

**MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE  
SUMY NATIONAL AGRICULTURAL UNIVERSITY**

**«APPROVED BY»**

Rector of Sumy National Agrarian  
University, Academician of NAASU,  
Doctor of Science, Professor  
\_\_\_\_\_ V.I. Ladyka  
\_\_\_\_\_ 2020y.

**EDUCATIONAL AND SCIENTIFIC PROGRAM**

**third (educational and scientific) level of higher education in the  
specialty 181 "FOOD TECHNOLOGIES"**

**field of knowledge 18 "Production and technology"**

**Qualification: Doctor of Philosophy in the field of "Production and  
Technology" in the specialty "Food Technology"**

Considered and approved  
at a meeting of the Academic  
Council Sumy National Agrarian  
University

Protocol of \_\_\_\_\_ 2020 № \_\_\_\_

Chairman of the Academic Council  
\_\_\_\_\_ V.I. Ladyka

**LETTER OF APPROVAL**  
**educational and scientific program**  
**"Food Technology"**

*Level of higher education - third (educational and scientific)*

<b>Project group consisting of:</b>	
<b>Project team leader:</b>	
Candidate of Technical Sciences, Associate Professor of Food Technology	_____ <b>O.Y. Melnyk</b>
<b>Project team members:</b>	
Doctor of Technical Sciences, Head of the Department of Food Technology	_____ <b>F.V. Pertsevov</b>
Doctor of Technical Sciences, Professor of the Department of Food Technology	_____ <b>I.K. Mazurenko</b>
Candidate of Technical Sciences, Associate Professor of Food Technology	_____ <b>T.M. Stepanova</b>
Candidate of Technical Sciences, Associate Professor of the Department of Engineering Technologies of Food Production	_____ <b>C.M. Sabadash</b>
graduate student of the Department of Food Technology	_____ <b>O.Y. Koshel</b>

## PREFACE

Developed by the project group of specialty 181 "Food Technology" Sumy National Agrarian University consisting of:

**Melnyk Oksana Yuriyivna** - project team leader, candidate of technical sciences, associate professor of the department of food technology;

**Pertsevov Fedor Vsevolodovich** - doctor of technical sciences, professor, head of the department of food technology;

**Mazurenko Igor Konstantinovich** - doctor of technical sciences, professor of the department of food technology;

**Stepanova Tetyana Mykhailivna** - candidate of technical sciences, associate professor of food technology;

**Sabadash Sergey Mikhailovich** - candidate of technical sciences, associate professor of the department of engineering technologies of food production;

**Koshel Olena Yuriyivna** – graduate student of the department of food technology.

## I. EDUCATIONAL COMPONENT OF THE EDUCATIONAL AND SCIENTIFIC PROGRAM

### 1. Profile of the educational and scientific program in the specialty 181 "Food Technology"

<b>1. General information</b>	
<b>Full name of the institution of higher education</b>	Sumy National Agrarian University
<b>Level of higher education</b>	The third (educational and scientific) level
<b>Degree of higher education</b>	Doctor of Philosophy (Philosophy Doctor degree)
<b>Field of knowledge</b>	18 Production and technology
<b>Specialty</b>	181 Food Technology
<b>Full title of the qualification in the original language</b>	Doctor of Philosophy in Production and Technology in the specialty "Food Technology" Doctor of Philosophy of Food Technology
<b>The official name of the educational and scientific program</b>	Food technology
<b>Qualification in the diploma</b>	Degree of higher education - Doctor of Philosophy Specialty - 181 "Food technologies" Educational program "Food Technology"
<b>Type of diploma and scope of the program</b>	Doctor of Philosophy single, first scientific degree, 4 academic years, 57 ECTS credits of the educational component of the educational-scientific program
<b>Restrictions on forms of education</b>	Missing
<b>Availability of accreditation</b>	Not accredited
<b>Program cycle/level</b>	NRC of Ukraine - level 8, FQ-EHEA - the third cycle, EQF-LLL - level 8
<b>Prerequisites</b>	Availability of higher education of the second (master's) level, (educational and qualification level of a specialist in specialties: 7.05170112 "Food Technology", 7.05170108 "Technology of storage, preservation and processing of milk" and 7.05170104 "Technology of storage, preservation and processing of meat"). Requirements to entrants are determined by the

	Rules of admission to the educational and scientific program PhD Doctor of Philosophy
<b>Language (s) of instruction</b>	Ukrainian, English
<b>Term of the educational program</b>	Until 2023 (launched in 2016).
<b>Internet address of the permanent placement of the description of the educational program</b>	<a href="https://science.snau.edu.ua/aspirantura/">https://science.snau.edu.ua/aspirantura/</a>
<b>2. The purpose of the educational program</b>	
Training of highly qualified specialists in the field of food technologies, able to solve complex problems in the field of professional and / or research and innovation activities in the field of scientific and technical development of food production, by conducting research aimed at obtaining new scientific fundamental and applied knowledge. deep rethinking of existing and creation of new holistic knowledge and / or professional practice.	
<b>3. Characteristics of the educational program</b>	
<b>Subject area (field of knowledge, specialty)</b>	Research, educational and professional activities in the field 18 Production and technologies in the specialty 181 Food technologies
<b>Object of study</b>	Theoretical and methodological, scientific and applied bases of food technologies; principles of optimization of technological processes to ensure a high level of quality and safety of food products, environmental safety and resource conservation of production; patterns of innovative development of food enterprises and food technologies; methodological principles of scientific, scientific-technical and scientific-pedagogical activity.
<b>Learning objectives</b>	Formation of professional, research and educational competencies necessary for innovative professional, research and educational activities and the introduction of modern technologies in the specialty "Food Technology". Creating conditions for applicants to achieve the ability to independently conduct research at an internationally recognized level; support for graduate students as highly qualified teachers, scientists and experts in food technology.
<b>The main focus of the educational program</b>	The educational and scientific program is formed as an optimal combination of academic and professional requirements, which allows students to form the ability to justify the solution of problems in industry "Production and technology" in the specialty "Food Technology", plan and implement basic and applied research on the creation and improvement of food technology, using modern research

	methodology, critically analyze research projects, collaborate with other researchers, including working in an interdisciplinary team, transfer professional knowledge.
<b>Theoretical content of the subject area</b>	In-depth comprehensive study of basic and applied sciences, specialty "Food Technology".
<b>Features of the program</b>	<p><i>Educational component of the program.</i> The educational component of the educational and scientific program covers a wide range of modern innovative vectors of development of the theory and practice of food technologies, in particular food technologies, which forms an updated theoretical and applied basis for research.</p> <p><i>Scientific component of the program.</i> The scientific component of the educational and scientific program involves the implementation of their own research under the guidance of one or two supervisors with the appropriate design of the results in the form of a dissertation. This component of the program is not measured by ECTS credits, but is drawn up separately in the form of an individual plan of research work of the graduate student and is an integral part of the curriculum.</p> <p>The peculiarity of the scientific component of the educational and scientific program of training doctors of philosophy in the specialty 181 - Food Technology is that some components of their own research graduate students will be able to perform during practical classes in the disciplines of professional training.</p>
<b>Methods, techniques and technologies</b>	Mastering the methodology of scientific research and experimental technology, adequate to solve scientific problems in food technology.
<b>4. Suitability of graduates of the educational program to employment and further training</b>	
<b>Suitability for employment</b>	Positions in research groups, research laboratories, profile departments, departments in higher educational institutions, profile institutes, commercial research organizations, enterprises and organizations of various activities and forms of ownership in management positions. The specialist is able to perform the specified professional work for (DK 003: 2010): 2310.2 teachers of universities and higher educational institutions; 2320 teacher of a professional educational institution; 2320 teacher of vocational school and other areas of activity in the specialty.
<b>Further training</b>	Training for development and self-improvement in

	<p>scientific and professional spheres of activity in the specialty 181 Food technologies, as well as other related fields of scientific knowledge, training at the 10th (scientific) level of the NQF of Ukraine in the field of 20 Agricultural sciences and food; educational programs, research grants and scholarships (including abroad) that contain additional educational components. Various forms of lifelong learning (both in Ukraine and abroad) to improve skills and improve administrative, scientific, research, teaching or other activities.</p> <p>Training during professional activity to improve scientific and practical competencies.</p> <p>Possible further training at the doctoral level in areas close to the field of food technology is possible.</p>
<b>5. Teaching and assessment</b>	
<b>Approaches to teaching and learning</b>	<p>Approaches to teaching and learning:</p> <ul style="list-style-type: none"> <li>- active learning (interactive teaching methods that provide a person-centered approach and development of systematic, creative and strategic thinking; joint learning in interdisciplinary groups; "inverted class"</li> <li>- learning by teaching (pedagogical practice);</li> <li>- training through research (including participation in budget and economic contract research, participation in research projects);</li> </ul> <p>personalized Learning: individual consultations with supervisors; elective professional disciplines).</p>
<b>Evaluation system</b>	<p><b><i>Educational component of the program.</i></b> The system of assessment of knowledge in the disciplines of educational and scientific program consists of current and final control.</p> <p><i>Current control</i> postgraduate knowledge is conducted orally (survey on the results of the processed material).</p> <p><i>Final control</i> knowledge in the form of an exam / test is conducted in writing, followed by an oral interview.</p> <p>Within disciplines that provide professional training, positive assessments of current and final control can be issued automatically if the graduate student has prepared and published scientific articles in collections that are part of professional publications and / or publications that are included in international scientometric databases. The number of articles and their topics are agreed with the supervisor.</p>

	<p><b><i>Scientific component of the program.</i></b> Assessment of scientific activity of postgraduate students (applicants) is carried out on the basis of quantitative and qualitative indicators characterizing preparation of scientific works, participation in conferences, preparation of separate parts of the dissertation according to the approved individual plan of scientific work of the postgraduate student (applicant). Reports of graduate students (applicants), based on the results of the individual plan, are approved annually at a meeting of departments and the academic council of the institute (faculty) with a recommendation to continue (or terminate) postgraduate studies.</p>
<p><b>Form of monitoring the success of postgraduate studies (applicant)</b></p>	<p><b><i>Educational component of the program.</i></b></p> <p>Final control of the applicant's learning success is carried out in the form of:</p> <ul style="list-style-type: none"> <li>- exam - based on the results of studying the mandatory disciplines of the educational program of the cycle general scientific training (philosophy of science, management of scientific projects), cycle of research training (registration of intellectual property rights, organization and methods of training, organization of preparation of scientific publications, management of scientific projects), language training cycle (foreign language for professional purposes, methods of preparation of scientific papers in a foreign language), as well as exams based on the results of studying disciplines of professional training (modern achievements of food science, methods and organization of preparation and dissertation writing / laboratory management);</li> <li>- credit - based on the results of studying all other educational components provided by the curriculum.</li> </ul> <p><b><i>Scientific component of the program.</i></b></p> <p>The scientific component of the SNP includes disciplines of cycles of general scientific training, special (professional), research training, language special (professional) and practical training (compulsory and elective) and pedagogical practice, which together with the educational part of the program and research with the participation of the supervisor, preparation and public defense of the dissertation in the specialized academic council provides obtaining the educational level "Doctor of Philosophy" in the specialty 181 "Food Technology".</p>
<p><b>6. Program competencies</b></p>	



<b>Integral competence (IC)</b>	<p>Ability to solve complex problems in the field of professional and / or research and innovation in the field of food technology, which involves a deep rethinking of existing and the creation of new holistic knowledge and / or professional practice.</p>
<b>General competencies (GC)</b>	<p>GC 1. Ability to abstract thinking, analysis and synthesis.  GC 2. Ability to communicate in a foreign language.  GC 3. Ability to use information and communication technologies.  GC 4. Ability to conduct research at the appropriate level.  GC 5. Ability to search, process and analyze information from various sources.  GC 6. Ability to generate new ideas (creativity).  GC 7. Ability to work in an international context.  GC 8. Ability to develop and manage projects.  GC 9. Ability to act on the basis of ethical considerations (motives).</p>
<b>Special (professional) competencies (PC)</b>	<p>PC 1. Ability to identify, pose and solve problems, organize, plan, implement research of fundamental and / or applied direction; analyze, evaluate and compare various theories, concepts and approaches in the subject area of scientific research; draw appropriate conclusions, make suggestions and recommendations.  PC 2. Ability to orally and in writing present and discuss the results of research and / or innovative developments in Ukrainian and foreign languages, to deeply understand scientific texts in the field of research, presented in a foreign language.  PC 3. Ability to use modern information technologies, databases and other electronic resources, specialized software in scientific and educational activities.  PC 4. Ability to develop regulatory, technical and patent documentation for the results of scientific and practical developments in the chosen field; ability to perform calculations to confirm the economic efficiency of decisions made as a result of their implementation in practice.  PC 5. Ability to analyze the scientific and technical level and trends in world and domestic food science, to generate new ideas to solve existing complex problems in the field of food technology.  PC 6. Ability to apply knowledge of modern theories of nutrition, food combinatorics to create foods with new properties;</p>

	<p>PC 7. Ability to apply knowledge to establish patterns of losses in the implementation of the technological process, when conducting technological calculations; ability to use in practice knowledge of the principles of resource and energy saving in the development or improvement of food technologies.</p> <p>PC 8. Ability to optimize processes in food technology and design the prescription composition of products using the apparatus of mathematical modeling and modern software.</p> <p>PC 9. Ability to develop and implement technological solutions to ensure and maintain the quality and safety of food raw materials and food products during the technological process and during storage.</p> <p>PC 10. Ability to scientific and pedagogical activities in the specialty, mastery of modern teaching methodologies and scientific and methodological terminology in the field of education, means of personal and professional self-expression.</p> <p>PC 11. Ability to conduct marketing research of the food market, assess the competitiveness of research projects and financial risks from their implementation.</p>
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**7. Program learning outcomes**

	<p>1. Have advanced conceptual and methodological knowledge in food technology and at the subject line, as well as research skills sufficient to conduct scientific and applied research at the level of the latest world achievements in the relevant field, gain new knowledge and / or innovate.</p>
	<p>2. Deeply understand the general principles and methods of food science, as well as the methodology of scientific research, apply them in their own research in the field of food technology and teaching practice.</p>
	<p>3. Have a thorough knowledge of the subject area, analyze the scientific and technical level of world and domestic food science, generate new ideas and formulate the purpose of their own research as part of the general civilization process.</p>
	<p>4. Know and understand the philosophical methodology of scientific knowledge and psychological and pedagogical aspects of professional and scientific activities.</p>
	<p>5. Know the foreign language at the level necessary for oral and written presentation of research results, conducting professional scientific dialogue, full understanding of foreign scientific texts.</p>
	<p>6. Have a systematic knowledge of modern research methods in the field of food technology.</p>
	<p>7. Have deep knowledge in the chosen field of research on food technology.</p>

	8. Understand the impact of technical solutions in the social, economic and social context.
	9. Plan and perform experimental and / or theoretical research in food interdisciplinary areas using modern tools, critically analyze the results of their own research and the results of other researchers in the context of the whole set of modern knowledge about the research problem.
	10. Solve complex problems of efficient storage and processing of food raw materials into food products in order to ensure their quality and safety, in accordance with current legislation.
	11. Freely present and discuss research results, scientific and applied problems in the field of food technology in state and foreign languages, qualified to reflect the results of research in scientific publications in leading international scientific journals.
	12. Develop and implement scientific and / or innovative engineering projects that provide an opportunity to rethink existing and create new holistic knowledge and / or professional practice and solve scientific and technological problems in food technology in compliance with academic ethics and taking into account social, economic, environmental and legal aspects.
	13. Develop and implement innovative technological solutions, tools and methods of technical sciences to solve existing problems and further development of food technology.
	14. Plan and implement the educational process based on modern methodological principles, apply active teaching methods, use different strategies of pedagogical interaction, ways of communicative influence, dialogic pedagogical communication, as well as demonstrate leadership and self-regulation skills based on self-knowledge.
	15. To forecast, plan and implement in practice the production of food products, to optimize the parameters of technological processes in accordance with the implementation of the principles of resource conservation and environmental safety.
	16. Develop grant proposals, technical documentation and industry recommendations in the field of food production.
	17. Ability to communicate in business scientific and professional language, to apply different styles of speech, methods and techniques of communication, to demonstrate a wide scientific and professional vocabulary.
	18. Ability to use modern information and communication tools and technologies to ensure effective scientific and professional communications.
	19. Ability to independently conduct research and make decisions.
	20. Ability to formulate their own author's conclusions, suggestions and recommendations.

	21. Ability to defend the results of research, to be aware of and take personal responsibility for them, the ability to present the results, including in the form of a dissertation.
<b>8. Forms of certification of applicants for higher education</b>	
<b>Forms of certification of applicants for higher education</b>	Certification is carried out in the form of a public presentation of research results in the form of a dissertation of a doctor of philosophy, provided that the graduate student fulfills his individual curriculum.
<b>Requirements for qualification work</b>	The dissertation of the Doctor of Philosophy involves solving a topical theoretical and / or experimental (practical) problem in the field of food technology and shows the ability of the applicant to conduct independent research, formulate new complex ideas and justify them. The dissertation is the result of independent scientific work of the graduate student, which has the status of an intellectual product on the rights of the manuscript and offers the solution of the actual scientific problem in the specialty 181 "Food Technologies".
<b>Requirements public protection</b>	The defense of the dissertation takes place in public at a meeting of the specialized academic council. Mandatory prerequisite for admission to the defense of the dissertation is the approbation of research results and main conclusions at scientific conferences and their publication in professional scientific journals, in accordance with current requirements.
<b>9. Resource support for the implementation of the educational program</b>	
<b>Staffing</b>	Scientific and pedagogical staff meets the requirements of current legislation of Ukraine. The scientific and pedagogical workers involved in the implementation of the educational program are employees of Sumy NAU, advanced training and internships of scientific and pedagogical workers are provided at least once every five years. 100% of scientific and pedagogical workers involved in teaching disciplines have scientific degrees and academic titles.
<b>Materially-technical software</b>	Provision of educational and scientific laboratories, including interdepartmental: laboratory of innovative food technologies, laboratory of meat processing technology, laboratory of the department of food technology on the basis of catering complex, laboratory of technological control of food, laboratory of food production equipment, interdepartmental scientific and practical laboratory of chemical and microbiological research of food.



MC. 8	Organization and methods of training	3.0		x								exam
MC. 9	Methods and organization of preparation and writing of the dissertation	3.0		x								exam
MC. 10	Management of scientific projects	3.0	x									exam
MC. 11	Foreign language for professional purposes	4.0	x	x								exam
MC. 12	Methods of preparation of scientific papers in a foreign language	3.0			x							exam
MC. 13	Pedagogical practice	4.0				x						test
<b>Together for all cycles of the main part of the plan</b>		<b>42.0</b>										
<b>2. Elective disciplines</b>												
SC.1	Innovations in the industry / Innovative food ingredients in technology of food products	5.0			x							test
SC.2	Innovative engineering institutions restaurant industry / Engineering innovations	5.0				x						test
SC.3	Food quality management / Modern instrumental research methods	5.0				x						test
<b>Total for the cycle of special (professional) training (at the student's choice)</b>		<b>15.0</b>										
<b>Together in elective disciplines</b>		<b>15.0</b>										
<b>Together on cycles of normative and variable parts</b>		<b>57.0</b>										

### 1.2.2. Structural and logical scheme of of the educational program

Applicants for higher education have the right to choose disciplines within the limits provided by the relevant educational program and working curriculum, in the amount of not less than 25 percent of the total number of ECTS credits provided for this level of higher education.

## 2.2. Structural and logical scheme of training doctors of philosophy

General training unit (competencies)			Block of professional training (competence)		
1 year	Philosophy of science	Organization and methods of training	Methodology of scientific research	→	Modern achievements of food science
				→	Registration of intellectual property rights
			Foreign language for professional purposes		
			Methods and organization of preparation and writing of the dissertation	↓	Communications in the scientific environment
2 years			Modern information technologies in scientific activity	→	
			Management of scientific projects		
			Modeling and planning of a scientific experiment		VK 1
				Methods of preparation of scientific papers in a foreign language	VK 2
				VK 3	
3 years		Pedagogical practice			

## **II. SCIENTIFIC COMPONENT OF THE EDUCATIONAL AND SCIENTIFIC PROGRAM**

The scientific component of the educational and scientific program involves the graduate student's own research under the guidance of one or two supervisors and registration of its results in the form of a dissertation. The scientific component of the educational and scientific program is made out in the form of the individual plan of scientific work.

The dissertation for the degree of Doctor of Philosophy is an independent detailed research that offers a solution to a complex problem in the field of food technology, in particular food technology, which involves a deep rethinking of existing and creating new holistic knowledge and/or professional practice.

The dissertation should not contain academic plagiarism, falsification. The dissertation should be posted on the website of the institution of higher education (scientific institution). The volume of the main text of the dissertation should be 4.0-5.5 author's sheets. The dissertation must meet other requirements established by law.

An integral part of the scientific component of the educational and scientific program is the preparation and publication of scientific articles (the number of which is provided by relevant regulations), monographs, scientific and methodological recommendations, abstracts, speeches at scientific conferences, participation in scientific seminars, round tables, symposia.

Participation in the implementation of budgetary, economic contract and initiative research work (topics).

Implementation of research results in production and educational process.

### **Research topics:**

1. Creation of new and improvement of existing food technologies.
2. Research of raw materials of animal, vegetable, hydrobiotic and other origin, semi-finished products, culinary products, drinking water, food and dietary supplements as objects of technological processing into food products.
3. Scientific substantiation and development of innovative technologies of food products from raw materials of animal, vegetable, hydrobiotic and other origin, semi-finished products and culinary products; food and dietary supplements.
4. Scientific substantiation, development and improvement of technologies of food products of special and functional purpose.
5. Establishment of the mechanism and kinetic laws of chemical, physical and biochemical phenomena that occur during the processing of raw materials of animal, vegetable, aquatic and other origin, semi-finished products and culinary products, as well as drinking water.
6. Development of food rations for certain groups of the population taking into account age, sex, intensity and working conditions, ecological conditions, type of diseases and other factors influencing human health and working capacity.



7. Scientific substantiation and development of technologies and technological modes of production and storage of bakery products, confectionery and pasta and food concentrates that provide energy conservation, environmental safety, increase technical and technological level of production, reduce losses, preserve and improve the quality of raw materials and finished products.

8. Establishing the mechanism and kinetic patterns of chemical, physical and biochemical phenomena that occur in the production and storage of bakery products, confectionery and pasta and food concentrates.

9. Scientific substantiation of new types of raw materials, development of a new range and technology of production of bakery products, confectionery and pasta and food concentrates of improved quality.

10. Research of regularities of functioning, modeling and optimization of technological processes of production of bakery products, confectionery and pasta and food concentrates.

11. Research of properties and quality of raw materials and bakery products, confectionery and pasta and food concentrates, improvement of assessment of their nutritional value.

12. Development of theoretical and practical bases of perspective methods and systems of quality control and safety of raw materials, semi-finished products and finished products at different stages of technology of bakery products, confectionery and pasta and food concentrates.

13. Research of meat, dairy and other livestock products, fish products and products from aquatic organisms and other aquaculture products as objects of technological processing into products for food, feed, technical or other purposes.

14. Development and improvement of methodological principles and scientific methods of research of chemical composition and structure, assessment of quality and safety of meat, dairy, fish raw materials, aquaculture products, as well as finished meat, dairy, fish and aqua products.

15. Improving the existing technological processes of processing meat, dairy, fish raw materials and aquaculture products in the direction of expanding the range and improving the quality and safety of finished products, reducing resource and energy costs for its production.

16. Scientific substantiation and development of innovative technologies of meat, dairy, fish products and aqua products.

17. Scientific substantiation and development of new methods of processing of meat, dairy, fish raw materials and aquaculture products, as well as finished meat, dairy and fish products.

18. Scientific substantiation, development and improvement of technologies of meat, dairy and fish products of special, medical-prophylactic, heroic or functional purpose, as well as pharmaceutical, chemical, protein and other preparations from meat, dairy, fish raw materials and aquaculture products.

### **III. CERTIFICATION OF APPLICANTS**

Certification of persons obtaining the degree of Doctor of Philosophy is carried out by a permanent or one-time specialized scientific council of a higher education institution or scientific institution accredited by the National Agency for Quality Assurance in Higher Education, based on public defense of scientific achievements in the form of a dissertation. The candidate for the degree of Doctor of Philosophy has the right to choose a specialized academic council.

A prerequisite for admission to the defense is the successful implementation of the graduate student's individual curriculum.

## **List of normative documents on which the standard of higher education is based**

1. Law of Ukraine "On Higher Education" of 01.07.2014 № 1556-VII.
2. Law of Ukraine "On the basic principles and requirements for food safety and quality" from 22. 07. 2014 № 1602-VII
3. Methodical recommendations for the development of standards of higher education // Baluba I. et al. Approved by the higher education sector of the Scientific and Methodological Council. - 29 p.
4. Resolution of the Cabinet of Ministers of Ukraine of 23.11.2011 № 1341 "On approval of the national qualifications framework".  
<http://zakon4.rada.gov.ua/laws/show/1341-2011-rr>
5. Resolution of the Cabinet of Ministers of Ukraine dated 29.04.15 № 266 "On approval of the list of branches of knowledge and specialties for which higher education students are trained".
6. Order of the Ministry of Education and Science of Ukraine dated 01.06.2016 №600 "On approval and implementation of Guidelines for the development of standards of higher education".
7. National Classifier of Ukraine: Classification of economic activities DK 009: 2010, effective from 2012-01-01.
8. National Classifier of Ukraine: Classifier of professions DK 003: 2010, valid from 2010-11-01.
9. Areas of Education and Training 2013 (ISCED-O 2013): Accompanying Guide to the International Standard Classification of Education 2011. - UNESCO Institute for Statistics, 2014. - Access mode:  
<http://www.uis.unesco.org/Library/Documents/isced-f-2013-fields-of-education-training-2014-rus.pdf>.
10. NSU ISO 22000: 2007 Food safety management systems. Requirements for any food chain organization (ISO 22000: 2005, IDT). - Kyiv: Derzhspozhyvstandart Ukrainy, 2007. - 30 p.
11. NSU ISO 22005: 2009 Traceability in feed and food chains. General principles and basic requirements for system development and implementation (ISO 22005: 2007, IDT). - Kyiv: Derzhspozhyvstandart Ukrainy, 2010. - 6 p.
12. Regulation (EU) of the European Parliament and of the Council of 28 January 2002 № 178/2002 laying down the general principles and requirements of food law establishes a European Food Safety Authority and establishes procedures for matters relating to food safety products.
13. Regulation (EU) of the European Parliament and of the Council of 29 April 2004 № 882/2004 "On official control measures applied to ensure the verification of compliance with feed and food law, animal health and animal welfare rules".
14. Regulation (EU) of the European Parliament and of the Council of 29 April 2004 № 852/2004 "On the hygiene of foodstuffs".

15. Regulation (EU) of the European Parliament and of the Council of 29 April 2004 № 854/2004 laying down special rules for the organization of official controls on products of animal origin intended for human consumption.

### Information sources

1. National Glossary 2014 - [http://ihed.org.ua/images/biblioteka/glossariy\\_Visha\\_osvita\\_2014\\_tempus-office.pdf](http://ihed.org.ua/images/biblioteka/glossariy_Visha_osvita_2014_tempus-office.pdf).
2. Standards and recommendations for quality assurance in the European Higher Education Area, ESG 2015. - [http://www.britishcouncil.org.ua/sites/default/files/standards-and-guidelines\\_for\\_qa\\_in\\_the\\_ehea\\_2015.pdf](http://www.britishcouncil.org.ua/sites/default/files/standards-and-guidelines_for_qa_in_the_ehea_2015.pdf)
3. Development of educational programs: methodical recommendations - [http://ihed.org.ua/images/biblioteka/rozroblennya\\_osv\\_program\\_2014\\_tempus-office.pdf](http://ihed.org.ua/images/biblioteka/rozroblennya_osv_program_2014_tempus-office.pdf).
4. Development of the quality assurance system of higher education in Ukraine: information-analytical review - [http://ihed.org.ua/images/biblioteka/Rozvitok\\_sisitemi\\_zabesp\\_yakosti\\_VO\\_UA\\_2015.pdf](http://ihed.org.ua/images/biblioteka/Rozvitok_sisitemi_zabesp_yakosti_VO_UA_2015.pdf).
5. ISCED (ISCED) 2011 - <http://www.uis.unesco.org/education/documents/isced-2011-en.pdf>.
6. ISCED-F (ISCED-G) 2013 - <http://www.uis.unesco.org/Education/Documents/isced-fields-of-education-training-2013.pdf>.
7. TUNING (for acquaintance with special (professional) competences and examples of standards - <http://core-project.eu/documents/Tuning%20G%20Formulating%20Degree%20PR4.pdf>.
8. TUNING (for acquaintance with special (professional) competences and examples of standards - <http://www.unideusto.org/tuningeu/>.
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Table 1

**Matrix of compliance of the competencies defined by the educational and scientific program with the descriptors of the national qualifications framework**

Classification competencies for the NQF	Knowledge	Skills	Communication	Autonomy and responsibility
<b>General competencies</b>				
GC 1. Ability to abstract thinking, analysis and synthesis.	•		•	
GC 2. Ability to search, process and analyze information from various sources, to critical analysis and evaluation of modern scientific achievements, synthesis of holistic knowledge, comprehensive problem solving.	•	•		
GC 3. Ability to generate new ideas and make informed decisions to achieve goals.	•	•		•
GC 4. Ability to participate in the work of domestic and international research teams and work in an international context.	•		•	
GC 5. Ability to develop and manage research projects, initiate research organizations in the field of research and innovation, assess the need for research funding, register intellectual property rights.	•		•	•
GC 6. Ability to plan and conduct comprehensive research at the current level using the latest information and communication technologies and compliance with the parameters of safe activities based on a holistic systematic scientific worldview using knowledge in the history and philosophy of science.	•	•		
GC 7. The ability to take initiative, take responsibility, motivate people and move towards a common goal.			•	•
GC 8. Ability to prepare scientific texts, present, discuss, lead discussions and scientific polemics on the results of their scientific work in state and foreign languages in a volume sufficient for full understanding, demonstrating the culture of scientific oral and written speech.	•	•	•	
GC 9. Ability to comply with the rules of scientific ethics, copyright and related intellectual property rights.	•			•
<b>Special (professional, subject) competencies</b>				
PC 1. Ability to identify, pose and solve problems, organize, plan, implement research of fundamental and / or applied direction; analyze, evaluate and compare various theories, concepts and approaches	•	•		•

in the subject area of scientific research; draw appropriate conclusions, make suggestions and recommendations.				
PC 2. Ability to orally and in writing present and discuss the results of research and / or innovative developments in Ukrainian and foreign languages, to deeply understand scientific texts in the field of research, presented in a foreign language.	•	•	•	
PC 3. Ability to use modern information technologies, databases and other electronic resources, specialized software in scientific and educational activities.	•	•		
PC 4. Ability to develop regulatory, technical and patent documentation for the results of scientific and practical developments in the chosen field; ability to perform calculations to confirm the economic efficiency of decisions made as a result of their implementation in practice.	•	•		•
PC 5. Ability to analyze the scientific and technical level and trends in world and domestic food science, to generate new ideas to solve existing complex problems in the field of food technology.	•		•	•
PC 6. Ability to apply knowledge of modern theories of nutrition, food combinatorics to create foods with new properties;	•	•		
PC 7. Ability to apply knowledge to establish patterns of losses in the implementation of the technological process, when conducting technological calculations; ability to use in practice knowledge of the principles of resource and energy saving in the development or improvement of food technologies.	•	•		
PC 8. Ability to optimize processes in food technology and design the prescription composition of products using the apparatus of mathematical modeling and modern software.	•	•		
PC 9. Ability to develop and implement technological solutions to ensure and maintain the quality and safety of food raw materials and food products during the technological process and during storage.	•	•		•
PC 10. Ability to scientific and pedagogical activities in the specialty, mastery of modern teaching methodologies and scientific and methodological terminology in the field of education, means of personal and professional self-expression.		•	•	

PC 11. Ability to conduct marketing research of the food market, assess the competitiveness of research projects and financial risks from their implementation.	•	•	•	•
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Table 2

**Matrix of correspondence of learning outcomes and competencies determined by the educational-scientific program**

Program learning outcomes	Integral competence	Competences																			
		General competencies										Special (professional) competencies									
		1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	10	11
	IC 1																				
PLO 1	+	+	+		+								+		+						
PLO 2	+	+	+	+	+		+					+		+			+			+	
PLO 3	+		+	+	+	+		+				+				+					
PLO 4	+	+						+												+	
PLO 5	+									+			+			+					
PLO 6	+							+				+		+							
PLO 7	+																+	+	+	+	
PLO 8	+				+										+			+		+	
PLO 9	+				+			+					+				+				
PLO 10	+															+			+	+	
PLO 11	+				+					+			+								
PLO 12	+					+			+			+			+	+		+	+	+	
PLO 13	+																+	+	+	+	
PLO 14	+								+					+						+	
PLO 15	+		+												+		+	+	+	+	
PLO 16	+			+		+					+				+		+	+	+	+	
PLO 17	+									+			+								
PLO 18	+		+					+						+							
PLO 19	+			+				+	+				+								
PLO 20	+									+			+			+					
PLO 21	+								+		+						+		+		



