MINISTRY OF AGRICULTURE OF THE REPUBLIC OF KAZAKHSTAN
NCJSC "KAZAKH AGROTECHNICAL RESEARCH UNIVERSITY NAMED AFTER S. SEIFULLIN"

Considered at the meeting of the Faculty Council
Protocol No. 1 dated 12/27/2023

APPROVE
Dean of the Faculty of «Veterinary Medicine and Animal Husbandry Technology»
_____ Akibekov O.S.
«03» 01 2024г.

PLAN
DEVELOPMENT OF THE EDUCATIONAL PROGRAM
EP 7M05101-" Veterinary Biotechnology"
for 2024-2027

It was considered at the extended meeting
of the Department of Microbiology and Biotechnology
Protocol No. 1 dated 08/28/2023.

Content

1. Passport of the educational programme development plan

for 2024-2027

Name of the Programme - Educational Programme Development Plan

	The grounds for developing a development plan for the EP	The Department of Microbiology and Biotechnology carries out its activities in accordance with the normative legal acts of the Ministry of Higher Education and Science of the Republic of Kazakhstan in the implementation of educational programs for the preparation of bachelors and undergraduates. Educational programs have been developed in accordance with the NRK and professional standards, in accordance with the Dublin Descriptors and the European Qualifications Framework, based on: 1. The Law of the Republic of Kazakhstan "On Education". 2. Law of the Republic of Kazakhstan "On Science". 3. Message of the Head of State to the people of Kazakhstan from 1 September 2021 "Unity of the people and system reforms - a solid basis for the prosperity of the country"; 4. Message of the Head of State to the people of Kazakhstan "Economic Course of Fair Kazakhstan" dated 1 September 2023. 5. Concepts of development of higher education and science in the Republic of Kazakhstan for the years 2023 - 2029 6. "Model rules of activity of organisations of higher and postgraduate education" Order of the Minister of Education and Science of the Republic of Kazakhstan dated 30 October 2018 No. 595. Registered with the Ministry of Justice of the Republic of Kazakhstan on 31 October 2018 No. 17657. 7. State obligatory standard of education of all levels of education. Order of the Ministry of Education and Science of the Republic of Kazakhstan dated 20 July 2022 No. 2. Registered with the Ministry of Justice of the Republic of Kazakhstan on 27 July 2022 No. 28916. 8. "Qualification requirements for educational activities and the list of documents confirming compliance with them" Order of the Ministry of Education and Higher Education of the Republic of Kazakhstan from 22.11.2022 № 152. 9. Model rules of admission to training in educational organisations implementing educational programmes of higher and postgraduate education. Order of the Ministry of Education and Higher Education of the Republic of Kazakhstan from 15.12.2022 № 189. 10. Development Programme of NAO "Kazakh Agrotechnical Research University named after S.Seyfullin" for the period of 15.12.2022 No. 189. S. Seifullin" for 2023-2029.
2	Main developers of the EP development plan	Work Plan Committee, Department of "Microbiology and Biotechnology", Academic Council on Quality, involved researchers, specialists and employers: LLP "National Centre of Biotechnology" MH RK, LLP "Republican Collection of Microorganisms" MH RK.

3	Timeframe for the implementation of the EP development plan	2024 to 2027
4	Amount and sources of funding	Budgetary and attracted funds
5	Expected end results of the implementation of the EP development plan	Availability of effective author's developments (programmes, teaching aids, methodical) and activities for their dissemination; Effective implementation of educational programmes providing continuous education of students: - Bachelor's degree-Master's degree-Doctoral studies; - opening of doctoral studies in the direction of training "Biological and related sciences"; - realisation of external academic mobility of students; -realisation of double-diploma education; - visit of professors and teaching staff of the "Summer School"; - participation and holding of the Republican competition of scientific research work of students in "Biological and related sciences"; - high quality of education; - renewal of personnel potential with knowledge of English; - implementation of the "Bolashak" programme, internships of the teaching staff, training in master's and doctoral programmes; - gaining practical experience, including practical training and dual training in large production organisations, breeding companies, leading Republican and national research centres and laboratories.

2 Analytical substantiation of the EP development plan

Updated content of the EP; high quality of graduates' training; implementation of the OP with the addition of in-depth training, taking into account the cognitive ability and needs of students.

2.1 Information about the educational programme

«Biotechnology» is one of the most promising areas of education today, not only in the Republic of Kazakhstan, but also in the world. Creation of new food products, development of veterinary biopreparations, diagnosticums, enzymes, biologically active additives, feed additives for farm animals and birds, environmental protection, is one of the most urgent issues on a global scale, the solution of which is impossible without the use of knowledge and methods of biotechnology. Therefore, the profession of biotechnologist combines the following professions: microbiologist, virologist, immunologist, chemist, pharmacist-analyst, food technologist, breeder-bioengineer. Specialists of this professional level are considered valuable employees. They are needed in the pharmaceutical, food, veterinary and processing industries.

This educational programme "Biotechnology" is developed in accordance with the National Qualifications Framework, based on the guidelines of the European Credit Transfer and Accumulation System (ECTS) in accordance with the European Qualifications Framework, agreed and discussed with representatives of production, specialists of research centres.

The uniqueness of the programme is the mastering of bachelors' skills in laboratory equipment, sampling of biological material, cultivation of microorganisms and analysis of microbiological data, conducting research in the field of diagnostics (ELISA, PCR, etc.), study of gene functions and DNA analysis, creation of molecular genetic constructs, obtaining biotechnological products, molecular biological research, work with bacteriophage transformation.

The stakeholders of the educational program are: agricultural enterprises, laboratories of the veterinary, food and processing, microbiological, pharmaceutical industries; veterinary stations, zootechnical breeding stations, research institutes and universities of biotechnological, biological, veterinary, agricultural profile; agricultural enterprises; breeding stations; biocombinates for the production of vaccines and biologics, laboratories for quality control and the safety of agricultural products. Graduates of the educational program 7M05101-"Veterinary biotechnology" can work in the following positions: researcher in research institutes and universities; technician, in production laboratories for the production of vaccines and biologics of veterinary direction; master, technologist in biotechnological industries; specialist in agricultural biotechnology; biotechnologist-breeder of animals; teacher of basic and specialized disciplines in biotechnology at universities.

After receiving a master's degree in natural Sciences, a graduate of this educational program has the opportunity to continue his studies in doctoral studies under the 6D051 program – "Biological and Related Sciences", "Veterinary Medicine" and receive a PhD degree.

The implementation of the educational program 7M05101-Veterinary Biotechnology is aimed at training highly qualified masters who are able to formulate and solve modern practical problems of veterinary biotechnology; instilling skills in the practical use of immunobiological, biochemical, molecular genetic, breeding, statistical and other methods of biological and related sciences in the creation of effective diagnostic, therapeutic and prophylactic agents and feed additives; formation of personal qualities of students as a future specialist and/or head of a scientific and production team.

The educational program is designed on the basis of a point-based system of studying disciplines, theoretical training in the amount of 120 credits for the master's degree.

The content of educational programmes is developed on the basis of the State General Educational Standard of Higher Education of the Republic of Kazakhstan "Order of the Ministry of Education and Science of the Republic of Kazakhstan from July 20, 2022 № 2". Registered in the Ministry of Justice of the Republic of Kazakhstan on 27 July 2022 № 28916, the classifier of directions of training of personnel with higher and postgraduate education from 13 October 2018 № 569 and opinions and suggestions of employers, stakeholders and students.

The EP is designed as a set and sequence of educational modules for the entire period of study and is aimed at mastering the competencies necessary for awarding the academic degree of Master of Natural Sciences in the relevant educational programs.

The purpose of the educational trajectory is to train specialists of a new formation, competitive in the labor market, in the field of biotechnology and nanotechnology, with broad fundamental knowledge and practical experience, able to adapt to the changing demands of the labor market and technologies that meet the requirements of employers.

Map of the direction of training in the educational programme	
Code and classification of the field of education	7M05- Natural sciences, mathematics and statistics
Code and classification of training areas	7M051- Biological and related sciences
Name of educational programme	7M05101-« Veterinary biotechnology»
Qualification characteristic of the graduate	
Master's degree awarded	Master of Natural Sciences in the educational program "Veterinary Biotechnology"
List of specialist positions	The master's degree can take the following positions: specialist (laboratory assistant) in research institutes and universities; biotechnologist in production laboratories; biotechnologist specialist in biotechnological industries; specialist in agricultural biotechnology; specialist in food and pharmaceutical production; biotechnologist-breeder; specialist in laboratories of molecular genetic research.
Area of professional activity	Production of biotechnological products for veterinary purposes and the development of modern biotechnological processes providing for the production of diagnostic, therapeutic, preventive and feed preparations of a new generation for veterinary and animal husbandry; breeding of microorganisms and animals; scientific and scientific-pedagogical activities in the field of education and science.
Object of professional activity	The objects of professional activity of graduates are: - research institutes and universities of biotechnological, biological, medical, agricultural profile; - production enterprises and laboratories of food and industrial processing, microbiological, pharmaceutical industries; - enterprises of microbiological, biochemical, food industry (bakeries, milk and meat processing plants, breweries, confectionery factories, etc.). - agricultural enterprises; - botanical gardens and zoological parks; - станции защиты растений; - district and regional breeding stations; - fish farms and fur farms; - universities, secondary schools, gymnasiums, colleges; - ecological services and organisations; - laboratories for quality and safety control of agricultural products. - - departments of expert forensics and molecular biology of the Ministry of Internal Affairs of the RK

2.2 Analysis of the student body. Currently, under the educational program "Biotechnology", full-time undergraduates are being trained. The training is conducted in the state and Russian languages.

The contingent of students enrolled in EP 7M05101-Veterinary biotechnology is -14, including 14 scientific and pedagogical areas, studying on a state grant -14.

The plan of the contingent of students in the master's program

№	Indicators	**2024-2025**	**2025-2026**
	The contingent of undergraduates	14	20
	The number of undergraduates studying under state grants	14	20
	The number of undergraduates studying on a fee basis	-	

2.3 Analysing the internal environment of the EP

The necessary material and technical support is available for the implementation of the EP development plan. In order to maintain the high quality of staff training and scientific research, significant resources are allocated annually to modernise the infrastructure. Considerable attention is paid to the creation of comfortable conditions for the creative and sports development of students, own information network, student polyclinic, social shop, pharmacy and other facilities are functioning.

For the development and implementation of the EP development plan at the department in the educational process are used educational and methodical literature, documentary films and videos on various biotechnological processes, slides with illustrative materials. For carrying out of LPZ there are NIP "Agricultural biotechnology", educational and scientific laboratories equipped with special equipment and materials (phytocamera, fermenter, electron microscopes, drying cabinets, thermostats, centrifuges, homogenisers, refrigerators and freezers, pharmaceutical refrigerators, in all classrooms laminar - boxes, etc.). There is also access to information and analytical resources for students. Practical field classes are held in various laboratories of RSE on PCV KVINC MEW RK "Republican Veterinary Laboratory", RSE on PCV KVINC MEW RK «National Veterinary Reference Centre», LLP «National Centre of Biotechnology» MH RK, as well as LLP «Republican Collection of Microorganisms» MZRC.

Multimedia rooms with interactive whiteboards are used in the educational process, which significantly expand the visualisation possibilities and the quality of lecture material presentation.

The auditorium and laboratory and training fund corresponds to the contingent of students and the content of OP training. Each auditorium has: passport, safety log, first aid kit, fire extinguishing equipment (fire extinguisher and centralised fire extinguishing system).

All laboratories meet the sanitary and hygienic state regulatory requirements for this category of facilities (SNiP Approved by the Government of the Republic of Kazakhstan from 10.01.12g. № 13), including the training area, according to the requirements for premises for training laboratories GOCO 5.03.014g.-2005g. Each laboratory has a passport, fire extinguishing means, individual and collective means of protection for the staff.

All teachers have access to personal computers and free access to the Internet.

EP provides students with the opportunity to undergo all types of professional practice, provided by the state obligatory standards of education.

In order to improve the quality of classes in the disciplines of the faculty and all types of practices, the department has concluded co-operation agreements with more than 30 practice bases (research institutes, research centres, enterprises of the industrial processing industry)

The department has the necessary educational and methodical materials developed in accordance with the normative documents: academic calendars, working curricula, catalogues of elective disciplines, UMKD, individual work plans of undergraduates, as well as working programs of research and development of undergraduates on scientific topics.

Research work of the department is carried out on budget-funded projects under the Ministry of Agriculture and Ministry of Education and Science of the Republic of Kazakhstan, is a multidisciplinary programme. For 2022-2023 years, the department conducted research on the most promising areas of development of the agro-industrial complex of the RK, on grant and programme-targeted financing of scientific research.

- PCF MES RK for 2021-2023 № BR10764944 "Development of methods of analytical control and monitoring of food safety" (Bulashev A.K.) 540 000 000 000 tenge;
- Grant financing of MES RK 2022-2024 "Development of immune enzyme test system based on recombinant antigen of Trichinella spp (Akibekov O.S.) 78 000 000 000 tenge;
- Grant funding of young scientists of the Ministry of Education and Science of the Republic of Kazakhstan 2021-2023 "Express - test for diagnostics of trichinellosis" (Akibekov O.S.) 54 000 000 tenge;
- Grant funding of MES RK for 2021-2023. Priority: "Life and Health Science" "Development of rapid test for diagnosis of salmonellosis abortion of horses based on monoclonal antibodies" (Borovikov S.N.) 64,000,000 tenge;
- PCF MFA RK 2020-2023 "Development of ICA for rapid detection of campylobacteriosis pathogen in biological material and livestock products" (Borovikov S.N.) 28 000 000;
- Grant financing of MNIVO RK for 2023-2025 "Development of RNGA-set on the basis of recombinant proteins for diagnostics of brucellosis" (Bulashev A.K.) 89 000 000 000tenge.

The amount of financing of scientific projects at the department is 280 000, 00 thousand tenge for 2023, and per 1 teacher is 10 000,00 thousand tenge.

The following teaching staff actively participate in the implementation of these projects: Bulashev A.K., Borovikov S.N., Akibekov O.S., Kuhar E.V., Suranshiev J.A., Begenova A.B., Omarova A.B., Kulmagambetov T.I., Baibolin J.K., Akanova J.J., Muranets A.P., Otepova G.M. Abdrakhmanova G.K., and others.

The annual and prospective plans of scientific research are developed at the department, which cover a wide range of problems relevant to the region and the Republic of Kazakhstan: creation of productive forms of animal lines, enrichment of the gene pool by combining methods of biotechnology and breeding, improvement of methods of assessment of veterinary and sanitary quality of livestock products, phenotypic and molecular-genetic characterisation of dermatophyte pathogens, creation of a test system for their diagnosis, development of ELISA, ICA-test, development of a modern method of diagnostics of infectious diseases, development of a modern method of diagnostics of infectious diseases.

Strengths:	**Weaknesses:**
1. Compliance of the content of educational programmes of the State Educational Standards, modern requirements of science and consumers, as well as their regular updating, due to constant changes in the needs for graduate competence, processes and economic integration. 2. Step-by-step planning of the process of mastering educational programmes, according to the trajectory chosen by students in accordance with the rules of the credit system of education. 3. Combination in educational programmes of theoretical and practical training, independent work, as well as the presence of compulsory disciplines of the university component and elective disciplines that include components for preparation for professional activity, development of intellectual skills, creative abilities and personality of the learner. 4. Development and introduction into the educational process of innovative forms, methods of mastering educational programmes, multimedia tools, providing training of highly qualified specialists. 5. Improvement of the intra-university quality management system, availability of structures to control and monitor the effectiveness of students' mastering of educational programmes; 6. Entry into the European educational space; 7. Academic mobility of students; 8. Interdisciplinary connection. 9. Provision of computers and Internet access, updating of the library fund 10. Realisation of double-diploma education with leading universities of RK and abroad	1. No joint educational programmes for student exchange and internships.
Opportunities: 1. After mastering the bachelor's degree programs, graduates have the opportunity to continue their education in postgraduate educational programs. 2. The ability of educational programs to bring them to a new high-quality level, including the international level. 3. Cooperation of agricultural universities of the republic in the training of specialists, exchange of experience in improving the effectiveness of educational programs.	**Threats:** 1. The weakness of employers to formulate requirements for the competence of a graduate, which often differ from the content of the mastered educational programs.

	2. The high cost of educational services compared to the average market price offered by competing universities.

2.4 Analysis of the external environment of the programme

The department determines the practice base for the students of the educational programme, concludes memorandums, agreements and tripartite contracts with enterprises, research institutes and centres for training, industrial, pre-diploma, research practice and master's theses. Currently, more than 40 practice agreements have been signed for the programme

1. RSE "Republican collection of microorganisms" of the Ministry of Education and Science of the Republic of Kazakhstan;
2. "National Centre of Biotechnology" KN MES RK;
3. LLP Scientific and Production Enterprise "Antigen;
4. "ProfDezGarant" LLP Mangistau region, Aktau city.
5. JSC "RCPW" "Asyl tulik" of the Ministry of Agriculture of the Republic of Kazakhstan;
6. District and regional breeding stations;
7. Colleges of biological direction;
8. LLP "Zerenda breeding farm";
9. Millina Food Production LTD LLP Mangistau oblast;
10. Branch of RSE on PCV "National Centre of Expertise" in Atyrau oblast;
11. "Ais" LLP Aktobe oblast;
12. "Scientific-Innovative Centre of Veterinary and Livestock Breeding" LLP
13. KGP on PCV "Pavlodar Regional Cardiology Centre";
14. KGP "Central Hospital of Karazhal city";
15. Atyrau Oil Refinery LLP.
16. NIP "Agricultural biotechnology".
17. Dairy plant "Stolichny" LLP
18. Ayan M JSC Dairy plant
19. JSC "Astana Onim" Akmola Oblysy
20. Ministry of Internal Affairs of the RK Operative and Forensic Department Molecular Genetic Laboratory
21. LLP "Gormolzavod" Kokshetau city
22. Desalination Plant "Caspiy" LLP RK Mangistau region, Aktau city
23. JSC "National Centre of Expertise and Certification" Astana city
24. "Kazakh Academy of Nutrition" Almaty city

25. Kokshetau Branch of RSE on PCVNCE of COOH MH RK in Akmola oblast

Every year, representatives from production, specialists from research institutes and centers, scientists from universities and research institutes of near and far abroad are involved in giving review lectures. In order to develop academic mobility, students are sent to partner universities.

2.5 Analysis of teaching staff implementing the educational program

The participation of teachers in improving the OP 7M05101-« Veterinary biotechnology» is carried out through updating the EP taking into account the requirements of the labor market and advanced scientific achievements; planning the volume of credits for studying elective disciplines; determining course policy; planning a schedule for passing test assignments; organization of control of students' knowledge; adjustment of forms and methods of teaching disciplines taking into account the results of quality monitoring; updating the topics of master's theses; attracting stakeholders, updating databases of research practices, etc. Currently, the OP 7M05101-« Veterinary biotechnology» is provided with highly qualified teaching staff of the department who have a basic education that meets the qualification requirements of the educational program. This requirement is mandatory and is strictly observed during the competitive selection of teaching staff, since it is included in the list of criteria for licensing educational activities of the Ministry of Education and Science of the Republic of Kazakhstan. Personal information about teachers participating in the implementation of OP 7M05101-« Veterinary biotechnology» is posted on the university portal at https://kazatu.edu.kz/ru/facultets, which indicates contact information, area of scientific interests, main merits, availability of developments, information about advanced training. This information is available to everyone. Teaching staff meets the qualification requirements for licensing educational activities. Basic education in the field of training for 94.4% of teachers. 7M05101-« Veterinary biotechnology» is served by 19 teachers, of which 4 doctors of science, 9 candidates of science, 5 PhD, 1 master, senior teacher. Along with full-time teachers, employees from among the employer-stakeholders are involved in the educational process, which makes up 20% of the total staff. Every year, the level of education of the department increases due to the implementation of a personnel policy to increase the share of advanced teaching staff, due to graduates of PhD-doctoral studies. Leading classes in the educational program of teaching staff undergo advanced training in the taught discipline every 3 years. Professional development of teachers is carried out through courses, seminars, individual internships, trainings, and master classes. Advanced training programs take into account modern trends in the development of education and science, promote teachers' mastery of innovative teaching technologies and their implementation in the educational process. Some EP teaching staff took courses: in the Department of Materials Engineering of Auburn University (Alabama, USA), Department of Biological and Medical Engineering of the University of California at Davis (USA), University of Giessen. Justus Liebig (Giessen, Germany), University of Genova (Italy), Food Institute at the Marmara Research Center (Gebze, Turkey), Bohemian Central University (Prague, Czech Republic), M.D. Anderson Cancer Center of the University of Texas (Texas, USA), University of Adelaide, Australian Center for Plant Functional Genomics (Adelaide, Australia), Federal Research Center of the Institute of Cytology and Genetics of the Siberian Branch of the Russian Academy of Sciences, Harbin Veterinary Research Institute (Harbin, China), English Language School (Kuala Lumpur, Malaysia), summer school in Tbilisi, (Georgia), at the Moscow State Academy of Veterinary Medicine and Biotechnology named after K.I. Skryabin Moscow Russian Federation, Federal State Budgetary Educational Institution of Higher Education "Russian State

Agrarian University - Moscow Agricultural Academy named after K.A. Timiryazev", Federal State Budgetary Educational Institution of Higher Education Altai State University, Kazan State Academy of Veterinary Medicine named after N.E. Bauman. Every year, university teachers participate in the Republican competition of the Ministry of Education and Science of the Republic of Kazakhstan for the title “Best University Teacher”. The holders of the state grant were 12 teaching staff who serve EP 6B05102-Biotechnology. Of no small importance in the development and implementation of OP 7M05101-« Veterinary biotechnology» is the research activity of teaching staff and research and development work; scientists serving OP 7M05101-« Veterinary biotechnology» from 2019-2024 completed funded projects (grant financing and PCF) for a total amount of 923,100,000 (project managers Doctor of Historical Sciences, Professor Bulashev A.K., Candidate of Biological Sciences, Acting Professor Borovikov S.N., Candidate of Historical Sciences, Acting Professor Akibekov O.S. .). The following laboratories are involved in the implementation of scientific research and the educational process: the accredited “Joint Kazakh-Chinese Laboratory for Biological Safety” (part of the Department of Microbiology and Biotechnology), 6 modern educational and scientific laboratories: “Microbiology”, “Virology”, “Biotechnology of Microorganisms” ", "Cellular biotechnology", "Veterinary biotechnology", "Plant biotechnology", "Animal biotechnology". The department conducts research work, which is carried out in the “Research and Production Platform of Agricultural Biotechnology”. Since 2021, program-targeted financing (PTF) program has been implemented

2.6 Analysis of the achievements of the EP.

Personnel training of OP 6B05101-Biotechnology, at S.Seifullin KazATRU is carried out in accordance with the State license for educational activities in the field of higher and postgraduate education No.KZ25LAA00035932 dated 11/30/2023 (07/02/2008) and appendices to the license in the areas of educational activity (https://kazatu.edu.kz/ru/pages/obucenie/licenzia-na-obrazovatelnuu-deatelnost).

In the Independent ranking of the demand for universities of the Republic of Kazakhstan – 2023 conducted by National rating of educational programs of NCE RK in the direction of the Master's degree program M082-Biotechnology took the 1st place.
https://kazatu.edu.kz/ru/pages/universitet/o-nas/dostizenia-universiteta-v-rejtingah

In 2022-2023, 7M05101-Veterinary biotechnology has successfully passed post-accreditation monitoring. Many graduates after graduation work in the field of Biotechnology. Graduates of this EP do not have problems with employment, it is 100%. In 2023, the annual external academic mobility of undergraduates with leading universities of France, the National School of Agronomy and Food Industry of ENSANIA University (AGREENIUM), was implemented. High publication activity of undergraduates and teaching staff. The high level of qualification of teaching staff, compliance with the qualification requirements for licensing educational activities.

3. Analysis of the problems that the EP development plan is aimed at solving, justification of the need to solve them.

There are not enough biotechnological enterprises in the Republic of Kazakhstan, which makes it difficult to select enterprises to undergo professional and research practices. In this regard, it is advisable to conclude contracts with foreign enterprises and organizations of a biotechnological profile. To conduct dual training in production conditions, access to these institutions and organizations is limited, many organizations require payment for practice and dual training, therefore it is necessary to include payment for the provision of dual training and professional practices in Public procurement. The number of undergraduate students decreases annually, this is due to a decrease in the number of

students passing the UNT in the core subject of biology and chemistry.

4 The main goals and objectives of the EP development plan with indications of the terms and stages of its implementation

The development plan of the EP corresponds to the Development Strategy of the NCJSC «Kazakh Agrotechnical Research University named after S.Seifullin», meets the requirements of the State Higher and Postgraduate Education (Order of the Minister of Science and Higher Education and Science of the Republic of Kazakhstan dated 07/20/2022 No. 2 of 2023), meet the goals and objectives of the university and meet the needs of students in high-quality education in their chosen field of study and obtaining relevant qualifications and competencies, aimed at training graduates of biotechnologists, scientific personnel who possess theoretical and practical knowledge, methods and tools in the field of biotechnology, who are able to apply the acquired knowledge, to evaluate and analyze the current state of biotechnology development, capable of formulating and making effective solutions to production-related problems, possessing fundamental and applied knowledge, capable of carrying out their professional activities, as well as developing sound approaches to solving problems in the field of biotechnology; preparation of bachelors with the abilities and skills of logical solution of tasks, a culture of mutual communication in a scientific society, able to work in a team and set goals in terms of the development of the chosen professional direction.

When developing the Educational Program Development Plan, the following were taken into account: The Law of the Republic of Kazakhstan "On Education" dated 07/27/2007 No. 319-III ZRK, with amendments and additions dated 03/27/2023 No. 216-VII; standard rules for the activities of organizations of higher and (or) postgraduate education (Order of the Minister of Education and Science of the Republic of Kazakhstan dated 10/30/2018 No. 595, with amendments and additions dated 01/20/2023 No. 23); state mandatory standards of higher and postgraduate education (SES) (Order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated 20.07.2022 No. 2, with amendments and additions dated 02/20/2023 No. 66); rules for the organization of the educational process on credit technology of education in organizations of higher and (or) postgraduate education (Order of the Minister of Education and Science of the Republic of Kazakhstan dated 04/20/2011 No. 152, with amendments and additions dated 04/05/2023 No. 145); qualification handbook positions of managers, specialists and other employees approved by the Order of the Minister of Labor and Social Protection of the Republic of Kazakhstan dated 12/30/2020 No. 553, with amendments and additions dated 08/12/2022 No. 309; Atlas of new professions and competencies of Kazakhstan (No. 03. Agriculture, 2020). Confirmation of the dynamism of the program's goals is the coordination of its content with employers.

The effectiveness of the goals of the EP is systematically assessed through planned consideration at meetings of the department, the Academic Council of the University of issues on student academic performance, on the results of work practice, on the level of residual knowledge, on the quality of defense of diploma projects and passing state exams, on the degree of student satisfaction with the quality of education. In addition, an important indicator of the effectiveness of the implementation of the goals of the educational program is the number of employed graduates.

The assessment of the level of achievement of the goals of the educational program is reflected in the relevant documentation of the educational process – the results of the examination session; minutes of meetings of the SAC for the protection of diploma projects, as well as passing state exams; minutes of meetings of the Academic Council and the Quality Assurance Committee; annual reports on the activities of departments, including all sections of educational, methodological, scientific and educational work. Indicators of the effectiveness of achieving the goals of the educational program are the results of external and internal monitoring: a high degree of demand for graduates of the program in the labor market:

the employment rate for 2023 was 96% (Atameken Rating). The accessibility and openness of the quality policy in JSC «S.Seifullin KATRU» of teaching staff, employees, students, as well as all interested parties will be confirmed by publication on the university's website and on the university's stands, placement on the electronic resources of the university.

The main objectives of the program are the following:

№	Name of the task	Terms of development	Stages of development
1	Creating conditions for obtaining a full-fledged, high-quality professional education	The entire period of study	Providing educational services for the development of professional skills
2	Formation of the main professional competencies of future specialists in hunting and animal husbandry	The entire period of study	Acquisition of professional competencies in the livestock industry
3	Creating prerequisites for independent search and research activities of the student within the framework of the experiment at all its stages	The entire period of study	Conducting search, research and experimental work in farms of various forms of ownership with which contracts have been concluded
4	The ability to work with scientific and technical information, use domestic and foreign experience in professional activities, systematize and summarize the information received	The entire period of study	Analysis and processing of the results obtained in the conditions of the department
5	Consultations of employers and scientists of the Research Institute in the selection of relevant and practically significant topics of theses	Completion of undergraduate studies	Proposals from employers, interested parties and consultations of the heads of theses

5 **Measures to reduce the impact of risks for EP:** The following measures are used in the implementation of educational programs to reduce risks:

Possible risk	Risk minimization measures	Responsible persons and deadlines for implementation
External risks		
Refusal of heads of enterprises to conclude contracts for practical training of students	Development of an educational trajectory for a potential employer	The heads of the EP
High degree of competition in the educational services market	Increasing the attractiveness of educational programs in accordance with the requirements of the regional economy; - - improving customer feedback to increase the employment rate of	The heads of the EP

	graduates; - - creation of conditions for professional and career growth of the teaching staff of the EP; - involvement of the teaching staff with practical work experience.	
Internal risks		
The outflow of personnel from the education and science system caused by insufficient wages in the industry	Combining teaching activities of teaching staff with participation in social, creative and scientific projects	Teaching staff - annually
Reducing the number of teaching staff who publish in international scientific journals	Motivation of teaching staff to publish articles in rating scientific publications : - allocation of a creative day for scientific work; - financial assistance for the publication of articles in prestigious rating publications	University management - annually
Lack of academic mobility of teaching staff	Cooperation of agricultural universities of the Republic of Kazakhstan in training specialists, exchange of experience in improving the effectiveness of educational programs. Learning English and attracting staff with knowledge of English	Teaching staff - annually
Annual decrease in the number of students in the educational program	Activation of career guidance work among students of secondary education. Implementation of career guidance through well-known social networks	Teaching staff - annually
Insufficient provision of new educational and methodological literature in specialized disciplines.	To plan the annual release of scientific and educational literature by scientists and teaching staff of the department according to the working curriculum of students and their acquisition from outside.	Teaching staff - annually
Staffing of classrooms and laboratories with modern equipment	Creation of specialized classrooms and research laboratories.	Teaching staff - annually
Rejuvenation of teaching and scientific staff	Training of highly qualified scientific personnel through master's and doctoral studies (PhD) at the level of modern requirements.	Teaching staff - annually

6 Action plan for the development of the educational program.

The development plan of the educational institution and measures for the development of the educational institution were developed in accordance with the «Development Strategy of the Kazakh Agrotechnical Research University named after Saken Seifullin», meet the goals and objectives of the university and meet the needs of students in high-quality education in their chosen field of study and obtaining relevant qualifications and competencies.

Name of the target indicator	Performance indicator (unit of measurement)	Terms of implementation			
		2024	2025	2026	2027
1. Improving academic performance					
The general contingent of the educational program 7M05101-Veterinary biotechnology	Person	10	15	20	25
The number of foreign undergraduates studying in the EP at our university	Person	2	3	3	4
The number of undergraduates studying within the framework of academic mobility (external mobility)	Person	1	2	3	4
The share of employed graduates of masters	%	100	100	100	100
The number of students enrolled in the framework of joint double-degree education	Person	-	1	1	1
Direction 1 Improvement of academic activities / improvement of the content of the EP					
Passage of specialized accreditation of educational institutions in Kazakhstan and international agencies that are full members of international European networks for ensuring the quality of education and included in the register	Number of EP	1 EP		1 EP	-
Membership in international organizations	Unit	-	-	1	1
The positions of the educational program in the ratings IAAR, QS	Place	1	1	1	1
Updating the databases of practices, concluding contracts for the passage of professional practice of students	Unit	10	12	14	15
The introduction of innovative teaching methods into the educational process	THE ACT of implementation	3	3	3	3
The number of textbooks and manuals, monographs	Unit	10	15	20	22
Direction 2 Development of human resources					
The number of teaching staff who have completed advanced training in the profile of the disciplines taught (72 hours)	Unit	5	10	15	20
Number of teaching staff who have completed advanced	number of	5	5	5	5

training/internships in inclusive education (72 hours)	teaching staff				
Number of teaching staff/ percentage of teaching staff who have completed internships	Person	2	2	2	3
The number of practitioners involved in lectures	Person	3	4	4	4
The number of attracted teaching staff from abroad	Person	-	1	1	1
Number of teaching staff/ percentage of teaching staff teaching in English	Person/ %	2	3	3	4
Number of teaching staff/ percentage of teaching staff with international certificates confirming proficiency in a foreign language	Person/ %	1			4
The share of settled teaching staff from the total number of full-time teachers	%	90	100	100	100
Direction 3. Development of scientific and research potential					
Percentage of teaching staff publishing research results in journals Committee for Control in the field of Education and Science of the Ministry of Education and Science of the Republic of Kazakhstan	% of full-time staff	30	50	60	73
The share of teaching staff publishing in rating publications according to information resources on the Web of Science, Scopus platform (Q1, Q2, Q3).		20	25	30	35
Participation in competitions for grant financing of scientific projects of the Ministry of Education and Science of the Republic of Kazakhstan, Ministry of Agriculture of the Republic of Kazakhstan	projects	3	5	7	9
Increasing the share of commercialized scientific developments from the total number of applied scientific research funded from the budget	projects	-	1	1	1
Participation in competitions of young scientists from the total number of scientists and researchers engaged in research and development.	projects	1	1	2	1
The number of R&D and scientific and technical services financed from the funds of economic entities	Quantity	-	1	1	1
The number of copyright certificates, patents of the Republic of Kazakhstan	Unit	1	2	3	3
For undergraduates involved in research activities	%	20	30	40	50
The number of startup projects implemented by teaching staff and	Unit	-	1	2	3

students					
The share of teaching staff participating in research projects from the total number of teaching staff	%	30	40	50	60
The share of teaching staff participating in joint international projects	%	-	-	1	2
Direction 4. Improvement of infrastructure and material and technical base					
Preventive maintenance of the 5th floor of the 8th building, insulation of classrooms, replacement of window rubbers, renovation of the stand on the floor	%	-	+	-	-
Renovation of the Anatomical Museum in the biotechnology building	%	-	+	-	-
The share of updated laboratory equipment	Unit/%	10	20	30	40
An increase in the number of attracted foreign scientists with a high h-index;	Unit	-	1	1	2

7. The mechanism of implementation of the EP development plan. The plan is being developed for 2 years. The development of a development plan for EP 7M05101-Veterinary biotechnology provides an integrated approach to the implementation of activities aimed at achieving the set goal through solving formulated specific tasks, contributes to the full implementation of planned activities.

Monitoring of the implementation of the Development Plan is carried out by analyzing and summarizing information on the implementation of development indicators in the following areas. Based on the results of the monitoring of the Plan, we present a report on the implementation of the Development Plan. The report is drawn up in any form, sent to the Dean of the faculty and is the basis for compiling the annual report of the faculty within the framework of strategic indicators and results for evaluating the Development Strategy of the university as a whole.

The following information will be reflected in the preparation of the report: 1) analysis and generalization of the information provided in the Development Plan of the EP; 2) on the degree of achievement of planned performance indicators (if there are deviations of actual results from planned ones, the reasons and factors that influenced the final results should be disclosed) and the activities carried out/ planned to achieve key performance indicators; 3) in the case of revision of individual goals, tasks, activities, reallocation of resources, and the development of new approaches to solving problems information on them; 4) to improve the effectiveness of the implementation of the EP plan and proposals for making changes to the development plan; 5) the degree of influence on the implementation of the goals and objectives of the EP by external stakeholders.

The processes of formation, monitoring and implementation of the EP development plan are based on the principles of openness and transparency. The EP development plan should be posted on the official website of the university. Any interested persons have the right to familiarize themselves with the development plan and its interim results. The development plan of the educational institution and the progress of its implementation are discussed at meetings of departments, meetings of collegial bodies of the faculty, meetings with employers, open seminars, meetings with active students and other events. The mechanism of implementation of the development plan EP 7M05101-Veterinary biotechnology will be aimed at purposeful work to increase the number of students, increase the number of grants for master's degree. To implement the plan for

the development of the educational program, the staff of the department will develop catalogs of elective disciplines with the direct participation of teachers, educational programs and disciplines of the university and elective components will be reviewed annually. Dual training will be implemented in research institutes, research institutes, organizations, higher educational institutions of the near and far abroad, leading scientists from the near and far abroad will be invited to conduct lectures and practical classes. The practice bases (research) will be expanded.

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