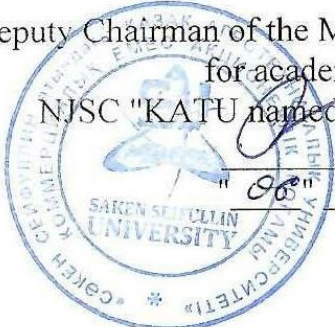


Ministry of Agriculture of the Republic of Kazakhstan

Kazakh Agrotechnical Research University named after. S.Seifullin

Considered  
at a meeting of the  
Academic Council  
of the University  
Protocol No. 16  
from " 24 " 05 2021

APPROVED  
Deputy Chairman of the Management Board  
for academic affairs - rector  
NJSC "KATU named after S. Seifullin"  
Abdyrov A.M.  
" 06 " 09 2021



**EDUCATIONAL PROGRAM**  
**"6B09102-Food safety"**

Code and classification of field of education: 6B09 Veterinary  
Code and classification of areas of training: 6B091 Veterinary  
Code in the International Standard Classification of Education: 0941  
Awarded degree/qualification: Bachelor of Veterinary Science in educational  
program 6B09102 - " Food Safety "

Duration of study: 5 years

Astana 2023

**Authors' team:**

Full name - academic degree, title, position, place of work


1. Abdrakhmanov Sarsenbay Kadyrovich, doctor of the veterinary science, professor, Dean of the Faculty of Veterinary Medicine and Animal Husbandry Technology, S.Seifullin State Medical University;
2. Adilbekov Zhanat Shabanbaevich, Ph.D., Associate Professor, Head of the Department of Veterinary Sanitation, KATRU named after. S.Seifullin;
3. Maikanov Balgabay Sadepovich, Doctor of Biological Sciences, Professor, S.Seifullin KATRU;
4. Dzhakupov Isatay Tusupovich, Doctor of Veterinary Sciences, Professor, KATRU named after. S.Seifullin;
5. Balji Yuri Alexandrovich, Ph.D., Associate Professor, KATRU named after. S.Seifullin;
6. Mustafina Raikhan Khusainovna, PhD, senior teacher, KATRU named after. S.Seifullin;
7. Sarsebekov Lukman Toleuuly, Director of Production of "Celinaya Delicacies Factory" LLP Talgat Bolatovich Karibaev, Head of the Laboratory for Diagnostics of Infectious Diseases, "National Reference Center in Veterinary " CVCS Ministry of Agriculture of the Republic of Kazakhstan;
8. Turmagambetov Shaken Nurushevich, director, "InvestPromAimak" housing and construction society;
9. Abdulkhalikov Sembay Bagdatshauly, Director of Republican Anti-Epizootic Detachment CVCS Ministry of Agriculture of the Republic of Kazakhstan;
10. Karibayev Talgat Bolatovich, Head of the Laboratory for the Diagnosis of Infectious Diseases, RSE at the National Reference Center in Veterinary Medicine KVKiN Ministry of Agriculture of the Republic of Kazakhstan;
11. Koishibaeva Meiramgul Sailauovna, 4th year student, KATRU named after. S.Seifullin;
12. Tolesh Salamat, 3rd year student, KATRU named after. S.Seifullin.

The team of authors was approved by order of JSC "KATRU named after S. Seifullin" No. 6 dated "07" 02 2023


**Educational program "Food Safety"**

reviewed at the meeting of the Department of Veterinary Sanitation, protocol No. 15 dated April 29, 2023 , approved by the Council of the Faculty of Veterinary and Livestock Technology, protocol No. 09 dated May 4, 2023 .

Dean of the Faculty of Veterinary and Livestock  
Technology Doctor of Veterinary Sciences

 Abdrakhmanov S.K.

Head of the Department of Veterinary Sanitation

 Adilbekov Zh.Sh.

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## **1 Educational passport programs**

### **1.1 The purpose of educational programs:**

The main goal of the educational program “Food Safety” is to train highly qualified specialists in the area of ensuring biological and food safety, as well as food quality control, which is currently relevant and a priority. In this regard, the content of the educational program is aimed at obtaining knowledge and practical skills for carrying out veterinary and sanitary examination of livestock products in the conditions of the Eurasian Economic Union and accession to the WTO, as well as in accordance with the requirements and recommendations of international veterinary organizations (OIE, FAO, WHO, etc.).

The ultimate goal of the educational program “Food Safety” presupposes a clear orientation to the future, which is manifested in the ability to build one’s education taking into account success in personal and professional activities. This program is designed taking into account the requirements of potential employers who need specialists to work in laboratories for veterinary and sanitary examination of food products.

Graduates will be able to monitor the quality and safety of meat and meat products, milk and dairy products, fish and fish products, eggs, honey, raw materials of animal origin and individual plant products, using organoleptic, microbiological, physicochemical, biochemical, toxicological, radiological, histological, ELISA methods, ICA, PCR, HPLC and other studies.

### **1.2. Learning outcomes**

**RE 1.** Describe and connect knowledge in the field of general educational disciplines, know general concepts about legal and anti-corruption culture, determine the importance of the principles and culture of academic integrity for the formation of a competent individual with high thinking potential, and also extract modern ideas in the information structure in the field of professional activity.

**RE 2.** Formulate zoological taxonomy, determine the anatomical and morphological features of the structure of organs and body systems of animals, understand the essence of physiological and biochemical processes in the body of animals, master methods of microscopic study of cells, tissues and organ systems.

**RE 3.** Know Latin grammar and the basics of Latin veterinary terminology, a professional foreign language for written and oral information exchange.

**RE 4.** Explain the patterns of inheritance of changing characteristics of living organisms, master the skills of biometric processing of primary material, carry out a sanitary and hygienic assessment of the system of keeping, feeding and watering animals and birds, determine the chemical composition and zootechnical indicators of feed, organize standardized feeding of animals.

**RE 5.** Understand the basic mechanisms of pharmacodynamic effects caused by drugs and know the principles of dosing of veterinary drugs. Know toxicity testing methods, identify causes and provide first aid for poisoning of farm animals. Know the pathological processes and changes in the organs and systems of the body during diseases, methodically correctly conduct autopsies of animal corpses.

**RE 6.** Understand the epizootic process, know the systematics, genetics, morphology and physiology of pathogens of infectious and viral diseases, make a diagnosis, conduct allergic and clinical, epizootological examinations, vaccinate animals, develop an action plan for infectious animal diseases.

**RE 7.** Know the rules for conducting veterinary and sanitary control during the production, transportation, storage and sale of products and raw materials of animal origin, management and legislative regulation in veterinary medicine, methods for determining economic damage and the economic efficiency of veterinary measures.

**RE 8.** Interpret the basic laws of zoology, systematization of species of the animal world, apply the main groups of antiparasitic drugs to treat sick animals, birds, fish and evaluate their quality and effectiveness.

**RE 9.** Know the theoretical and practical foundations of veterinary radiobiology, work with dosimetric instruments, acquire skills in laboratory, clinical diagnostics, clinical examination, therapeutic techniques, carry out therapeutic and preventive measures for surgical, obstetric-gynecological and internal diseases of animals.

**RE 10.** Master the rules of veterinary care for slaughter animals, technology and hygiene in the production of products of animal origin, acquire the skills of veterinary and sanitary examination to assess the quality and safety of livestock products at each stage of production, as well as veterinary forensic examination.

**RE 11.** Be able to carry out veterinary and sanitary control at the border and transport, at meat and dairy enterprises, carry out quality control of meat and dairy products, as well as crop, fish farming and beekeeping products, know the rules for sanitary assessment of the quality and safety of products when contaminated with foreign substances.

**RE 12.** Consider issues of organization and production of livestock products on farms of various forms of ownership, master methods for determining the productivity of farm animals.

**RE 13.** Possess the skills of conducting epizootological examination and monitoring, organizing preventive and anti-epizootic measures, know the patterns of manifestation of trans-boundary and exotic animal diseases

**RE 14.** Know theoretical and practical knowledge of hormones, enzymes, proteins, nucleotides and nucleosides, the structures of DNA, RNA, biosynthesis of nucleic acids, Aminoacyl-tRNA synthetase, have the skills to solve chemical problems, draw up reaction equations, determine the main ways of practical use of organic compounds in agriculture farm.

## **2. General characteristics of the educational program (relevance, features, competitive advantages, uniqueness, stakeholders and etc.)**

The educational program “Food Safety” is compiled in accordance with the National Qualifications Framework and professional standards, consistent with the Dublin descriptors and the European Qualifications Framework. The educational program contains theoretical training, including the study of cycles of general education, basic and major disciplines; additional types of training, professional practice, physical education, etc. The volume of the educational program is 300 credits, including 240 credits of theoretical training, 28 credits of professional practice, 8 credits of physical education and 12 credits of writing a thesis or final certification.

The relevance of the developed educational program (EP) lies in the fact that it is harmonized with the requirements of the standard curriculum and the competencies of a first-day graduate (veterinary specialist) by the World Health Organization and FAO, which makes it possible to integrate the EP into the international veterinary educational space.

The peculiarity of the developed EP is that in terms of structure, logic of training and discipline components, it is 60-70 % with educational work programs with the world's leading universities in the field of veterinary education (J. Liebig University of Giessen, University of California Davis, Toulouse National veterinary school), which will contribute to the professional mobility of students.

The main stakeholders are: regional territorial inspections of the KVKN of the Republic of Kazakhstan, the Republican Veterinary Laboratory of the RSE on PCV, the Republican State Institution Republican Anti-Epizootic Squad, LLP Astana aulsharashylygy onimderi zerthanasy (TD "Alem", TD "Eurasia", KR "Shapagat", TD "Artem"), National veterinary reference center, as well as veterinary clinics located in the city of Astana.

## **3 Competency model (portrait) graduate**

### **3.1 Professional areas activities**

- veterinary laboratories (food departments security);
- laboratory of veterinary and sanitary examination of food markets;
- in-house production control laboratories of meat and dairy enterprises industry;
- enterprises for the production, processing, storage, sale of food products and animal

feed origin;

- institutions of the state veterinary service, at veterinary posts on the border and transport, at checkpoints;
- enterprises for the production and control of biological preparations and biologically active substances, veterinary pharmacies;
- research institutes, public and private veterinary organizations profile;
- slaughterhouses, vehicles for transporting animals, premises for keeping animals.
- all types of agricultural business entities production;

### **3.2 Types of professional activities**

Types of professional activities are:

- production and technological;
- organizational and managerial;
- experimental research;
- scientific research;
- design;
- educational;
- military veterinary service;

### **3.3 General educational competencies**

Disciplines of the mandatory component of the GED cycle:

- aimed at developing the worldview, civic and moral positions of a future specialist, competitive on the basis of mastery of information and communication technologies.

- form skills of self-development and education throughout life;

- upon completion of studying the compulsory disciplines of the GED cycle, the student is able to:

- evaluate the surrounding reality on the basis of ideological positions formed by knowledge of the fundamentals of philosophy.

- justify your own assessment of everything that happens in the social and industrial spheres;

The UC and (or) CC disciplines of the GED cycle consist of at least 5 academic credits, which are aimed at developing students' competencies in the field of economics and law, the basis of anti-corruption culture, ecology and life safety, as well as entrepreneurship skills and scientific research methods.

Descriptors reflect learning outcomes that characterize students' abilities:

1) demonstrate knowledge and understanding of the field of study based on advanced knowledge;

2) apply knowledge and understanding at a professional level, formulate arguments and solve problems in the field of study;

3) collect and interpret information to form judgments, taking into account social, ethical and scientific considerations;

4) apply theoretical and practical knowledge to solve educational, practical and professional problems in the field of study;

5) learning skills necessary for independent continuation of further education in the field of study;

6) know the methods of scientific research and academic writing and apply them to the field of study;

7) apply knowledge and understanding of facts, phenomena, theories and complex dependencies between them in the studied area;

8) understand the importance of the principles and culture of academic integrity.

### **3.4 Basic competencies**

The programs of disciplines and modules of the BD and PD cycles are interdisciplinary and multidisciplinary in nature, providing training for veterinary specialists at the intersection of a number of areas of knowledge.

The EP ensures that graduates acquire basic competencies that meet the WHO and FAO requirements for specialists. The OP trajectory provides for training graduates in special competencies in the field of examination, quality and food safety, veterinary hygiene, pharmacy, animal welfare, national and international veterinary legislation and ethics.

Graduates receive practical competencies in the field of organizing veterinary services, veterinary inspection and certification, food safety, risk methodology, analysis of scientific research, ensuring safe and high-quality products of animal origin in business.

### **3.5 Professional competencies**

*Legislative regulation of veterinary affairs in the Republic of Kazakhstan:* know the structure of the veterinary service of the republic and the functions of state veterinary organizations, modern methods of disinfection of biological waste, wastewater from livestock breeding and processing enterprises; state policy in the field of veterinary medicine and veterinary activities related to the state monopoly;

*Technical Regulations "On Food Safety":* know the main indicators of state standards for determining the quality, safety and market value of livestock, poultry, fish farming, meat and milk products, beekeeping and crop products. Requirements for food products, for the processes of production (manufacturing), storage, transportation (transportation), sales and disposal.

*Veterinary and sanitary control and supervision of food quality and safety:* master modern methods for assessing the quality and safety of food products during procurement, processing, production, transportation, storage and sales; exercise control over the veterinary and sanitary condition of enterprises processing products and raw materials of animal origin and ensure the production of high-quality products; carrying out a set of general veterinary-sanitary and organizational-economic measures upon detection of diseases of infectious, invasive and non-infectious etiology.

## **4 Professional passing base practitioner**

The educational program "Food Safety" includes 4 types of practices, which are carried out in parallel with theoretical training or in a separate period.

- 1) Educational practice in a cycle DB;
- 2) Educational and clinical practice in a cycle DB;
- 3) Industrial practice in a cycle PD;
- 4) Pre-diploma internship in a cycle PD.

Educational practice - practice bases: veterinary clinics in Astana - "Zoosphere", "Kulager", JSC "Astana Onim", National Reference Center for Veterinary Medicine of the Ministry of Agriculture of the Republic of Kazakhstan.

Educational and clinical practice: KGP at the PVC "Vetservice", slaughter point "Altyn Taga", LLP "Astana Onim", veterinary clinics "Vitadog", "Zoosphere", "Vetexpress", LLP Astana auylysharashylygy onimderi zerthanasy (TD "Alem", TD "Eurasia", KR "Shapagat", TD "Artem"), LLP "Virgin factory delicacies", RSU "Republican anti-epizootic detachment" Ministry of Agriculture RK, territorial Inspectorate of Astana, RSE at the RVC "Republican Veterinary laboratory".

Production practice – RGP "Republican veterinary laboratories" Ministry of Agriculture RK, regional territorial inspection, "Committee of Veterinary Control and Supervision" of the Ministry of Agriculture of the Republic of Kazakhstan of Akmola, North Kazakhstan, Karaganda, Pavlodar region, RSE "Republican Veterinary Laboratories" of the Ministry of Agriculture of the Republic of Kazakhstan, RGU "Republican Anti-Epizootic Squad" of the Ministry of Agriculture of the Republic of Kazakhstan, National Reference Center for Veterinary Medicine of the Ministry of Agriculture of the Republic of Kazakhstan, Astana.

Pre-graduation practice: RSE "Republican Veterinary Laboratories" of the Ministry of Agriculture of the Republic of Kazakhstan, regional territorial inspections, "Committee of Veterinary Control and Supervision" of the Ministry of Agriculture of the Republic of Akmola, North Kazakhstan, Karaganda, Pavlodar regions, RG "Republican Veterinary

Laboratories" of the Ministry of Agriculture of the Republic of Kazakhstan, RSU "Republican Anti-Epizootic Squad" » Ministry of Agriculture of the Republic of Kazakhstan, National Reference Center in Veterinary of the Ministry of Agriculture of the Republic of Kazakhstan, Astana.

### Structure of the educational program

No.	Name of cycles and disciplines	Total labor intensity	
		in academic hours	in academic credits
1	2	3	4
<b>1</b>	<b>Cycle of general education disciplines (GED)</b>	<b>1680</b>	<b>56</b>
1)	<b>Required component</b>	<b>1530</b>	<b>51</b>
	History of Kazakhstan	150	5
	Philosophy	150	5
	Foreign language	300	10
	Kazakh (Russian) language	300	10
	Information and communication technologies	150	5
	Module of socio-political knowledge (political science and sociology, cultural studies and psychology)	240	8
	Physical Culture	240	8
2)	<b>Component of choice</b>	<b>150</b>	<b>5</b>
	Fundamentals of Economics and Law Fundamentals of anti-corruption culture Innovative entrepreneurship Labor protection and basic life safety Fundamentals of scientific research	150	5
<b>2</b>	<b>Cycle of basic disciplines (BD)</b>	<b>3930</b>	<b>131</b>
1)	University component	<b>2 940</b>	<b>98</b>
	Anatomy of animals and birds 1	150	5
	Anatomy of Animals and Birds 2	150	5
	Latin veterinary terminology	120	4
	Animal Physiology	150	5
	Biochemistry of animals	150	5
	Veterinary microbiology and immunology	1 80	6
	Private microbiology	120	4
	Veterinary hygiene and sanitation 1	150	5
	Veterinary hygiene and sanitation 2	150	5
	Veterinary pharmacology	120	4
	Clinical pharmacology with toxicologists _	150	5
	Cytology, embryology and histology	150	5
	Pathological physiology	150	5
	Pathological anatomy of animals 1	150	5
	Pathological anatomy of animals 2	1 50	5
	Feeding the animals	1 50	5
	Livestock	90	3
	Clinical diagnostics of animals	90	3
	Bioorganic chemistry	150	5
	Educational practice	120	4
	Educational and clinical practice	150	5
2)	Component of choice	<b>990</b>	<b>33</b>



	Zoology Zoogeography	90	3
	Veterinary virology Virological research methods	120	4
	Veterinary genetics with basics of biostatistics Veterinary genetics with the basics of animal breeding	150	5
	Laboratory work in veterinary medicine Laboratory diagnostics in veterinary medicine	90	3
	Veterinary surgery Small Animal Surgery	120	4
	Internal diseases of animals Practical therapy _	150	5
	Veterinary radiobiology For the sake of biological safety	90	3
	Epizootic monitoring and organization of veterinary measures Transboundary and exotic animal diseases	1 80	6
<b>3</b>	<b>Cycle of major disciplines (PD)</b>	<b>3090</b>	<b>103</b>
1)	<b>University component</b>	<b>2 460</b>	<b>82</b>
	Professionally oriented foreign language	90	3
	Veterinary obstetrics and gynecology	150	5
	Veterinary and sanitary examination of livestock and poultry products 1	150	5
	Veterinary and sanitary examination of livestock and poultry products 2	150	5
	Veterinary and sanitary examination of livestock and poultry products 3	150	5
	Technology, sanitation and veterinary and sanitary examination of meat and dairy products 1	150	5
	Technology, sanitation and veterinary and sanitary examination of meat and dairy products products 2	150	5
	Veterinary epidemiology 1	150	5
	Veterinary epidemiology 2	150	5
	Parasitology and invasive animal diseases 1	90	3
	Parasitology and invasive animal diseases 2	150	5
	Veterinary and sanitary examination of crop, fish and beekeeping products 1	150	5
	Veterinary and sanitary examination of crop products, fish farming and beekeeping 2	150	5
	Internship	600	20
	Undergraduate practice	30	1
2)	<b>Component of choice</b>	<b>630</b>	<b>21</b>
	Veterinary control at the border and transport Veterinary and sanitary supervision during export-import transportation	30	3
	Food safety 1 Contamination of livestock products 1	150	5
	Food safety 2 Contamination of livestock products 2	150	5
	Forensic veterinary examination Forensic thanatology	150	5

	Management in veterinary medicine Organization of veterinary affairs	90	3
<b>4</b>	Additional types of training (ADE)		
<b>5</b>	final examination	240	8
1)	Writing and defending a thesis (project) or preparing and passing a comprehensive exam	240	8
	Total	<b>9000</b>	<b>300</b>

Duration of training 5 years

## Annex 1 . Academic calendar

Утверждаю

Председатель Ученого Совета  
НАО «КАТИУ им.С.Сейфуллина»

Тиреуов К.М.

« 29 » 05 2023 г.

### АКАДЕМИЧЕСКИЙ КАЛЕНДАРЬ

на 2023-2024 учебный год

по уровням подготовки

(БАКАЛАВРИАТ)

1	Презентационная неделя, регистрация на дисциплины	1 курс с 28 августа включительно 31 августа
2	<b>I семестр</b>	<b>с 1 сентября по 15 декабря</b>
3	<i>День конституции</i>	<i>30 августа</i>
4	День знаний	1 сентября
5	<i>День Республики</i>	<i>25 октября</i>
6	<i>День независимости</i>	<i>16 декабря</i>
7	Экзаменационная сессия	с 18 по 29 декабря
8	Сдача FX	с 18 по 29 декабря
9	<i>Новогодний праздник</i>	<i>1, 2 января</i>
10	Каникулы	с 1 января по 26 января
11	<b>II семестр</b>	<b>29 января по 10 мая</b>
12	<i>Международный женский день</i>	<i>8 марта</i>
13	<i>Праздник Наурыз</i>	<i>21,22,23 марта</i>
14	<i>Праздник единства народа Казахстана</i>	<i>1 мая</i>
15	<i>День защитника Отечества</i>	<i>7 мая</i>
16	<i>День Победы</i>	<i>9 мая</i>
17	Экзаменационная сессия	с 13 мая по 24 мая
18	Сдача FX	с 13 мая по 31 мая
19	Запись на летний семестр	с 27 мая по 31 мая
20	Итоговая аттестация	до 30 июня
21	Летний семестр	с 3 июня по 12 июля
22	Каникулы	с 27 мая по 31 августа
23	<i>День Столицы</i>	<i>6 июля</i>
	Практика*	

Утвержден на Ученом совете НАО «КАТИУ им.С.Сейфуллина»,  
протокол № 16 от 29.05.2023 г.

**Примечание:** В случае совпадения с выходным или праздничным днем занятие начинается в следующий рабочий день.

\* Виды и сроки профессиональной практики определяются рабочим учебным планом образовательных программ.









**Appendix 3 Matrix of achievability of the generated learning outcomes in the educational program using academic disciplines**

No.	Name of the discipline	Brief description of the discipline	Number of credits	Formed learning outcomes													
				RO 1	RO 2	RO 3	RO 4	PO5	RO 6	RO 7	RO 8	RO 9	RO 10	RO 11	RO 12	PO13	PO14
<b>Cycle of general education disciplines University component/Elective component</b>																	
	<i>Fundamentals of Economics and Law</i>	Studies the basics of economics and law, gives basic concepts on social production, economic systems, mechanisms of functioning of the market system (demand, supply, price and competition). Forms concepts about production, costs and income of the company. Includes the study of the national economy (content, structure and measurement of results), government regulation and economic security of the national economy, the main branches of Kazakhstan law (civil, labor, criminal law).	5	V													
	Entrepreneurship	The discipline is focused on developing in students a comprehensive understanding of entrepreneurship and the possibilities of organizing entrepreneurial activities. The content of the discipline characterizes the essence of entrepreneurial activity, its types and functions, business entities and the business environment, and also reflects the features of the mechanism for creating your own business, business planning, financial and personnel support, characterizes the types of business risks and ways to prevent and minimize them.	5	V													
	Law and anti-corruption culture	Issues under study: the essence of corruption as a social and legal phenomenon; manifestation of corruption in public life; measure of moral and legal responsibility for corruption offenses; current legislation in the field of anti -corruption; prevention of crime . Competencies being developed: orientation in matters of current legislation; possession of skills in the analysis of legal acts, relations regulated by law, legal analysis of information; application of	5	V													



		the law in specific situations, adherence to moral and legal norms in everyday practice; expression and justification of one's own point of view on issues of law and anti-corruption culture; conducting polemics in the legal field.															
	Safety vital activity	Formation of knowledge and practical skills in students to identify dangerous and harmless natural conditions, to prevent the causes and conditions of dangerous situations, to protect the population and production facility and the national economy from the possible consequences of dangerous situations. Features of labor protection for women and youth, supervision and control over compliance with labor protection legislation and responsibility for compliance with labor protection standards.	5	V													
	Ecology		5	V													
	Scientific Research Methods		5	V													
<b>Cycle of basic disciplines University component</b>																	
	Anatomy of animals and birds 1	Studies the general patterns of the structure of the animal body, determines the sections and directions of the animal body. Considers the sections of osteology, syndesmology, myology, dermatology .	5		V												
	Anatomy of Animals and Birds 2	Studies the patterns of structure of the internal organs of animals and birds, features of topographic data depending on the species. Describes the structure of the digestive and respiratory systems, as well as the urinary, endocrine, immune , cardiovascular and nervous systems and reproductive organs of animals , the features of their structure depending on the type of animal. Examines the features of the organs of the circulatory and lymph circulation systems and the importance of analyzers (organs of vision, hearing, smell, touch and taste) .	5		V												

	Latin veterinary terminology	Considers issues of knowledge of the Latin alphabet and Latin terminology, classification of medical and veterinary terms, reading words and phrases of the Latin language in compliance with the rules of the lexical and grammatical minimum of the veterinary profile, and the implementation of spelling correct writing of anatomical, histological and clinical terms. Forms skills in using Latin veterinary terminology in professional activities.				v											
	Veterinary hygiene and sanitation 1	Determines the sanitary and hygienic assessment of systems for keeping , feeding and watering animals and birds, the influence of various climatic factors on the health and productivity of animals and birds . Studies soil hygiene, sanitary and hygienic assessment of various methods of removal, storage and disinfection of manure, veterinary and sanitary methods for testing and disinfecting water, as well as veterinary and sanitary standards and requirements for feed quality.	5				v										
	Veterinary hygiene and sanitation 2	Studies sanitary and hygienic requirements for livestock buildings, sanitary and hygienic assessment of ventilation of livestock buildings, zoohygienic requirements for keeping farm animals, the basics of designing livestock buildings. Gives skills in calculating air exchange and heat balance of livestock buildings. Studies private hygiene and zoohygienic requirements when transporting animals.	5				V										
	<i>Feeding the animals</i>	Studies the importance and role of animal feeding in the production of livestock products, assessment of the nutritional value of feed, methods of zootechnical analysis of feed. Forms skills in prescribing and selecting the correct, standardized feeding of animals, taking into account the species, breed, age, and productivity.	5				V										
	Livestock	Considers issues of organization and production of livestock products on farms of various forms of ownership, methods for determining the productivity of farm animals. Studies the	5											v			

		characteristics of breeds bred in Kazakhstan and abroad, their use for the production of one or another type of product in the country and in the world.															
	Animal Physiology	Forms theoretical knowledge on the structural and functional organization of animals, homeostasis, the principles of nervous and humoral regulation of functions, the physiology of parts of the central nervous system and the autonomic nervous system, the cerebral cortex, modern ideas about ethology, the physiology of the cardiac system, digestive and respiratory systems. Studies the physiological processes occurring in the body of animals, the role and physiology of the endocrine glands, the biological significance of energy and metabolic processes, the processes of excretion of waste products of the body	5		V												
	Bioorganic chemistry	Studies the basic concepts of theoretical organic chemistry, the relationship between composition and structure, and the reactivity of organic substances. Forms skills in solving chemical problems, drawing up reaction equations, and determines the main ways of practical use of organic compounds in agriculture.	5		V												
	Biochemistry of animals	Forms theoretical and practical knowledge on hormones, enzymes, proteins, nucleotides and nucleosides, DNA, RNA structures, nucleic acid biosynthesis, Aminoacyl-tRNA synthetase. Studies the stages of protein synthesis, the multi-enzyme mechanism of protein synthesis, recombinant molecules and problems of genetic engineering, methods of hybridization, protein biosynthesis, biochemistry of blood, muscle tissue, urine excretion, milk and milk formation.	5		V												
	Veterinary microbiology and immunology	Studies the systematics, genetics, distribution, morphology, physiology and immunology of pathogens, the defense mechanisms of the macroorganism (immune system, cells that carry out the immune response, antibodies, cellular receptors for them and complement, the body's immune response). Forms competencies in studying the cul-	6						V								

		tural and biochemical properties of microorganisms, studying the microflora of water, milk, soil, and air.															
	Private microbiology	Studies the causative agents of infectious diseases: pathogenic cocci, enterobacteria families, brucellosis, tuberculosis, swine erysipelas, listeriosis, leptospirosis, anthrax, pathogenic anaerobes, pathogenic spirochete, dermatomycosis. Considers issues of modern diagnostics and specific prevention of the most common infectious animal diseases.	4					V									
	Cytology embryology and histology	Studies the microscopic and submicroscopic structure and basic aspects of cell life, cell division and differentiation, classification of organ tissues, features of their development and structure, morphological basis of reactivity, adaptation and characteristics of organs and tissues. Forms skills in using microscopic and electron microscopic forms of technology	5														
	Pathological anatomy of animals 1	Studies pathoanatomical and pathohistological changes in organs and tissues in systemic non-contagious animal diseases of various etiologies: pathophysiology of general and local circulatory disorders and their relationship, typical microcirculation disorders, types of peripheral or local blood circulation and microcirculation. Considers issues of pathomorphology of the blood system and blood formation, hematopoietic organs, respiratory system, digestive organs, liver diseases, kidney diseases, diseases of the endocrine and nervous systems.	5					V									
	Pathological anatomy of animals 2	Studies the general clinical and pathomorphological characteristics of infectious diseases, the pathogenesis of local and general changes, their diagnostic significance, mixed infections and complications, the influence of various body reactions on the course and outcome of infectious diseases. Considers the features of pathomorphological and pathohistological changes in organs and tissues during acute and chronic bacterial infections, viral diseases, mycoses and mycotoxicoses by animal species, as well as protozoosis and helminthiasis. Forms the skills of pathological dissection of the corpses of	5					V									

		various domestic animals and birds.															
	Pathological physiology	Studies the general patterns of development of pathological processes in the body of animals in various diseases: general nosology, thanatology, general etiology, the effect of environmental factors, general pathogenesis, the influence of heredity, constitution, age , resistance, reactivity on the development of pathology. Considers issues of the damaging effects of causes, as well as inflammatory, dystrophic, necrobiotic, necrotic, tumor processes and compensatory-adaptive, restorative and pathomorphological, histological manifestations in these processes.	5					V									
	Veterinary pharmacology	Studies the classification of medicinal substances, the general patterns of interaction of medicinal substances with the body's biosubstance, as well as the pharmacokinetics and pharmacodynamics of medicinal products. Considers the mechanisms of action of substances that depress and excite the central nervous system (narcotic substances, opioid and non-opioid analgesics, neuroleptics and tranquilizers , analeptics of the cerebral cortex, medulla oblongata and spinal cord, general tonics).	4					V									
	Clinical pharmacology with toxicology	He studies substances that change the conduction of impulses through the efferent section of the reflex arc, reduce and increase the sensitivity of afferent nerve endings, substances that act on certain physiological and metabolic processes in the body, antimicrobial and antiparasitic agents. Considers the general patterns of the action of poisons on the body, methods of diagnosis and treatment of poisoning, classifies poisons by origin and purpose, studies poisoning with mineral poisons and pesticides, feed toxins, mycotoxins, phytotoxins, and animal poisons.	5														
	Clinical diagnostics of animals	Studies the methodology of clinical diagnosis of non-communicable diseases of farm animals, carnivores and birds, the scientific basis of diagnosis, prognosis assessment and establishment of epicrisis for diseases of various etiologies using classical and modern instrumental, clinical and la-	3									V					

		laboratory methods for assessing the functions of organs and body systems. Forms competencies in X-ray diagnostic methods: fluoroscopy, radiography, computed tomography, fluorography.															
	<i>Educational and clinical practice</i>	Provides skills in autopsy of corpses and disposal of pathological materials, as well as carrying out a set of diagnostic, therapeutic, preventive and anti-epizootic measures at veterinary facilities. Mastering the rules of sampling, methods of organoleptic and laboratory analysis of the good quality of food products, techniques for pre-slaughter and post-slaughter inspection of carcasses and internal organs of slaughtered animals.	5								V						
<b>Cycle of basic disciplines Elective component with alternatives</b>																	
	<i>Zoology</i>	Forms knowledge in matters of fitness and patterns of distribution of various animals on Earth. Studies all types of invertebrate and vertebrate animals, their body structure, taxonomy, origin of various animal species, development paths, diversity of animals, their role in nature, animal ecology.	4								V						
	<i>Zoogeography</i>	Demonstrates the basic patterns of distribution of various animals depending on natural and climatic conditions. Forms theoretical knowledge in the field of ecology of the animal world.	4								V						
	<i>Veterinary genetics</i>	Studies the fundamentals of modern genetics, the laws of heredity and variability using cytological and molecular principles of genetic analysis. Forms skills in the use of interspecific and intergeneric hybridization, statistical processing of experimental data.	5				V										
	<i>Veterinary genetics with the basics of animal breeding</i>	He studies the basics of molecular genetic analysis and its role in animal breeding. Forms theoretical and practical skills in breeding work in livestock breeding units.	5				V										
	<i>Veterinary virology</i>	Determines the characteristics, isolation and reproduction of viruses, the stability of viruses in the environment, the genetics and ecology of viruses, the pathogenesis of viral diseases, the body's antiviral immunity. Forms skills in diagnosis and specific prevention of viral diseases	4						V								

		of farm animals.															
	<i>Virological research methods</i>	General description of viruses, chemical composition, their resistance to various physicochemical and biological factors, rules and safety precautions when working with materials containing viruses, methods of growing viruses in chicken embryos and cell cultures, immunological methods of combating viruses, the emergence and spread of viral diseases, the fight against them, familiarization with the features of treatment and prevention.	4						V								
	Laboratory diagnostics in veterinary medicine	Forms theoretical and practical skills for working in a veterinary laboratory, studies modern methods of laboratory diagnosis of animal diseases. Studies the rules for organizing work in veterinary laboratories and maintaining the necessary documentation.	5								V						
	Laboratory work in veterinary medicine	Familiarizes with the structure, activities and ongoing research in state veterinary laboratories, with the definition of safety rules when working in veterinary laboratories. Studies modern laboratory research methods for diagnosing diseases of contagious and non-contagious etiology in animals.	5								V						
	Veterinary surgery	Forms surgical thinking skills when treating surgically ill animals. The issues of identifying surgical pathologies and carrying out therapeutic and preventive measures aimed at preserving the lives of animals and increasing their productivity are considered.	4								V						
	Small Animal Surgery	Forms theoretical and practical skills of the peculiarities of the course of surgical pathologies in small animals. Methods of diagnosis and treatment of surgical diseases.	4								V						
	Veterinary radiobiology	Examines the patterns of biological effects of ionizing radiation on the animal body. Forms knowledge in the field of dosimetry and radiometry.	3								V						
	Radiobiological safety	Considers the issues of protecting animals from exposure to ionizing radiation, and methods of providing assistance to animals exposed to radiation. Develops skills in working with measuring instruments in radiobiology.	3								V						
	Internal	Forms a general understanding of internal diseases	5								V						

	diseases of animals	of animals and the features of clinical examination of animals, clinical examination, therapeutic techniques, physiotherapy and physioprophyllaxis.															
	Hands-on therapy	Forms medical thinking skills and practical ability to use therapeutic equipment when carrying out therapeutic and preventive measures for internal diseases of animals.	5								V						
	Epizootic monitoring and organization of veterinary activities	Studies the general principles of epizootological research and monitoring, methods of epizootological analysis, planning of preventive and anti-epizootic measures. Develops skills in conducting epizootological examinations, statistical processing of obtained data, and organizing veterinary activities.	6						V								
	Transboundary and exotic animal diseases	Studies the patterns of manifestation of transboundary and exotic animal diseases, features of the epizootic process and develops skills in using modern methods in the diagnosis, treatment and prevention of these diseases.	6						V								
<b>Cycle of major disciplines University component</b>																	
	Professionally oriented foreign language	Forms professional foreign language speech of future specialists to improve the level of professional competence, proficiency in a professional foreign language for the implementation of written and oral information exchange, and further development of speech activity. Studies the rules of speech behavior in accordance with situations of professional communication, depending on the style and nature of communication in the social, everyday and academic spheres.	3				V										
	Veterinary and sanitary examination of livestock and poultry products 1	Studies regulatory documentation, methods of sanitary and hygienic examination of livestock products, determines the rules for their veterinary and sanitary assessment. Studies the basics of technology and hygiene of animal slaughter, post-mortem veterinary and sanitary examination. Studies veterinary and sanitary examination of carcasses and internal organs for non-contagious, infectious and invasive diseases.	6									V					
	Veterinary and sanitary	Studies veterinary and sanitary examination and the basics of milk production technology, examination	5									V					



	examination of livestock and poultry products 2	of milk obtained from sick animals. Studies veterinary and sanitary examination of livestock raw materials (leather and fur, keratin containing, intestinal, offal).															
	Veterinary and sanitary examination of livestock and poultry products 3	Studies methods of veterinary and sanitary examination of poultry meat and poultry products, veterinary and sanitary assessment of poultry meat and eggs for non-contagious, infectious and invasive diseases.	4									V					
	Veterinary and sanitary examination of crop, fish and beekeeping products 1	Studies general characteristics, types of quality control, defects and nutritional value of plant products, methods of quality control of fresh root vegetables, vegetables, fruits, berries and mushrooms, nuts, grain products and exotic fruits. Studies the basics of technology and veterinary and sanitary examination of salted, pickled, dried fruits and vegetables, production technology and quality control of canned vegetable products.	5										V				
	Veterinary and sanitary examination of crop products, fish farming and beekeeping 2	Studies the nutritional value of fish meat, the characteristics of commercial fish, veterinary and sanitary examination of fish for infectious, invasive, mycotic diseases, technology and quality control of canned, dried, dried, salted and smoked fish. Quality control of meat of marine mammals and invertebrates.	5										V				
	Technology, sanitation and veterinary and early sanitary examination of meat and dairy products 1	Studies the prospects for the development of meat production, the nutritional value and classification of meat products, the basics of technology and hygiene in sausage production. Forms the skills of sampling, conducting sanitary and hygienic examination and technochemical control of sausages.	5									V	V				
	Technology, sanitation and veterinary and early sanitary examination of meat and dairy products 2	Studies the basics of technology and hygiene in the production of dairy products, nutritional value and classification, requirements for the quality of raw materials and finished products. Forms sampling skills, methods of sanitary and hygienic examination of liquid fermented milk products, sour cream, cottage cheese, cheeses, butter, national dairy products.	5									V	V				

Veterinary epidemiology 1	Studies infection, its types and their epizootological significance, the theory of the epizootic process, its driving forces and research methods, infectious diseases common to all animal species. Forms the development of students' abilities to diagnose, prevent infectious diseases of animals and carry out health measures.	5							V							
Veterinary epidemiology 2	Studies infectious diseases of animals: definition of the disease, history of its study, causative agent, epizootological features, pathogenesis, clinical signs, pathological changes, diagnosis and treatment, prevention and control measures. Forms diagnostic skills, general and specific preventative care, planning and organization of preventive and anti-epizootic measures.	5							V							
Parasitology and invasive animal diseases 1	He studies the ecological patterns of relationships between parasites and their hosts, transmissible natural focal invasive diseases, classification, life cycles of parasites, innovative approaches to the diagnosis, treatment and prevention of parasitoses caused by them. Forms the skills of modern helminthological diagnostics.	3								V						
Parasitology and invasive animal diseases 2	He studies private helminthology, veterinary acarology, protozoology and entomology, methods of studying animals and samples from them for helminthiasis, arachnoentomosis and protozoosis. Forms theoretical and practical skills in organizing therapeutic and preventive measures against parasitosis of humans, animals, poultry and fish.	5								V						
Veterinary obstetrics and gynecology	Studies the identification and pathological processes developing in the reproductive apparatus of female farm animals during the periods of puberty, pregnancy, childbirth and the postpartum period, diseases of newborns, diseases of the mammary gland, obstetrics techniques, operational methods of providing obstetric care, diagnostics, treatment and prevention of obstetric diseases. Determines the specific features of the structure and function of the mammary gland of females of different animal species.	5									V					
<b>Cycle of major disciplines Optional component</b>																

Forensic veterinary examination	He studies issues of judicial proceedings in cases of controversial cases, with deliberate falsification, forensic veterinary autopsy, toxicology and thanatology of judicial proceedings. Generates knowledge in the preparation of documentation of examinations performed.	5										V				
Forensic thanatology	They develop in students the knowledge and skills to resolve judicial issues that arise in legal, investigative and judicial practice based on knowledge of the structure and logic of a pathological diagnosis. Thanatology is based on the knowledge base of pathological anatomy in comparison with normal one.	5										V				
Management in veterinary medicine	Studies general organizational issues, legislative regulation and structure in veterinary affairs, planning of veterinary activities, logistics of veterinary services. He studies issues of veterinary services abroad, regulations of international veterinary organizations, legislative regulation, and the structure of veterinary affairs. Provides training for veterinary specialists and scientific support for veterinary services.	5							V							
Organization of veterinary affairs	He studies the organizational structure of the veterinary service, its management on a republican and regional scale, organization in districts and rural districts. Develops skills in organizing veterinary activities in business entities for the prevention and elimination of animal diseases of contagious and non-contagious etiology. Studies issues of international cooperation in the field of veterinary medicine, scientific, financial and logistical support of veterinary services. Forms skills in calculating the economic efficiency of veterinary activities.	5							V							
Food safety 1	Studies the general concept of foreign substances, regulatory documentation regulating the quality and safety of food products, assessing the safety of livestock products when contaminated with foreign substances of biogenic origin (microbial contaminants).	5											V			
Food safety 2	Studies the assessment of food safety when	5											V			

		contaminated with foreign substances of biogenic origin (antibiotics, hormonal drugs, microscopic fungi and mycotoxins), as well as the assessment of the safety of genetically modified foods.															
	Contamination of livestock products 1	Studies methods for studying contaminated animal products and technical raw materials of animal origin, contaminated with biogenic foreign substances, and determines the rules for their veterinary and sanitary assessment.	5										V				
	Contamination of livestock products 2	Studies methods for studying contaminated animal products and technical raw materials of animal origin, contaminated with technogenic foreign substances, and determines the rules for their veterinary and sanitary assessment.	5										V				
	Veterinary control at the border and transport	Studies the issues of carrying out veterinary and sanitary measures to prevent the spread of diseases along the routes of road, rail and air transport, implementing veterinary and sanitary measures and ensuring security at the border and transport. Develops skills in control and accounting of controlled goods and documentation.	3										V				
	Veterinary and sanitary supervision during expert import transportation	Develops knowledge on organizing movements during export-import operations by all types of transport of animals, products and raw materials of animal origin. Studies measures to prevent the spread of diseases along the route, and to comply with veterinary and sanitary requirements during transportation.	3										V				

Head of the department

Adilbekov Zh.Sh.

Employer

Abdulkhalikov S.B.

Chairman of the Faculty Council  
for Academic Quality

Shaikenova K.H.

Dean of the Faculty

Abdrakhmanov S.K.

