later than October.
31. The student who has started preparing the MT must submit a request in the LSMUSIS system for the approval of the Bioethics Center. The request must be submitted for review no later than the end of the 9<sup>th</sup> semester, except in cases specified in section 8.3. Without this approval, the methodology planned in the MT may not be implemented.
32. The student shall prepare the MT independently following the requirements set herein. The student shall collect material for MT during independent work hours and/or during practical training at the Academy's Departments, at the LSMU VA Centre for Practical Training and Experimentation, livestock farms, enterprises, laboratories or other institutions involved in veterinary activities.
33. The MT may be prepared based on scientific abstracts and/or articles previously prepared and presented by the student during the VM study years.
  - 33.1. The abstracts must be of a single thematic focus, related to the study program, and must meet the criteria of scientific quality, novelty, and relevance.
  - 33.2. This form of MT is permitted if the student is the author of three abstracts or a co-author of two articles, with their individual contribution clearly indicated.
  - 33.3. Requirements for MT prepared based on previously prepared abstracts or scientific articles:
    - 33.3.1. The MT may be submitted for defense as a Master's thesis based on a collection of scientific articles (minimum 2 articles where the student is a co-author) or abstracts (minimum 3 abstracts where the student is the first author and presenter).
    - 33.3.2. A summary of the articles and/or abstracts must be prepared according to the MT structure presented in Annex 1, but the overall length of the thesis should be shorter,

considering the content of the articles and/or abstracts. The recommended length of the MT is up to 10 pages.

- 33.3.3. When preparing the MT, copies of the student's scientific publications and/or abstracts, which form the basis of the MT defense, must be provided, indicating the specific personal contribution.
- 33.3.4. The student must have published the most important research results in at least two articles (as a co-author or main co-author), which have been published or accepted for publication (with a Digital Object Identifier (DOI) or other proof of acceptance) in international scientific journals indexed in *Clarivate Analytics Web of Science (CA WoS)* database or in the continuous scientific journal of LSMU Veterinary Academy "Veterinarija ir Zootechnika."
34. In agreement with the head of the Department and the Supervisor of the MT, the student may have access to the equipment necessary for the MT preparation at the departments, laboratories or other units of the University.
35. During the preparation of the MT, the Supervisor evaluates the student's work according to the MT work plan and records the assessment as passed/not passed in the electronic gradebook of the LSMUSIS system at the end of the 9<sup>th</sup>, 10<sup>th</sup>, and 11<sup>th</sup> semesters.
36. The student must submit an electronic version of the interim MT report (Annex 10) to the Supervisor by June 1. After reviewing and approving the interim report, the Supervisor submits it to the study administrator for consideration by the Department. The progress of the MT preparation is discussed at the end of the 10<sup>th</sup> semester in the Department where the MT is conducted.
  - 36.1. An excerpt from the Department meeting protocols, indicating whether the student has completed the planned tasks, is submitted to the Dean's Office of the FVM. If the student has not completed the planned tasks, an academic debt is recorded.
  - 36.2. The academic debt can be cleared during the retake week, provided the student submits the prepared interim report and gives an oral presentation on the completion of the tasks planned in the individual MT work plan at the Department meeting.
37. The completed MT must be submitted to the Supervisor by the date specified in the individual MT work plan or another date set by the Faculty Dean's Office of the FVM.
38. The prepared MT, approved by the Supervisor using electronic means according to the instructions provided by the Dean's Office of the FVM, is reviewed during the Department meeting. The Department organizes a review of the submitted MT and assesses whether the students' oral presentations meet the requirements.
  - 38.1. The Department's study administrator submits an excerpt from the meeting protocols to the Dean's Office of the FVM, indicating the names of students recommended/not recommended for public defense of the MT and the final titles of the MT.
39. The students, who have met all the requirements of the study programme, are allowed to defend the MT. The decision to allow the student to defend the MT shall be executed as the Rector's order.
40. The student, who has academic failures, is not allowed to defend the MT.
41. If dishonest behaviour, plagiarism, duplication or falsification of research data are determined while preparing the MT, the person who identified the aforementioned misconduct, shall write an official report to the Dean. The further procedure is specified in the LSMU Regulation of the Studies.

42. All MTs must be checked for plagiarism following the procedure established by the LSMU Senate. The Supervisor uses a University-subscribed and administrated text-matching software to evaluate the MT for any potential violations of copyright. The overall text similarity in the MT may not exceed 30%. The similarity report generated by the software must be submitted electronically to both the student and the Dean's Office of the FVM.
- 42.1. If generative artificial intelligence (hereinafter – GenAI) was used during MT preparation, this must be disclosed in accordance with the guidelines approved by the LSMU Senate (Resolution No. 178-06 of April 18, 2024) on the use of artificial intelligence in studies, research, innovation, and clinical practice.
- 42.2. Students using GenAI in their MT assume full responsibility for its ethical use and societal impact. Improper or unauthorized use of GenAI is considered an act of academic dishonesty.
43. Once the MT is approved for defense, the student must upload the electronic version of the MT to the LSMU Science Information System (CRIS) repository no later than 14 calendar days before the public defense date set by the Rector.
44. When uploading the electronic version of the Master's Thesis (MT) to CRIS, students must confirm the following statements:
- 44.1. "I grant the University a non-exclusive, perpetual license to use my thesis free of charge in the institutional repository of the University, under the conditions defined for access to the Work."
- 44.2. "I guarantee that the submitted Work is original and does not infringe upon the copyright of others. Any third-party content included is used either under conditions that do not require prior permission, or such permission has been duly obtained and acknowledged in the text".
- 44.3. "I guarantee that the Work does not contain confidential or restricted information subject to any legal limitations on disclosure".
- 44.4. "I guarantee that the submitted version is final (approved by the supervisor), written in correct language, and formatted according to the required style guidelines".
- 44.5. Non-Exclusive Distribution License
- By signing and submitting this license, I (the author or copyright owner) grant to the University the non-exclusive right to reproduce, translate (as defined below), and/or distribute my submission (including the abstract) worldwide in print and electronic format and in any medium, including but not limited to audio or video. I agree that the University may, without changing the content, translate the submission to any medium or format for the purpose of preservation. I also agree that the University may keep more than one copy of this submission for purposes of security, backup, and preservation. I represent that the submission is my original work, and that I have the right to grant the rights contained in this license. I also represent that the submission does not, to the best of my knowledge, infringe upon anyone's copyright. If the submission contains material for which I do not hold copyright, I represent that I have obtained the unrestricted permission of the copyright owner to grant the University the rights required by this license, and that such third-party owned material is clearly identified and acknowledged within the submission. If the submission is based upon work that has been sponsored or supported by an agency or organization other than the University, I represent that I have fulfilled any right of review or other obligations required by such contract or agreement. The University will clearly identify my name as the author of the submission and will not make any alteration, other than as allowed by this license, to my submission. I have read and I approve.*
45. The detailed requirements for the writing of MT are given in Annexes 1 and 2.

#### **IV. MASTER THESES EVALUATION, REVIEW PROCEDURE**

46. The revised MT, following the comments provided during the Department meeting, shall be submitted for evaluation by the MT Supervisor.
  - 46.1. The completed MT and the student's individual contribution to its preparation shall be evaluated by the Supervisor based on the criteria set out in clause 56.
  - 46.2. The Supervisor's evaluation (Annex 6) shall be submitted to the Dean's Office no later than 3 working days prior to uploading the MT to the CRIS.
47. No later than 14 days before the MT defense, the electronic version of the MT shall be submitted via the CRIS to the Reviewer, who must belong to the scientific field in which the reviewed MT is written. The Reviewer evaluates the MT according to the specified criteria and submits the MT review (Annex 7) with an evaluation to the Dean's Office of the FVM by the date set by the Dean's Office of the FVM.
48. The Dean's Office of the FVM provides the student with the Supervisor's evaluation and the Reviewer's review no later than 3 days before the MT defense. The student prepares to respond to the Reviewer's questions and comments.
49. If the reviewer's assessment of the MT is negative, the second reviewer shall be ordered by the dean's decree to review the MT. If the second reviewer evaluates the final work negatively, defence of the MT is not allowed. If the second reviewer evaluates MT positively, the MT is allowed to be defended. The final evaluation formula incorporates the grade provided by the second reviewer.

#### **V. MASTER THESES DEFENCE PROCEDURE**

50. The date of public defence of the MTs shall be announced at least one month before the defence day on the board of the Dean's Office of the FVM and/or digital area of University.
51. The Commission's chairman and members have to review the MTs in the CRIS before the date of defence of the MTs.
52. The MTs are defended in public meetings of the Commission.
53. Prior to the meeting, the Dean's Office of the FVM submits the MTs along with the evaluations from the MTs Supervisors and the Reviewers to the Chair of the Commission via electronic means, and only the MT itself to the Commission members.
54. Defence procedure of the MTs:
  - 54.1. The Commission's chairman shall present the composition of the Commission, its powers and explain the defence procedure.
  - 54.2. The student shall present presentation – the prepared report on the MT (it is recommended to use the faculty template prepared in *Microsoft PowerPoint*), where the topic, its relevance, objective, tasks, research methodology, results, conclusions and recommendations or suggestions are given.
  - 54.3. The student has up to 15 minutes to give the presentation, followed by 5 minutes of questions and discussion.
  - 54.4. After the student's presentation, the chairman of the Commission presents the Reviewer's comments and questions, and the student responds to the questions raised by the Reviewer and the Commission members. The evaluations of the MT Supervisor and the Reviewer are not publicly disclosed.

## VI. EVALUATION OF THE MASTER THESES

55. The MT Supervisor evaluates the student's work on the MT based on the criteria listed in section 56 and provides a written assessment (Annex 6).
56. The reviewer evaluates the MT in accordance with the criteria specified in section 57 (Annex 7).
57. The Commission's members shall evaluate each MT during the meeting according to the criteria specified in section 58 by completing the evaluation form of MT by the Commission's member (Annex 8). The Commission's member shall write his/her observations, arguments and questions on the form. When the final evaluation is given the meaning of evaluation in the words shall be provided in the brackets.
- 58. Criteria of MT evaluation for Supervisor:**
  - 58.1. Compliance of structural parts of the MT to requirements set in the procedure. Formation of content, glossary of key terms and abbreviations.
  - 58.2. Informativeness of the MT summary and correct usage of the foreign language. Properly selected keywords.
  - 58.3. Review of scientific literature, completeness, adequacy of the scientific literature used for the bibliographical review with the content of the MT, its comprehensiveness and novelty.
  - 58.4. Description of research investigation and research methods. Description of data statistical analysis and appropriate selection and performance of statistical methods.
  - 58.5. Presentation of research results, clearness and consistency of description. Correct analysis of the findings and clear presentation of statistical calculations.
  - 58.6. Interpretation of the findings and comprehensiveness of discussion, suitable substantiation with the data of other scientists and comparison of results, expression of opinion.
  - 58.7. Validity, concreteness and compliance of the conclusions (recommendations/suggestions) with the topic and objectives of the MT.
  - 58.8. Correct citation of information sources in the MT. Creation of a bibliographical list.
  - 58.9. MT compliance to the requirements of the style (the text is fluent, consistent, scientific) and correct language. Technical formalization of MT text, tables, pictures, and other information following the requirements listed below.
  - 58.10. Student's active involvement in the preparation of the MT, constructive cooperation with the Supervisor, and participation in LMT and other research projects.
- 59. Criteria of MT evaluation for Reviewer:**
  - 59.1. Compliance of structural parts of the MT to requirements set in the procedure. Formation of content, glossary of key terms and abbreviations.
  - 59.2. Informativeness of the MT summary and correct usage of the foreign language. Properly selected keywords.
  - 59.3. Substantiation of the scientific relevance of the selected topic.
  - 59.4. Correct formulation and substantiation of the MT objective and tasks (tasks covers the topic of MT).
  - 59.5. Review of scientific literature, completeness, adequacy of the scientific literature used for the bibliographical review with the content of the MT, its comprehensiveness and novelty.

- 59.6. Description of research investigation and research methods. Description of data statistical analysis and appropriate selection and performance of statistical methods.
- 59.7. Presentation of research results, clearness and consistency of description. Correct analysis of the findings and clear presentation of statistical calculations.
- 59.8. Interpretation of the findings and comprehensiveness of discussion, suitable substantiation with the data of other scientists and comparison of results, expression of opinion.
- 59.9. Validity, concreteness and compliance of the conclusions (recommendations/suggestions) with the topic and objectives of MT.
- 59.10. Correct citation of information sources in the MT. Creation of a bibliographical list.
- 59.11. MT compliance to the requirements of the style (the text is fluent, consistent, scientific) and correct language. Technical formalization of MT text, tables, pictures, and other information following the requirements listed below.
- 59.12. Scientific theses and/or articles as the topic of the MT.

**60. Evaluation criteria of the MT and its presentation (report) at the Commission:**

- 60.1. Substantiation of the relevance of the topic, highlighting of the matter, formulation of the objective and raising the tasks.
- 60.2. Selection and presentation of research methodology, correctness of application of methods. Correct selection of statistical methods.
- 60.3. Analysis and consistency of presentation of the findings. Statistical processing of data.
- 60.4. Summarisation and interpretation of the findings, expression of opinion.
- 60.5. The specificity of the conclusions, adequacy to the objective and the tasks.
- 60.6. The scientific level of the MT.
- 60.7. The quality of visual material and oral presentation.
- 60.8. Reasoned and logical answers to questions, ability to discuss. Fluency of language.

**61. Evaluation of the MT in the ten-grade system:**

- 61.1. ***Excellent (10 points)*** – the quality of the MT content and presentation satisfies all requirements and evaluation criteria of this procedure. The data analysis has been carried out correctly. The logical and comprehensive of the findings has been presented. The conclusions have been formed correctly and based on the findings. The original research of scientific significance has been carried out. There are no drawbacks of content or editorial character. The presentation of the MT is clear, informative, and the answers to the questions are comprehensive, correct and reasoned.
- 61.2. ***Very good (9 points)*** – the quality of the MT content and presentation satisfies all requirements and evaluation criteria of this procedure; however little supplementation and editorial corrections are needed, which would not change the received results, their interpretation or conclusions. The data analysis and interpretation of results have been carried out correctly. The conclusions have been formed correctly and are reasoned. The answers to the questions are comprehensive, essentially correct and reasoned.
- 61.3. ***Good (8 points)*** – not all requirements and evaluation criteria of this procedure are satisfied; some supplementation and/or correction of results' analysis and/or methodology are needed, which would change the interpretation of received results; or some conclusions have to be specified without changing their essence. The present data analysis has been carried out correctly. The conclusions have been formed correctly and

based on results. The presentation of the MT does not have any structural drawbacks, the answers to the questions are reasoned and essentially correct, although their clarity could be corrected.

- 61.4. **Moderate (7 points)** – not all requirements and evaluation criteria of this procedure are satisfied. Some supplementation and/or correction of results' analysis and/or methodology are needed, which would change the interpretation of received results and some conclusions; or the conclusions have to be supplemented (the lacking conclusions should be inserted). The analysis of results is not comprehensive; however the majority of the data analysis has been carried out correctly; the corresponding conclusions have been formed correctly and based on the findings. The presentation of the MT needs to be specified; there are some unclear points. During the defence the student is not able to answer some questions comprehensively, and the reasoning is lacking.
- 61.5. **Satisfactory (6 points)** – the majority of the requirements and evaluation criteria of this procedure are not satisfied. The MT is incomplete or has drawbacks of the theoretical analysis, data analysis, official content and formal figuration drawbacks, etc. The research tasks do not correspond to the research objective or some tasks important for the research have been implemented only in part. The review of literature does not correspond to the topic of the MT. Some research results or their examination are inadequate with the research topic. During the defence the student does not answer or answers incorrectly to the essential topic-related questions.
- 61.6. **Weak (5 points)** – the requirements and evaluation criteria of this procedure are satisfied minimally. The MT has all the necessary structural parts, but the results do not satisfy the majority of the requirements and evaluation criteria, especially related to the research methodology, research results, correctness of their analysis and validity of conclusions. During the defence the student is not able to answer the questions of the reviewer or members of the Commission.
- 61.7. **Failed** – the MT does not satisfy minimal requirements of this procedure: the majority or all of the structural parts are lacking, the majority of the research results are incorrect, and the conclusions are not reasoned. During the defence the student does not answer the questions of the reviewer or members of the Commission related to the research topic, research results, conclusions and their validity. The MT is evaluated with negative grade or the permission to defend the MT is not given if the Commission determines the fact of plagiarism or in other cases of academic dishonesty.
62. The final evaluation of the MT consists of Supervisor's evaluation – 10 percent (percent coefficient – 0.1), Reviewers' evaluation – 40 percent (percent coefficient – 0.4) and mean of evaluations of the Commission's members – 50 percent (percent coefficient – 0.5). The results of all the calculations shall be rounded down according to the mathematical rules.
63. The final grade of the MT is calculated according to the following formula:

$$E = 0,1 \times V + 0,4 \times R + 0,5 \times \left( \frac{K_1 + \dots + K_n}{n} \right)$$

E – final grade of the MT;

V – evaluation of Supervisor;

R – evaluation of Reviewer;

K – evaluations of the Commission's members;

n – number of the Commission's members.

64. The secretary shall write the topic of the MT, the mean with hundredths of evaluation of the MT Supervisor, Reviewer and Commissions members and final grade into the Commission's protocols. The protocols shall contain the questions asked by the Commission and the student's answers to them. The protocols shall be signed by all the members of the Commission.
65. The final evaluations are recorded by the Secretary of the Commission in the MT defense evaluation sheet, which is signed by each member of the Commission.
66. The final grades of the MT shall be verified by the Commission.
67. The not defended MT, which receive less than 5 grades, are regarded as academic failure and the student is expelled.
68. A student who failed to present the MT is allowed to defend the MT only after renewal of studies in accordance with the procedure of the LSMU Regulation of the Studies.
69. If the student does not agree with the evaluation of the MT, s/he has a right to submit an appeal following the procedure described in the LSMU Regulation of the Studies.
70. The persons, who implement the study programme and defend the MT, are conferred with the qualification of veterinary doctor and Master's degree. The diploma of higher education together with the supplement are issued for them.

## **VII. EFFECT OF THE PROCEDURES**

71. The amendments of the procedure for the preparation, defense, and evaluation of Master Theses of the study programme of Veterinary Medicine shall enter into force on September 1, 2026.

## **VIII. FINAL PROVISIONS**

72. The description may be amended by decision of the Council of the FVM.

# ANNEXES

## DETAILED REQUIREMENTS FOR THE STRUCTURE OF THE THESIS

- The main structural elements of the thesis are the following:
  - Title page;
  - Table of contents;
  - Summary in Lithuanian and English;
  - Abbreviations;
  - Introduction with the objective and tasks of the work;
  - Review of literature;
  - Research methods and material;
  - Research results;
  - Discussion of results;
  - Conclusions;
  - Suggestions/recommendations;
  - A list of the Abstracts and/or Articles prepared by the student during the Veterinary Medicine studies, along with copies or active links;
  - Acknowledgement;
  - List of literature;
  - Annexes.
- The **title page** (Annex 3) provides the necessary information: name of the university, name of the faculty, full name of the student, title of the topic (in Lithuanian and English), name of the study programme – MASTER THESIS of Integrated studies of Veterinary Medicine, full name of the supervisor, pedagogical title, scientific degree, city, year. The topic's title has to be informative, concrete and in compliance with the presented material. It is not recommended to use expressions such as “conducted at X clinic,” “in X city,” or similar in the title of the MT.
- **Table of contents** – it is a part that itemizes the structure of the thesis. The table of contents is written as the chapter's headline – in capital letters. All chapters, sections and subsections of the thesis shall be referred in the table of contents. The enumeration shall be done in Arabic numerals. The abbreviations, summary in the Lithuanian and English languages, introduction, acknowledgement(s), conclusions, recommendations, list of literature, and annexes shall not be enumerated. The table of contents shall be presented tidily. The titles of the chapters shall be written in capital letters, while the titles of sections and subsections – in small letters. The titles of the chapters, sections and subsections provided in the table of contents have to correspond to the titles given in the thesis, and their enumeration without changing the succession. The table of contents must be active. It should be updated once the MT is finalized.

- **Summary** (Annexes 4 and 5) – is a concise description or synthesis of the MT. Written in several short paragraphs and in the third person, the summary provides the reader with an understanding of the key aspects of the MT. It briefly presents: the aim and objectives of the MT; methods used; research conducted and results obtained; main conclusions. The summary is submitted on a separate page and should be 300–500 words in length. Two summaries must be provided: one in Lithuanian and one in English. The author of the MT is responsible for the accuracy and correctness of the summary written in a foreign language. If the thesis is written in Lithuanian, the Lithuanian summary is presented first, followed by the English version. If the thesis is written in English, the English summary comes first, followed by the Lithuanian one. The summary must include: *the full title of the MT; the author's name and surname; keywords (4–6 relevant keywords)*. The summary is prepared only after the MT is completed.
- **Abbreviations** – the abbreviations acceptable on the international level or used as shortened scientific names should be provided. The abbreviations shall be explained when they are used in the text for the first time. The abbreviations cannot be used in the titles of the chapters, sections and subsections, except when the abbreviations are conventional.
- **Introduction** – it is an introductory part of the MT, serving as its “business card”. The relevance of the work is highlighted in the introduction. The reasoned explanation about works performed in the particular analysed area and about lack of researches shall be provided with regard to scientific publications. In such a way the **objective** and the set **tasks** of the thesis presented in the end of the introduction are substantiated. The introduction has to be directly related to particular topic of the work, researches performed in the work, and objective of the work. The volume of the introduction shall be 1-2 pages.
- **Objective of research** – it is a formed goal to attain the particular MT result. The objective has to correspond to the title of the topic and cover it. It is formed briefly, usually by one sentence.
- When the objective of the MT is formed, the concrete **research tasks (it is recommended 3-5 tasks)** that allow to reach the objective of the research and which reflect work consistency and logics, are determined. All tasks shall be enumerated. It is not suitable to formulate such tasks as, for example: "To make a review of literature on the chosen topic" or "To summarize the obtained results and to present conclusions and recommendations", as this is not a task related to a specific task, but applies to all master's theses.
- **Review of literature** – the topic-related scientific researches carried out in Lithuania and abroad have to be described in separate sections and subsections. The review of literature has to be directly related to the topic of the MT and the carried-out researches. It is recommended to use the latest publications of the authors (recommended not older than 10 years). It is not recommended to quote the textbooks because they are not original; only the material re-quoted by other authors. The review of literature should not be very wide with regard to the topic. It has to correspond certain topic and conducted researches. The structure of textbooks (e.g., aetiology, clinical symptoms, pathogenesis, epizootic data, diagnosing, prophylaxis, treatment, etc.) or facts of textbooks should be avoided in this part. It is not recommended to use the literature not related to the topic. The volume of this part should not exceed 15 percent of the total MT (up to 6 pages). In the “Literature Review” section of the MT, any text generated using generative artificial intelligence (GenAI) must be indicated in quotation marks. In parentheses, specify the name of the GenAI tool, the date the text was generated, and the query used (in quotation marks).
- **Research methods and material.** The place, time and period of performed research shall be described in this part of MT. Then this part describes consistently the object of the conducted or analysed researches, tested animals and methods, methodical grouping, or

describes the course of research and other important research conditions, student clearly describes his own input, what (s)he has done (her)himself. If the animals were examined, it has to be noted that the scientific research have been conducted in observation of requirements for animal care, keeping, usage and veterinary requirements. The approval number issued by the LSMU Bioethics Center for the conducted research must be indicated. The statistical methods and software (e.g., Microsoft Excel, SPSS, Statistica, SAS, etc.) should be indicated in this part. The grouping principles of data, models of statistical data and calculated statistical indexes should be presented. It is important to clearly indicate the scope of the research (number of samples tested). Research methods are presented in accordance with the order of the formulation of tasks. Student must draw a scheme of the research. The volume of this part should be 4-6 percent of the total volume of the MT (up to 2-3 pages). In the "Research Materials and Methods" section of the MT, the purpose of using generative artificial intelligence (GenAI) (e.g., for creating ideas or text elements, etc.) and the conditions of its use must be indicated. The specific GenAI program and its version used should also be stated.

- **Research results** – the chapter, where the results of the researches conducted by the author are described. The results of other authors shall not be used in this part. The results shall be presented in such a sequence as defined in the tasks. This chapter may have sections and subsections. The clear and substantiated data of researches, veterinary procedures, observations, expertizes, inspections, etc. shall be presented and described. The data shall be presented in the text, tables or pictures without repeating them, and in the text by references to tables or pictures. When the results are described, it is recommended to stress immediately, which result was higher or lower than some other (e.g., infection in the group A (82.3%) was 3 times higher ( $P < 0.001$ ) than the infection in group B (27.4%)). When calculating the correlation, the value of the correlation coefficient is indicated. Percentage differences can be reported. The data provided in the chapter of research results should be processed by statistical methods. It is necessary to indicate whether the results obtained are statistically reliable, by writing the value of  $p$  after the result (e.g.,  $p < 0.05$ ). The considerations, presumptions or explanations of results should not be included in this chapter. The volume of the research result's part should make 30-40 percent of the total volume of the MT (up to 20 pages).
- **Discussion of results.** This part is used to compare the acquired results with the findings of other authors, to explain the received results on the ground of findings of other authors and to express author's opinion. The description of results outlined in the results section should not be repeated here. The text should not be overloaded with numbers; the tables or pictures should not be presented. The volume of this part should be about 10 percent of the total volume of the MT (up to 5 pages).
- **Conclusions.** There are clear and brief answers to the tasks set in the beginning of the thesis. The conclusions shall be written on the new page. They shall be enumerated and formed on the ground of the research results, concretely, briefly, and according to the sequence of tasks. The conclusions must be accurate, concise and clearly stated. Is not allowed to repeat results only. Usually one conclusion (several if necessary) shall be written for one task. The conclusions should demonstrate whether the tasks set in the introductory part have been solved and whether the objective of the work has been achieved. The tables, pictures, quotations and other references to the bibliographical sources shall not be presented in this chapter.
- **Suggestions/Recommendations.** The practical suggestions/recommendations regarding the research methods, tools and modes to solve the problem shall be provided in this part. The recommendations shall be formed briefly, concretely and they shall be enumerated. This

chapter is optional. The suggestions may not be separated into separate chapter. They may be included into the chapter of discussions.

- The **list of literature** shall be presented on the new page. The enumerated descriptions of the used literature and Internet sources (the latest, if possible) shall be presented. In order to make the list of literature, the Vancouver system should be used. The detailed information about Vancouver system is provided on the LSMU website, column of library (Information for users → Library Rules and Regulations). The bibliographical descriptions of the publications used in the work shall be presented according to their sequence of quotation in the text, starting with the first reference source. The descriptions should not be transliterated (e.g., sources written in Russian should be written in Russian letters).
- **Annexes** – optional yet necessary part in certain cases. The additional, auxiliary information or information prepared by the author independently may be included into the annexes (for example, statistical more concrete information, questionnaires of survey, more thorough tables, pictures, maps, etc.). Besides, the annexes contain the information on publications from the research material, if the graduate was (co-)author, as well as on the made scientific reports, etc. The characters of the annexes are not included into the number of thesis' characters. The annexes shall be named and enumerated (e.g., Annex 1. Questionnaire of Survey). The references to the annex should be included into the text of the thesis.

## CLERICAL REQUIREMENTS FOR THE THESES

- The text of the Master Thesis has to be written by computer on one side of standard white paper of A4 format (210 x 297 mm).
- The recommended volume of the Master Thesis is 35-50 pages without annexes.
- The MT has to be written in Lithuanian. The foreign students write the MT in the language specified in the contract (English).
- The MT has to be tidy, written in correct and fluent language, without any proof mistakes. It has to satisfy the writing and punctuation requirements of the Lithuanian (English for foreign students) language. The ideas have to be laid out clearly, consistently, intelligibly and systematically.
- The computerized illustrations (diagrams, schemes, pictures, photos) have to be of good quality and sufficiently expressive.
- Margins of the text: from the left – 30 mm, from the top and the bottom – 20 mm, from the right – 10 mm.
- The pages (except for the title page) shall be enumerated. The page's number shall be written in the lower right corner of the page, in Arabic numerals, without any dots or commas.
- The first line of each paragraph shall be dragged from the left margin by 10 mm. The bilateral justification shall be set for the paragraphs – the text shall be justified according to the right and left margins.
- The space of 1,5 lines shall be left between the lines. The titles of the sections shall be dragged from the text by 2-line spacing, and the titles of sub-sections – by 1,5 lines.
- The MT shall be printed in the font Times New Roman. The height of the characters of the main text is 12 pt (font). The Italic may be used in the text, for example, when Latin terms are written. The percent shall be marked in words in the text – proc., while the mark % shall be used in the English text.
- The text of the MT is divided into **chapters, sections and subsections**.
- The titles of the chapters shall be written in capital letters in 16 pt bold font. The titles of the sections shall be written in 14 pt, subsections– 12 pt bold font, in small letters, except for the first letter.
- The title of the chapter shall be written in the new page, while the sections and subsections remain in the same page. The titles of the chapters and the sections shall be laid out symmetrically within the page's width, while the titles of subsections shall be started as the first line of the paragraph.
- The number of chapters, sections and subsections depends on the topic; however, the smallest structural unit should not be smaller than 0,5 page. The main keywords present in the title of the topic have to reflect and be related to the titles of the chapters, sections and subsections. The titles of the chapters, sections and subsections have to correspond to the content and reflect the consistent and logical examination of the topic.
- The headlines' words cannot be transferred. No dot is put after the headline. The headline cannot stay on one page, while the text starts on the other. The sections receive the number of the chapter and its running number (e.g., 1.1., 1.2., etc.). The subsections receive the number of the section and its running number (e.g., 1.1.2., 1.1.3., etc.).

- The **tables** shall be enumerated successively along the entire MT in Arabic numerals.
  - The number of table shall be written above the table in the left corner next to the word "Table". Both the table number and the word "Table" shall be written in **12 pt Italic bold** font. The title of table shall be written above it starting with capital letter in *12 pt Italic* font (e.g.: **Table 1.** *Dynamics of Human Salmonellosis in Lithuania in 2005-2015*). The informative title shall be given to the tables. If the name does not fit in one line, then the 1.5 interval between the title strings is not used (1 interval spacing shall be selected). After the title of the table, the dot is not given. If the tables are created by other authors, the number of source in the brackets has to be given.
  - Explanations/notes (if necessary) shall be written bellow the table in 10 pt font.
  - The references to the table have to be given in the text. In all the cases the tables have to be closely related to the text's material and thus they have to be commented accordingly.
  - The table has to be laid out vertically on the page or inserted in such a way that it should be rotated clockwise while reading the text.
  - The dimensions of values shall be written in the table's headline under the title of the descriptive value; therefore, only the numbers shall be presented in the main part of the table.
  - The numbers in the columns have to be aligned. No free space can be left in the table. If no data are available, the dash shall be written. The recurrent numbers cannot be replaced by quotation marks. The quotation marks shall be written only when the words repeat in the table's columns.
  - Small tables may be inserted in the same page one under another. In case of very long tables, which cover several pages, when the tables are transferred, the top headlines shall be repeated on the next pages and such as inscription as "Continuation of the Table 2" shall be written on the top of the table.
  - The first titles of top headlines of the tables shall be started with capital letter. If the table in vertical columns is divided in smaller parts under the top headline, the headlines of all the divided (smaller) columns shall be started with small letters (in the table, words and numbers shall not be written in bold)
- **Pictures** (illustrations/figures) shall be enumerated successively along the entire MT in Arabic numerals.
  - The number of picture shall be written bellow the picture in the middle next to the word "Fig.". Both the picture number and the word "Fig." shall be written in **12 pt Italic bold** font. The picture's title shall be written bellow the picture starting with capital letter in *12 pt Italic* font using the abbreviation "Fig." (e.g.: **Fig. 1.** *Dynamics of Human Salmonellosis in Lithuania in 2005-2015*). The informative title shall be given to the pictures. If the name does not fit in one line, then the 1.5 interval between the title strings is not used (1 interval spacing shall be selected). After the title of the picture, the dot is not given.
  - Explanations/notes (if necessary) shall be written under the picture in 10 pt font.
  - Illustrations – graphs, photos, schemes and drawings are also considered to be pictures – shall be of good quality and sufficient resolution.
  - The titles of the x and y axes and the units of measurement shall be indicated.
  - If the pictures are created by other authors, the number of source in the brackets has to be given.

- The references to the picture have to be given in the text. In all the cases the illustrations have to be closely related to the text's material and thus they have to be commented accordingly. The text can not repeat the results shown in the picture.
- The illustrations shall be laid out in the text just under the references to them or in the annexes.
- The illustrations with their numbers and titles have to be in one page and cannot be transferred.
- When submitting non-text elements (e.g., images, diagrams) created using GenAI in the MT, the name and version of the GenAI program used, the creation date of the element, and the prompt (in quotation marks) must be indicated in parentheses.
- **Quotation of literature sources.** When the literature sources are quoted in the text, the Vancouver system should be used. When the source is quoted for the first time in the text, its number in Arabic numerals should be indicated, e.g., (1). If the same source I quoted in the other place in the text, the original quotation number should be left. When the author is mentioned in the text, the following words should be used: P. Petraitis (5) states that... When several sources are quoted in the same place, the numbers should be separated by comma, e.g., “Protein metabolism in the rumen is the result of the metabolism of microorganisms (16, 19)”. If several sources are written in sequence the shortening is used e.g., “Bacteria of rumen absorb and process non-protein nitrogen and synthesize it into proteins (5–7, 12). The dash cannot be used between the quoting sources if only to adjacent sources are quoted (1, 2). The text shall be quoted and the statements of other authors shall be rephrased without distortion of essence. The statements, which repeat the thoughts of other authors word by word, shall be presented as quotations (within the quotation marks). It is unethical and considers as plagiarism to publish the text of some work in the MT using original ideas or thoughts of other author without reference to that author. It is recommended to rely on scientific articles rather than textbooks. Literature sources should generally be no older than 10 years (except in justified cases). If text or other elements created using GenAI were used in the MT, this must be indicated as defined in these Regulations. GenAI-generated content is not listed as a separate source in the references list.



LITHUANIAN UNIVERSITY OF HEALTH SCIENCES  
**FACULTY OF VETERINARY  
MEDICINE**

**Name Surname**

**Title EN**

**Title LT**

**MASTER THESIS**  
of Integrated Studies of Veterinary Medicine

Supervisor: Assoc. Prof. Dr. Name Surname

KAUNAS year

## SKIRTINGŲ LAKTACIJŲ KARVIŲ, SERGANČIŲ ENDOMETRITU, GIMDOS BAKTERINIS UŽTERŠTUMAS

Vardenis Pavardenis

Magistro baigiamasis darbas

### SANTRAUKA

Endometrito patogenezėje svarbus vaidmuo tenka bakterijoms. Šio darbo tikslas – nustatyti bakterijas iš endometritu sergančių skirtingų laktacijų karvių gimdos. Ištirti 47 pirmos–penktos laktacijos karvių gimdos išskyrų mėginiai, mikrobiologiniam tyrimui imti steriliais kateteriais iš gimdos kaklelio. Išskirtos bakterijos identifikuotos pagal biochemines ir antigenines savybes. Bakterijų padermių jautrumo/atsparumo antimikrobinėms medžiagoms tyrimas atliktas pagal Kirby-Bauer metodiką. Ištyrus 47 karvių, sergančių endometritu, gimdos išskyrų mėginius, bakterijos išskirtos iš 39 (83 proc.). Gryna bakterijų kultūra nustatyta 18 mėginių (38,30 proc.), dvi rūšys – 16 mėginių (34,04 proc.). Trijų skirtingų rūšių bakterijos rastos penkiuose mėginiuose (10,64 proc.). Ištyrus endometrito sukėlėjus, visų laktacijų karvių gimdoje vyravo aplinkos mikroorganizmai – *Enterococcus faecalis* (36,2 proc.), *Streptococcus uberis* (19,1 proc.) ir *Escherichia coli* (44,7 proc.).

Keturiolikai karvių (29,79 proc.) pirmą savaitę po veršiamosi buvo užsilaikiusi placenta. Pagrindinis sukėlėjas – *Escherichia coli*, išskirtas 92,8 proc. atvejų. Atlikę statistinę analizę nustatėme, kad *Escherichia coli* darė įtaką endometrito išsivystymui ( $p < 0,05$ ), skirtingos karvių laktacijos – placentos užsilaikymui ( $p < 0,05$ ).

Gramteigiamų ir gramneigiamų bakterijų padermės, išskirtos iš skirtingų laktacijų karvių gimdos, jautriausios amoksicilinui su klavulanine rūgštimi.

**Raktažodžiai:** karvės, bakterijos, endometritas, skirtingos laktacijos.

## **BACTERIAL CONTAMINATION OF THE UTERUS IN DIFFERENT LACTATION COWS ON ENDOMETRITIS**

Vardenis Pavardenis

Master Thesis

### **SUMMARY**

Bacteria play an important role in the pathogenesis of endometritis in cows. The aim of the present investigation was to determine the bacteria from the uteri of different lactation cows on endometritis. In total, forty seven secretion samples from the uteri of the 1st to 5th lactation cows were investigated. Samples for microbiological analysis were collected with sterile catheters from uterine cervix of dairy cows of different lactation. Bacteria were identified according to biochemical and antigenic properties. The Kirby Bauer method was used to determine susceptibility of the pathogenic isolated bacteria to antimicrobial substances. Bacteria were isolated in 39 (83.0 %) cow's uterine secretion samples (from 47 investigated samples). The pure culture was determined in 18 (38.30 %) samples, two types of bacteria (mixed culture) were identified in 16 (34.04 %) samples, and three types in 5 (10.64%) samples. The results revealed that environmental bacteria were the most common isolates from cases of endometritis in the examined cows: *Enterococcus faecalis* (36.2 %), *Streptococcus uberis* (19.1 %) and *Escherichia coli* (44.7 %).

Fourteen cows had retained placenta (29.79 %) in the first postpartum week. The main agent *Escherichia coli* was isolated in 92.8 % ( $p < 0.05$ ) of cows. Statistical analysis showed that isolation of *Escherichia coli* influenced the development of endometritis and the difference in lactation influenced the retention of placenta ( $p < 0.05$ ).

Gram-positive and Gram-negative bacteria strains isolated from the uteri of different lactation cows on endometritis were most sensitive to amoxicillin with clavulanic acid.

**Keywords:** cows, bacteria, endometritis, different lactation.



**EVALUATION OF THE MASTER THESIS  
 EVALUATION OF THE SUPERVISOR**

Author of the MT: \_\_\_\_\_  
 Title of the MT: \_\_\_\_\_  
 Study programme: Veterinary Medicine  
 Volume of the MT: ... pages

No.	Evaluation criteria of the MT (substantiation of evaluation is necessary)	Evaluation in the ten- grade (1-10) system
1.	<p><b>Formal matching</b></p> <p>Compliance of structural parts of the MT to requirements set in the Procedure. Formation of content, glossary of key terms and abbreviations. Informativeness of the thesis' summary and correct usage of the foreign language. Properly selected keywords. Correct citation of information sources in the MT. Creation of a bibliographical list. MT compliance to the the requirements of the style (the text is fluent, consistent, scientific) and correct language. Technical formalization of MT text, tables, pictures, and other information following the requirements listed below.</p> <p><i>Substantiation of Supervisor's evaluation*:</i></p>	
2.	<p><b>Theoretical part</b></p> <p><b>Introductory part</b></p> <p>Substantiation of the scientific relevance of the selected topic. Correct formulation and substantiation of the MT objective and tasks (tasks covers the topic of thesis).</p> <p><i>Substantiation of Supervisor's evaluation*:</i></p> <p><b>Literature review</b></p> <p>Review of scientific literature, completeness, adequacy of the scientific literature used for the bibliographical review with the content of the work, its comprehensiveness and novelty.</p> <p><i>Substantiation of Supervisor's evaluation*:</i></p>	
3.	<p><b>Investigative part:</b></p> <p><b>3.1. Research methods and material</b></p> <p>Description of research investigation and research methods. Description of data statistical analysis and appropriate selection and performance of statistical methods.</p> <p><i>Substantiation of Supervisor's evaluation*:</i></p>	
3.2.	<p><b>Research results</b></p> <p>Presentation of research results, clearness and consistency of description. Correct analysis of the findings and clear presentation of statistical calculations.</p> <p><i>Substantiation of Supervisor's evaluation*:</i></p>	

<b>4.</b>	<b>Discussion of results</b>	
	Interpretation of the findings and comprehensiveness of discussion, suitable substantiation with the data of other scientists and comparison of results, expression of opinion.	
	<i>Substantiation of Supervisor's evaluation*:</i>	
<b>4.1.</b>	<b>Conclusions (and suggestions/recommendations)</b>	
	Validity, concreteness and compliance of the conclusions (recommendations/suggestions) with the topic and objectives of the work.	
	<i>Substantiation of Supervisor's evaluation*:</i>	
<b>5.</b>	<b>Student's active involvement in the preparation of the MT, constructive cooperation with the Supervisor, and participation in LMT and other research projects</b>	
	<i>Substantiation of Supervisor's evaluation*:</i>	
<b>6.</b>	<b>Theses and/or articles submitted by the student**</b>	
	<i>If the MT is prepared based on scientific articles and/or conference abstracts, the Supervisor's Report shall include confirmation of the student's stated contribution to the preparation of the articles and/or abstracts.</i>	
<b>The evaluation of MT in grade (to be written in hundredths):</b>		

*\*If any part is evaluated less than 10 points the evaluation of this part has to be substantiated by giving comment.  
\*\*If students do not submit theses and/or articles, clause 6 is not included in the final evaluation; instead, 'Not submitted' is recorded, as this is not a mandatory element of the MT unless the MT is prepared on the basis of such publications.*

*MT Supervisor's Report (comments, observations, and, where applicable, confirmation of the student's contribution to the preparation of scientific articles and/or conference abstracts if the MT is prepared based on such publications):*

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*(MT Supervisor's name, surname, signature)*

*(date)*



LITHUANIAN UNIVERSITY OF HEALTH SCIENCES  
**FACULTY OF VETERINARY  
 MEDICINE**

**EVALUATION OF THE MASTER THESIS  
 EVALUATION OF THE REVIEWER**

Author of the MT: \_\_\_\_\_  
 Title of the MT: \_\_\_\_\_  
 Study programme: Veterinary Medicine  
 Volume of the MT: ... pages

No.	Evaluation criteria of the MT (substantiation of evaluation is necessary)	Evaluation in the ten- grade (1-10) system
<b>1.</b>	<b>Formal matching</b>	
	Compliance of structural parts of the MT to requirements set in the Procedure. Formation of content, glossary of key terms and abbreviations. Informativeness of the MT summary and correct usage of the foreign language. Properly selected keywords. Correct citation of information sources in the thesis. Creation of a bibliographical list. MT compliance to the requirements of the style (the text is fluent, consistent, scientific) and correct language. Technical formalization of MT text, tables, pictures, and other information following the requirements listed below. <i>Substantiation of Reviewer's evaluation*:</i>	
<b>2.</b>	<b>Theoretical part</b>	
	<b>Introductory part</b>	
	Substantiation of the scientific relevance of the selected topic. Correct formulation and substantiation of the MT objective and tasks (tasks covers the topic of thesis). <i>Substantiation of Reviewer's evaluation*:</i>	
	<b>Literature review</b>	
	Review of scientific literature, completeness, adequacy of the scientific literature used for the bibliographical review with the content of the MT, its comprehensiveness and novelty. <i>Substantiation of Reviewer's evaluation*:</i>	
<b>3.</b>	<b>Investigative part:</b>	
<b>3.1.</b>	<b>Research methods and material</b>	
	Description of research investigation and research methods. Description of data statistical analysis and appropriate selection and performance of statistical methods. <i>Substantiation of Reviewer's evaluation*:</i>	
<b>3.2.</b>	<b>Research results</b>	
	Presentation of research results, clearness and consistency of description. Correct analysis of the findings and clear presentation of statistical calculations. <i>Substantiation of Reviewer's evaluation*:</i>	

<b>4.</b>	<b>Discussion of results</b>	
	Interpretation of the findings and comprehensiveness of discussion, suitable substantiation with the data of other scientists and comparison of results, expression of opinion.	
	<i>Substantiation of Reviewer's evaluation*:</i>	
<b>4.1.</b>	<b>Conclusions (and suggestions/recommendations)</b>	
	Validity, concreteness and compliance of the conclusions (recommendations/suggestions) with the topic and objectives of the MT.	
	<i>Substantiation of Reviewer's evaluation*:</i>	
<b>5.</b>	<b>Theses and/or articles submitted by the student**</b>	
<b>The evaluation of MT in grade (to be written in hundredths):</b>		

*\*If any part is evaluated less than 10 points the evaluation of this part has to be substantiated by giving comment.*

*\*\*If students do not submit theses and/or articles, clause 5 is not included in the final evaluation; instead, 'Not submitted' is recorded, as this is not a mandatory element of the MT.*

*Reviewer's questions (1-2), observations, comments:*

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*(Reviewer's name, surname, signature)*

*(date)*



LITHUANIAN UNIVERSITY OF HEALTH SCIENCES  
**FACULTY OF VETERINARY  
 MEDICINE**

**EVALUATION OF THE MASTER THESIS  
 EVALUATION OF THE MEMBER OF THE COMMISSION OF MASTER THESIS**

*Author of the MT* \_\_\_\_\_

*Title of the MT* \_\_\_\_\_

Study programme of Veterinary Medicine

No	Evaluation criteria of the MT and its' presentation	Evaluation in the ten-grade (1-10) system
1.	Substantiation of the relevance of the topic, highlighting of the matter, formulation of the objective and raising the tasks.	
2.	Selection and presentation of research methodology, correctness of application of methods. Correct selection and substantiation of statistical methods.	
3.	Analysis and consistency of presentation of the findings. Statistical processing of data.	
4.	Summarisation and interpretation of the findings, expression of opinion.	
5.	The specificity of the conclusions, adequacy to the objective and the tasks.	
6.	The scientific level of the work.	
7.	The quality of visual material and oral presentation.	
8.	Reasoned and logical answers to questions, ability to discuss. Fluency of language.	
	<b>Evaluation of the Commission's member in grades (to be written in hundredths):</b>	

*Comments and reasoning of the MT Commission's member when a criterion is evaluated with less than 10 points:*

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*Questions asked by the Commission's member:*

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*(title, scientific degree, name, surname)*

*(signature)*



LITHUANIAN UNIVERSITY OF HEALTH SCIENCES  
**FACULTY OF VETERINARY  
MEDICINE**

**I APPROVE:**  
Dean of the faculty  
of Veterinary Medicine  
Name Surname  
20..

**LITHUANIAN UNIVERSITY OF HEALTH SCIENCES  
PROGRAMME OF VETERINARY MEDICINE  
INTEGRATED STUDIES  
DEPARTMENT/CLINIC/INSTITUTE (select the correct)**

Student Name Surname of the  
... year of the ... group

**INDIVIDUAL WORK PLAN**

Preparation duration of Master Thesis: 01 02 yyyy – 05 yyyy

Topic of Master Thesis:

**Title title title title title title title title title title title title**

**MT Supervisor**  
Assoc. Prof. Dr. Name Surname

Kaunas, year

## Objective of the MT:

### Tasks of the MT:

- 1.
- 2.
- 3.
- 4.

## MASTER THESIS PREPARATION PLAN

The tasks	Deadline
<p><b>Discussion of the topic with the Supervisor.</b>  <b>Preparation of the individual MT work plan (Annex 9), consideration on the plan in the Department (department/clinic/institute), presentation to the Supervisor and Dean's Office of the FVM</b> <i>(the approved individual MT work plan shall be delivered to the Dean's Office together with the extract from the protocols of the Department's meeting before the 1<sup>st</sup> of February of the current year).</i></p>	<p><b>September ..... 20.. *</b></p>
Theoretical studies necessary to solve the problem of MT. Thorough analysis of bibliographical sources. Analysis of theories, conceptions, models. Preparation of the plan of the Literature review chapter and arrangement with the Supervisor. Evaluation of the Supervisor in the LSMUSIS (Pass/Fail).	January 20..
Comprehension and integration of relevant literature.	February 20.. – May 20...
Planning of the experiment, mastering of work methodologies, sampling.	March 20.. – May 20...
Approval for the research granted by the LSMU Bioethics Center.	
Comprehensive analysis of relevant literature sources. Preparation of the literature review. Evaluation of the Supervisor in the LSMUSIS (Pass/Fail).	June 20..
<p><b>Preparation of the report for the first work stage according to the defined form (Annex 10). Presentation of the report in the Department's (department's/clinic's/institute's) meeting.</b> <i>(The report and the extract from the protocols of the unit's meeting shall be delivered to the Dean's Office of the FVM).</i></p>	<p><b>June 20..*</b></p>
Qualitative and quantitative data analysis. Description of the results.	June-September 20..
Summing-up the results. Preparation of concise conclusions, suggestions and recommendations.	September-November 20..
Submission of the interim version of the MT to the Supervisor. Evaluation of the Supervisor in the LSMUSIS (Pass/Fail).	January 20..
Preparation of the bibliographical list. Arrangement of the MT (correction of the title page, table of contents, pictures, tables, texts, citation, etc.).	February 20..
Preparation of summary in English and Lithuanian languages.	February 20..
Discussion and revisions of the MT with the Supervisor	March 20..
<b>Submission of the MT to the Supervisor. Supervisor's evaluation of the MT suitability for Departmental review.</b>	<p><b>Up to the 1<sup>st</sup> of April 20..*</b></p>

<b>The tasks</b>	<b>Deadline</b>
<b>Oral presentation of the MT at the Department</b> <i>(date may be adjusted in the current academic year).</i>	<b>May 20..</b>
<b>Final submission of the MT for the Supervisor's evaluation. Evaluation of the Supervisor (Annex 6)</b> <i>(the exact date will be specified in the current academic year).</i>	<b>May 20..</b>
<b>Uploading the MT to the LSMU Science Information System (CRIS) repository</b> <i>(the exact date will be specified in the current academic year).</i>	<b>May 20.. *</b>
<b>Review of MT. Evaluation of the Reviewer (Annex 7).</b>	<b>May 20.. *</b>
<b>Prospective date of the defence</b> <i>(the exact date will be indicated by the Dean's Office of the FVM in the current year).</i>	<b>June 20.. m*</b>

Remark: \* - Rows can be inserted into the table as needed; changing the entered dates is not recommended.

\*\* A work plan must also be prepared when planning to write the MT based on theses and/or articles, taking into account the required stages and the need for Supervisor's evaluations in order to receive credit.

The individual work plan of the scientific research work was discussed in the meeting of the Department (department/clinic/institute) of .....  
on.....20....., protocol No. ....

Student .....  
(Signature)

Name Surname



LITHUANIAN UNIVERSITY OF HEALTH SCIENCES  
**FACULTY OF VETERINARY  
MEDICINE**

**PROGRAMME OF VETERINARY MEDICINE  
INTEGRATED STUDIES  
DEPARTMENT/CLINIC/INSTITUTE (select the correct)**

Student Name Surname of the  
5<sup>th</sup> year of the ... group

**REPORT  
OF MASTER THESIS PREPARATION**

Preparation period: 02 yyyy – 06 yyyy

Kaunas, year

**Title of the Master Thesis:**

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**1. Analysis of literature under the analyzed topic.**

*A list of active links to the sources used in the literature review submitted to the MBD Supervisor is provided.*

**2. Research methodologies learnt by the author of Master Thesis and methods of statistical analysis planned for application (brief description).**

*The approval number issued by the LSMU Bioethics Center is provided.*

*The planned MT research design and a description of the necessary research methodologies are presented.*

*Justification of the intended statistical methods to be used.*

**3. Collected material under the analyzed topic (brief description).**

*A brief description is provided, e.g., the nature and number of samples, information about the collected data (Excel tables are submitted to the MT Supervisor).*

**4. Other information based on the individual plan**

*A brief comment is provided on the points listed in the Individual Plan, including encountered difficulties, completed tasks, planned activities, and an assessment of potential risks.*

**5. Relevant information:** *participation in courses, internships, conferences; presentations at conferences and seminars; published articles and theses — including active links, titles, certificate numbers, number of hours, etc. Participation in LMT and/or other projects.*

No.	<i>Courses, trainings, seminars, trips (Erasmus), conferences, theses, presentations</i>						
	<i>Transcript of Records/ Certificate number</i>	<i>Date</i>	<i>Name of the organizer or full name (first name and surname)</i>	<i>Form (participant, presenter)</i>	<i>Program registration number</i>	<i>Topic</i>	<i>Number of hours</i>

**5. I have (not) implemented all the tasks according to the individual plan.**

The MBD report has been reviewed ..... in the meeting of the department/clinic/institute of ..... on ..... 20.., minutes No. ....

Student .....  
(Signature)

Name Surname

## **Structure of a Master's Thesis Based on Scientific Publications or Conference Abstracts**

A MT must consist of the following sections:

**1. Title Page.**

**2. Table of Contents.**

**3. List of Abbreviations.**

**4. Introduction (2–3 pages).** The Introduction must include: the relevance and novelty of the topic; definition of the scientific problem; research hypothesis (if applicable); research aim and objectives.

**5. List of Articles or Conference Abstracts.**

**Note:** In the articles, the student must be a co-author, with their contribution clearly specified. For conference abstracts, the student must be the first author and must personally present the work at the conference.

**Note:** The MT must include published or accepted-for-publication scientific papers, as well as scientific works presented at conferences. Copies of the publications, abstracts or conference proceedings, and proof of conference participation must be included.

**6. Student's and Co-authors' Contributions.**

**Note:** In this section, the student must clearly and specifically **describe their contribution** to each scientific article and/or conference abstract included in the MT, indicating the activities performed and the nature of their involvement. This information is provided to identify the student's participation in the preparation of the publication and the conduct of the research; however, the extent or sufficiency of the contribution is not subject to evaluation.

**7. Literature Review.** A general review of the scientific literature related to the research topic under investigation shall be provided. The literature review must present the theoretical background of the research and serve as a common framework for all parts of the thesis, integrating the topics addressed in both the conference abstracts and the scientific articles.

**Note:** The literature review may be omitted as a separate chapter if the theoretical background of the research is sufficiently and comprehensively presented in the Introduction, Discussion, or the attached articles and/or conference abstracts.

**8. Research Materials and Methods.** A general methodology section shall be provided, including the following:

8.1. Research setting and study period;

8.2. Study object and sample;

8.3. Research methods applied;

8.4. Limitations of the study design and methodology (Reference number(s) of Bioethics Center approval(s));

8.5. Statistical analysis (including a description of the statistical methods applied).

**9. Research Results.** A general results section shall be provided, presenting all results obtained during the study. The Results chapter may be divided into subsections corresponding to different parts of the research, reflecting the results presented in the conference abstracts or scientific articles.

**10. Discussion.** A general discussion of the results shall be provided and may be divided into subsections. The Discussion must include the interpretation of the findings, comparison of the results with those reported by other authors, and a discussion of the study limitations.

**11. Conclusions.**

**12. Practical Recommendations.**

### **13. References.**

**14. Appendices.** Conference abstracts or scientific articles (copies of the conference abstracts or scientific articles shall be included); supplementary tables, datasets, or other supporting information (if applicable).

**Note:** In the main sections of the MT (Literature Review, Research Materials and Methods, Research Results, and Discussion), the student must independently and coherently present the course of the research and its results, integrating the information reported in the publications into a single, comprehensive thesis. The MT may not consist solely of copies of publications or their technical rearrangement.

**Note:** When preparing an MT based on publications, the principles of academic integrity must be observed. Text, tables, or figures included in publications may be used only with appropriate citation of the source and in compliance with copyright and publisher requirements. Publications submitted as appendices to the MT shall not be considered self-plagiarism.