



MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN FEDERATION
Federal state autonomous educational institution
of higher education
«Far Eastern Federal University»
(FEFU)

INSTITUTE OF LIFE SCIENCES AND BIOMEDICINE (SCHOOL)

AGREED

Head of OP

(signature) (full name)
«28» September 2021 r.

APPROVE

Head of VSP

(signature) (full name)
«28» September 2021 r.

WORKING PROGRAM OF THE DISCIPLINE

Biotechnological features of the production of animal products
Direction of training 19.04.01 «Biotechnology»
(«Agri-Food Biotechnology»)
Form of training full-time

course 2 semester 4
lectures 9 hours.
practical classes 27 h.
laboratory work 0 hours.
including using
total classroom hours 36 hours.
independent work 36 h.
including preparation for the exam 36 hours (if the exam is provided).
control works (quantity) are not provided
term paper / term project are provided
credit not included
exam 4 semester

The program of the state final certification was compiled in accordance with the requirements of the Federal State Educational Standard in the field of study 19.04.01 Biotechnology, approved by order of the Ministry of Science and Higher Education of the Russian Federation dated August 10, 2021 No. 737.

The program at the meeting of the Academic Council of the Institute of Life Sciences and Biomedicine (School) December 21, 2021
Director of the Department of Food Science and Technology Kalenik T.K.
Compiled by: T.V. Tanashkina.

Reverse side of the title page of the RPMU

I. The work program was revised at the meeting of the department:

Protocol dated « _____ » _____ 20__ № _____

Director _____

(signature)(full name)

II. The work program was revised at the meeting of the department:

Protocol dated « _____ » _____ 20__ № _____

Director _____

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III. The work program was revised at the meeting of the department:

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IV. The work program was revised at the meeting of the department:

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ABSTRACT

Bachelor's/Specialist's/Master's degree in 19.04.01 Biotechnology
Study profile/ Specialization/ Master's Program "Title" "Agri-food biotechnology"

Course title: Biotechnological features of production of animal products

Variable part of Block 1, 3credits

Instructor: T.V. Tanashkina

At the beginning of the course a student should be able to:

- the ability to carry out the process in accordance with the regulations and use technical means to measure the main parameters of biotechnological processes, the properties of raw materials and products;
- the ability to carry out standard and certification testing of raw materials, finished products and technological processes;
- the ability to develop the main stages of the biotechnological process.

Learning outcomes: specific professional competences (SPC)

SPC 11 – ability to provide technical discipline, sanitary and hygienic mode of operation of the enterprise, maintenance of processing equipment in proper technical condition

SPC 13 – readiness for the organization, planning and management of the operating biotechnological processes and production

SPC 14 – ability to use typical and develop new methods of engineering calculations of technological parameters and equipment of biotechnological productions

SPC 17 – readiness for pilot development of technology and scaling-up

SPC 18 – ability to develop and scientific substantiate schemes for optimal integrated certification of biotechnological products

SPC 19 – ability to analyze the indicators of the technological process for compliance with the original scientific developments

Course description: structure and chemical composition of animal raw materials; secondary resources of animal raw materials; microorganisms in biotechnological production from animal raw materials; biotechnological processes in individual food production.

Main course literature:

1. Measuring methods for monitoring indicators of quality and food safety: studies. manual for universities / V.V. Shevchenko [et al.]. Animal products. - SPb. : Trinity Bridge, 2009. - 200 p. (3 copies.)

<http://lib.dvfu.ru:8080/lib/item?id=chamo:358419&theme=FEFU>

2. Rogov, I.A. General technology of meat and meat products / I.A.Rogov, A.G. Zabashta, G.P. Kazyulin. - M .: KolossS, 2010. - 367 p. (5 copies.)
<http://lib.dvfu.ru:8080/lib/item?id=chamo:340686&theme=FEFU>

3. Technology of fish and fish products: a textbook for universities / [S. A. Artyukhova, V.V. Baranov, N.E. Brazhnaya and others]; by ed. A.M. Ershov. - Moscow: Kolos, 2010. - 1063 p. (1 copy)
<http://lib.dvfu.ru:8080/lib/item?id=chamo:665020&theme=FEFU>

4. Metrology, standardization and certification of products of animal origin: a textbook / L.P. Bessonova, L.V. Antipova. - St. Petersburg: GIORD, 2013. - 591 p. (2 copies) <http://lib.dvfu.ru:8080/lib/item?id=chamo:736850&theme=FEFU>

5. Basic principles of processing raw materials of plant, animal, microbiological origin and fish: method. directions for special students 240902 "Food Biotechnology" of all forms of training / comp. E.V. Makarova, Vladivostok: Publishing House of the Pacific University of Economics, 2009. - 80 p. (10 copies.) <http://lib.dvfu.ru:8080/lib/item?id=chamo:356130&theme=FEFU>

6. Animal biochemistry: a textbook for universities / V. V. Rogozhin, [St. Petersburg]: GIORD, 2009, 552 p. (9 copies.)
<http://lib.dvfu.ru:8080/lib/item?id=chamo:353962&theme=FEFU>

7. Form of final control: exam.

1. Purpose and objectives of mastering the discipline:

The purpose of the discipline is to acquire knowledge about the features of biotechnology of food products from animal materials..

Objectives of the discipline:

- acquaintance with traditional and modern directions of using animal materials in food biotechnology;
- consideration of the structural features, chemical composition and properties of various types of animal materials intended for biotechnological processing;
- knowledge of the characteristics of biotechnology of products from animal materials;
- ability to work with normative and technical documentation in the field of circulation of animal raw materials and food products based on it.

As a result of studying this discipline, the following professional competencies (elements of competencies) are formed in students:

| Code and wording of competency | Competency Stages | |
|--|--------------------------|--|
| SPC 11 – ability to provide technical discipline, sanitary and hygienic mode of operation of the enterprise, maintenance of processing equipment in proper technical condition | Knows | fundamental principles of the regulations for ensuring technological discipline and sanitary and hygienic regime of operation of a biotechnological enterprise for the processing of plant raw materials. |
| | Is able | plan work to ensure technological discipline and organize the technological process in accordance with the requirements of regulatory, technical and sanitary documentation at biotechnological enterprises for the processing of plant materials. |
| | Owns | the skills of organizing and ensuring the implementation of technological discipline and sanitary and hygienic regime at a biotechnological enterprise for the processing of plant materials. |
| SPC 13 – readiness for the organization, planning and management of the operating biotechnological processes and production | Knows | fundamental principles of organization, planning and management of biotechnological processes at enterprises for the processing of plant materials. |
| | Is able | to find optimal solutions in the organization, planning and management of biotechnological processes at enterprises for the processing of plant materials. |
| | Owns | organization skills, planning and effective management of biotechnological processes at enterprises for the processing of plant materials. |
| SPC 14 – ability to use | Knows | standard methods of engineering calculations in |

| | | |
|---|---------|--|
| typical and develop new methods of engineering calculations of technological parameters and equipment of biotechnological productions | | biotechnological production for the production of food products. |
| | Is able | develop and produce engineering calculations in the organization of biotechnological production for the production of food from plant materials. |
| | Owns | methods of standard and experimental calculations in biotechnological productions for the processing of plant materials. |
| SPC 17 – readiness for pilot development of technology and scaling-up | Knows | principles and methods of organizing and conducting tests with the introduction of new technologies in biotechnological food production. |
| | Is able | organize pilot testing of technologies and scaling up processes when introducing new biotechnological food production at the enterprise. |
| | Owns | skills of pilot testing of new technologies for the production of food products from plant materials. |
| SPC 18 – ability to develop and scientific substantiate schemes for optimal integrated certification of biotechnological products | Knows | principles and methods of organizing optimal integrated certification of biotechnological products. |
| | Is able | substantiate and develop schemes for optimal integrated certification of food products obtained during the biotechnological processing of plant materials. |
| | Owns | skills of scientific substantiation and drawing up schemes for optimal integrated certification of food products obtained during the biotechnological processing of plant materials. |
| SPC 19 – ability to analyze the indicators of the technological process for compliance with the original scientific developments | Knows | regulations and methods for assessing the performance of the technological process in the processing of plant materials and food production. |
| | Is able | to assess and analyze the indicators of the technological process at food enterprises. |
| | Owns | methods of establishing the correspondence of the values of indicators of the technological process indicated in scientific developments to the actual data. |

To form the above competencies in the framework of the discipline “Biotechnological features of the production of animal products”, the following methods of active / interactive training are used: lecture-press conference, seminar-press conference, thesis, compilation of intelligence- cards, small group work, whirlpool, debriefing.

2. The complexity of the discipline and types of training sessions in the discipline

The total labor intensity of the discipline is 3 credit units (108 academic hours).

The types of training sessions and work of the student in the discipline can be:

| | |
|-------------|--|
| Designation | Types of training sessions and work of the student |
| Lec | Lectures |
| Lab | Labs |
| Pe | Practical exercises |
| Oc | Online course |
| SR | Independent work of the student during the period of theoretical training |
| Control | Independent work of the student and contact work of the student with the teacher during the period of intermediate certification |

Discipline structure:

The form of education is full-time.

| № | Section namedisciplines | Semester | The number of hours by type of training sessions and work of the student | | | | | | Forms of intermediate certification, current monitoring of progress | |
|---|---|----------|--|-----|----|----|----|---------|---|---------------|
| | | | Lec | Lab | Pe | Oc | SR | Control | | |
| 1 | Section I. Animal raw materials for biotechnological productions | 4 | 4 | | 12 | | | 36 | 36 | Seminar, exam |
| 2 | Section II. Biotechnological features of the processing of animal raw materials | 4 | 5 | | 15 | | | 36 | 36 | Seminar, exam |
| | Total: | | 9 | | 27 | | | 36 | 36 | |

3. STRUCTURE AND CONTENT OF THE THEORETICAL PART OF THE COURSE

Section I. Animal raw materials for biotechnological productions

Topic 1. Introduction to the discipline. Characterization of traditional types of animal raw materials for biotechnological industries (using the method of active learning lecture-press conference)

Traditional and modern areas of biotechnological production based on animal feed. The main types of animal feed in biotechnology products.

The main purpose of the lecture and press conference at the beginning of the course is to identify the range of interests and needs of students, their degree of preparedness for work, their attitude to the subject. The need to formulate a question and correctly ask it initiates mental activity, and the expectation of an answer to your question concentrates the student's attention.

Topic 2. Secondary resources of animal raw materials for biotechnological industries, using the active teaching method

Types of secondary raw materials of animal origin for biotechnological production of food, feed, food and biologically active additives.

Section II. Biotechnological features of the processing of animal raw materials

Topic 1. Enzyme preparations in biotechnological industries, using the method of active teaching

Enzymatic preparations of plant, animal and microbial origin. Modern enzyme preparations of complex action. Features of the use of enzyme preparations for processing various types of raw materials.

Topic 2. Microorganisms in biotechnological industries

Microorganisms in the biotechnology of dairy products. Theoretical foundations of microbiological processes in meat. Microorganisms for starter cultures and starter cultures.

Topic 3. Biotechnological features of individual food production

Meat biotechnology. Biotechnology of dairy products. Biotechnological processes in cheese making. Biotechnology of fish and hydrobionts.

4. STRUCTURE AND CONTENT OF THE PRACTICAL PART OF THE COURSE

Practical classes (including 8 hours using active learning methods)

Lesson 1. Characteristics of animal raw materials (including 2 hours using active training methods, seminar, press conference, whirlpool)

1. Examination (incoming inspection).
2. Types of animal raw materials for food, biologically active additives, enzyme preparations, etc.
3. Features of various types of animal raw materials.
4. Standardization of meat, fish and milk.
5. Preparation of analytical tables "Characteristics of meat, dairy, fish and other types of animal raw materials."

The essence of the seminar-press conference method is that the teacher instructs several students to prepare reports on each item of the seminar plan on the topic of the next seminar. After a brief introduction, the leader of the seminar gives his choice of the floor to one of the students who are preparing to speak. The report lasts 10-12 minutes. Then each student asks the speaker one question. Questions and answers to them form the central part of the seminar.

The essence of the method of active learning whirlpool is to cross-evaluate the content of the material, when each student acts as an expert and evaluates the work of other students. In this lesson, the analytical tables "Characteristics of meat, dairy, fish and other types of animal raw materials" are subject to examination. When revealing inaccuracies, errors, insufficiency of materials, the expert makes appropriate notes in the fields of the tables. When protecting the table, the student must answer all the expert's comments. This method develops the analytical abilities of students and makes it possible to test their own knowledge on a specific issue.

Lesson 2. Enzyme preparations in biotechnological industries (2 hour using the method of active training debriefing)

1. Enzymes of animal raw materials and their role in food production.
2. The use of enzymes in the biotechnology of raw materials and animal products
3. Technological features of proteolytic enzymes of various origins

4. Immobilized enzymes in food technology.

The essence of the method of active learning debriefing is to more fully comprehend the students presented in the lesson material, isolating the main information from the entire amount of information, the ability to generate new ideas. The method is applied after consideration of all issues in order to generalize the material and formulate conclusions.

Lesson 3. Meat biotechnology (2 hours using the active learning method seminar-press conference)

1. Biotechnological methods of the process of ripening meat.
2. Enzyme preparations in the processing of raw meat.
3. Starting crops in the technology of raw smoked meat products.
4. Microflora of raw smoked meat products and its influence on the ripening process.
5. Biotechnology in the production of food from poultry meat.
6. Testing.

The essence of the seminar-press conference method is that the teacher instructs several students to prepare reports on each item of the seminar plan on the topic of the next seminar. After a brief introduction, the leader of the seminar gives his choice of the floor to one of the students who are preparing to speak. The report lasts 10-12 minutes. Then each student asks the speaker one question. Questions and answers to them form the central part of the seminar.

Lesson 4. Biotechnology of dairy raw materials

1. Methods for producing lactic acid starter cultures.
2. Characterization of microorganisms used for the production of yogurt, yogurt, fermented baked milk, fermented milk, koumiss, yogurt and other fermented milk products.
3. Enzyme preparations for the intensification of the production of fermented milk products.
4. Biotechnology of products from secondary dairy raw materials.
5. Assortment and classification of skim milk and buttermilk drinks.

6. Drinks fermented from unclarified whey.

7. Drawing up an intelligence card “Biotechnology of products from secondary dairy raw materials”.

The essence of the method of compiling intelligence cards is to structure and graphically display materials on a given topic. Work in small groups in the preparation of intelligence cards develops students' initiative and communication skills.

The essence of the method of active learning whirlpool is to cross-evaluate the content of the material, when each student acts as an expert and evaluates the work of other students. When revealing inaccuracies, errors, insufficiency of materials, the expert makes appropriate notes in the fields of the tables. When protecting the table, the student must answer all the expert's comments. This method develops the analytical abilities of students and makes it possible to test their own knowledge on a specific issue.

Lesson 5. Biotechnological processes in the production of cheese

1. Biotechnological aspects of cheese production.
2. The microbiological essence of cheese making. Ripening cheeses.
3. Biotechnological basis for the production of soft acid and rennet cheeses.
4. Biotechnological methods for preparing the milk-vegetable mixture in the production of soft cheeses.

Lesson 6. Biotechnology of fish and non-fish aquatic organisms (including 2 hour using the method of active training, debriefing)

1. Enzyme preparations in innovative technologies of preserves from fish fillets.
2. Biologically active substances in the waste from the cutting of fish raw materials. Production of biologically active additives based on aquatic organisms of animal origin.
3. Innovative technologies for producing hydrolysates, enzyme preparations, carotenoids, polyunsaturated fatty acids from waste from the cutting of hydrobionts. Chitin and chitosan from crustacean shells.

The essence of the method of active learning debriefing is to more fully comprehend the students presented in the lesson material, isolating the main information from the entire amount of information, the ability to generate new ideas. The method is applied after consideration of all issues in order to generalize the material and formulate conclusions.

5. TRAINING AND METHODOLOGICAL SUPPORT OF STUDENTS'S INDEPENDENT WORK

Educational and methodological support for the independent work of students in the discipline "Biotechnological features of the production of animal products" is presented in Appendix 1 and includes:

- a schedule of independent work on the discipline, including approximate norms of time to complete each task;
- characteristics of tasks for independent work of students and guidelines for their implementation;
- requirements for the presentation and presentation of the results of independent work;
- criteria for evaluating the performance of independent work.

6. CONTROL OF ACHIEVING COURSE OBJECTIVES

| № | Supervised sections / topics of discipline | Codes and stages of formation of competencies | | Evaluation Tools | |
|---|--|---|--|--|----------------------------|
| | | | | current control | intermediate certification |
| 1 | Section I Animal feedstock for biotechnological industries | SPC-18 | Knows how to organize and conduct the technological process within the framework of the technology for the production of biotechnological products adopted in the organization Able to apply methods of organizing and conducting a | UO-1 - interview, UO-3 - report, communication, PR-1 - test, PR-14 - analytical tables | Exam Questions 1-14 |

| | | | | | |
|---|---|--|--|---|----------------------|
| | | | technological process within the framework of the technology for the production of biotechnological products adopted in the organization | | |
| | | | Owns methods of organizing and conducting the technological process within the framework of the technology for the production of biotechnological products adopted in the organization | | |
| 2 | Section II Biotechnological features of animal feed processing | SPC-11 SPC-13 SPC-14 SPC-17 SPC-19 | Knows how to develop proposals for optimizing biotechnological processes and managing the release of biotechnological products | UO-1 - interview, UO-3 - report, message, PR-14 - analytical tables, PR-15 - intelligence card | Exam Questions 10-15 |
| | | Able to apply methods for developing proposals for optimizing biotechnological processes and managing the release of biotechnological products | | | |
| | | Owns how to develop proposals for optimizing biotechnological processes and managing the release of biotechnological products | | | |

Typical control tasks, methodological materials that determine the procedures for assessing knowledge, skills and (or) experience, as well as criteria and indicators necessary for assessing knowledge, skills, and characterizing the stages of formation of competencies in the process of developing an educational program are presented in the Appendix 2.

7. LIST OF TRAINING LITERATURE AND INFORMATION AND METHODOLOGICAL SUPPORT OF DISCIPLINE

Main literature

(electronic and print editions)

1. Measuring methods for monitoring indicators of quality and food safety: textbook. manual for universities / V.V. Shevchenko [et al.]. Products of animal origin. - SPb. : Trinity Bridge, 2009. - 200 p. (3 copies)

<http://lib.dvfu.ru:8080/lib/item?id=chamo:358419&theme=FEFU>

2. Rogov, I.A. General technology of meat and meat products / I.A. Rogov, A.G. Zabashta, G.P. Kazyulin. - M .: KolosS, 2010. - 367 p. (5 copies)

<http://lib.dvfu.ru:8080/lib/item?id=chamo:40406&theme=FEFU>

3. Technology of fish and fish products: a textbook for high schools / [S. A. Artyukhov, VV Baranov, N. E. Brazhnaya, etc.]; under the editorship of A.M. Ershov. - Moscow: Kolos, 2010. - 1063 s. (1 copy)

<http://lib.dvfu.ru:8080/lib/item?id=chamo:665020&theme=FEFU>

4. Metrology, standardization and certification of animal products: a textbook / L. P. Bessonova, L. V. Antipova. - St. Petersburg: GIOR, 2013. - 591 p. (2 copies) <http://lib.dvfu.ru:8080/lib/item?id=chamo:736850&theme=FEFU>

5. Basic principles of processing raw materials of plant, animal, microbiological origin and fish: method. directions for students special. 240902 "Food biotechnology" of all forms of education / comp. E.V. Makarova, Vladivostok: Publishing House of the Pacific Economic University, 2009. - 80 p. (10 copies) <http://lib.dvfu.ru:8080/lib/item?id=chamo:356130&theme=FEFU>

6. Animal biochemistry: a textbook for high schools / VV Rogozhin, [St. Petersburg]: GIOR, 2009, 552 p. (9 copies)

<http://lib.dvfu.ru:8080/lib/item?id=chamo:353962&theme=FEFU>

Additional literature

(electronic and print editions)

1. Arsenieva T.P. Biotechnology of products from secondary dairy raw materials [Electronic resource]: teaching aid / Arsenyeva TP - Electron. textual data. — SPb .: NRU ITMO, 2014.— 49 c. — Access mode: <http://www.iprbookshop.ru/67811.html>

2. Vasiliev, S. B. The basic principles of processing raw materials of plant, animal, microbiological origin and fish. In 2 parts. Part 1. Processing of raw materials of animal origin and fish [Electronic resource]: textbook / S.B. Vasiliev, N.I. Davydenko, O.V. Zhukov. - The electron. Dan. - Kemerovo: KemSU, 2008. - 104 p. - Access Mode: <https://e.lanbook.com/book/4610>

3. Gorbatova, K.K. Biochemistry of milk and dairy products [Electronic resource] / K.K. Gorbatova, P.I. Gunkova. - The electron. Dan. - St. Petersburg: GIORD, 2010 .-- 336 p. - Access Mode: <https://e.lanbook.com/book/4896>

4. Zabodalova, L.A. Technology of whole milk products and ice cream [Electronic resource]: study guide / L.A. Zabodalova, T.N. Evstigneeva. - The electron. Dan. - SPb .: NRU ITMO, 2013 .-- 304 p. - Access Mode: <https://e.lanbook.com/book/71137>

5. Ryabtseva, S.A. Microbiology of milk and dairy products [Electronic resource] / S.A. Ryabtseva, V.I. Ganina, N.M. Panova. - The electron. Dan. - St. Petersburg: Doe, 2019 .-- 192 p. - Access Mode: <https://e.lanbook.com/book/102586>

6. Biotechnology of combined food products and their analogues based on raw materials of animal origin: method. instructions for laboratory work for special students. 240902 "Food biotechnology" / comp. L.M. Povoiko, L.A. Tekutieva, T.A. Shepel. Vladivostok: Publishing House of the Pacific State Economic University, 2008. - 40 p. Access Mode: <http://lib.dvfu.ru:8080/lib/item?id=chamo:352729&theme=FEFU>

7. Ermishin, A.P. Genetically modified organisms and biosafety [Electronic resource]: monograph / A.P. Ermishin - Minsk: Belarusian Science, 2013 .-- 172 p. <http://www.iprbookshop.ru/29440.html>

8. Zonin, V.G. Modern production of sausages and salted-smoked products / V.G. Zonin - St. Petersburg: Profession, 2007 .-- 222 p. Access Mode: <http://lib.dvfu.ru:8080/lib/item?id=chamo:351428&theme=FEFU>

9. Food biotechnology: a textbook for high schools [In 4 kn.] Book. 1. The basics of food biotechnology / I.A. Rogov, L.V. Antipova, G.P. Shuvaev. - M. : KolosS, 2004 .-- 440 p. - Access mode: <http://lib.dvfu.ru:8080/lib/item?id=chamo:4242243&theme=FEFU>

10. Meledina T.V. Methods of planning and processing the results of scientific research [Electronic resource]: textbook / Meledina TV, Danina MM - Electron. textual data. — SPb. : NRU ITMO, 2015. — 108 p. — Access mode: <http://www.iprbookshop.ru/67290.html>

11. Schmid, R. Visual biotechnology and genetic engineering [Electronic resource] / R. Schmid; trans. with him. - 2nd ed. (email). - The electron. text data (1 pdf file: 327 s.). - M.: BINOM. Knowledge Lab, 2015. - Access mode: <http://znanium.com/bookread2.php?book=541279>

Regulatory Materials

1. GOST 10.76-74 Meat. Horse meat supplied for export. Technical requirements. - Enter. 1975-06-01. - M. : Standartinform, 2006 .-- 3 p. - Access mode: <http://gostexpert.ru/gost/gost-10.76-74>

2. GOST 11285-2017 Frozen pancreatic glands of cattle and pigs. - Enter. 2019-01-01. - M. : Standartinform, 2017 .-- 13 p. - Access mode: <http://www.internet-law.ru/gosts/gost/65007>

3. GOST 12512-67 Meat and beef in quarters, frozen, supplied for export. Technical conditions - Enter. 1968-07-01. - M. : Standartinform, 2006 .-- 3 p. - Access mode: <http://gostexpert.ru/gost/gost-12512-67>

4. GOST 12513-67 Frozen half-carcass pork meat, supplied for export. Technical conditions - Enter. 1968-01-01. - M. : Standartinform, 2006 .-- 4 p. - Access mode: <http://gostexpert.ru/gost/gost-12513-67>

5. GOST 17164-71 Dairy industry. Production of whole milk products from cow's milk. Terms and Definitions. - Enter. 1973-01-01. - M .: Standartinform, 1973. - 12 p. - Access mode: <http://gostexpert.ru/gost/gost-17164-71>
6. GOST 18157-88 Products of slaughter of cattle. Terms and Definitions. - Enter. 1989-06-30. - M .: Standartinform, 2005 .-- 18 p. - Access mode: <http://gostexpert.ru/gost/gost-18157-88>
7. GOST 18158-72 Production of meat products. Terms and Definitions. - Enter. 1974-01-01. - M .: Standartinform, 2005 .-- 18 p. - Access mode: <http://gostexpert.ru/gost/gost-18158-72>
8. GOST 27568 Solid rennet cheeses for export. Specifications. - Introduction. 1989-01-01. - M .: Standartinform, 2008 .-- 5 p. - Access mode: <http://gostexpert.ru/gost/gost-27568-87>
9. GOST 31450-2013 Drinking milk. Technical conditions - Enter. 2014-07-01. - M .: Standartinform, 2014 .-- 8 p. - Access mode: <http://gostexpert.ru/gost/gost-31450-2013>
10. GOST 31990-2012 Duck meat (carcasses and parts thereof). General specifications. - Enter. 2014-01-01. - M .: Standartinform, 2013 .-- 10 p. - Access mode: <http://gostexpert.ru/gost/gost-31990-2012>
11. GOST 32260-2013 Semisolid cheeses. Technical conditions - Enter. 2015-07-01. - M .: Standartinform, 2014 .-- 17 p. - Access mode: <http://gostexpert.ru/gost/gost-32260-2013>
12. GOST P 52313-2005 Poultry processing industry. Food Products. Terms and Definitions. - Enter. 2006-01-01. - M .: Standartinform, 2007 .-- 11 p. - Access mode: <http://gostexpert.ru/gost/gost-52313-2005>
13. GOST R 52427-2005 Meat industry. Food Products. Terms and Definitions. - Enter. 2007-01-01. - M .: Standartinform, 2006 .-- 18 p. - Access mode: <http://gostexpert.ru/gost/gost-52427-2005>

14. GOST R 52469-2005 Poultry processing industry. Poultry processing. Terms and Definitions. - Enter. 2007-01-01. - M .: Standartinform, 2006 .-- 7 p. - Access mode: <http://gostexpert.ru/gost/gost-52469-2005>
15. GOST R 54673-2011 Quail meat (carcasses). Technical conditions - Enter. 2013-01-01. - M .: Standartinform, 2012 .-- 9 p. - Access mode: <http://gostexpert.ru/gost/gost-54673-2011>
16. GOST R 52686-2006 Cheeses. General specifications. - Enter. 2008-01-01. - M .: Standartinform, 2008 .-- 18 p. - Access mode: <http://gostexpert.ru/gost/gost-52686-2006>
17. GOST R 55337-2012 Meat of guinea fowl (carcasses and their parts). Technical conditions - Enter. 2014-01-01. - M .: Standartinform, 2014 .-- 11 p. - Access mode: <http://gostexpert.ru/gost/gost-55337-2012>
18. TR TS 033/2013 Technical regulation of the Customs Union “On the safety of milk and dairy products” - Access mode: <http://gostexpert.ru/gost/gost-32366-2013>
19. GOST 32366-2013 Frozen fish. Technical conditions . - Enter. 2015-01-01. - M .: Standartinform, 2014 .-- 22 p. - Access mode: <http://gostexpert.ru/gost/gost-32366-2013>
20. GOST 814-96 Chilled fish. Technical conditions - Enter. 1997-07-01. - M .: Standartinform, 2010 .-- 5 p. - Access mode: <http://gostexpert.ru/gost/gost-814-96>

The list of resources of the information and telecommunication network

"Internet"

1. <http://elibrary.ru> Scientific electronic library eLIBRARY.RU
2. The electronic library system "Doe" <http://e.lanbook.com/>
3. The electronic library system "IPRBOOK" <http://www.iprbookshop.ru>
4. Scopushttp database: <http://www.scopus.com/home.url>
5. Web of Science Database <http://apps.webofknowledge.com/>

6. Database of full-texting academic journals in China
<http://oversea.cnki.net/>

7. The electronic library of dissertations of the Russian State Library
<http://diss.rsl.ru/>

8. EBSCO Electronic Databases <http://search.ebscohost.com/>

List of information technology and software

In the process of training in the discipline "Biotechnological features of the production of animal products", the following software is used installed on the personal computers of the School of Biomedicine: office suite Microsoft Office 2010 professional plus, version 14.0.6029.1000; educational software package 7-Zip, version 9.20.00.0; training complex of programs Abbyy FineReader 11, version 11.0.460; training complex of programs Adobe Acrobat XI Pro, version 11.0.00; browser for working in the environment of WWW Coogole Chrome, version 42.0.2311.90; Teaching software package CoreDraw Graphics Suite X3, version 13.0.0.739.

PowerPoint is used to prepare presentations for lectures and practical exercises. Each student has access to individual unlimited access to the electronic library system (ELS) and the information and network resources of the FEFU scientific library.

8. METHODOLOGICAL INSTRUCTIONS FOR THE DEVELOPMENT OF THE DISCIPLINE

In accordance with the curriculum in the discipline "Biotechnological features of the production of animal products / Lecture, practical classes, as well as independent work of the student.

At lectures, the student is provided with basic information on the course, the basic concepts are revealed, the main provisions of theories, hypotheses are stated.

The most important task of the lecture course is the formation of the skills to highlight problems, formulate and test hypotheses, and evaluate the current state of science. Lectures lay the foundations of scientific knowledge among students, are a method and means of forming scientific thinking. Lecture material is necessary for students to further work on mastering the discipline program.

In practical classes, self-preparation of students on the topic of classes, which is announced to teachers in advance, is of great importance. Also, at the beginning of the semester, students are provided with a plan and a calendar schedule for practical classes.

In preparation for the practical lesson, it is necessary to build on the theoretical knowledge gained in the lecture, which should be expanded, deepened and illustrated using additional sources of information. At the same time, important attention should be paid to the structuring and systematization of the material presented. In case of preparation of the message, it is necessary to provide it with a presentation.

The independent work of the student is an integral element of the discipline program. This part of the planned educational work is carried out on assignment and with the methodological guidance of the teacher, but without his direct participation. Independent work is aimed at mastering the system of scientific and professional knowledge, the formation of skills, gaining experience in independent creative activity. Tasks for independent work of students and its educational and methodological support are presented in Appendix 1.

Only those students who do not have arrears in the current control, i.e. they successfully completed individual tasks, passed test tasks. To prepare for the exam, students are offered questions that cover and systematize both theoretical and practical material of the course.

Students should master theoretical knowledge regularly, systematically, sequentially from lesson to lesson, carefully prepare for practical exercises, perform individual tasks, tests, etc. in the allotted time. Only in this case, one can

expect a high level of assimilation of the material, the formation of the necessary competencies and, how consequence, successful passing the exam.

9. MATERIAL AND TECHNICAL SUPPORT OF DISCIPLINE

Lecture and practical classes are held in the classroom equipped with multimedia equipment. For independent work of students, reading rooms of the FEFU scientific library and computer classes of the School of Biomedicine with free access are used.

Laboratory of General Food
Biotechnology
Vladivostok, Russian island, p.
Ajax 10, Building 25.1, aud. M
311.
The classroom for lectures,
practical and laboratory classes,
group and individual consultations,
ongoing monitoring and interim
certification.

Training furniture for 25 workplaces, teacher's
place (table, chair).
Analytical and technological equipment
(M311): Milk centrifuge with heating IJIM 1-
12; Liquid thermostat LOIP Lt-208a, volume
8l, 120x150 / 200mm; Analyzer of milk quality
Lactan 1-4 mod. 230; PH-millivoltmeter with
tripod pH-150MI; VSP 1.5-2-3T scales;
Refrigerator "Ocean-RFD-325B"; Drying
cabinet, stainless steel chamber. steel, 58l;
electric stove 111CH 101-226589; PE-6110
magnetic stirrer with heating; VNZh-0,3-KhS3
viscometer (d-1.41) glass capillary; Tripod PE-
2710 lab. for burettes.

Multimedia equipment: Monoblock Lenovo
C360G-i34164G500UDK; Screen with electric
236 * 147 cm Trim Screen Line; DLP
projector, 3000 ANSI Lm, WXGA 1280x800,
2000: 1 EW330U Mitsubishi; Subsystem of
specialized hardware mounts CORSA-2007
Tuarex; Video Switching Subsystem: DVI
DXP 44 DVI Pro Extron matrix switcher;
Extender DVI over twisted pair DVI 201 Tx /
Rx; Subsystem of audio switching and sound
reinforcement; ceiling mount speaker SI 3CT
LP Extron; Sennheiser EW 122 G3 UHF
Microphone Lavalier Radio System with a
wireless microphone and receiver; DMP 44 LC
Extron digital audio processor; Extron IPL T
S4 Network Management Controller; Wireless
LANs for students are provided with a system
based on 802.11a / b / g / n 2x2 MIMO (2SS)
access points.

Reading rooms of the FEFU
Scientific Library with open access
to the fund

Reading room equipment of the FEFU
Scientific Library: HP All-in-One 400 All-in-
One Monoblock 400 19.5 (1600x900), Core i3-

Vladivostok, Russian island.
settlement Ajax 10, building A -
level 10

4150T, 4GB DDR3-1600 (1x4GB), 1TB HDD
7200 SATA, DVD +/- RW, GigEth, Wi-Fi,
BT, usb kbd / mse, Win7Pro (64-bit) +
Win8.1Pro (64-bit), 1-1-1 Wty Internet access
speed of 500 Mbps. Workplaces for people
with disabilities are equipped with braille
displays and printers; equipped with: portable
devices for reading flat-printed texts, scanning
and reading machines with a video enlarger
with the ability to control color spectra;
magnifying electronic magnifiers and
ultrasonic markers

Computer class
Vladivostok, Russian Island, 10
Ajax, Building 25.1, aud. M621.
The classroom for lectures,
practical exercises, group and
individual consultations, ongoing
monitoring and interim
certification.

Training furniture for 17 workplaces, teacher's
place (table, chair),
Monoblock Lenovo C360G-i34164G500UDK
19.5 "Intel Core i3-4160T 4GB DDR3-1600
SODIMM (1x4GB) 500GB Windows Seven
Enterprise - 17 pcs; Wired LAN - Cisco 800
series; Wireless LAN for students with a
system based on 802.11a / b access points / g /
n 2x2 MIMO (2SS).

10. VALUATION FUNDS

| Code and wording of competency | Competency Stages | |
|--|-------------------|--|
| SPC 11 – ability to provide technical discipline, sanitary and hygienic mode of operation of the enterprise, maintenance of processing equipment in proper technical condition | Knows | fundamental principles of the regulations for ensuring technological discipline and sanitary and hygienic regime of operation of a biotechnological enterprise for the processing of plant raw materials. |
| | Is able | plan work to ensure technological discipline and organize the technological process in accordance with the requirements of regulatory, technical and sanitary documentation at biotechnological enterprises for the processing of plant materials. |
| | Owns | the skills of organizing and ensuring the implementation of technological discipline and sanitary and hygienic regime at a biotechnological enterprise for the processing of plant materials. |
| SPC 13 – readiness for the organization, planning and management of the operating biotechnological processes and production | Knows | fundamental principles of organization, planning and management of biotechnological processes at enterprises for the processing of plant materials. |
| | Is able | to find optimal solutions in the organization, planning and management of biotechnological processes at enterprises for the processing of plant materials. |
| | Owns | organization skills, planning and effective management of biotechnological processes at enterprises for the processing of plant materials. |
| SPC 14 – ability to use typical and develop new methods of engineering | Knows | standard methods of engineering calculations in biotechnological production for the production of food products. |

| | | |
|---|---------|--|
| calculations of technological parameters and equipment of biotechnological productions | Is able | develop and produce engineering calculations in the organization of biotechnological production for the production of food from plant materials. |
| | Owens | methods of standard and experimental calculations in biotechnological productions for the processing of plant materials. |
| SPC 17 – readiness for pilot development of technology and scaling-up | Knows | principles and methods of organizing and conducting tests with the introduction of new technologies in biotechnological food production. |
| | Is able | organize pilot testing of technologies and scaling up processes when introducing new biotechnological food production at the enterprise. |
| | Owens | skills of pilot testing of new technologies for the production of food products from plant materials. |
| SPC 18 – ability to develop and scientific substantiate schemes for optimal integrated certification of biotechnological products | Knows | principles and methods of organizing optimal integrated certification of biotechnological products. |
| | Is able | substantiate and develop schemes for optimal integrated certification of food products obtained during the biotechnological processing of plant materials. |
| | Owens | skills of scientific substantiation and drawing up schemes for optimal integrated certification of food products obtained during the biotechnological processing of plant materials. |
| SPC 19 – ability to analyze the indicators of the technological process for compliance with the original scientific developments | Knows | regulations and methods for assessing the performance of the technological process in the processing of plant materials and food production. |
| | Is able | to assess and analyze the indicators of the technological process at food enterprises. |
| | Owens | methods of establishing the correspondence of the values of indicators of the technological process indicated in scientific developments to the actual data. |

Criteria for grading a student in an exam in the discipline

"Biotechnological features of the production of animal products":

| Exam grade | Requirements for formed competencies |
|-------------------|--|
| “excellent” | The student is rated as “excellent” if he has deeply and firmly grasped the program material, sets out it comprehensively, consistently, clearly and logically in order, knows how to closely relate theory to practice, freely copes with tasks, questions and other types of application of knowledge, and does not have difficulty the answer when modifying tasks, uses the material of monographic literature in the answer, correctly substantiates the decision made, has versatile skills and techniques for performing practical tasks. |
| «good» | The student is rated “good” if he knows the material well, correctly and essentially sets out it, avoiding significant inaccuracies in answering the question, correctly applies theoretical principles when solving practical questions and tasks, and possesses the necessary skills and techniques for their implementation. |

| | |
|------------------|---|
| "satisfactorily" | A student is rated "satisfactory" if he has knowledge of only the basic material, but has not learned its details, admits inaccuracies, insufficiently correct wording, violations of the logical sequence in the presentation of program material, and has difficulty performing practical work. |
| "Unsatisfactory" | Evaluation of "unsatisfactory" is given to a student who does not know a significant part of the program material, makes significant errors, uncertainly. with great difficulty performs practical work. As a rule, the rating "unsatisfactory" is given to students who cannot continue their studies without additional classes in the relevant discipline. |

Recommendations for independent work of students

Student's independent work (SIW) in the discipline "Biotechnological features of the production of animal products" includes the following activities:

- study of educational material (lecture notes, educational and scientific literature, normative and normative-technical documentation);
- preparation for practical exercises;
- Preparation of messages and presentations on given topics;
- preparation and implementation of reporting materials on the topics of practical training;
- preparation and writing of term paper;
- preparation for testing;
- exam preparation.

It is recommended that you spend an average of 2 hours a week on independent work.

Guidelines for the implementation of the SIW

The development of educational material using lecture notes, educational and scientific literature, normative and regulatory technical documentation, sanitary legislation documentation, etc. should be carried out regularly, sequentially throughout the semester. This will allow you to successfully master the following topics.

One of the types of SIW in the discipline is the preparation of reports and multimedia presentations on given topics.

Report topics

1. Types of animal raw materials for food, biologically active additives, enzyme preparations, etc.
2. Features of various types of animal raw materials.
3. Enzymes of animal raw materials and their role in food production.
4. The use of enzymes in the biotechnology of raw materials and animal products
5. Technological features of proteolytic enzymes of various origins
6. Immobilized enzymes in food technology.
7. Biotechnological methods of the ripening process of meat.
8. Enzyme preparations in the processing of raw meat.
9. Starting crops in the technology of raw smoked meat products.
10. Microflora of raw smoked meat products and its influence on the ripening process.
11. Biotechnology in the production of food from poultry meat.
12. Methods for producing lactic acid starter cultures.
13. Characterization of microorganisms used for the production of yogurt, yogurt, fermented baked milk, fermented milk, koumiss, yogurt and other fermented milk products.
14. Enzyme preparations for the intensification of the production of fermented milk products.
15. Biotechnology of products from secondary dairy raw materials.
16. Assortment and classification of skim milk and buttermilk drinks.
17. Drinks fermented from un clarified whey.
18. Biotechnology of lacto-lactulose syrup, lactitol sugar alcohol, glucose-galactose syrups, hydrolyzed condensed milk whey.
19. Biotechnological aspects of cheese production.
20. The microbiological essence of cheese making. Ripening cheeses.
21. Biotechnological basis for the production of soft acid and rennet cheeses.

22. Biotechnological methods for preparing the milk-vegetable mixture in the production of soft cheeses.

23. Enzyme preparations in innovative technologies of preserves from fish fillets.

24. Biologically active substances in the waste from the cutting of fish raw materials. Production of biologically active additives based on aquatic organisms of animal origin.

25. Innovative technologies for producing hydrolysates, enzyme preparations, carotenoids, polyunsaturated fatty acids from waste from the cutting of hydrobionts. Chitin and chitosan from crustacean shells.

When preparing reports, it is necessary to use the sources of educational, educational, methodical, scientific literature, patent and regulatory documents. It is recommended to attract scientific articles not only from Russian, but also from foreign authors. The data selected for communication should be carefully analyzed, clearly structured and presented mainly in the form of analytical graphic materials (diagrams, tables, figures, graphs, charts, etc.).

When preparing reports, you must adhere to the following recommendations. The duration of the performance should be no more than 15 minutes. The content should cover all issues necessary for consideration. You should use only those terms and concepts whose meaning is known to the speaker and, if necessary, he can give explanations to the audience. The speaker should know well the material on the topic of his speech, quickly and freely navigate it. The content of the presentation should be followed. It is not permissible to read or repeat the text of the slides by heart. Speaker's speech should be clear, intelligible, moderate pace. After the presentation, the speaker should be able to essentially answer the questions of the audience.

In preparing the presentation should be guided by the following recommendations. The first slide should reflect information about the title of the topic (message) and the author of the presentation. Each slide should have a title, the information on it should correspond to the content of the report. The slide

should have a minimum amount of text, information should be presented in the form of tables, diagrams, graphs, figures, diagrams, etc. For all presentation slides, the same layout should be used. The font for the title is at least 24 pt., For the main text - at least 14 pt. For color design - no more than 3 colors on one slide. All slides must be numbered.

Reports and presentations are evaluated on a 10-point scale. Correspondence of the content to the report subject, completeness and structuredness of the presented material, presentation of the material, contact with the audience, answers to questions are taken into account.

In the preparation of the course work, it is necessary to draw up a course work plan, determine the issues to be considered, and determine the necessary information resources. It is recommended to perform the work in accordance with the schedule proposed by the teacher. Written parts of the work should be sent for examination to the supervisor, and for final verification to the teacher of the discipline. The defense of the term paper takes place in a practical lesson in discipline in the presence of students and a special commission, which includes teachers of the department and academic advisors. Assessment for term paper is set by the commission collegially.

Assessment of term paper is carried out on a 5-point scale. The content is consistent with the topic of the course work, the completeness and structure of the submitted material, the design of the course work, the presentation of the material, the quality of the presentation prepared to protect it, and the answers to questions.

Guidelines that determine the procedures for assessing the results of mastering the discipline

Current student certification. The current certification of students in the discipline "Biotechnological features of the production of animal products" is carried out in accordance with local regulations of the FEFU and is mandatory.

The current certification in the discipline "Biotechnological features of the production of animal products" is carried out in the form of control measures (speaking with a message on practical work, drawing up analytical tables, intelligence cards, evaluating the work of other students, testing) to assess the actual learning outcomes of students and carried out by a leading teacher. The objects of evaluation are:

- academic discipline (activity in the classroom, timeliness of the various types of tasks, attendance of all types of classes in the certified discipline);
- the degree of assimilation of theoretical knowledge;
- the level of mastery of practical skills in all types of educational work;
- results of independent work.

The degree of assimilation of theoretical knowledge is evaluated during an interview, testing. The level of mastery of practical skills - while listening to messages on a given topic, the quality of presentations prepared by students. The results of independent work - in the preparation of analytical materials in the form of tables, diagrams, diagrams, figures, etc.

Interim certification of students. Interim certification of students in the discipline "Biotechnological features of the production of animal products" is carried out in accordance with local regulations of the FEFU and is mandatory. In accordance with the curriculum, the type of intermediate certification is an exam. Students who have fully completed the academic tasks in the discipline are allowed to the exam. The exam takes the form of an oral answer to the questions of the exam ticket. The student has 40 minutes to prepare. In the course of the answer, he is asked clarifying and additional questions to assess the degree of ownership of the material.

Evaluation tools for intermediate certification

Questions for exam preparation

1. Animal feed for food, dietary supplements, enzyme preparations.
2. Enzyme preparations in plant, animal and microbial origin in biotechnology of raw materials and products from animal raw materials.
3. Immobilized enzymes in food technology.
4. Starting crops in the technology of raw smoked meat products.
5. Microorganisms for the production of dairy products. Lactic Ferment
6. Standardization of meat.
7. Standardization of cheeses.
8. Standardization of dairy raw materials and products.
9. Standardization of fish.
10. Biotechnology of meat.
11. Biotechnology of dairy raw materials.
12. Biotechnology of products from secondary dairy raw materials.
13. Biotechnological aspects of the production of cheese.
14. Biotechnology of fish and hydrobionts.
15. Biotechnological methods for producing biologically active substances, enzyme preparations from secondary fish raw materials.

Sample Examination Ticket

МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ
Федеральное государственное автономное образовательное учреждение высшего образования

«Дальневосточный федеральный университет»

ИНСТИТУТ НАУК О ЖИЗНИ И БИОМЕДИЦИНЫ (ШКОЛА)

19.04.01 Биотехнология

Дисциплина Биотехнологические особенности продуктов животного происхождения

Форма обучения очная

Семестр осенний 2019 - 2019 учебного года

осенний, весенний

Департамент пищевых наук и технологий

реализующий департамент

Examination ticket № 1

1. Biotechnology of carbohydrate-containing syrups from secondary milk raw materials.
2. Starting crops in the technology of raw smoked products.

Director of the
Department of Food Science and Technology

T.K.Kalenik

Sample topics of term paper in the discipline

"Biotechnological features of the production of animal products"

1. Biotechnological features of the production of combined foods based on animal raw materials.
2. Enzyme preparations in the production of meat products.
3. Enzyme preparations in the production of cheese.
4. Enzyme preparations in the production of lactic acid products.
5. Innovative technologies for processing whey.
6. Biotechnological processing of ostrich meat using enzyme preparations.
7. The technology of salting fermented products from deer meat.
8. Functional food products based on animal raw materials.
9. Biotechnology of goat milk based curd products.
10. Starter microflora in the production of cheese.

Criteria for grading a student for term paper in the discipline

"Biotechnological features of the production of animal products":

| Term paper grade | Requirements for the content, design, protection of term paper |
|-------------------------|--|
| «excellent» | Is given to the student if the student fully presented the material on the formulated problem, argued for it, precisely determined its content and components. The data of domestic and foreign literature, statistical information, regulatory information are given. The student knows and possesses the skill of independent research work on the topic of research; methods and techniques of analysis of theoretical and / or practical aspects of the study area. Graphically, the work is framed correctly. The report and presentations are made at a high level. When defending the work, comprehensive answers to questions are given. |
| «good» | the work is characterized by semantic integrity, coherence and consistency of presentation; no more than 1 mistake was made in explaining the meaning or content of the problem. For argumentation, data from domestic and foreign authors are given. Demonstrated research skills. There are no actual errors related to understanding the problem. Minor errors in the design of the work. When answering questions, inaccuracies were made. |
| "satisfactorily" | the student conducts a fairly independent analysis of the main stages and semantic components of the problem; understands the basic foundations and theoretical justification of the chosen topic. The main sources on this topic are brought. No more than 2 errors were made in the sense or content of the problem, the design of the work. The student has difficulty answering questions. |
| "Unsatisfactory" | the work is a completely rewritten source text without any comments, analysis. The structure and theoretical component of the topic is not disclosed. The bibliography contains a limited number of sources. Three or more errors were made in the semantic content of |

| | |
|--|---|
| | the disclosed problem and in the design of the work. The student is poorly oriented in the material presented, is experiencing serious difficulties in answering questions. |
|--|---|

Evaluation tools for ongoing certification

The following are used as means for the current certification in the discipline "Biotechnological features of the production of animal products":

- input control in the form of a written work;
- Messages and presentations prepared by students on a given topic;
- preparation of analytical tables, intelligence cards;
- testing.

Evaluation criteria for oral presentations made in the form of presentations

| Report Evaluation | Content Requirements |
|--------------------------|---|
| 10-9 points | are given to the student if the student expressed his opinion on the formulated problem, argued for it, accurately determining its content and components. The data of domestic and foreign literature, statistical information, regulatory information are given. The student knows and possesses the skill of independent research work on the topic of research; methods and techniques of analysis of theoretical and / or practical aspects of the study area. There are no factual errors related to understanding the problem; graphically, the work is framed correctly |
| 8-7 points | the work is characterized by semantic integrity, coherence and consistency of presentation; no more than 1 mistake was made in explaining the meaning or content of the problem. For argumentation, data from domestic and foreign authors are given. Demonstrated research skills. There are no actual errors related to understanding the problem. One or two errors in the design of the work |
| 6-5 points | the student conducts a fairly independent analysis of the main stages and semantic components of the problem; understands the basic foundations and theoretical justification of the chosen topic. The main sources on this topic are brought. No more than 2 errors were made in the meaning or content of the problem, the design of the work |
| less than 5 points | the work is a retransmitted or completely rewritten source text without any comments or analysis. The structure and theoretical component of the topic is not disclosed. Three or more than three errors were made in the semantic content of the disclosed problem and in the design of the work |

Presentation Evaluation Criteria:

| Rating | less than 5 points (unsatisfactory) | 5-6 points (satisfactory) | 7-8 points (good) | 9-10 points (excellent) |
|----------------------------------|--|---|---|--|
| Criteria | The content of the criteria | | | |
| Disclosure of the problem | The problem is not solved. Missing conclusions | The problem is not fully disclosed. Conclusions are not made and / or conclusions are not substantiated. | The problem is solved. The analysis of the problem without involving additional literature. Not all conclusions are made and / or substantiated | The problem is fully disclosed. The analysis of the problem with the involvement of additional literature. The conclusions are justified. |
| Performance | The information provided is not logically related. No professional terms used | The information provided is not systematized and / or inconsistent. 1-2 professional terms used | The information provided is not systematic and consistent. More than 2 professional terms used. | The information presented is systematized, consistent and logically connected. More than 5 professional terms used. |
| Design | Not used Power Point technology. More than 4 errors in the information provided | Partial Power Point technology used. 3-4 errors in the information provided | Used Power Point technology. No more than 2 errors in the information provided | Widely used technology (Power Point, etc.). There are no errors in the information provided. |
| Answers on questions | No answers to questions. | Only answers to basic questions | Answers to questions full and / or partially complete | The answers to the questions are complete, with the appearance of examples and / or explanations |

Entrance control. Written Examination Questions

Entrance control in the form of a written test is carried out at the first practical lesson to assess the student's readiness to study the discipline "Biotechnological features of animal products." Basic knowledge regarding objects, processes and biotechnology products is subject to verification. The student is asked two questions to which he must give a brief written answer. The task takes 10-15 minutes. The results of the assessment of this work are informative in nature and do not affect the overall assessment of the discipline.

Variant 1

1. The main objects of biotechnology.
2. The main biotechnology products used in health care, agriculture, food industry, energy, chemical industry.

Test tasks on the topic "Meat raw materials"

Variant 1

1. To obtain rennet use:
 - a) the stomach of pigs
 - b) abomasum of young calves
 - c) cattle abomasum

2. The moisture content in meat affects:
 - a) organoleptic indicators
 - b) the amount of minerals
 - c) for amino acid rate

3. The sequence of post-slaughter changes in meat:
 - a) maturation, deep autolysis, rigor mortis
 - b) muscle rigor, maturation, deep autolysis
 - c) deep autolysis, rigor mortis, maturation

4. Introduction to meat of plant enzymes contributes to:
 - a) extension of shelf life
 - b) softening meat tissue
 - c) color stabilization

5. Carbohydrate muscle tissue:
 - a) hemoglobin, myoglobin
 - b) glycogen, maltose, glucose
 - c) cholesterol, lactose

6. Offal of the first category:
 - a) brains; liver, kidneys

- b) spleen, heart, trachea
- c) light, pork tail

7. Secondary meat protein-containing raw materials include:

- a) meat 2 varieties
- b) pork skin, shkvara, offal 2 categories, blood
- c) fatty pork

8. Plant-based enzymes for processing raw meat:

- a) papain, bromelain, ficin;
- b) pepsin, chymotrypsin, ficin;
- c) papain, trypsin.

9. The meat is considered frozen if its temperature:

- a) minus 5 ° C
- b) minus 8 ° C
- c) 0 - 4 ° C

10. Ripening of meat occurs under the influence of:

- a) oxygen;
- b) temperature factor;
- c) own intracellular enzymes.

Criteria for assessing the implementation of test tasks "Meat raw materials":

Credited – 7-10 points

Not credited – less than 7 points