Ministry of Education and Science of Ukraine
Sumy National Agrarian University
Faculty of Biology and Technology
Department of Feed and Animal Feeding Technologies

Work program (syllabus) of the educational component

OK 3. Modern technologies of feeds and feed additives

(required / optional)

Implemented within the educational program
Technology of production and processing of livestock products

in the specialty **H2 Animal Husbandry**

at the second (master's) level of higher education

Sumy – 2026

Developer: Victor Opara, associate professor
(signature (surname, initials)) (academic degree and title, position)

Reviewed, approved and ratified at the department meeting **Feed and animal feeding technologies**	protocol dated 18.05.26 № 11
	Manager departments _____ (signature) Victor Opara (last name, initials)

Agreed:

Educational program guarantor _____ (signature) Opara V.O. (full name)

Dean of the faculty where the educational program is implemented _____ (signature) V. Vechorka (full name)

Review of the work program (attached) provided by: Anna SHKVRAT (Full name)

Oleksandr MYKHAILKO (Full name)

Methodologist of the Department of Educational Quality, licensing and accreditation _____ (signature) (MARIIA KOVALOVA) (full name)

Registered in the electronic database: date: 26.06 2026.

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Information on reviewing the work program (syllabus):

Academic year in which changes are made	Number of the appendix to the work program with a description of the changes	Changes reviewed and approved		
		Date and number of the minutes of the department meeting	Manager departments	Educational program guarantor

1. GENERAL INFORMATION ABOUT THE EDUCATIONAL COMPONENT

1.	Name OK	Modern technologies of feed and feed additives					
2.	Faculty/department	Biological and technological/Feed and animal feeding technologies					
3.	Status OK	Mandatory					
4.	Program/Specialty(s) that include OK	Technology of production and processing of livestock products/ H2 Livestock					
5.	The OK can be offered for (*filled in for selective OKs)*	-					
6.	NRC level	Level 7					
7.	Semester and duration of study	1st semester - 15 weeks; 2nd semester -11 weeks					
8.	Number of ECTS credits	5					
9.	Total hours and their distribution	Contact work (classes)				Independent work	
		Lectures		Practical			
		daytime	correspondence	daytime	correspondence	daytime	correspondenc
		28	16	3 6	16	86	118
10.	Language of instruction	Ukrainian					
11.	Teacher/Educational Component Coordinator	Opara Viktor Oleksiyovych					
11.1	Contact information	Associate Professor of the Department of Feed and Animal Feeding Technologie room 319 of the main building email address: victor . opara @ snau . edu . u.a consultations: every Wednesday 1:00 PM -2: 00 PM .					
12.	General description of the educational component	The discipline Modern Technologies of Feed and Feed Additives contributes to th training of specialists capable of solving practical problems of professional activit in the production of high-quality feed and their effective use in the field of livestoc production. Main topics to be studied: Comprehensive assessment of feed nutritional valu production, use and quality **control** of green fodder; **preparation** , storage an quality control of roughage; technology and conditions for harvesting high-qualit silage; technology for harvesting haylage; root and tuber crops and other succule fodder; grain and methods of its processing; technologies for the production an use of animal feed, microbiological and chemical synthesis, compound feed an balancing feed additives; production of feed at processing plants; moder technologies for distributing feed. As a result of studying the educational component, the student will be able evaluate and analyze: the quality of feed and the feed base of the farm technological maps for feed procurement; work with certificates and feed quali standards, organize rational storage and effective use of feed and feed additives.					
13.	Purpose of the educational component	Formation of students' knowledge and skills regarding systems for assessing th nutritional value and quality of feeds based on a set of indicators, features o modern technologies for the procurement, storage and use of feeds and fee additives; acquiring skills in developing measures to optimize the feed base an improve the quality of feed on the farm. The educational component is aimed at achieving professional progra competencies, which is implemented through disciplinary learning outcomes, i particular the ability to assess the quality and control the safety of feeds and fee					

		materials and, through their effective use, optimize nutrition levels. farm anima and poultry.
14.	Prerequisites for studying OK, connection with other educational components of OP	The educational component is the basis for OK4 Innovative technologies fo livestock production, OK8 Productivity biology , OK9 Innovations in dairy an bee cattle breeding, VK 6 Animal nutrition and feed quality
15.	Academic Integrity Policy	The academic integrity policy at SNAU is regulated by the Code of Academic Integrity. http://docs.snau.edu.ua/documents/education/quality/kodeks_ akadem_dobrochesnosti.pdf In accordance with it, the requirements for a student to maintain academic integrit while studying the educational component are as follows: Be responsible for your responsibilities, complete the tasks provided for by th curriculum on time and in good faith; be present at all classes; perform independe work; honestly and responsibly prepare for current, modular and final contro submit only independently completed work for evaluation. It is unacceptable for a student to: show disrespectful and incorrect attitude towards the teacher; be late for classe and miss them without good reason; use hints, other people's work, telephone during the educational process; provide and receive assistance from third partie when passing current, modular and final control; receive or offer a bribe fo obtaining any advantages in educational activities. For violating the rules of academic integrity, students may be held liable in the following ways: − re-taking the assessment (test, exam, test, etc.); − retaking the training course; − warning; − issuing a reprimand; − expulsion from the university (Part 5, Article 48 of the Law of Ukraine “On Education”); − arrest or restriction of liberty, or deprivation of liberty.
16.	Link to the course in Moodle	https://cdn.snau.edu.ua/moodle/course/view.php?id=276
17.	Keywords	Feed, feed preparation technology, nutritional value, feed consumption, rations, compound feeds.

2. LEARNING OUTCOMES BY EDUCATIONAL COMPONENT AND THEIR RELATIONSHIP WITH PROGRAM LEARNING OUTCOMES

Learning outcomes for OK: After studying the educational component, the student is expected to be able to…	Program learning outcomes that the OC aims to achieve (indicate the number according to the numbering given in the OP)		How is RND assessed?
	PRN 1	PRN 4	
DRN 1. To classify feeds, distinguish feeds by origin and nutritional value, analyze the	x		Individual assignment, final exam

chemical composition of feeds and, based on the results of a comprehensive nutritional analysis, predict its productive effect.			
DRN 2. Based on the results of organoleptic evaluation and laboratory research, establish the appropriate class of bulk feed and the effectiveness of its use in animal feeding.	x		Individual assignment, final exam
DRN 3 . Evaluate concentrated animal and microbiological feed materials and various feed additives according to organoleptic and laboratory indicators and plan their effective use in animal and poultry feeding.	x	x	Individual calculation work, final exam
DRN 4. Analyze the quality and implement effective use of feed mixtures Using modern feed distribution equipment and software **,** identify anti-food substances and undesirable impurities in basic feeds based on the results of organoleptic evaluation and laboratory tests in order to avoid poisoning and metabolic disorders in animals.	x	x	Individual assignment, final exam

3. CONTENT OF THE EDUCATIONAL COMPONENT (COURSE PROGRAM)

Topic. List of issues to be addressed within the topic	Distribution within the overall time budget						Recommended reading
	Classroom work				Independent work		
	Luke		Pz				
	day	correspondence	day	correspondence	daytime	correspondence	
Topic 1. Modern classifications and a system for comprehensive assessment of the nutritional value and quality of feed. State control over the production, circulation and use of feed. 1. Classification of feed materials 2. Comprehensive assessment of feed nutritional value. Methods of quality assessment and factors affecting the composition and nutritional value of feed. 3. Law of Ukraine " On Safety and Hygiene of Feed "	4	2	4	2	20	22	Main sources: 1, 2, 3, 4, 5, 6 , Additional sources: 10 electronic resources
Topic 2. Production, use and quality control of bulk *feeds* . 1. Field fodder production and use of natural fodder lands 2. Green fodder. 3. Procurement, storage and quality control of roughage. 4. Silo. 5. Haymaking. 6. Root and tuber crops and other succulent foods.	10	6	18	6	20	34	Main sources: 1, 2, 3, 4, 5, 6 , Additional sources: 10

Topic 3 . Concentrated, combined, animal and microbiological feedstuffs. Mineral, vitamin and other additives. 1. Grain and methods of its processing. 2. Animal feed. 3. Feeds of microbial and chemical synthesis. 4. Mineral, vitamin and other supplements.	8	4	6	4	20	30	Main sources: 1, 2, 3, 4, 5, 6 , Additional sources: 10, 11, 13, 14, 15
Topic 4. Modern technologies for the production, distribution and effective use of complete feed mixtures. Anti-nutrients and undesirable impurities in basic feeds. 1. Technology of production and use of compound feeds 2. Complete feed for dogs and other carnivores 3. Antinutrients and undesirable impurities in basic feeds. 4. Modern feed distribution technologies.	6	4	8	4	30	32	Main sources: 1, 2, 3, 4, 5, 6 , Additional sources: 10, 11, 12, 13, 14, 15
Total	**28**	**16**	**30**	**16**	**90**	**118**	

4. TEACHING AND LEARNING METHODS

DRN	**Teaching methods** (work that will be carried out by the teacher during classroom lessons , consultations)	**Number of hours**	**Teaching methods** (what types of learning activities should the student perform independently)	**Number of hours**
DRN 1	Lecture, practical work,	8/4	Studying the abstract, literary sources, completing an individual task	20/22
DRN 2	Lecture, practical work, classes.	28/12	Studying the abstract, literary sources, completing an individual task	20/34
DRN 3	Lecture, presentation, practical lesson	14/8	Studying the abstract, literary sources, completing an individual task	20/30
DRN 4	Lecture, practical work	14/8	Study of the abstract, literary sources, completion of an individual task.	30/32

5. EVALUATION BY EDUCATIONAL COMPONENT

5.1. Summative assessment

5.1.1. For the assessment of expected learning outcomes, the following is provided:

No.	Summative assessment methods	Points / Weight in the overall score	Date drafting
1.	Individual assignment on Topic 1.	40 points / 40%	1 semester, Week 8
2.	Individual assignment on Topic 2.	60 points / 60%	1 semester, Week 15
3.	Individual calculation work on Topic 3 .	35 points / 35%	2nd semester, Week 6
4.	Individual calculation work on Topic 4.	35 points / 35%	2nd semester, 11 weeks
5.	Exam	30 points / 30%	2nd semester, exam session

5.1.2. Evaluation criteria

Component	**Unsatisfactorily**	**Satisfactorily**	**Good**	**Perfectly**
Individual tasks for Topics 1	*<8 points*	*8-10 points*	*10-12 points*	*12-14 points*
	Task requirements not met	Most requirements are met, but individual calculations are missing, there is no analysis of the data obtained	All task requirements met	All task requirements were met, critical thinking and thoughtfulness were demonstrated, and an original solution to the problem of improving feed efficiency was proposed.
Individual tasks for Topics 2	*<13 points*	*13-17 points*	*17-19 points*	*19 -22 points*
	Task requirements not met	Most requirements are met, but individual calculations are missing, there is no analysis of the data obtained	All task requirements met	All task requirements have been met, a deep understanding of the specialized field has been demonstrated, and opportunities for improving the quality of feed on the farm have been identified.
Individual tasks for Topics 3	*<10 points*	*10-13 points*	*13-15 points*	*15-17 points*
	Task requirements not met	Most of the requirements are met, but some questions are not fully covered, the student does not fully understand the material.	All task requirements have been met, fluency in the material has been demonstrated	All task requirements were met, high awareness of quality assessment and effective use of feed additives in animal feeding was demonstrated
Individual tasks for Topics 4	*<10 points*	*10-1 3 points*	*1 3 -16 points*	*1 5 -17 points*
	Task requirements not met	Most requirements are met, but individual calculations are missing, there is	All task requirements met	All requirements of the task were met, and a deep understanding of the need to apply modern technologies

		no analysis of the data obtained		for the production and distribution of feed was demonstrated.
Exam	*<19 points*	*19-22 points*	*23-2 8 points*	*2 8 -30 points*

5.2. Formative assessment

To assess current progress in learning and understand areas for further improvement,

No.	**Elements of formative assessment**	**Date**
1.	Oral survey after studying the topics	At the next practical session after presenting the material on the topic
2.	Verbal feedback from the teacher while working on a calculation task during classes	During the semester
3.	Verbal feedback from the teacher after completing the calculation task	In the next lesson after the student submits the completed assignment
4.	Oral feedback from the teacher and students after the presentation of the assignment	Immediately after the presentation ends

6. LEARNING RESOURCES (LITERATURE)

6.1. Main sources

6.1.1. Textbooks, manuals

1. Kulyk M.F., Zasukha T.V., Obertyukh Yu.V. Technologies of feed procurement and storage: a textbook. Kyiv: NUBiP of Ukraine, 2022. 286 p.

2. Petrenko I.P., Slavov V.P., Lytvynenko T.M. Feed production and use of feeds: a textbook. Kyiv: Agrarian Education, 2022. 420 p.

3. Quality control and product safety in the industry (compound feed industry). Yegorov B.V. Oldi+. 2024. 446 p.

4. Gnoevy V.I., Trynchuk O.O. Feed production and feed resources of Ukraine. Kharkiv: Stilna typografiya, 2022. 384 p.

5. Feeding of farm animals. G.V. Provatorov, V.O. Provatorova. University book. 2024. 510 p.

6. Fodder base and feeding of hunting animals / V. O. Opara, V. V. Popsuy, O. V. Korzh, O. B. Kiselyov. – Sumy: FOP Tsoma S. P., 2024, 152 p.

6.1.2. Methodological support

7. Modern technologies of feed and feed additives. Lecture notes for students of the Master's degree program in specialty 204 "Technology of production and processing of livestock products", full-time, part-time and distance learning. Sumy, 2022. - 246 p.

8. Modern technologies of feeds and feed additives. Methodological guidelines for conducting independent work for 1st year master's students of the Faculty of Biology and Technology in the specialty 204 Technology of production and processing of livestock products, full-time and part-time forms of study Sumy, 2022. - 87 p.

9. Modern technologies of feed and feed additives. Methodological instructions for conducting laboratory and practical classes and independent work for students of the Master's degree program in specialty 204 "Technology of production and processing of livestock products", full-time, part-time and distance learning. Sumy, 202 3 . - 114 p.

6.1.3. Electronic resources

1. Website: https://zakon.rada.gov.ua/laws/show/2264-19#Text
2. Website: https://ips.ligazakon.net/document/MN023531?an=2
3. Website: https://agropolit.com/news/19192-zakon-pro-bezpechnist-ta-gigiyenu-kormiv-pochav-diyati
4. *Website: http://godivlya.blogspot.com*
5. Website: *http://tvarynnyctvo.ru/godivlja-tvaryn*
6. Website: *http://agrobiznes.org.ua*
7. Website: *http://webfermer.org.ua*
8. Website: *http://www.propozitsiya.com*
9. Website: *http://www.milkua.info/uk/news*

6.2. Additional sources

10. Provatorov G.V., Ladyka V.I. et al. Norms, rations and nutritional value of feeds for various types of farm animals: Handbook. – Sumy: VTD "University Book", 2023. - 448 p.

11. Danylenko O.M. Modern technologies for the production of compound feeds and feed additives. Odesa: Oldi+, 2024. 295 p.

12. Encyclopedia of Animal Feeding - E-book. Clive Phillips. CABI Publishing. 2023. 696 p.

13. Bazurin O.A., Opara V.O., Korzh O.V., Popsuy V.V. The effectiveness of various methods of preventing mycotoxicoses in pig farming. // Bulletin of the Sumy National Agrarian University: scientific journal. – Ser. "Animal Husbandry" 2 (57) – Sumy: SNAU, 2024. – P. 12-19

14. Opara V.O. Efficiency of piglet rearing with the use of zinc oxide and amoxicillin in compound feeds / V. O. Opara, V. V. Popsuy, O. V. Korzh, M. Yu. Romanchenko // Bulletin of the Sumy National Agrarian University: scientific journal. – Ser. "Animal Husbandry " – Sumy: SNAU, 2021. – Issue 4 (47) P. 108-113
DOI: https://doi.org/10.32845/bsnau.lvst.2021.4.18

15. Povod, M. G., Opara, V. O., Mykhalko, O. G., Guty, B. V., Chaly, O. I., Verbelchuk, T. V., Verbelchuk, S. P., & Kobernyuk, V. V. (2023). EFFICIENCY OF USING HIGH-PROTEIN SUNFLOWER CONCENTRATE IN GROWING PIGS IN INDUSTRIAL COMPLEX CONDITIONS . *Bulletin of the Sumy National Agrarian University. Series: Livestock* , (4), 33-41.
https://doi.org/10.32845/bsnau.lvst.2022.4.5

2. Scientific and scientific and production journals:
- Bulletin of Agricultural Science
- Livestock of Ukraine
- Offer

6.3. Software

1. Excel .
Word text editor .
3. Microsoft Office Power Point .
4. Programs for the analysis and calculation of rations for various types of farm animals / for students of the directions of "production and processing of livestock products" and "veterinary medicine", as well as for teachers and specialists of agricultural enterprises. – Sumy: Sumy National Agricultural University, 2014.

Review of the work program (syllabus)
OK 3. Modern technologies of feeds and feed additives

Implemented within the educational program "Technology of production and processing of livestock products"
in the specialty H2 Animal Husbandry
at the second (master's) level of higher education

Developed *by Candidate of Agricultural Sciences Opara V. O.*

Parameter by which the work program (syllabus) of the educational component is evaluated by the guarantor or a member of the project team	**Yes**	**No**	**Comment**
Learning outcomes for the educational component (DOL) correspond to the NQF			
Results training according to the educational component (DRN) correspond to provided for by the PRN (for mandatory OKs)			
Results training on the educational component gives possibility measure and evaluate level their achievement			

Member of the OPP project team:

Parameter by which the work program (syllabus) of the educational component is evaluated by the teacher of the relevant department	**Yes**	**No**	**Comment**
General information about the educational component is sufficient			
Learning outcomes for the educational component (DOL) correspond to the NQF			
Learning outcomes by educational component (LE) make it possible to measure and assess the level of their achievement			
Learning outcomes (LOs) relate to student competencies, not to the content of the discipline (contain knowledge, skills, abilities, and not to the topics of the discipline curriculum)			
The content of the OK is formed in accordance with the structural and logical scheme			
Learning activity (teaching and learning methods) enables students to achieve expected learning outcomes (ELOs)			

The educational component involves learning through research that is appropriate and sufficient for the appropriate level of higher education.			
The assessment strategy within the educational component is in line with the University/Faculty policy.			
The provided assessment methods allow you to assess the degree of achievement of learning outcomes by educational component.			
The student workload is adequate for the educational component.			
The recommended learning resources are sufficient to achieve the learning outcomes (LOEs)			
The literature is relevant			
The list of learning resources contains the software products necessary to achieve the DRL			

Reviewer