

Non-profit Joint-stock Company "SHAKARIM UNIVERSITY"		
Level 4 QMS document		
The program of the entrance exams to PhD- doctoral studies	Edition №1 02.03.2026	FP 042-2.07-2026

Research School of Veterinary Medicine and Agriculture


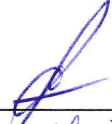
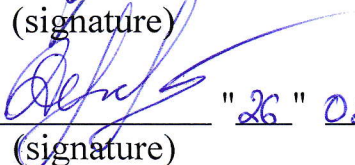
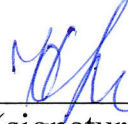
Department "Veterinary"

**The program
of the entrance exams to PhD-doctoral
studies in the group of educational programs
D138 Veterinary**


Semey – 2026

1 DEVELOPED

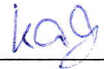

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Protocol № 7 "26" 02 2026.

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1. Introduction

The PhD doctoral entrance examination program for the educational program is intended to determine the level of professional training of applicants, their readiness for research activities, as well as their ability to make informed decisions in accordance with modern veterinary medical requirements and international standards.

Main requirements for the level of training of specialists in the group of educational programs D138 – Veterinary Medicine.

An applicant for doctoral studies must:

Have an understanding of:

- modern trends in the development of veterinary medicine, biotechnology, and biosafety;
- modern methods of diagnosis, prevention, and treatment of infectious and non-infectious animal diseases;
- principles of organizing scientific research, epizootic monitoring, and veterinary sanitary control;
- international standards and regulatory documents in the field of veterinary medicine and biosafety;
- modern achievements in molecular biology, genetics, and immunology in veterinary medicine.

Be competent in:

- analysis and interpretation of scientific research results;
- application of modern laboratory diagnostic methods, including PCR, ELISA, and other molecular techniques;
- organization and implementation of scientific research activities;
- assessment of the epizootic situation and development of measures for the prevention and eradication of animal diseases;
- use of modern information technologies and statistical methods for processing scientific data.

Possess skills in:

- independent conduct of scientific research and analysis of obtained results;
- preparation of scientific publications, reports, and presentations;
- drawing substantiated conclusions based on scientific research findings;
- application of modern laboratory and instrumental research methods;
- analysis of achievements in veterinary medical science in industrial and specialized research activities;
- critical thinking and solving current scientific problems in the field of veterinary medicine.

The doctoral entrance exam is conducted in written or computer format in accordance with the Model Regulations for admission to studies in educational organization, implementing educational programs of technical and vocational education, approved by the Order of the Minister of Education and Science of the Republic of Kazakhstan of October 31, 2018 № 600.

2. Course Titles and Their Main Sections

2.1. Veterinary and Sanitary Examination of Meat and Dairy Products

Topic 1. Requirements for the Quality and Safety of Meat and Dairy Products. Quality of meat products. Quality of dairy products. Safety requirements. Sanitary and hygienic requirements.

Topic 2. Methods of Sanitary Examination of Meat and Dairy Products. Hygiene of milk production and veterinary-sanitary examination. Rules for sampling meat and milk for laboratory studies. Modern methods of quality control.

Topic 3. Hazardous Factors in Meat and Dairy Products. Pathogenic microorganisms. Chemical substances. Microbiological risks. Toxins. Effects of mycotoxins, pesticides, radionuclides, and antibiotics on the quality and nutritional value of milk. Foodborne toxico-infections caused by conditionally pathogenic microflora.

Topic 4. Sanitary Examination of Meat Products. Primary meat processing. Determination of meat suitability. Storage and transportation of meat products. Morphological and chemical composition of meat and its commodity characteristics. Changes in meat during storage (lipochromatosis, melanosis, meat from immature animals). Determination of species origin of meat (anatomical-morphological and physico-chemical indicators).

Topic 5. Veterinary and Sanitary Examination of Dairy Products. Milk quality control. Production and processing of dairy products. Analysis of the composition of dairy products. Storage of dairy products.

Topic 6. Legal Basis for Controlling the Safety and Quality of Meat and Dairy Products. Veterinary legislation and regulatory documents of Kazakhstan. International standards. Sanitary-epidemiological control. Codex Alimentarius.

Topic 7. Chemical, Biological, and Physical Hazards in Meat and Dairy Products. Chemical substances. Biological hazards. Physical hazards. Environmental aspects of producing safe food products. Goals and objectives of the HACCP system. Principles of HACCP.

2.2. Veterinary and Sanitary Control in the Export and Import of Animal-Origin Products

Topic 1. General Requirements for Export and Import of Animal-Origin Products.

Basics of veterinary-sanitary control. International trade requirements. Product safety and quality. Documentation control. Veterinary-sanitary control of controlled goods at the border. Export, import, and transit operations during transportation.

Topic 2. Veterinary Control of Exported Animal-Origin Products. Export requirements. Veterinary certification. Veterinary-sanitary control at borders and during transport. Determination of product origin. Quarantine measures.

Topic 3. Veterinary Control of Imported Animal-Origin Products. Rules for import control. Border veterinary inspection. Product quality assessment. Identification of hazardous products. Veterinary-sanitary measures during import-export operations.

Topic 4. Procedure for Conducting Veterinary and Sanitary Examination. Examination methods. Laboratory studies. Microbiological and chemical analysis. Evaluation of results.

Topic 5. International Veterinary Standards and Requirements. International norms. Veterinary certificates. Sanitary requirements in trade. Compliance control.

Topic 6. Hazards in Animal-Origin Products and Risk Management. Biological hazards. Chemical hazards. Physical hazards. Risk assessment and preventive measures.

Topic 7. Border Veterinary Control and Supervision System. Operation of control checkpoints. Inspection procedures. Document verification. Detection of violations and enforcement measures. Features of veterinary control during transit of controlled products through the customs territory of the Customs Union.

2.3. Veterinary and Sanitary Control at Veterinary Supervision Facilities

Topic 1. General Principles of Veterinary and Sanitary Control at Supervision Facilities. Concept of veterinary supervision. Control objects. Sanitary requirements. System of state supervision. State veterinary control of product safety in the Republic of Kazakhstan. Protection of Kazakhstan's borders from the introduction of infectious diseases.

Topic 2. Types of Veterinary Supervision Facilities. Livestock facilities. Slaughterhouses and meat processing plants. Dairy farms. Processing enterprises.

Topic 3. Sanitary and Hygienic Requirements at Facilities. Cleanliness requirements. Disinfection, disinsection, deratization. Industrial hygiene. Personal hygiene of personnel.

Topic 4. Methods of Veterinary and Sanitary Control. Clinical examination. Laboratory research. Organoleptic assessment. Documentation control.

Topic 5. Control of Animal-Origin Products at Facilities. Inspection of meat. Inspection of milk. Product quality assessment. Identification of unfit products.

Topic 6. Prevention and Control of Infectious Diseases. Quarantine measures. Vaccination. Disease detection. Anti-epizootic measures.

2.4. Microbiological Control of Livestock and Poultry Products

Topic 1. Fundamentals of Microbiological Control of Livestock and Poultry Products. Concept of microbiological control. Microbiological control of livestock and poultry products during food storage. Product safety. Role of microorganisms. Sanitary requirements.

Topic 2. Types of Microorganisms in Products. Pathogenic microorganisms. Conditionally pathogenic microorganisms. Saprophytic microflora. Viruses and fungi. Microbiological control of egg processing products.

Topic 3. Microbiological Control of Meat Products. Sources of meat contamination. Bacteriological studies. Sanitary assessment. Determination of suitability. Microbiological control of Kazakh national products made from horse meat.

Topic 4. **Microbiological Control of Poultry Products.** Inspection of poultry meat. Microbiological status of eggs. Contamination factors. Storage requirements.

Topic 5. **Microbiological Control of Milk and Dairy Products.** Milk microflora. Bacterial contamination. Effectiveness of pasteurization. Product quality assessment. Microbiological control of milk.

2.5. Disinfection in Veterinary Sanitation

Topic 1. **General Principles of Disinfection in Veterinary Sanitation.** Concept of disinfection. Purpose and importance. Sources of infection. Sanitary requirements. Contaminant microorganisms and their entry into production. Scheme of microbiological control in production.

Topic 2. **Types of Disinfection.** Preventive disinfection. Current disinfection. Final disinfection. Planned and emergency disinfection. Methods of bacteriological testing of canned products before sterilization. Physical methods of disinfection.

Topic 3. **Disinfectants.** Chemical agents. Physical methods. Biological methods. Features of application. Physical and biological disinfectants.

Topic 4. **Methods of Disinfection.** Wet method. Aerosol method. Gas disinfection. Burning and boiling methods.

Topic 5. **Disinfection at Livestock Facilities.** Disinfection of premises. Equipment treatment. Disinfection of transport vehicles. Cleaning of production areas

2.6. Infectious Diseases of Animals

Topic 1. **General Principles of Infectious Diseases in Animals.** Concept of infectious disease. Epizootiological features. Sources of infection and transmission routes. Risk factors. Modern molecular methods for diagnosing infectious diseases (PCR, ELISA, etc.). Development of the infectious process.

Topic 2. **Bacterial Infectious Diseases.** Salmonellosis. Tuberculosis. Brucellosis. Other bacterial diseases of sheep and cattle. Epizootiological features of zoonotic infections.

Topic 3. **Viral Infectious Diseases.** Avian influenza. Severe infectious hepatitis. Pasteurellosis and viral infections in livestock.

Topic 4. **Parasitic Infectious Diseases.** Trichinellosis. Cryptosporidiosis. Helminthiases. Prevention of invasive diseases.

Topic 5. **Fungal (Mycotic) Infectious Diseases.** Mycoses and skin diseases. Epidemiological characteristics. Level of harm. Preventive measures.

Topic 6. **Measures for Prevention and Control of Infectious Diseases.** Vaccination. Quarantine measures. Sanitary-veterinary regime. Epizootiological monitoring. Different types of vaccines. Antibiotic resistance. Modern approaches to biosecurity in livestock production.

2.7. Invasive Diseases (Parasitology)

Topic 1. **General Principles of Invasive Diseases.** Concept of invasive disease. Types of parasites. Sources of infection and transmission routes. Epizootiological features. Laboratory methods for diagnosing helminthiases (coprological, serological, molecular).

Topic 2. **Helminthiases.** Nematodoses in cattle and sheep. Cestodoses. Trematodoses. Pathogenesis and clinical manifestations. Importance of sanitary-hygienic measures in controlling parasitic infections. Integrated measures for parasite control in industrial livestock production.

Topic 3. **Protozoal Diseases.** Trichomonosis. Coccidiosis. Toxoplasmosis. Disease transmission routes and risk factors. Influence of climatic factors on the spread of parasitic diseases.

Topic 4. **Ectoparasitic Diseases.** Fleas, lice, ticks. Effects on animals. Clinical signs. Prevention and control measures. Mechanism of action and effectiveness of modern anthelmintic drugs.

2.8. Non-communicable Internal Diseases

Topic 1. **General Principles of Non-communicable Internal Diseases.** Concept of disease. Endogenous and exogenous factors. Pathogenesis of diseases. Risk factors. Effectiveness of pharmacological and non-pharmacological treatments. Modern methods for diagnosing metabolic disorders. Diagnosis of respiratory diseases in different animal species.

Topic 2. **Metabolic and Nutritional Diseases.** Vitamin and mineral deficiencies. Digestive disorders. Obesity and energy metabolism disorders. Modern diagnostic methods for metabolic diseases (clinical, biochemical, instrumental).

Topic 3. **Endocrine Diseases.** Enzymatic and hormonal disorders of the mammary gland. Diseases of the thymus and adrenal glands.

Topic 4. **Blood and Lymphatic System Diseases.** Anemia. Leukosis. Disorders of blood composition and the immune system. Mechanisms of cardiovascular diseases in animals.

Topic 5. **Skeletal, Muscular, and Nervous System Diseases.** Osteoporosis, rickets. Muscle atrophy. Neuropathies. Paralysis. Influence of stress factors on the development of somatic diseases.

Topic 6. **Systemic Poisonings and Toxicoses.** Chemical and biological toxins. Occupational poisonings. Symptoms and preventive measures.

2.9. Veterinary Microbiology and Immunology

Topic 1. Basics of Veterinary Microbiology. Concept of microorganisms. Veterinary significance. Pathogenic and saprophytic microorganisms. Epizootiological characteristics.

Topic 2. Bacteriology. Bacterial diseases in animals. Pathogenic bacteria. Diagnostic methods. Preventive measures. Modern methods for isolating and identifying microorganisms.

Topic 3. Viruses and Virology. Viral infections of animals. Viral pathogenesis. Vaccination methods. Control of viral diseases. Serological methods for infection diagnostics. Antigenic structure of bacteria, viruses, and fungi.

Topic 4. Basics of Immunology. Concept of immunity. Antigens and antibodies. Innate and acquired immunity. Immunological reactions. Role of innate immunity in protection against infections. Role of cytokines in regulating immune responses.

2.10. Veterinary Epizootology and Epidemiology

Topic 1. **General Principles of Veterinary Epizootology.** Concept of epizooty. Patterns of disease spread. Epizootic status of animal populations. Importance of the One Health approach.

Topic 2. **Basics of Epidemiology.** Epidemiological process. Pathogens. Transmission routes. Risk factors. Concept of "infection reservoir."

Topic 3. **Epizootic Investigation of Infectious Diseases.** Identification of disease foci. Population monitoring. Epizootic monitoring methods. Approaches used in different countries.

Topic 4. **Epidemiology of Invasive and Parasitic Diseases.** Helminthiases, protozoal and ectoparasitic diseases. Routes of transmission. Preventive measures. Methods for epizootological analysis.

Topic 5. **Epizootic Control Methods.** Clinical monitoring. Laboratory testing. Sanitary-veterinary inspections. Effectiveness of quarantine and restriction measures. Strategies for eliminating and controlling infectious diseases.

2.11. Modern Diagnostic Methods in Veterinary Medicine

Topic 1. **Basics of Modern Veterinary Diagnostic Methods.** Concept of diagnostics. Purpose and objectives. Importance of early detection of diseases. Role of digital technologies and artificial intelligence in diagnostics. Possibility of using field rapid tests. Opportunities of multiplex diagnostics.

Topic 2. **Laboratory Diagnostic Methods.** Microbiological testing. Chemical analysis. Serological and molecular methods. Modern diagnostic methods for parasitic diseases.

Topic 3. **Molecular and Genetic Diagnostics.** PCR (Polymerase Chain Reaction). Detection of genetic markers. DNA and RNA analysis methods.

Topic 4. **Immunological Diagnostic Methods.** Detection of antibodies. ELISA, agglutination, and immunofluorescence methods. Assessment of vaccine efficacy.

3. List of recommended literature

1. Қожабергенов М.К. Ет және сүт өнімдерінің ветеринариялық-санитариялық сараптамасы. – Алматы: Эверо, 2020. – 320 б.
2. Әбдірешов Қ.А. Ветеринариялық-санитариялық сараптау негіздері. – Алматы, 2019. – 280 б.
3. Сейітов З.С. Халықаралық ветеринариялық бақылау. – Астана, 2021. – 240 б.
4. Қасымов Е.К. Ветеринариялық қадағалау және биологиялық қауіпсіздік. – Алматы, 2022. – 310 б.
5. Нұртаев М.Н. Ветеринариялық бақылау және қадағалау. – Алматы, 2020. – 26 б.
6. Омаров Р.Ә. Ветеринариялық санитария. – Алматы, 2018. – 330 б.
7. Жүнісов Қ.Ж. Мал шаруашылығы өнімдерінің микробиологиялық қауіпсіздігі. – Алматы, 2021. – 295 б.
8. Ахметов К.А. Ветеринариялық микробиология және иммунология. – Алматы: Эверо, 2021. – 420 б.
9. Қасымов Е.К. Ветеринариялық санитариядағы дезинфекция және дезинсекция. – Алматы, 2018. – 240 б.
10. Төлеубаев Б.Т. Биологиялық қауіпсіздік және дезинфекция. – Астана, 2021. – 260 б.
11. Төлеубаев Б.Т. Жануарлардың жұқпалы аурулары. – Алматы, 2020. – 510 б.
12. Әбдірахманов С.К. Инфекциялық аурулар эпизоотологиясы. – Астана, 2021. – 340 б.
13. Нұртаев М.Н. Инвазиялық аурулар. – Алматы, 2021. – 400 б.
14. Әлібеков Т.С. Ветеринариялық паразитология. – Алматы, 2019. – 360 б.
15. Омаров Р.Ә. Ішкі жұқпалы емес аурулар. – Алматы, 2019. – 530 б.
16. Қожанов С.А. Жануарлардың терапиялық аурулары. – Астана, 2020. – 410 б.
17. Сейітов З.С. Иммунология негіздері. – Алматы, 2020. – 280 б.
18. Әбдірахманов С.К. Ветеринариялық эпизоотология және эпидемиология. – Астана, 2022. – 360 б.
19. Төлеубаев Б.Т. Эпизоотиялық мониторинг негіздері. – Алматы, 2021. – 250 б.
- Қазіргі ветеринариядағы диагностиканың молекулалық әдістері (ПТР, ELISA және т.б.). – Астана, 2023. – 270 б.
20. Сейітов З.С. Ветеринариялық зертханалық диагностика. – Алматы, 2022. – 300 б.
21. Смирнов А.М. Ветеринарно-санитарная экспертиза мяса и молока. – Москва: КолосС, 2020. – 480 с.
22. Житенко П.В. Ветеринарно-санитарная экспертиза продуктов животноводства. – Санкт-Петербург: Лань, 2019. – 350 с.
23. Кузнецов А.Ф. Ветеринарно-санитарный контроль при экспорте и импорте продукции животного происхождения. – Санкт-Петербург: Лань, 2021. – 350 с.
24. Макаров В.А. Ветеринарная санитария. – Москва: Агропромиздат, 2019. – 41с.

25. Поляков А.А. Ветеринарно-санитарный контроль на объектах надзора. – Москва, 2021. – 300 с.

26. Шевченко А.А. Микробиологический контроль продукции животноводства и птицеводства. – Москва, 2019. – 310 с.

27. Сидоров М.А. Ветеринарная микробиология и иммунология. – Москва: Академия, 2020. – 560 с.

28. Бессарабов Б.Ф. Паразитология и инвазионные болезни животных. – Санкт-Петербург: Лань, 2022. – 450 с.

29. Акбаев М.Ш. Паразитология и инвазионные болезни сельскохозяйственных животных. – Москва, 2021. – 520 с.

30. Данилевский В.М. Внутренние незаразные болезни животных. – Москва, 2020. – 700 с.