

Ministry of Education and Science of Ukraine
Sumy National Agrarian University
Faculty of Veterinary Medicine
Department of Internal Medicine, Pharmacy and Biochemistry

Work program (syllabus) of the educational component
PHYSIOLOGICAL BASIS OF SMALL ANIMAL NUTRITION
(Mandatory)

Specialty	211 Veterinary medicine
Educational program	Veterinary medicine
Level of higher education	Second (Master's)

Author:  (Kalashnyk O.M., Phd, Associate professor of department of Internal Medicine, Pharmacy and Biochemistry)

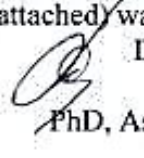
Module syllabus agreed at the _____ Department meeting	Minutes No <u>17</u> dated <u>09.06.2025</u>
	Head of the Department of Internal Medicine, Pharmacy and Biochemistry <u></u> (Nechiporenko O.L.)

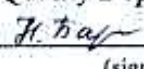
Approved by:

Guarantor of the educational program 
(signature) (full name)

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

A review of the work program (attached) was provided by:

 Doctor of Veterinary Sciences, Professor Shkromada O.I.
 PhD, Associate Professor Plyuta L.V.

Methodologist of the Education Quality Department,
licensing and accreditation  N. Baranik
(signature) (full name)

Registered in the electronic database: date: 01.07. 2025 .

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	Head of the Department	Educational program guarantor
2025-2026				

1. GENERAL INFORMATION ABOUT THE EDUCATIONAL COMPONENT

1.	Name OK	Physiological foundations of small animal nutrition			
2.	Faculty/department	Faculty of Veterinary Medicine, department of Internal Medicine, Pharmacy and Biochemistry			
3.	Status OK	Selective			
4.	Program/Specialty (programs), part of which is the OK for (<i>filled in for mandatory OKs</i>)	H6 Veterinary medicine			
5.	The OK can be offered for (<i>filled in for selective OKs</i>)	EP "Veterinary Hygiene, Sanitation and Expertise"			
6.	Semester and duration of study	IV semester 1-18 weeks			
7.	Number of ECTS credits	III semester: 5 credits total: 150 hours, audi. 2, incl. 0 hours of lectures, 2 hours of practical work, 148 hours of self-study, exam			
8.	Total hours and their distribution	Contact work (classes)			Independent work
		Lectures 0	Practical/seminar -	Laboratory 2	148
9.	Language of instruction	English			
10.	Teacher/Educational Component Coordinator	Kalashnik Oleksandr Mykolayovych			
11.1	Contact information	kalashnikan @ukr.net			
11.	General description of the educational component	The PhD in "Physiological Fundamentals of Small Animal Nutrition" studies the positive impact of proper feeding on the condition of healthy and sick animals. The main goal of the discipline is to expand and deepen the professional competencies acquired during the study of normative disciplines, namely: • Ability to apply the principles of preventive medicine and the correct use of dietary treatment; • Ability to understand the prognostic significance of proper nutrition; • Mastering the technique of correct composition of the diet of small animals and making a forecast of preventive actions; • Features of animal feeding during growth, reproduction and maturity; • Ability to assess the condition of the animal • Concepts of industrial dog and cat food, • Ability to develop nutritional and safety programs for various diets for small domestic animals			
12.	Purpose of the educational component	The purpose of the educational component is to acquire knowledge of the genetic foundations of heredity, to clarify the patterns of inheritance of opposite qualitative and quantitative traits in individual species of small animals, to study the processes that occur in animal populations and their use in selection and breeding work and prevention of digestive diseases. Also, the study of the discipline aims to clarify the patterns of exterior and constitutional features of animals depending on the breed and type of nutrition, to master the basic principles of selection and selection, methods of animal breeding, and to master modern technologies for the production of the main types of feed. It is a component of the educational process that ensures the achievement of goals, competence and significant results in the learning process.			
13.	Prerequisites for studying OK, connection with other educational components of OP	1. The educational component is based on the studied OKs in anatomy, morphology, genetics, cytology and physiology 2. The educational component is the basis for the study of therapy, pathological anatomy and physiology, obstetrics, gynecology			
14.	Academic Integrity Policy	All tasks related to calculations, planning, and accounting documentation will have individual source data. Violation of academic integrity when studying the course "Physiological Fundamentals of Nutrition of Small Animals" will be considered: academic plagiarism, academic fraud (copying, deception, passing off someone else's work as your own), use of electronic devices during the final knowledge test.			

		For violation of academic integrity, students may be held accountable for the following academic responsibilities: Academic plagiarism – score 0, re-do the assignment. Academic fraud – cancellation of scores received; retaking the assessment; re-doing work completed independently with new input data; Using electronic devices during the final knowledge test – suspension from work, score 0, retaking the final test.
15.	Key word	Physiology, Animals, animal feeding

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, the achievement of which is aimed at the OK (number according to the numbering given in the OP)					How is the DRN assessed?
	PRN 2. Use information from domestic and foreign sources to develop diagnostic, strategies	PRN 3. Determine the essence of physicochemical and biological processes that occur in the body of animals under normal and pathological conditions.	PRN 5. Determine the relationship between the clinical manifestations of the disease and the results of genetic studies.	PRN 7. Formulate conclusions regarding the effectiveness of selected methods and means of keeping, feeding and treating animals, prevention of infectious and non-infectious diseases, as well as production and technological processes at enterprises for keeping, breeding or operating animals of various classes and species.	PRN 11. Summarize and analyze information on the effectiveness of the work of veterinary specialists .	
DRN 1. Know the features of the structure and function of the digestive system of cats and dogs .	+					Case study and situation analysis
DRN 2. Know the features of nutrient metabolism. Classification of nutrients. Who determines the norms of nutrients that are necessary in the diet of dogs and cats. The role and sources of essential nutrients in the body of dogs and cats.		+				Presentations and discussions with self- and peer-assessment.
DRN 3. Know the digestion, absorption, and excretion of proteins, carbohydrates, and fats in non-ruminant herbivores, omnivores, and carnivores.					+	Presentations and discussions.
DRN4. Be able to use methods for determining energy and energy balance and measure energy expenditure and energy needs of an animal. Know the difference between BER, RER, MER and DER; between GE, DE, ME and NE. Compare with other physiological states.				+		Situational tasks
DRN 5. Be able to determine the nutrition of animals and the impact on their growth, development and reproduction. Changes in nutrient requirements from the growth period to the adult stage of animal life, including the reproductive stage. The impact of different stages of adult life on nutrition. Features of the nutrition of carnivores compared to omnivores. Nutritional problems associated with age. Know the feeding strategy and diet options for different life stages.			+			Practical assessment of application skills

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 ¹	
	Classroom work		Independent work		
	Luke	P.z / semin.z	Lab. with.		
1 semester: (hours)					
Topic 1. <i>Features of the structure and function of the digestive system of cats and dogs</i>			2	10	1, 2, 3, 4, 5, 11
1. Anatomical features of the digestive system of dogs, causes of pathology and consequences .			2	6	
2. Differences in the anatomical structure of the digestive system of cats, causes of pathology and consequences.				4	
Topic 2. <i>Features of nutrient metabolism.</i>				20	1, 2, 3, 4, 6, 7, 10, 12, 14
Classification of nutrients. Who determines the norms of nutrients that are necessary in the diet of dogs and cats. The role and sources of essential nutrients in the body of dogs and cats.				4	
Protein. Function and structure of proteins. Essential and non-essential amino acids. Protein digestion and metabolism. Protein requirements of carnivores, omnivores and herbivores. Methods for measuring protein in the body and food. Protein quality. Protein assessment. Symptoms of protein deficiency				6	
Carbohydrates. Definition of carbohydrates (CHO). Simple and complex carbohydrates. Mono- and disaccharides. Digestion, absorption and metabolism of carbohydrates. Digestion, absorption and excretion of carbohydrates in non-ruminant herbivores, omnivores and carnivores. Fiber and its general classification. Evaluation of carbohydrates.				6	
Lipids. Lipid classes, their structure and nomenclature. Mechanisms of lipid digestion and absorption. Lipid transport in the body and metabolism. Essential fatty acids (EFAs) and their functions. Clinical signs of EFAs deficiency. Assessment of animal lipids.				4	
Topic 3. <i>Definition of energy and energy balance .</i>				16	1, 2, 3, 4, 5, 6, 7, 10, 13, 14
Energy measurement and energy units. Animal energy requirements. Difference between BER, RER, MER and DER. Difference between GE, DE, ME and NE. Conditions for energy concentration in feeds. Conditions for animal energy requirements. Comparison with other physiological states.				16	

Topic 4. <i>Nutrition during neonatal development .</i>				14	1, 2, 3, 4, 5, 6, 18
Factors that provoke kitten and puppy extinction syndrome. Expected birth weight, growth rate, growth rate of newborns. Rules for feeding newborns, orphaned animals. Feeding, diet selection and recommendations for weaning newborns.				10	
How animal nutrition affects growth, development, and reproduction. Changes in nutrient requirements from growth to adulthood, including reproductive life. Effects of different stages of adulthood on nutrition. Nutritional characteristics of carnivores compared to omnivores. Nutritional issues associated with age. Feeding strategies and ration options for different life stages .				4	
Topic 5. <i>Alternative diets .</i>				24	1, 2, 3, 4, 5, 6, 7, 9, 10, 12, 14
Raw Meat Based Diets (RMBD). The role of heat treatment in pet foods. Assessing the safety of RMBD for pets and owners. Risks and benefits of RMBD and homemade diets. Nutritional imbalances associated with homemade diets. Choosing high-quality dietary supplements.				12	
Everything you need to know to treat adiposity. The three main risk factors for obesity in cats and dogs. Diagnosing overweight and obesity. Key nutritional factors and calorie restriction strategies, including the rationale for food choices for weight management. Assessing the optimal weight of an overweight or obese cat or dog. A safe weight loss and maintenance plan for cats and dogs.				12	
Topic 6. <i>Nutrition in various pathologies.</i>				22	1, 2, 3, 4, 6, 7, 15, 18
1. Nutrition in diabetes mellitus. Contrasting differences in the approach to nutrition of cats and dogs with diabetes mellitus. Basic dietary goals and strategies for feeding cats and dogs with diabetes mellitus. Feeding plan for cats and dogs with diabetes mellitus.				14	
2. Nutrition for vomiting and diarrhea. Identify and explain the mechanisms of diarrhea. Identify dietary goals and formulate feeding strategies related to vomiting. Identify dietary goals and formulate feeding strategies related to acute and chronic diarrhea. Conduct a therapeutic and dietary test of a patient with chronic enteropathy.				4	
3.Lymphangiectasia, constipation, liver disease. Clinical problems associated with fat malabsorption. Dietary goals and related feeding strategies. Lymphangiectasia and protein-losing enteropathy. Constipation in cats and dogs. Liver diseases . Hepatic lipidosis.				4	
Topic 7. <i>Dietary nutrition in diseases.</i>				32	1,2, 3, 4, 16, 18
Topic 1. Nutrition in Pancreatic Disorders.				6	

Key Nutritional Factors for Cats and Dogs with Pancreatic Disease. Nutritional Goals and Nutritional Strategy for Exocrine Pancreatic Insufficiency (EPI) and Pancreatitis.					
Topic 2. Dietary nutrition for skin diseases . Top 3 allergic skin diseases. Diagnosis of food allergy. The most common food allergens in cats and dogs. Characteristics of new protein and hydrolyzed protein products. Elimination diet. Key signs of dermatoses associated with vitamin A, zinc and tyrosine deficiency.				6	
Topic 3. Dietary management Lower Urinary Tract . Signs and Urolithiasis. Learn about the most common types of urolithiasis in dogs and cats. Identify the relationship between urolithiasis and predisposing/risk factors. Describe the conditions for urolith formation. Identify the pathogenesis of most common urolithiasis. Learn about dietary management recommendations for common urolithiasis and FLUTD.				10	
Topic 4. Dietary management of osteoarthritis . Key nutritional factors in osteoarthritis (OA). The relationship between OA and obesity. Dietary nutrition for cats and dogs with OA.				10	
Total			2	148	

4. TEACHING AND LEARNING METHODS

DRN	Teaching methods (work that will be carried out by the teacher <u>during classroom lessons</u> , consultations)	Teaching methods (what types of learning activities should the student perform <u>independently</u>)
DRN 1. Know the features of the structure and function of the digestive system of cats and dogs .	Consideration of situations and variations with the inheritance characteristics of different breeds of dogs and cats.	To study research methods and analyze research results; drawing conclusions from the data obtained; - mandatory preparation for the LPZ, assimilation of independent material for conducting the LPZ.
DRN 2. Know the features of nutrient metabolism. Classification of nutrients. Who determines the norms of nutrients that are necessary in the diet of dogs and cats. The role and sources of essential nutrients in the body of dogs and cats.	Group tasks on the comprehensive application of methods for determining the metabolism of organisms, the effectiveness of beneficial nutrients that provide reliable protection for animals.	To study the processes of animal metabolism, including protein, carbohydrate, and lipid metabolism.
DRN 3. Know the digestion, absorption, and excretion of proteins, carbohydrates, and fats in non-ruminant herbivores, omnivores, and carn-	Explanation of possible situations of nutritional features of different dog breeds. Introduction to types of hereditary variability and the ability to ana-	Solve problems to model: digestion processes of various nutrients; consolidate material on modern ap-

vores.	lyze the effect of different nutrients on the body. Introduction to populations and types of diets. Solving problems on diet analysis.	proaches to organizing and managing diet composition in order to maximize the genetic potential of animals .
DRN4. Be able to use methods for determining energy and energy balance and measure energy expenditure and energy needs of an animal. Know the difference between BER, RER, MER and DER; between GE, DE, ME and NE. Compare with other physiological states.	Problem solving. Understand the impact of various processes on energy use in the animal's body. Apply knowledge of genetic and automatic processes in populations to optimize the diet of small animals. Conduct an analysis of the recovery of the animal's condition in case of diseases.	To learn the structure of energy metabolism and its correction. To distinguish genetic theories that explain the features of energy metabolism in animals.
DRN 5. Be able to determine the nutrition of animals and the impact on their growth, development and reproduction. Changes in nutrient requirements from the growth period to the adult stage of animal life, including the reproductive stage. The impact of different stages of adult life on nutrition. Features of the nutrition of carnivores compared to omnivores. Nutritional problems associated with age. Know the feeding strategy and diet options for different life stages.	Explanation of the purpose and principles of interaction of mandatory components for animal reproduction. Familiarization with the methods of introducing different diets and analyzing the success of the operations performed (by the presence of a marker - animal constitution). Ability of the veterinarian to distinguish between positive and negative aspects of changing diets in animals.	Understand the methods for determining the constitution of animals. Be able to compile and analyze pedigrees; predict the impact of certain factors of nutrition and age of animals on the condition of the body.

5. EVALUATION BY EDUCATIONAL COMPONENT

5.1.Diagnostic assessment (indicated as needed)

5.2.Summative assessment

5.2.1. To assess the expected learning outcomes, there are

No.	Summative assessment methods	Points / Weight in the overall score	Date of compilation
Fall semester			
1.	Surveys in laboratory and practical classes, notebook design	75/75%	3, 8, 12,15 weeks
2.	Design of abstracts/presentations	15/15%	Week 15

5.3. Evaluation criteria

Fall semester

Component ²	Unsatisfactorily	Satisfactorily	Good	Perfectly ³
Surveys in laboratory and practical classes, notebook design	< 20 points	21-41 points	42-54 points	55-75 points
	The notebooks for laboratory and practical classes are not completed, there are no conclusions and their analysis.	The notebook of laboratory and practical classes is completed, there are no conclusions and their analysis	The notebook of laboratory and practical classes is completed, there are conclusions, but their analysis is missing.	The notebook of laboratory and practical classes is perfectly designed, there are conclusions and their analysis, the student understands the problems to be solved, is able to develop and evaluate possible solutions to this problem
Abstract preparation	< 8 points	9-12 points	13-14 points	15 points
	Task not completed	The abstract is written without understanding the relationship between the tasks set to be solved, unable to critically evaluate information from literary sources	The abstract contains a good level of analysis, synthesis, generalization and critical evaluation of data from literary sources cited in the abstract, capable of critically evaluating information from literary sources	The abstract is impeccably designed, the material is logically arranged with an understanding of the interrelationships of the processes revealed on this topic, and demonstrates a highly developed ability to critically review academic literature and other sources of information.

5.4. Formative assessment:

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

No.	Elements of formative assessment	Date
1	Surveys during laboratory and practical classes, preparation of a note-book with comments	According to the class schedule
2	Oral (written) review of abstracts	Within a week before the end of the educational process
3	Test – multiple choice test	According to the exam schedule

6. LEARNING RESOURCES (LITERATURE)

6.3. Main sources

6.3.1 Textbooks and manuals

1. Lecture course "Fundamentals of dog and cat nutrition" Materials were translated and adapted to create the lectures: Mars Petcare , Royal canin , FEDIAF , NRC , AAFCO , Small Animal Clinical Nutrition , WSAVA . – Kyiv: Royal Canin Ukraine, 2020. – 111 p.
2. Protsenko M.Yu. Genetics / M.Yu. Protsenko. – K.: Higher School, 2014. – 302 p.
3. Animal Genetics / [Khmelnychy L.M., Suprun I.O.]. – Kyiv:, 2020. – 402 p.
4. Breeding of agricultural animals / [Basovskyi M.Z., Burkat V.P., Vinnychuk D.T. and others]. – Bila Tserkva, 2021 – 400 p.
5. Breeding of farm animals with the basics of special zootechnics / [T.V. Zasukha, M.V. Zubets, Y.Z. Siratsky, O.G. Tymchenko and others]. –K.: Agrarna nauka, 2020. – 510 p.
6. Workshop on breeding farm animals / [Melnik Yu.F., Naidenko K.A., Zhuravel M.P. and others]. – K.: Publishing House “Slovo”, 2017. – 240 p.

6.3.2 Methodological support

8. Methodical instructions for laboratory and practical work on studying the course “Genetics in veterinary medicine” and tasks for self-control “ Genetic patterns of inheritance of traits ” / [O. M. Kalashnyk, M. D. Kambur, L. V. Plyuta]. – Sumy, 2022 – 25 p.
9. Methodological instructions for laboratory and practical work on studying the course “Genetics in veterinary medicine” and tasks for self-control “ Genetic variability ” / [O. M. Kalashnyk, M. D. Kambur, L. V. Plyuta]. – Sumy, 2022 – 25p.
10. Methodological instructions for laboratory and practical work on studying the course “Genetics in veterinary medicine” and tasks for self-control “ Methods of veterinary genetics ” / [O. M. Kalashnyk, M. D. Kambur, L. M. Kovalenko]. – Sumy, 2021 – 25 p.

6. 4. Additional sources

11. Pavliv B.A. Genetic anomalies of various species of animals and birds, their manifestation and patterns of inheritance / B.A. Pavliv. – Lviv, 2018.– 30 p.
12. Interior of farm animals: Textbook / [Y.Z. Siratskyi E.I. Fedorovych, B.M. Hopka and others]. – K.: Higher Education, 2009. – 280 p.
13. Breeding work (reference book). / Edited by M.V. Zubets, M.Z. Basovsky. – Kyiv: Association “Ukraine”, 2015. – 440 p.
14. <https://www.pet-medcenter.com/patient-resources/health-topics/nutrition-and-pet-foods>
15. <https://www.pet-medcenter.com/patient-resources/health-topics/nutrition-and-pet-foods>
16. <https://www.webmd.com/pets/dog-cat-nutrition>

6.5. Software

17. Work program (syllabus) of the educational component "Physiological foundations of nutrition of small animals"
18. Schedule for the defense of laboratory and practical notebooks