Ministry of Agriculture of the Russian Federation
Federal State Budgetary Educational Institution
of Higher Education
"St. Petersburg State University of Veterinary Medicine"

APPROVED BY
Vice-Rector for Educational
Work and Youth Policy
_____ Sukhinin A.A.
May 6, 2024

Department of feeding and breeding of animals

EDUCATIONAL WORK PROGRAM

for the discipline

«Animal feeding with the basics of forage production»

The level of higher education
SPECIALIST COURSE

Specialty 36.05.01 Veterinary Medicine
Full-time education
Education starts in 2024

Reviewed and adopted
at the meeting of the department
on April 27, 2024.
Protocol No. 10

Head of the Department
of Feeding and Breeding of Animals
Candidate of Veterinary Medicine, Associate Professor
_____ Suyazova I.V.

Saint Petersburg
2024

1. AIMS AND OBJECTIVES OF THE DISCIPLINE "FEEDING ANIMALS WITH THE BASICS OF FORAGEPRODUCTION"

The main **objective** of the discipline in the training of veterinary doctors is to provide students with fundamental morphological knowledge of the functioning, developing and adapting organism.

In order to achieve the objective, the following tasks should be **accomplished**:

a) The general educational task is to familiarise students in depth with the structure of the animal organism and provides fundamental biological education in accordance with the requirements for higher education institutions of biological profile.

b) Applied task covers the issues related to animal feeding with the basics of fodder production and creates a conceptual basis for the implementation of interdisciplinary structural and logical links in order to develop skills of medical thinking.

c) The special task is to familiarise students with modern trends and methodological approaches used in animal nutrition with the basics of feed production to solve problems of animal husbandry and veterinary medicine, as well as available achievements in this field.

2. LIST OF PLANNED RESULTS OF MASTERING THE DISCIPLINE (MODULE), CORRELATED WITH THE PLANNED RESULTS OF MASTERING THE EDUCATIONAL PROGRAMME

As a result of mastering the discipline, the student prepares for the following types of activities, in accordance with the educational standard of the FSE on 36.05.01 "Veterinary Medicine".

The field of professional activity:

13 Agriculture

2.1. The student's competencies formed (acquired) as a result of mastering the discipline

The education of the discipline should form the following competencies:

a) General professional competencies (GPC):

GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.

GPC-2 ID-1 - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.

GPC-2 ID-2 - To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors.

GPC-2 ID-3 - To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.

a) Professional competencies (PC):

PC-9 - Development of recommendations for special feeding of sick animals for therapeutic purposes.

PC-9 ID-1 - To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy.

PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.

PC-15 ID-3 - **To be able** to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.

3. THE PLACE OF THE DISCIPLINE IN THE STRUCTURE OF THEMPEP EDUCATIONAL PROGRAMME

The discipline B1.O.26 "Feeding animals with the basics of forageproduction" is a discipline of block 1 of the mandatory part of the federal state educational standard of higher education on speciality 36.05.01 "Veterinary science" (speciality level).

It is learnt in the 3rd and 4th semesters (full-time).

When teaching the discipline "Animal feeding with the basics of fodder production" uses knowledge and skills acquired by students when mastering the disciplines of animal anatomy, veterinary genetics, biology with the basics of ecology, inorganic and analytical chemistry, medicinal and poisonous plants. The discipline "Feeding of animals with the basics of fodder production" is a basic discipline on which most of the following disciplines are based, such as:

1. Biotechnology.
2. Hygiene of animal.
3. Pathological physiology of animals.
4. Diseases of birds.
5. Dietetics.
6. Clinical diagnostics.
7. Pathological physiology of animals.

4. THE SCOPE OF DISCIPLINE AND TYPES OF ACADEMIC WORK

4.1. The scope of the discipline for full-time education

Type of educational work	Hours	Semesters	
		3	4
Classroom classes (total)	**68**	**32**	**36**
Including:	-	-	-
Lectures, including interactive forms	**34**	**16**	**18**
Practical (PP), including interactive forms, among which are:	34	16	18
practical training (PT)	8	4	4
Self-study	**76**	**40**	**36**
Abstract	+		+
Type of intermediate and final certification (credit, exam)	credit, exam	Credit - 3	Exam - 4
Total labor intensity: hours/credits	**144/4**	**72/2**	**72/2**

5. THE CONTENT OF THE DISCIPLINE AND TYPES OF CLASSES
5.1. The content of the discipline (full-time education)

№	The title	Achieved competences	Semesters	Types of academic work, including students' self-study and labor intensity (in hours)			
				Lectures	Practical lessons	Practical training	Self-study
1.	Brief information from the history of the science of animal nutrition. Assessment of feed nutrition by chemical composition.	***GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.*** GPC-2 ID-1 - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 - To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors. GPC-2 ID-3 - To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. ***PC-9 - Development of recommendations for special feeding of sick animals for therapeutic purposes.*** PC-9 ID-1- To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy. ***PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.*** PC-15 ID-3 - To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.	3	2	2		6

2.	Digestibility of forages and estimation of their nutritive value by the sum of digestible substances.	***GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.*** GPC-2 ID-1 - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 - To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors. GPC-2 ID-3 - To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. ***PC-9 - Development of recommendations for special feeding of sick animals for therapeutic purposes.*** PC-9 ID-1- To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy. ***PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.*** PC-15 ID-3 - To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.	3	2	2		4

3.	Evaluation of the energy nutritive value of forages and its relationship to animal performance and health.	***GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.*** GPC-2 ID-1 - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 - To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors. GPC-2 ID-3 - To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. ***PC-9 - Development of recommendations for special feeding of sick animals for therapeutic purposes.*** PC-9 ID-1- To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy. ***PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.*** PC-15 ID-3 - To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.	3	2	2		4

4.	Comprehensive assessment of feed nutrition. Protein nutrition of fodder. Carbohydrate nutrition of fodder. Lipid nutrition of fodder.	***GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.*** GPC-2 ID-1 - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 - To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors. GPC-2 ID-3 - To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. ***PC-9 - Development of recommendations for special feeding of sick animals for therapeutic purposes.*** PC-9 ID-1- To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy. ***PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.*** PC-15 ID-3 - To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.	3	2	2		6

5.	Mineral nutrient content of fodder. Vitamin nutrition of forages.	***GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.*** GPC-2 ID-1 - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 - To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors. GPC-2 ID-3 - To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. ***PC-9 - Development of recommendations for special feeding of sick animals for therapeutic purposes.*** PC-9 ID-1- To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy. ***PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.*** PC-15 ID-3 - To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.	3	2	2		4

6.	Feeds their composition and classification. The concept of feed and feed additives.	***GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.*** GPC-2 ID-1 - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 - To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors. GPC-2 ID-3 - To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. ***PC-9 - Development of recommendations for special feeding of sick animals for therapeutic purposes.*** PC-9 ID-1- To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy. ***PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.*** PC-15 ID-3 - To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.	3	2	-		6

7.	Characteristics of forages and their harvesting technology. Green fodder, hay, grass meal and cutting.	***GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.*** GPC-2 ID-1 - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 - To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors. GPC-2 ID-3 - To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. ***PC-9 - Development of recommendations for special feeding of sick animals for therapeutic purposes.*** PC-9 ID-1- To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy. ***PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.*** PC-15 ID-3 - To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.	3	2	-		4

8.	Fodder production, ha-characteristics of forages and technology of silage and haylage harvesting. Production technology of grain fodder, animal fodder, mixed fodder.	***GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.*** GPC-2 ID-1 - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 - To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors. GPC-2 ID-3 - To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. ***PC-9 - Development of recommendations for special feeding of sick animals for therapeutic purposes.*** PC-9 ID-1- To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy. ***PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.*** PC-15 ID-3 - To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.	3	2	2	4	6
		TOTAL FOR THE 3TH SEMESTER:		**16**	**12**	**4**	**40**

10.	Basics of normalized feeding of farm animals.	***GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.*** GPC-2 ID-1 - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 - To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors. GPC-2 ID-3 - To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. ***PC-9 - Development of recommendations for special feeding of sick animals for therapeutic purposes.*** PC-9 ID-1- To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy. ***PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.*** PC-15 ID-3 - To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.	4	2	-	2	4

11.	Feeding of breeding bulls.	***GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.*** GPC-2 ID-1 - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 - To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors. GPC-2 ID-3 - To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. ***PC-9 - Development of recommendations for special feeding of sick animals for therapeutic purposes.*** PC-9 ID-1- To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy. ***PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.*** PC-15 ID-3 - To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.	4	2	2		4

12.	Feeding lactating cows.	***GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.*** GPC-2 ID-1 - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 - To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors. GPC-2 ID-3 - To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. ***PC-9 - Development of recommendations for special feeding of sick animals for therapeutic purposes.*** PC-9 ID-1- To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy. ***PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.*** PC-15 ID-3 - To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.	4	2	-	2	4

13.	Feeding of sterile dry cows and heifers.	***GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.*** GPC-2 ID-1 - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 - To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors. GPC-2 ID-3 - To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. ***PC-9 - Development of recommendations for special feeding of sick animals for therapeutic purposes.*** PC-9 ID-1- To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy. ***PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.*** PC-15 ID-3 - To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.	4	2	2		4

14.	Feeding of repair young cattle.	***GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.*** GPC-2 ID-1 - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 - To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors. GPC-2 ID-3 - To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. ***PC-9 - Development of recommendations for special feeding of sick animals for therapeutic purposes.*** PC-9 ID-1- To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy. ***PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.*** PC-15 ID-3 - To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.	4	2	2		4

15.	Feeding of cattle in growing and fattening for meat.	***GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.*** GPC-2 ID-1 - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 - To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors. GPC-2 ID-3 - To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. ***PC-9 - Development of recommendations for special feeding of sick animals for therapeutic purposes.*** PC-9 ID-1- To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy. ***PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.*** PC-15 ID-3 - To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.	4	2	2		4

16.	Sheep and goat feeding	***GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.*** GPC-2 ID-1 - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 - To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors. GPC-2 ID-3 - To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. ***PC-9 - Development of recommendations for special feeding of sick animals for therapeutic purposes.*** PC-9 ID-1- To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy. ***PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.*** PC-15 ID-3 - To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.	4	2	2		4

17.	Feeding pigs, the impact of its quality on productivity and health of the animal.	***GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.*** GPC-2 ID-1 - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 - To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors. GPC-2 ID-3 - To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. ***PC-9 - Development of recommendations for special feeding of sick animals for therapeutic purposes.*** PC-9 ID-1- To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy. ***PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.*** PC-15 ID-3 - To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.	4	2	2		4

18.	Feeding of agricultural poultry	***GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.*** GPC-2 ID-1 - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 - To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors. GPC-2 ID-3 - To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. ***PC-9 - Development of recommendations for special feeding of sick animals for therapeutic purposes.*** PC-9 ID-1- To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy. ***PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.*** PC-15 ID-3 - To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.	4	2	2		4
TOTAL FOR THE 4TH SEMESTER:				**18**	**14**	**4**	**36**

6. THE LIST OF EDUCATIONAL AND METHODOLOGICAL SUPPORT FOR STUDENTS' SELF WORK

6.1. Guidelines for self – work

1. Feeding animals with the basics of fodder production: a workbook with methodical instructions for practical exercises and independent work, for students in the specialty 36.05.01 "Veterinary" full-time, part-time and part-time forms of training / Pristach NV, Pristach LN, Vinogradova ND, Safronov SL; SPbGAVM - St. Petersburg: SPbGAVM, 2019.- 103 pp. - Access mode: https://clck.ru/RFLmx (access date: 04/27/2024).

2. Animal feeding with the basics of fodder production. Section: Meadow fodder production : workbook with methodological instructions for practical exercises and independent work for students on specialty 36.05.01 "Veterinary" full-time, part-time and part-time forms of training / author: N. V. Pristach, L. N. Pristach, N. D. Vinogradova, S. L. Safronov ; SPbGAVM. - SPb: SPbGAVM, 2019. - 56 c. - Access mode: https://clck.ru/RFKX7 (accessed: 04/27/2024).

3. Feeding animals with the basics of fodder production: methodical instructions and tasks on the performance of control work for students on specialty 36.05.01 "Veterinary medicine" correspondence courses / author: N. V. Pristach, L. N. Pristach, N. D. Vinogradova, S. L. Safronov ; SPbGAVM. - SPb: SPbGAVM, 2019. - 23 c. - Access mode: https://clck.ru/RFMCL (accessed: 04/27/2024).

4. Feeding animals with the basics of fodder production : methodological guidelines for independent work of students on the implementation and design of the abstract for students studying on specialty 36.05.01 "Veterinary" full-time, part-time and part-time forms of training / author-composer: N. V. Pristach, L. N. Pristach, N. D. Vinogradova, S. L. Safronov ; SPbGAVM. - SPb: SPbGAVM, 2019. - 21 c. - Access mode: https://clck.ru/RFMJa (accessed: 04/27/2024).

6.2. Literature for self-work

1. Makartsev N.G. Feeding of farm animals: textbook / N.G. Makartsev. - Kaluga: Izd. Bocharova N.F., 2007. - 608 c.

2. Norms and rations of feeding agricultural animals. Reference manual. 3rd ed. revision and supplement / Edited by A.P. Kalashnikov, V.I. Fisinin, V.V. Scheglov, N.I. Kleimenov. - M., 2003. - 456 c.

3. Kolomeychenko, V.V. Fodder production [Electronic resource]: textbook / V.V. Kolomeychenko - St. Petersburg. Kolomeychenko - SPb.: Lan, 2015.-660 p. - Access mode: http://lanbook.com/ books/ ele-ment hp. pli -id - 56161 (accessed: 04/27/2024).

7. THE LIST OF BASIC AND ADDITIONAL LITERATURE NECESSARY FOR THE EDUCATION OF THE DISCIPLINE

7.1. Basic literature

1. Makartsev, N.G. Feeding of farm animals [Text]: textbook / N.G. Makartsev. - Kaluga: Izd. Bocharova N.F., 2007. - 608 c.

2. Kolomeychenko, V.V. Kormoproizvodstvo [Electronic resource]: textbook / V.V. Kolomeychenko - SPb.: Lan, 2015.-660 p.. mode of access: http://lanbook.com/ books/ element hp. pli -id - 56161 (accessed: 04/27/2024).

7.2. Additional literature

1. Norms and rations of feeding of farm animals. Reference manual / Edited by A.P. Kalashnikov, V.I. Fisinin, V.V. Scheglov, N.I. Kleimenov. - M., 2003. - 456 c.

8. THE LIST OF RESOURCES OF THE INFORMATION AND TELECOMMUNICATION NETWORK "INTERNET" NECESSARY FOR EDUCATION OF THE DISCIPLINE

Students can use the following Internet resources to prepare for practical classes and perform independent work:

1. https://meduniver.com - Medical information site.

Electronic library systems:

1. ELS "SPBGUVM"
2. ELS "Lan Publishing House"
3. Legal reference system "ConsultantPlus"
4. University information system "RUSSIA"
5. Full-text database POLPRED.COM
6. Scientific electronic Library ELIBRARY.RU
7. Russian Scientific Network
8. Database of international scientific citation indexes Web of Science
9. Scopus database of International Science Citation Indexes
10. Full-text interdisciplinary database on agricultural and environmental sciences ProQuest AGRICULTURAL AND ENVIRONMENTAL SCIENCE DATABASE
11. Electronic books of the publishing house "Prospekt Nauki" http://prospektnauki.ru/ebooks/
12. Collection "Agriculture. Veterinary medicine" publishing house "Quadro" ELS "Elibris" publishing house "Quadro" https://elibrica.com/

9. METHODOLOGICAL GUIDELINES FOR STUDENTS ON EDUCATION OF THE DISCIPLINE

Guidelines for students - a set of recommendations and explanations that allow the student to optimally organize the process of studying the discipline.

The content of methodological recommendations, as a rule, may include:

- Tips on planning and organizing the time required to study the discipline. A description of the sequence of actions of the student, or "scenario of studying the discipline".

Morning time is the most fruitful for study work (from 8-14 hours), then afternoon (from 16-19 hours) and evening (from 20-24 hours). The most difficult material is recommended to be studied at the beginning of each time interval after rest. After 1.5 hours of work a break is necessary (10-15 minutes), after 4 hours of work the break should be 1 hour. Part of the scientific organization of work is mastering the technique of mental work. Normally a student should devote about 10 hours a day to studying (6 hours at university, 4 hours at home).

- Recommendations for working on the lecture material

When preparing for a lecture, the student is recommended to:

1) review the notes of the previous lecture and restore in memory the previously studied material;

2) it is useful to review the upcoming material of the future lecture;

3) if an independent study of separate fragments of the topic of the previous lecture is assigned, it should be done without delay;

4) to psychologically tune in to the lecture.

This work includes two main stages: lecture notes and subsequent work on the lecture material.

Outlining means making an outline, i.e. a brief written summary of the content of something (an oral presentation - speech, lecture, report, etc. or a written source - a document, article, book, etc.).

The method of work in outlining oral speeches differs significantly from the method of work in outlining written sources.

When outlining written sources, the student has the opportunity to repeatedly read the necessary passage of text, reflect on it, highlight the main thoughts of the author, briefly formulate them, and then write them down. If necessary, he/she can note his/her attitude to this point of view. When listening to a lecture, the student should postpone most of the complex of the above-mentioned works for another time, trying to use every minute to record the lecture, but not to comprehend it - there is no time left for this. Therefore, when taking notes on a lecture, it is recommended that on each page you separate the fields for subsequent notes in addition to the lecture notes.

Having written down the lecture or made its outline, one should not leave the work on the lecture material until the beginning of the preparation for the credit. It is necessary to do as early as possible the work that accompanies the outlining of written sources and that could not be done during the recording of the lecture - to read their notes, deciphering certain abbreviations, analyze the text, to establish logical connections between its elements, in some cases to show them graphically, to highlight the main ideas, to note the issues that require additional processing, in particular, the advice of the teacher.

When working on the text of the lecture, the student should pay special attention to the problematic issues raised by the teacher during the lecture, as well as to his tasks and recommendations.

For each lecture, practical training and laboratory work, the number, topic, list of issues covered, volume in hours and references to the recommended literature are given. For classes conducted in interactive forms, their organizational form should be indicated: computer simulation, business or role-playing game, case study, etc.

- Recommendations on preparation for practical classes

Practical (seminar) classes are an important part of students' professional training. The main purpose of practical (seminar) classes is to form students' analytical and creative thinking by acquiring practical skills. Also practical classes are held to deepen and consolidate knowledge gained in lectures and in the process of independent work on normative documents, educational and scientific literature. In preparation for practical training for students should study or repeat the theoretical material on a given topic.

When preparing for the practical training it is recommended that the student adhere to the following algorithm;

1) familiarize with the plan of the upcoming class;

2) study the literature sources that have been recommended and familiarize themselves with the introductory remarks to the relevant sections.

Methodological instructions for practical (seminar) classes in the discipline along with the working program and the schedule of the educational process are among the methodological documents that determine the level of organization and quality of the educational process.

The content of practical (seminar) classes is fixed in the working training programs of disciplines in the sections "List of topics of practical (seminar) classes".

The most important component of any form of practical classes are tasks. The basis of the assignment is an example, which is analyzed from the standpoint of the theory developed in the lecture. As a rule, the main attention is paid to the formation of specific skills, which determines the content of students' activities - problem solving, laboratory work, clarification of categories and concepts of science, which are a prerequisite for proper thinking and speech.

Practical (seminar) classes fulfill the following tasks:

- stimulate regular study of recommended literature, as well as attentive attitude to the lecture course;

- consolidate the knowledge obtained in the course of lecture training and independent work on the literature;

- expand the scope of professionally significant knowledge, skills, abilities;

- allow to check the correctness of previously acquired knowledge;

- impart skills of independent thinking, oral presentation;

- contribute to the free operation of terminology;

- provide the teacher with an opportunity to systematically control the level of independent work of students.

Methodological instructions for practical (seminar) classes in the discipline should be oriented to the modern conditions of economic management, current regulatory documents, advanced technologies, the latest achievements of science, technology and practice, on modern ideas about those or other phenomena, the studied reality.

Recommendations for work with literature

Work with literature is an important stage of independent work of the student to master the subject, contributing not only to the consolidation of knowledge, but also to the expansion of horizons, mental abilities, memory, the ability to think, state and confirm their hypotheses and ideas. In addition, the skills of research work, necessary for further professional activity, are developed.

When starting to study the literature on the topic, it is necessary to make notes, notes, notes. It is obligatory to outline the works of theorists, which allow you to comprehend the theoretical basis of the study. Otherwise, you can limit yourself to extracts from the studied sources. All extracts, quotations must have an exact "return address" (author, title of the work, year of publication, page, etc.). It is desirable to write the abbreviated name of the question to which the extract or quotation refers. In addition, it is necessary to learn to immediately make a card index of special literature and publications of sources, both proposed by the teacher and identified independently, as well as to refer to bibliographic directories, annals of journal articles, book annals, abstract journals.

In this case, publications of sources (articles, book titles, etc.) to write on separate cards, which should be filled out according to the rules of bibliographic description (surname, initials of the author, title of the work.

Place of publication, publishing house, year of publication, number of pages, and for journal articles - the name of the journal, year of publication, page numbers). On each card it is advisable to record the idea of the author of the book or a fact from this book only on one specific issue. If the work, even in the same paragraph or phrase, contains more judgments or facts on another issue, they should be written out on a separate card. The statement should be concise, precise, without subjective assessments. On the reverse side of the card you can make your own notes about the book or article, its content, structure, the sources on which it was written, and so on.

Explanations on how to work with test materials for the course, recommendations for homework.

Testing is a check that allows you to determine whether the actual behavior of a program corresponds to the expected one by performing a specially selected set of tests. A test is the fulfillment of certain conditions and actions necessary to check the work of the tested function or its part. Each question on the discipline must be answered correctly by choosing one option.

- Recommendations for the implementation of course work (if it is assumed by the curriculum), defining their thematic focus, goals and objectives of implementation, requirements for the content, scope, design and organization of management of their preparation on the part of departments and teachers.

According to the methodological guidelines presented in the list of methodological guidelines.

10. EDUCATIONAL SOCIAL WORK

As part of the implementation of the discipline, educational work is carried out to form a modern scientific worldview and a system of basic values, the formation and development of spiritual and moral, civil and patriotic values, a system of aesthetic and ethical knowledge and values, attitudes of tolerant consciousness in society, the formation of students' need for work as the first vital necessity, the highest value and the main way to achieve success in life, to realize the social significance of your future profession.

11. THE LIST OF INFORMATION TECHNOLOGIES USED IN THE IMPLEMENTATION OF THE EDUCATIONAL PROCESS

11.1 Information technologies

for the educational process of the discipline is previewed the use of information technologies:

- ✓ **practical classes using multimedia;**
- ✓ **interactive technologies (dialogues, collective discussion on various topics for realization a particular educational and professional task);**
- ✓ **interaction with students via e - mail;**
- ✓ **community work in the electronic information and educational environment of St. Petersburg State University: https://spbguvm.ru/academy/eios/**

11.2. Software

The list of licensed and free- distributed software, including national programs

№ п/п	Technical and computer programs recommended by sections and topics of the program	License
1	MS PowerPoint	67580828
2	LibreOffice	free software
3	OS Alt Education	AAO.0022.00
4	ABIS " MARK-SQL"	02102014155
5	MS Windows 10	67580828
6	System Consult Plus	503/KJI
7	Android OS	free software

12. THE MATERIAL AND TECHNICAL BASE NECESSARY FOR THE IMPLEMENTATION OF THE DISCIPLINE EDUCATIONAL PROCESS

The title of the discipline (module), practice in accordance with the curriculum	The title of special rooms and rooms for self-work	Equipment of special rooms and rooms for self-work
Feeding animals with the basics of	359 (196084, St. Petersburg, Chernigovskaya str., 5) Classroom	*Specialised furniture:* desks, chairs, blackboard, chalk, cloth.

forage production	for seminars, group and individual consultations, current control and interim certification	*Visual aids and teaching materials:* herbariums. *Technical teaching aids*: multimedia projector, screen, laptop.
	340 (196084, St. Petersburg, Chernigovskaya str., 5) Classroom for seminars, group and individual consultations, current control and interim certification	*Specialised furniture:* desks, chairs, stools, blackboard, chalk, cloth. *Technical means of education:* multimedia projector, screen, laptop.
	342 (196084, St. Petersburg, Chernigovskaya str., 5) Classroom for seminars, group and individual consultations, current control and interim certification	*Specialised furniture:* desks, chairs, stools, blackboard, chalk, cloth. *Technical means of education:* multimedia projector, screen, laptop.

Developer:

Associate Professor of the Department Feeding and Breeding of Animals,
Doctor of Agricultural Sciences S. L. Safronov

Annex 1

Ministry of Agriculture of the Russian Federation
Federal State Budgetary Educational Institution
of higher education
«Saint Petersburg State University of Veterinary Medicine»

Department of Feeding and Breeding of Animals

FUND OF ASSESMENT TOOLS
for the discipline
«FEEDING ANIMALS WITH THE BASICS OF FORAGE PRODUCTION»

Level of higher education
SPECIALIST COURSE

Specialty 05.36.01 Veterinary medicine
Full-time education

Education starts in 2024

Saint Petersburg
2024

1. PASSPORT OF THE FUND OF ASSESMENT TOOLS

№	Acquired competence	Assessed modules of a discipline	Assesment tool
1.	GPC-2 Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body. GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors. GPC-2 ID-3 To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. PC-9 Development of recommendations for special feeding of sick animals for therapeutic purposes. PC-9 ID-1 To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy. PC-15 Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement. PC-15 ID-3 To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.	Brief information from the history of the science of animal nutrition. Assessment of feed nutrition by chemical composition. Digestibility of forages and assessment of their nutrition by the sum of digestible substances.	Survey, tests, abstract
1.		Estimation of energy nutrition of forages and their relationship to animal performance and health.	Survey, tests, abstract
3.		Comprehensive assessment of feed nutrition. Protein nutrition of fodder. Carbohydrate nutrition of fodder. Lipid nutrition of fodder.	Survey, tests, abstract
4.		Mineral nutrient content of fodder. Vitamin nutritionality of fodder.	Survey, tests, abstract
5.		Fodder composition and classification. The concept of fodder and fodder additives.	Survey, tests, abstract
6.		Characteristics of forages and their harvesting technology. Green fodder, hay, grass meal and cutting.	Survey, tests, abstract
7.		Fodder production, fodder characteristics and technology of silage and haylage preparation.	Survey, tests, abstract
8.		Technology of production of grain fodder, animal fodder, com-bi-feed.	Survey, tests, abstract
9.		Basics of normalized feeding of farm animals.	Survey, tests, abstract
10.		Кормление племенных быков.	Survey, tests, abstract
11.		Feeding of lactating cows.	Survey, tests, abstract
12.		Feeding of sterile dry cows and heifers.	Survey, tests, abstract
13.		Feeding of repair young cattle.	Survey, tests, abstract
14.		Feeding of cattle in growing and fattening for meat.	Survey, tests, abstract
15.		Feeding sheep and goats	Survey, tests, abstract
16.		Feeding of pigs and the influence of its quality on productivity, and health of the animal.	Survey, tests, abstract
17.		Feeding of farm poultry	Survey, tests, abstract

List of assessement tools

№	Name of the assessment tool	Brief description of the assesment tool	Presentation of the assessment tool in the fund
1.	Oral questioning	A means of controlling the assimilation of educational material of the topic, section or sections of the discipline, organized as a training session in the form of an interview between the teacher and students	Questions on topics/sections of the discipline
2.	Test	A system of standardized tasks, which allows to automate the assessment of students' knowledge and skills	A fund of test assignments
3.	Report in the form of a presentation	A means of control, organized as a report on topics related to the discipline under study, and designed to find out the amount of knowledge of the student on a particular section, topic, problem, etc. as a control of self-development based on the principles of self-education	Topics of reports to the discipline sections

2. INDICATORS AND CRITERIA FOR ASSESSING COMPETENCIES AT VARIOUS STAGES OF ITS FORMATION, DESCRIPTION OF ASSESSMENT SCALES

Planned results of competency acquaired	The level of development				Assesment tool
	Unsatisfactory	Satisfactory	Good	Exellent	
GPC-2 Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.					
GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.	The level of knowledge below the minimum requirements, there were gross mistakes	The minimum acceptable level of knowledge, many minor errors	The level of knowledge in extent, consistent with training program training program, admitted a few minor mistakes	The level of knowledge in extent, consistent with training program level of knowledge in the scope of the training program, without errors.	Survey, tests, abstract
GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities	When solving basic skills were not demonstrated in solving standard tasks, there were gross errors in solving standard tasks.	Demonstrated basic skills, solved typical problems with minor errors, completed all tasks, but not fully all tasks have been completed, but not to the full extent	Demonstrated all basic skills, solved all basic tasks with minor errors. all tasks are completed in full, but some with deficiencies some with deficiencies	Demonstrated all basic skills, solved all basic problems with some minor problems. insignificant all tasks are completed in their entirety	Survey, tests, abstract

and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors.					
GPC-2 ID-3 To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.	When solving basic skills were not demonstrated in solving standard tasks, there were gross errors in solving standard tasks.	There is minimum set skills to solve standard tasks with some deficiencies	Demonstrated basic skills in solving standard problems with some deficiencies	Demonstrated skills in solving non-standard tasks without errors and mistakes	Survey, tests, abstract
PC-9 Development of recommendations for special feeding of sick animals for therapeutic purposes.					
PC-9 ID-1 To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy.	The level of knowledge below the minimum requirements, there were gross mistakes	The minimum acceptable level of knowledge, many minor errors	The level of knowledge in extent, consistent with training program training program, admitted a few minor mistakes	The level of knowledge in extent, consistent with training program level of knowledge in the scope of the training program, without errors.	Survey, tests, abstract
PC-15 Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.					

PC-15 ID-3 To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.	When solving basic skills were not demonstrated in solving standard tasks, there were gross errors in solving standard tasks.	Demonstrated basic skills, solved typical problems with minor errors, completed all tasks, but not fully all tasks have been completed, but not to the full extent	Demonstrated all basic Demonstrated all basic skills, solved all basic tasks with minor errors. all tasks are completed in full, but some with deficiencies some with deficiencies	Demonstrated all basic skills, solved all basic problems with some minor problems. insignificant all tasks are completed in their entirety	Survey, tests, abstract

3. A LIST OF CONTROL TASKS AND OTHER MATERIALS, NECESSARY FOR THE ASSESSMENT OF KNOWLEDGE, SKILLS AND WORK EXPERIENCE

3.1.Typical tasks for the current control of academic progress
3.1.2 Questions for oral questioning

Questions to assess the competence

GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.

GPC-2 ID-1 - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.

1.What groups of substances are included in the scheme of zootechnical analysis of forages, methods of their determination. What does the term raw mean?
2.Ash, methods of determination and characterization of composition. List vital macro- and microelements.
3.Protein, methods of determination; characterization of compounds united by the term "crude protein".
4.Protein substances: physical and chemical properties that affect their availability and degree of utilization in the animal body.
5.Crude fat, methods of determination and characterization of substances united by this term.
6.Raw fiber, the features of its physical and chemical properties, the impact on the digestibility of nutrients in the feed.
7.Nitrogen-free extractive substances; characterization of compounds united by this term.
8.Vitamins, classification, distribution in nature, physiological importance.
9.What is the digestibility of nutrients and energy?
10.How and for which nutrients can be determined digestibility?
11. What is the coefficient of digestibility and how is it calculated?
12. Methods of conducting experiments to assess the digestibility of nutrient substances of forage
13. Nitrogen and carbon balance. How is it determined and what is it used for?
14.List the effects of "-", "O" and "+" of N and C balance.
15. The balance of energy in the animal body.
16.What are PPW energy, metabolic energy, maintenance energy, production energy, and energy loss in the form of heat production?
17.What are the differences between basic metabolic and maintenance energy requirements?
18.Features of energy expenditure on milk synthesis at positive, negative and zero energy balance.
19.The main stages in the history of the development of the system of evaluation of feed nutritive value. Their positive sides and disadvantages.
20. What is starch equivalent? The coefficient of fodder completeness according to Kelner. How does the level of crude fiber in the feed affect the indicators of true fat deposition?
21. Armsby's Therms. What are the commonalities and differences between the Kelner and Armsby methods of assessing feed performance?

GPC-2 ID-2 - To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors.

1. Nutritional evaluation by the sum of digestible nutrients.
2.What is an oat feed unit? What initial information is needed to calculate the oat feed unit?
3. Disadvantages of the system of estimation of feed nutrition in oat feed units.
4.The concept of energy feed unit, advantages of this system of estimation of feed nutrition.
5.Protein nutrition of forages.
6.What cost elements make up the need of animals in protein?
7.The concept of biological value of protein, what is it expressed in?
8.Classification of amino acids.
9.Determination of protein quality by the net protein ratio method.
10.Nutritional value of protein by the method of "index of essential amino acids".
11. Mineral nutrition of forages,
12.List the main symptoms of deficiency of mineral elements in animal diets
13.Methods of calculating the necessary amount of mineral elements and their salts (supplements).
14.Methods of introducing mineral supplements into animal rations.
15.Vitamin nutrition of forages
16.Classification of vitamins.
17.List the main consequences of vitamin imbalance in animal diets.
18.Methods of introduction of vitamin preparations in animal diets.

GPC-2 ID-3 - To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.

1. Classification of forages (essence, principles and practical importance). 2.
2. The main fodder crops used for green fodder. 3.
3. Methods of assessing the quality of harvested fodder. 4.
4. Rough fodder: classification and preparation for feeding.
5.Technology of hay harvesting. Zootechnical characteristics of hay.
6.Technology of preparation of grass meal and grass cutting. Zoo-technical characteristic.
7.Concentrated forages: general characteristics, technology of storage and preparation for feeding.
8. Animal fodder: difference from vegetable fodder, place in the fodder balance.
9. Combine feeds: classification, basic requirements for composition and quality.
10. Methods of canning green fodder, classification, the essence of the mechanism of canning and efficiency of use.
11. Factors determining the quality of finished silage. Intensity of fermentation and duration of silage maturation depending on the moisture content of raw materials, the degree of crushing and compaction.
12. Technological issues of silage preparation.

13.Raw materials and the essence of canning in the preparation of haylage.
14.Chemical preservatives, the mechanism of their action and effectiveness of use.

Questions to assess the competence:

PC-9. Development of recommendations for special feeding of sick animals for therapeutic purposes.
PC-9 ID-1 - To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy.

1. What does the concept of animal nutrient and bioactive substance requirements include?
2. What factors affect the nutrient requirements of animals?
3. List the basic elements of rationed animal feeding.
4. What does the concept of rationing include?
5. What is a feeding ration?
6. What are the rules for formulating feed rations?
7. What are the types of feeding rations?
8. Give the concept of animal feeding regimen.
9. List the indicators of control of normalized feeding of farm animals.
10. What are the features of feeding and metabolism in cattle?
11. Justify the needs of lactating cows in nutrients and biologically active substances?
12. What are the norms, rations and feeding regimen for lactating cows by seasons of the year?
13. Name the systems of feeding cows in the summer period?
14. List the precautions of feeding green fodder to cows?
15. What are the peculiarities of feeding cows in the phases of lactation?
16. What is the effect of feeding on productivity, quality of milk and milk products?
17. List indicators for controlling ration volume and overall nutritional level of cows?
18. List the indicators of control of protein, carbohydrate, lipid, mineral and vitamin nutrition of cows?
19. Specify the importance of adequate nutrition of sterile dry cows in obtaining healthy and viable calves?
20. What are the norms, rations and feeding regimen of steer dry cows and heifers?
21. Justify the needs of dry cows in nutrients and biologically active substances?
22. What is the feeding regimen for calves during the milking period?
23. Name the schemes of feeding calves in the milk period?
24. What are the norms, rations and feeding regimen for breeding heifers and steers?
25. List the indicators of control of fullness of rations of calves and young cattle?
26. What factors determine the health, level and quality of meat productivity of cattle when growing for meat and fattening?
27. Give schemes of feeding young cattle up to 6 months of age when growing for meat?
28. What are the norms, rations and feeding regimen of young animals when growing for meat and fattening?
29. What are the features of feeding young animals during growing and fattening on silage, haylage, cake, bard, mesga, green fodder, pelleted and briquetted feed mixtures and intensive technology?
30. What are the norms, rations and mode of fattening of adult cattle?
31. How to organize fattening of livestock?
32. List the indicators of control of the fullness of diets of mo-lodders when growing for meat and fattening?
33. What is the effect of feeding on reproductive functions of breeding bulls?
34. What are the norms of needs, rations and feeding regimen of breeding bulls?
35. Give economic and biological features of sheep and goats, determining the specificity

of their feeding.
36. What are the norms, rations and feeding regimen of breeding rams?
37. What are the peculiarities of feeding single ewe lambs when preparing them for insemination?
38. Give the norms, rations and feeding regimen for pregnant and lactating ewe lambs.
39. What is the effect of feeding on wool and other productivity of sheep and wool quality?
40. List the methods of growing suckling lambs.
41. What is the feeding regimen for lambs in traditional, early and artificial rearing?
42. What are the norms, rations and feeding regimen for young sheep?
43. What are the peculiarities of feeding of wool breeds?
44. What are the norms, rations and feeding regimen of sheep during fattening and fattening?
45. What are the norms, rations and feeding regimen for adult goats?
46. Characterize the feeding regime of goats.

PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.

PC-15 ID-3 - To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.

1. Name the indicators of control of fullness of sheep and goat diets.
2. What economic and biological features of pigs determine the specificity of their feeding?
3. What indicators control the completeness of pig diets?
4. Specify the structure of types of feeding pigs.
5. How does feeding affect the quality of semen production and sexual potency of breeding boars?
6. Give the norms, rations and feeding regimen of breeding boars.
7. What is the effect of feeding on the health, reproductive function and productivity of sows?
8. What are the norms, rations and feeding regimen for gestating and suckling sows?
9. List the consequences of inadequate feeding of sows.
10. What is the mode of feeding suckling piglets?
11. What are the norms, rations and feeding regimen of weaning piglets?
12. Characterize the features of the feeding regime of breeding young pigs.
13. List the consequences of inferior and unbalanced feeding in piglets and young pigs.
14. What conditions affect the results of fattening pigs?
15. Define the types of fattening pigs.
16. What are the norms, rations and feeding regimen of pigs in meat fattening?
17. What are the features of feeding pigs in bacon fattening?
18. What are the norms, rations and feeding regimen of pigs in fattening to fatty condition?
19. Determine the consequences of unbalanced feeding in fattening pigs.
20. By what indicators control the completeness of the rations of pigs on fattening?
21. What are the features of digestion and metabolism in poultry?
22. What are the principle and specifics of rationing of agricultural poultry.
23. Specify the norms, rations and feeding regimen of laying hens.
24. What are the features of the feeding regime of egg chickens breeding and industrial flock?
25. What are the features of feeding laying hens in phases of productivity?
26. What are the features of feeding laying hens in dry and combined methods?
27. Specify the norms, rations, methods and mode of feeding young chickens.
28. What is the mode of feeding broiler chickens full-fledged com-bi-feeds and wet mash?

29. List the types of mixed fodder for broiler chickens.
30. What are the features of rationing for adult geese?
31. How to feed young geese of different ages?
32. List the features of feeding geese for meat and to obtain fatty liver.
33. What are the features of feeding adult ducks?
34. Name the ways and mode of feeding young ducks.
35. What are the features of normalized feeding of adult turkeys?
36. What are the methods and feeding regimen for turkeys of different ages?
37. Indicate the consequences of inadequate and unbalanced feeding of poultry.
38. List indicators for monitoring the nutritional adequacy of poultry diets.

3.1.2 Topics of abstracts

Topics of essays for competence assessment:

GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.

GPC-2 ID-$_1$ - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.

1.Rational normalized feeding as a factor in increasing animal productivity and improving product quality. Prevention of metabolic disorders, reproductive functions and alimentary diseases.
2.Problems of high-grade feeding of farm animals. Strengthening the fodder base of animal husbandry, improving the quality and rational use of fodder in farms. Ways of solving the problems of energy, protein, mineral and vitamin nutrition of animals.
3.Nutrients and their physiological importance in the metabolism of substances.
4.The importance of carbohydrates in the nutrition of ruminants and non-ruminants.
5.Proteins and their role in nutrition, the role of amino acids in providing full protein nutrition of animals.
6.Lipids, fatty acids and their influence on metabolism and product quality.
7.The importance of macro- and microelements in the nutrition of farm animals.
8.Biologically active substances: the characteristics of vitamins, the role of vitamins in animal nutrition (avitaminosis, hypovitaminosis and hypervitaminosis in animals), antibiotics, hormones, enzymes, their effect on growth and productivity.
9.Mineral substances: interaction of individual organic and mineral compounds.
10.Anti-nutritive and toxic substances of feed, ways of their inactivation.

GPC-2 ID-2 - To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors.

1. Peculiarities of digestion of ruminants and non-ruminants. Factors affecting the digestibility of fodder.

2. Biological importance of energy in the animal body, the concept of gross, digestible, metabolizable and productive energy. Increasing the utilization of substances and energy from feeds and rations.
3.Modern systems of evaluation of feed nutrition in Russia and other countries.
4.Integrated assessment of feed nutrition. Control of nutritional adequacy of feeding.
5.The need of farm animals in energy and nutrients. Indicators taken into account in determining the need of animals in nutrients and biologically active substances.
6.The importance of normalized feeding in animal husbandry. Principles of rations and their zootechnical and economic justification. The structure of rations for different species and age groups of farm animals. Type of feeding and its justification.
7.The concept of feed and classification of feeds.
8.Characteristics of the main groups of forages. Methods of economic evaluation of good quality of fodder means. Control of fodder quality.
9.Rational use of pastures and increasing their productivity, creation of cultural pastures.
10.Hay, the impact of the timing of harvesting herbs on the yield and nutritional value of hay, drying time of green plants, loss of dry matter, protein and carotene, techniques that accelerate the drying of herbs.
11. technology of hay production. Storage of hay. Method of active ventilation.
12. Technological process of preparation of grass meal, losses

GPC-2 ID-3 - To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.

1.Nutritive value of grass meal from different raw materials, granulated and briquetted fodder, production technology, nutritive value, efficiency of use in feeding farm animals.
2. Main silage crops. Silosability of plants. Regulation of the silage process.
3. Silage production technology. Essence of chemical fodder preservation. The concept of sugar minimum and buffer capacity.
4.The essence of the method and features of the technology of hay production. The main containers used for storage of haylage. Chemical composition and nutritional value of forage. Evaluation of haylage quality.
5.Nutritional value of straw and other coarse fodder, the importance of preparing them for feeding. The main methods of preparation of straw for feeding, their features, advantages and disadvantages.
6.Classification of mixed fodders, their purpose. Recipes of mixed fodders and mixed fodders-concentrates. Scheme of organization of production of com-bi-feeds, technology of their production.
7.The value and recipes of protein and mineral additives, the effectiveness of their use.
8.Substitutes for whole milk in the cultivation of calves and piglets, recipes, the effectiveness of their use.
9.Premixes, preparation and their use in the feeding of animals.
10.The basic principles of staging experiments on the feeding of farm animals.
11.Digestibility of feed nutrients, nitrogen and carbon balance, schemes for calculating the biological value of protein.
12.The importance of nutritious feeding in the prevention of metabolic disorders. Function of reproduction and diseases of farm animals. The importance of limiting nutrition in the occurrence of metabolic disorders.

PC-9. Development of recommendations for special feeding of sick animals for therapeutic purposes.
PC-9 ID-1 - To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy.

1.Nutrient requirements of lactating cows, (for maintenance of life, lactation, weight gain and pregnancy). Feeding norms and principles of their construction. Costs of nutrients per 1 kg of milk annual milk yield in cows of different productivity.
2. Types of feeding and the structure of rations in feeding cows. Physiological and economic justification of feeding types and ration structures. Approximate ration.
3.Influence of level and fullness of feeding of dairy cows on productivity and reproductive abilities. Economic and physio-logical substantiation of the level of fullness of feeding of dairy cows. Annual need of cows in forages and nutrients.
4.The system of high-grade feeding, providing 8000-9000 kg of annual milk yield of cows. Year-round stabling of cattle on complexes and requirements for feeding. The main forages in milk production.
5 Feeding dry cows and milking cows, its features in the conditions of industrial technologies. Feeding high-yielding cows.
6. Feeding of breeding bulls, the influence of different feeds on spermogenesis.
7. Features of growing young animals in dairy cattle breeding.
8.Features of growing young animals in beef cattle breeding. Intensive fattening of young cattle.
9.Fattening of cattle. Features of growing and fattening of cattle on industrial complexes and farms of different types of beef production. Types, norms, rations, feeding techniques.

PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.

PC-15 ID-3 - To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.

1.Influence of sheep feeding on growth and quality of wool.
2.Feeding of ewe mothers in preparation for mating, in the period of suyagnoosti and suckling.
3.Feeding of rams-producers.
4.Feeding lambs in the suckling period and after weaning. Early weaning of lambs, their cultivation and intensive fattening.
5.Feeding of woolen rams, fattening.
6.Features of feeding sheep at industrial complexes and farms of different types. Norms, rations, feeding techniques.
7.Feeding gestating and suckling sows.
8.Feeding boars-producers.
9.Feeding piglets at different weaning dates.
10.Fattening of pigs, types of fattening, the influence of feed on the quality of pro-production. Types, norms, rations, feeding techniques.
11.The need of horses in nutrients and energy.
12.Feeding of breeding, working and sport horses.
13.Fattening horses for meat. Norms, rations, feeding and watering techniques.
14.Features of digestion and metabolism in poultry and the need for energy and nutritional elements.

15.Influence of high-grade poultry feeding on the composition and hatching qualities of eggs.
16.System of feeding laying hens in industrial conditions.
17.Growing chickens in industrial production.
18.Feeding broiler chickens in industrial conditions.
19.Feeding of waterfowl.
20.Basic provisions of feeding fur-bearing animals. Feeds, norms, rations, feeding techniques.
21.Feeding rabbits - males, females, young animals.

4.1.3 Test-questins

GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.

GPC-2 ID-**1** - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.

1. **What is feed?**

1 It is specially prepared physiologically acceptable food containing the nutrients required by the animal in an available form. 2.

2. It is a product that can be fed to animals.

3. It is a product that contains nutrients.

4. It is a product that can be fed to animals and contains nutrients.

2. **What are the nutritional parameters that characterise feed?**

1The chemical composition of feed, digestibility of feed nutrients and the degree of utilisation (assimilation) of feed nutrients for milk production in lactating cows, live weight gain in fattening animals, eggs in poultry and other products.

2. chemical composition of feed.

3. Digestibility of feed nutrients.

4. The degree of utilisation (assimilation) of feed nutrients for milk production in lactating cows, live weight gain in fattening animals, eggs in poultry and other products.

3 **What is feed nutrition?**

1) It is the property of feed to satisfy the natural requirements of animals. 2) It is the availability of nutrients in the feed.

2. It is the presence of nutrients in the feed.

3. It is the quantitative content of nutrients in the feed.

4. It is the chemical composition of the feed.

4. Protein nutrition should be understood as?

1. The property of the feed to fulfil the amino acid requirement of the animal.
2. The availability of amino acids in the feed.
3. The amount of digestible amino acids in the feed.
4. The gross crude protein content of the feed.

Type of professional tasks: medical

5. **How do you determine the amount of crude protein in a feed?**

1. By the presence of nitrogenous matter in the feed. Multiply the total amount of nitrogen in the feed by 6.25 (protein contains an average of 16% nitrogen).
2. By the protein content of the feed.
3. By the amino acid content of the feed.

4. By amide content of the feed.

6. Which amino acids are called essential?

1. those amino acids that cannot be synthesised in the animal body at all, or at a rate that provides the need for them.
2. those that are ingested by the animal with feed.
3. those that are deficient in the animal's body.
4. Those that are lacking in the animal's body and are scarce in feed.

7. What is the protein ratio in a diet?

1. It is the ratio of the sum of digestible nitrogen-free matter (fat × 2.25 + fibre + BEV) to digestible protein.
2. It is the amount of digestible protein per 1 energy feed unit of the diet.
3. It is the amount of crude protein per 100 g of feed mixture.
4. It is the ratio of digestible protein to crude protein.

8. What is the protein ratio of a ration?

1. Narrow (1:6), medium (1:8), wide (1:10).
2. Concentrated, diluted.
3. Dense, loose.
4. Concentrated, diluted, dense, loose.

9. How is protein nutrition monitored?

1. By the content of crude and digestible protein in feed and rations, for ruminants additionally RP and NRP, and comparison of data with detailed norms of protein requirements of farm animals; by biochemical indices of blood, urine, milk, hair (wool), etc.
2. According to biochemical indicators of blood, urine, milk, hair (wool), etc. in blood serum the content of total protein and its fractions is determined; in urine - the content of urea nitrogen, ammonia nitrogen, amine nitrogen; in milk and wool the content of protein is determined. The results of the analysis are compared with physiological norms.
3. On the content of crude and digestible protein in the feed and diet, for ruminants additionally RP and NRP, and comparison of the data with detailed norms of the needs of farm animals in protein.
4. On its quantitative content in the diet.

10. What are lipids?

1) They are fats and fat-like substances that make up feeds.
2) They are the fatty acids that make up feeds.
3. They are the fats that make up feeds.
4. These are the fat-like substances that make up feeds.

11. How are lipids defined in zootechnical analysis of feeds?

1. defined as an ether extract. Neutral fat (compounds of fatty acids with glycerol), fatty acids, pigments (carotene, chlorophyll, etc.), vitamins A, D, E, K, waxes, resins, phosphatides, sterols, etc. are dissolved in ether.
2. As an extract of crude fat from feed.
3. By calculation.
4. By the energy value of the feed.

12. What is the importance of fat in the nutrition of farm animals?

1. Fats are the main accumulator of energy in the organism of animals. They give about 2 times more energy than carbohydrates and proteins (when 1 g of fat is oxidised in the

body, 9.5 kcal (40 kJ of energy) is released). Fats play the role of the main reserve substance in the body, as well as create a kind of "buffer" for internal organs (kidney, mesenteric fat, etc.). Fat is a structural material in the protoplasm of animal cells. Fats form the basis of many enzymes, vitamins and hormones. Fats take part in the formation of milk fat in lactating animals. Fats take part in the synthesis of sex hormones of males and females. Fatty acids such as linoleic, linolenic and arachidonic acids are essential for animal growth, normal skin function, and for preventing disorders of cholesterol metabolism in animals.

2. Fats play the role of the main reserve substance in the body, as well as create a kind of "buffer" for internal organs (kidney, mesenteric fat, etc.). Fats take part in the synthesis of sex hormones of males and females.

3. fats form the basis of many enzymes, vitamins and hormones. Fatty acids such as linoleic, linolenic and arachidonic acids are essential for animal growth, normal skin function, and for preventing disorders of cholesterol metabolism in animals.

4. Fats are the main accumulator of energy in the animal body. They provide about 2 times more energy than carbohydrates and proteins (when 1 g of fat is oxidised in the body, 9.5 kcal (40 kJ of energy) is released).

13. **How is lipid nutrition of farm animals controlled?**

1. The content of crude fat in feeds and rations is compared with detailed norms of animal needs in fat. In this case, the deficiency or excess of fat in the diet is established. Biochemical parameters of blood, urine and milk analyses. The content of phospholipids is determined in blood, the presence of ketone bodies is determined in urine and milk, the results of the analysis are compared with physiological norms. In milk, the fat content is analysed and compared with the basic fat content of animals of a given breed. Appearance of hypovitaminosis of fat-soluble vitamins in animals, as well as various skin diseases.

2. By biochemical indicators of blood, urine and milk analyses. In the blood is determined by the content of phospholipids, in the urine and milk is determined by the presence of ketone bodies, the results of the analysis are compared with physiological norms.

3. In milk, the fat content is analysed and compared with the basic fat content of animals of a given breed. Appearance of hypovitaminosis of fat-soluble vitamins in animals, as well as various skin diseases.

4. The content of crude fat in feeds and diets is compared with detailed norms of animal fat requirements.

14. **From the options listed below, indicate what is the importance of carbohydrates in the nutrition of farm animals?**

1. Carbohydrates are the source of energy in the body of animals.

2. Carbohydrates are reserve substances in the body of animals in the form of glycogen (muscle and liver), as well as in the form of fat deposition.

3. Carbohydrates are used for tissue respiration with oxidation to carbon dioxide and water, and the released energy goes to ensure the processes of muscle contraction.

4. They play the role of the main reserve substance in the body, as well as create a kind of "buffer" for internal organs (kidney, mesenteric fat, etc.).

5. Carbohydrates are necessary for animals and as structural material for organs, tissues and cells of the body.

6. Pectin substances have bactericidal properties, protect the body from various toxic substances.

7. Take part in the synthesis of sex hormones of males and females.

8. Carbohydrates for ruminants provide conditions for the normal functioning of the rumen microflora.

9. Sugar of feed in the rumen of cattle and sheep promotes the formation of microbial protein, enhances the synthesis of amino acids, as well as the synthesis of vitamins B and K.

10. Fodder fibre in the rumen of ruminants promotes the synthesis of low molecular weight volatile fatty acids (VFA) - acetic, propionic and butyric acids, which are precursors of milk fat in lactating animals.

11. In animals with a single-chamber stomach, fibre provides intestinal motility and, in addition, in sows it prevents elementary agalactia.

12. Fatty acids such as linoleic, linolenic and arachidonic acids are essential for animal growth, normal skin function and for the prevention of cholesterol metabolism disorders in animals.

15. **What is the sugar-protein ratio in a diet and what should it be?**

1 It is the ratio of the amount of sugar to digestible protein. The optimum ratio is 0.8-1.2, i.e. for 100 g of digestible protein there should be a minimum of 80 g and a maximum of 120 g of sugar.

2 This is the ratio of sugar to crude protein. The optimal ratio is 0.5-2.0, i.e. per 100 g of crude protein there should be a minimum of 50 g and a maximum of 200 g of sugar.

3. This is the ratio of the amount of sugar to the amino acid content of the diet. The optimal ratio is 1.0-2.5, i.e. per 100 g of amino acids in the diet there should be a minimum of 100 g and a maximum of 250 g of sugar.

4. This is the ratio of the amount of sugar to the protein content of the diet. The optimal ratio is 2.0-2.5, i.e. per 100 g of protein in the diet there should be a minimum of 200 g and a maximum of 250 g of sugar.

16. **Which indicators are characterised by mineral nutrition of forages:**

1. Content of raw and clean ash. Presence of macroelements - calcium, phosphorus, magnesium, sulphur, chlorine, sodium and potassium and microelements - iron, copper, cobalt, zinc, manganese, iodine, fluorine, etc. in ash. The ratio of individual elements - calcium to phosphorus, sodium to potassium, calcium to zinc, etc. Acid-alkaline ratio.
2. Raw and clean ash content. Acid-alkaline ratio.
3. presence of macronutrients - calcium, phosphorus, magnesium, sulphur, chlorine, sodium and potassium and trace elements - iron, copper, cobalt, zinc, manganese, iodine, fluorine, etc. in ash.
4. The ratio of individual elements - calcium to phosphorus, sodium to potassium, calcium to zinc, etc.
5. The acid to alkaline ratio.

17. **From the options listed below, indicate what is the importance of minerals in the nutrition of farm animals?**

1. Mineral substances are part of the structural elements of the body.
2. They are a source of energy in the animal body.
3. Minerals are necessary for the synthesis of vital compounds and are part of the molecules of complex organic compounds.
4. Mineral substances play a major role in regulating the osmotic pressure of body fluids, on which the condition of cells and tissues of the animal body depends.
5. They are plastic material for the construction of the organic part of products.
6. Are part of the organic matter.
7. Minerals regulate the reaction of blood and tissue fluid and maintain acid-base balance in the body.
8. Minerals play a major role in digestion, absorption and assimilation of feed nutrients in the body, contributing to the environment in which enzymes and hormones operate.

18. **The importance of calcium in the animal body?**

1. Calcium serves as a material for building bone tissue. It plays a part in regulating the reaction of the blood, the excitability of muscular and nervous tissue, and takes part in blood coagulation.
2. It is a member of trace elements and forms, acid sulphur in the animal's body.
3. It is part of the wool of sheep, and is the main source for the construction of wool.
4. plays an essential role in the processes of hematopoiesis. In case of deficiency in fodder and diets in farm animals anaemia develops, it is necessary for the synthesis of vitamin B12.
5. It is a component of metabolic energy.

19. **The importance of phosphorus in the animal body?**

1. Phosphorus is a part of bone tissue and nuclear matter of all cells of the animal organism. It is also found in muscles and blood. Phosphorus takes part in carbohydrate and fat metabolism. Phosphates are important buffer substances that maintain a certain concentration of hydrogen ions in the blood (pH), participate in the process of absorption of nutrients and excretion of products of cellular metabolism.
2. Phosphorus is a part of the skin. It is also found in vitamins and starch. Phosphorus takes part in the metabolism of dry matter.
3. It is a part of trace elements and forms alkaline sulphur in the animal's body.
4. It is a constituent of metabolic energy.

20. **The importance of magnesium in the animal organism?**

1. Magnesium is a constituent of all tissues of the animal body and is considered essential for the maintenance of life. When magnesium is deficient in feed, animals develop extreme excitability, followed by magnesial tetany and hypomagnesaemia. Magnesial tetany occurs most often in cattle in summer when fed green grass (grass tetany) in which the potassium to magnesium ratio is disturbed. The disease occurs most often when high doses (over 150 kg/ha) of potassium fertilisers are applied to the soil.
2. Magnesium serves as a material for building bone tissue. It plays a role in regulating the blood reaction, excitability of muscle and nervous tissue, takes part in blood coagulation.
3. Magnesium is a part of bone tissue and nuclear substance of all cells of the animal organism. It is also found in muscles and blood. Magnesium takes part in carbohydrate and fat metabolism.
4. They are plastic material for the construction of the organic part of production.

GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors.

21. **Importance of potassium, sodium, chlorine in animal organism?**

1. These mineral elements in the animal organism regulate osmotic pressure in cells, maintain the reaction of blood and tissue fluid at a constant level, play an important role in water metabolism. Chlorine is important in digestion, it is part of gastric juice in the form of hydrochloric acid. If there is a lack of potassium in the feed, animals suffer from cardiac disorders (arrhythmia, hypotension), liver and kidney functions are impaired. Lack of sodium causes loss of appetite, reduces the synthesis of fat and protein, increases heat formation in the body. Lack of chlorine reduces the secretion of hydrochloric acid, which leads to poor digestion of nutrients in the feed.

2. Potassium, sodium, and chlorine are part of all animal body tissues and are considered essential for the maintenance of life. When these mineral elements are deficient in feed, animals develop extreme excitability.

3. Potassium, sodium, chlorine is a part of bone tissue and nuclear substance of all cells of the animal body. It is also found in muscles and blood. Potassium, sodium, chlorine takes part in carbohydrate and fat metabolism. Potassium, sodium, chlorine are important buffer substances that maintain a certain concentration of hydrogen ions in the blood (pH), participate in the process of absorption of nutrients and excretion of products of cellular metabolism.

4. Potassium, sodium, chlorine serves as a material for the construction of bone tissue. Plays a role in regulating blood reaction, excitability of muscle and nerve tissue, takes part in blood coagulation.

22. **The importance of sulphur in the animal body?**

1. Sulphur performs its physiological role through amino acids - methionine, cystine, cysteine, which include sulphur. In addition, sulphur is a component of insulin and thiamine. Sulphur deficiency is most often observed in sheep diets, as sulphur-containing amino acids are abundant in wool protein.

2. Sulphur in the body of animals regulate osmotic pressure in cells, maintain at a constant level the reaction of blood and tissue fluid, play an important role in water metabolism. Sulfur is important in digestion, it is part of gastric juice in the form of hydrochloric acid. At deficiency in the feed in animals there is a disorder of cardiac activity (arrhythmia, hypotension), liver and kidney functions are disturbed. Lack of sulphur causes loss of appetite, reduces the synthesis of fat and protein, increases heat formation in the body. Deficiency reduces the secretion of hydrochloric acid, which leads to poor digestion of nutrients in the feed.

3. Sulphur is a part of bone tissue and nuclear substance of all cells of the animal body. It is also found in muscles and blood. Sulphur takes part in carbohydrate and fat metabolism. Sulphur is an important buffer substances that maintain a certain concentration of hydrogen ions in the blood (pH), participate in the process of absorption of nutrients and excretion of products of cellular metabolism.

4. Sulphur is a constituent of all animal body tissues and is considered essential for the maintenance of life. When animals lack sulphur in their feed, they develop extreme excitability.

23. **The importance of iron, copper, and cobalt in the animal body?**

1. Iron, copper, cobalt, these trace elements play an essential part in the processes of hematopoiesis. When iron, copper and cobalt are deficient in feed and rations, anaemia develops in farm animals. Cobalt is necessary for the synthesis of vitamin B12.

2. Iron, copper, cobalt is a part of all tissues of the animal's body and is considered essential for the maintenance of life. When these mineral elements are deficient in feed, animals develop extreme excitability.

3- Iron, copper, cobalt is a part of bone tissue and nuclear matter of all cells of the animal body. It is also found in muscles and blood. Sulphur takes part in carbohydrate and fat metabolism. Sulphur is an important buffer substance that maintains a certain concentration of hydrogen ions in the blood (pH), participate in the absorption of nutrients and excretion of products of cellular metabolism.

4. Iron, copper, cobalt serves as a material for the construction of bone tissue. It plays a role in regulating blood reaction, excitability of muscle and nervous tissue, takes part in blood coagulation.

24. **The importance of zinc in the animal body?**

1. Zinc in animal organism takes part in metabolism, promotes absorption of nitrogenous substances and utilisation of feed vitamins. Zinc regulates reproductive function and

skin condition of animals. In case of zinc deficiency in the feed, farm animals suffer from a skin disease called parakeratosis. Parakeratosis most often occurs in animals fed diets with excessive calcium. Chronic deficiency of zinc in the feed reduces the fertility of mothers and can lead to infertility.

2. Zinc is a part of bone tissue and nuclear substance of all cells of the animal organism. It is also found in muscles and blood. Zinc takes part in carbohydrate and fat metabolism. Zinc is an important buffer substances that maintain a certain concentration of hydrogen ions in the blood (pH), participate in the process of absorption of nutrients and excretion of products of cellular metabolism.

3. Zinc plays an essential role in the processes of hematopoiesis. If there is a deficiency of iron, copper and zinc in feeds and diets, farm animals develop anaemia. Zinc is necessary for the synthesis of vitamin B12.

4. Zinc is a part of bone tissue and nuclear substance of all cells of the animal body. It is also found in muscles and blood. Zinc takes part in carbohydrate and fat metabolism.

25. **What is the importance of iodine in the animal organism?**

1. iodine is a component of thyroxine, a thyroid hormone. In case of iodine deficiency in the feed, farm animals get endemic goitre, which leads to stunted growth of young animals and reduced reproduction in breeding stock. Cows have abortions, sows have an increased number of stillborn piglets, sometimes completely deprived of bristles.

2 Iodine in the animal body takes part in metabolism, promotes absorption of nitrogenous substances and utilisation of feed vitamins. Iodine regulates reproductive function and skin condition of animals. In case of iodine deficiency in the feed, farm animals suffer from a skin disease called parakeratosis. Parakeratosis most often occurs in animals fed diets with excess iodine. Chronic deficiency of iodine in feed reduces the fertility of mothers and can lead to infertility.

3 Iodine plays an essential role in the processes of hematopoiesis. In case of deficiency of iodine in feeds and diets, anaemia develops in farm animals. Iodine is necessary for the synthesis of vitamin B12.

4 Iodine is a part of bone tissue and nuclear substance of all cells of the animal organism. It is also found in muscles and blood. Iodine takes part in carbohydrate and fat metabolism.

26. **What is the importance of manganese in the animal organism?**

1. Manganese in the animal body stimulates tissue respiration, takes part in the synthesis of ascorbic acid, phosphatase and peroxidase enzymes. Manganese is necessary as a catalyst in the use of thiamine in the body. In pigs and birds, manganese stimulates growth and development. It is essential for the normal development of chicken embryos. When manganese is deficient in hatching chicken eggs, chondrodystrophy occurs in embryos and perosis disease in chickens.

2. Manganese in the organism of animals takes part in metabolism, contributes to the absorption of nitrogenous substances and the use of vitamins in the feed. Manganese regulates reproductive function and skin condition of animals. In case of manganese deficiency in the feed, farm animals suffer from a skin disease called parakeratosis. Parakeratosis most often occurs in animals fed diets with excessive manganese. Chronic deficiency of manganese in feed reduces fertility of uteruses and can lead to infertility.

3 Manganese is a component of thyroid hormone thyroxine. In case of manganese deficiency in the feed, farm animals get endemic goitre, which leads to stunted growth of young animals, reduced reproduction in the mother stock. Cows have abortions, sows have an increased number of stillborn piglets, sometimes completely devoid of bristles.

4. Manganese is a constituent of all animal body tissues and is considered essential for the maintenance of life. When manganese is deficient in feed, animals develop extreme excitability, followed by magnesian tetany and hypomagnesaemia.

27. **The importance of fluoride in the animal body?**

1. Fluoride in animals is found in bone tissue and mainly in the enamel of teeth. If there is a lack of fluoride, tooth enamel is destroyed and teeth fall out. In biogeochemical provinces where there is a lack of fluoride in feed, fluoride is added to drinking water. When feed phosphates, which sometimes contain more fluoride than the animal needs, are fed as part of the diet, fluoride poisoning is observed because fluoride is a toxic element. Toxicity is evident when 1kg of dry matter of the ration will contain more than 0.008% fluoride.

2. Fluorine in the body of animals takes part in metabolism, promotes absorption of nitrogenous substances and utilisation of feed vitamins. Fluorine regulates reproductive function and skin condition of animals. If there is a lack of fluoride in the feed, farm animals suffer from a skin disease called parakeratosis. Parakeratosis most often occurs in animals fed diets with excess fluoride. Chronic lack of fluoride in feed reduces the fertility of mothers and can lead to infertility.

3. Fluoride in the body of animals stimulates tissue respiration, takes part in the synthesis of ascorbic acid, enzymes phosphatase and peroxidase. Fluorine is necessary as a catalyst in the use of thiamine in the body. In pigs and birds, fluoride stimulates growth and development. It is essential for the normal development of chicken embryos. When fluoride is deficient in hatching chicken eggs, chondrodystrophy occurs in embryos and perosis disease in chickens.

4. Fluoride plays an essential role in the processes of hematopoiesis. If there is a lack of fluorine in feed and diets, farm animals develop anaemia. Fluorine is necessary for the synthesis of vitamin B12.

28. **How is the control of mineral nutrition of farm animals carried out?**

1. The content of macro- and microelements in the feed ration is compared with detailed norms and the need of animals in mineral substances. In this case, the deficiency or excess of certain mineral elements in the diet is established.
2. On the content of macro- and microelements in the environment.
3. Biochemical blood analysis for the content of calcium, phosphorus and other macronutrients, as well as reserve alkalinity. The analysis data are compared with physiological norms.
4. Hair samples for the content of trace elements.
5. By analysing the products obtained.
6. By saliva analysis.
7. By sampling the products received for the content of trace elements.

29. **What is the classification of vitamins according to solubility?**

1. On fat-soluble (lipovitamins) A-retinol, D-calciferol, E-tocopherol, K-phylloquinone, and water-soluble (hydrovitamins), B1-thiamine, B2-riboflavin, B3-pantothenic acid, B4-choline chloride, B5-nicotinic acid, B6-pyridoxine, B12-cyancobalamin, B-folic acid, H-biotin, C-ascorbic acid.
2. Into acid-soluble and alkaline-soluble.
3. Into digestible and non- digestible.
4. Alcohol-soluble and insoluble.

30. **The importance of vitamin A in the nutrition of farm animals?**

1. Vitamin A (retinol, antixerophthalmic, axerophthol, anti-infectious, growth and vision vitamin). In the body of farm animals, vitamin A takes part in the synthesis of visual purple (rhodopsin) of the retina, which is a combination of protein and vitamin; maintains the mucous membranes in normal condition; is necessary for the synthesis of steroid hormones; stimulates the growth of young animals.

2. Vitamin A is involved in the regulation of phosphorus-calcium metabolism in the body of animals, as well as in the growth and mineralisation of bone tissue. It activates the absorption of calcium and phosphorus from the intestine.

3. Vitamin A in farm animals regulates reproductive function. Vitamin A acts in the body as biocatalysts and plays the role of antioxidants in relation to unsaturated fatty acids.

4. Vitamin A is essential for maintaining normal blood coagulation in animals, it is involved in the synthesis of prothrombin from prothrombinogen in the liver.

31. The importance of vitamin D in the nutrition of farm animals?

1. Vitamin D (calciferol, antirachitic). Vitamin D is involved in the regulation of phosphorus-calcium metabolism in the body of animals, as well as in the growth and mineralisation of bone tissue. It activates the absorption of calcium and phosphorus from the intestine.

2. Vitamin D in farm animals vitamin D takes part in the synthesis of visual purple (rhodopsin) retina, which is a combination of protein and vitamin; maintains the normal state of mucous membranes; is necessary for the synthesis of steroid hormones; stimulates the growth of young animals.

3. Vitamin D in farm animals regulates reproductive function. Vitamin D act as biocatalysts in the body and play the role of antioxidants in relation to unsaturated fatty acids.

4. Vitamin D exerts its action by binding to enzymes. It is a member of the active groups of numerous cellular enzymes, which occupy a key position in the processes of energy generation.

GPC-2 ID-3 To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.

32. **The importance of vitamin E in the nutrition of farm animals?**

1. Vitamin E (tocopherol, anti-sterol, reproduction vitamin). Vitamin E in farm animals regulates reproductive function. E vitamins act as biocatalysts in the body and play the role of antioxidants in relation to unsaturated fatty acids, vitamin A and carotenes.

2. Vitamin E is involved in the regulation of phosphorus-calcium metabolism in animals, as well as in the growth and mineralisation of bone tissue. It activates the absorption of calcium and phosphorus from the intestine.

3. Vitamin E manifests its action by binding to enzymes. It is a member of the active groups of numerous cellular enzymes, which occupy a key position in the processes of energy generation.

4. Vitamin E is a member of more than 70 enzymes and is involved in the synthesis of fatty acids, phosphatides, cholesterol, bile acids, steroid hormones, haemoglobin, acetylcholine, etc. 33.

33. **Importance of vitamin K in the nutrition of farm animals?**

1. Vitamin K (phylloquinone, naphthoquinone, anti-haemorrhagic). Vitamin K is necessary for maintaining normal blood coagulation in animals, it takes part in the synthesis of prothrombin from prothrombinogen in the liver. Prothrombin further under the action of prothrombinase passes into thrombin, which is a proteolytic enzyme that cleaves specific peptide bonds of soluble blood protein fibrinogen to form insoluble fibrin.

2. Vitamin K in farm animals Vitamin K takes part in the synthesis of visual purple (rhodopsin) of the retina of the eye, which is a combination of protein and vitamin; maintains

mucous membranes in normal condition; is necessary for the synthesis of steroid hormones; stimulates the growth of young animals.

3. Vitamin K is part of more than 70 enzymes; it is involved in the synthesis of fatty acids, phosphatides, cholesterol, bile acids, steroid hormones, haemoglobin, acetylcholine, etc.

4. Vitamin K in farm animals Vitamin K takes part in the synthesis of visual purple (rhodopsin) of the retina, which is a combination of protein and vitamin; maintains mucous membranes in normal condition; is necessary for the synthesis of steroid hormones; stimulates the growth of young animals.

34. **The importance of vitamin F in the nutrition of farm animals?**

1. Vitamin F (polyunsaturated fatty acids). Vitamin F (fat) is a set of 3 unsaturated fatty acids - linoleic, linolenic and arachidonic acids. These acids are not synthesised in the body. With a lack of vitamin F there is a loss of hair, develops dermatitis with eczema, and young animals stop growing. In severe cases, there is fatty degeneration of organs, sclerosis of blood vessels, decreased resistance to infectious diseases and ionising radiation.

2. Vitamin F is necessary to maintain normal blood coagulation in animals, it takes part in the synthesis of prothrombin from prothrombinogen in the liver. Prothrombin further under the action of prothrombinase passes into thrombin, which is a proteolytic enzyme that cleaves specific peptide bonds of soluble blood protein fibrinogen to form insoluble fibrin.

3. Vitamin F in farm animals regulates reproductive function. F vitamins act as biocatalysts in the body and play the role of antioxidants in relation to unsaturated fatty acids, vitamin A and carotenes.

4. Vitamin F is involved in the regulation of phosphorus-calcium metabolism in animals, as well as in the growth and mineralisation of bone tissue. It activates the absorption of calcium and phosphorus from the intestine.

35. **The importance of vitamin B1 in the nutrition of farm animals?**

1. Vitamin B1 (thiamine, antineurin, aneurin). Thiamine is part of the coenzymes of various cellular enzymes involved in carbohydrate metabolism. In case of vitamin B1 deficiency, reactions of the citric acid cycle are inhibited, as a result of which keto acids accumulate in blood and tissues, causing severe disorders in tissues, especially those with intensive metabolism (brain, heart).

2. Vitamin B1 is necessary to maintain normal blood coagulation in animals, it takes part in the synthesis of prothrombin from prothrombinogen in the liver. Prothrombin further under the action of prothrombinase is converted into thrombin, which is a proteolytic enzyme that cleaves specific peptide bonds of soluble blood protein fibrinogen to form insoluble fibrin.

3. Vitamin B1 in farm animals regulates reproductive function. F vitamins act as biocatalysts in the body and play the role of antioxidants in relation to unsaturated fatty acids, vitamin A and carotenes.

4. Vitamin B1 is involved in the regulation of phosphorus-calcium metabolism in animals, as well as in the growth and mineralisation of bone tissue. It activates the absorption of calcium and phosphorus from the intestine.

36. **The importance of vitamin B2 in the nutrition of farm animals?**

1. Vitamin B2 (riboflavin). Riboflavin exerts its action by binding to enzymes. It is a member of the active groups of numerous cellular enzymes, which occupy a key position in the processes of energy generation. Deficiency of vitamin B2 disrupts the activity of many enzyme systems of the body, which leads to a sharp decline in productivity and other functional disorders.

2. Vitamin B2 is involved in the regulation of phosphorus-calcium metabolism in the body of animals, as well as in the growth and mineralisation of bone tissue. It activates the absorption of calcium and phosphorus from the intestine.

3. Vitamin B2 in farm animals regulates reproductive function. Vitamin B2 act as biocatalysts in the body and play the role of antioxidants in relation to unsaturated fatty acids.

4. Vitamin B2 is essential for maintaining normal blood coagulation in animals; it is involved in the synthesis of prothrombin from prothrombinogen in the liver.

37. **The importance of vitamin B3 in the nutrition of farm animals?**

1. Vitamin B3 (pantothenic acid). Pantothenic acid - (pantoten - everywhere located) is part of more than 70 enzymes, is involved in the synthesis of fatty acids, phosphatides, cholesterol, bile acids, steroid hormones, haemoglobin, acetylcholine and others. In case of insufficiency of this vitamin in animals growth stops, there are debilitating diarrhoea, dermatitis. There are degenerative changes in the posterior roots of the spinal cord, sciatic nerve, movement coordination is impaired.

2. Vitamin B3 in the organism of farm animals vitamin B3 takes part in the synthesis of visual purple (rhodopsin) retina, which is a combination of protein and vitamin; maintains normal mucous membranes, is necessary for the synthesis of steroid hormones, stimulates the growth of young animals.

3. Vitamin B3 is a part of more than 70 enzymes; it is involved in the synthesis of fatty acids, phosphatides, cholesterol, bile acids, steroid hormones, haemoglobin, acetylcholine, etc.

4. Vitamin B3 in the organism of farm animals Vitamin B3 takes part in the synthesis of body protein, maintains the normal state of the oblique tissue; it is necessary for the synthesis of steroid hormones; stimulates reproductive functions of the organism.

38. **The importance of vitamin B4 in the nutrition of farm animals?**

1. Vitamin B4 (choline). Choline is needed primarily for fat metabolism and transmission of nerve excitation. Vitamin B4 prevents: liver obesity (lipotropic property), liver cirrhosis, hepatitis. In vitamin B4 deficiency, there is increased deposition of fat in tissues and organs.

2. Vitamin B4 is a set of 3 unsaturated fatty acids - linoleic, linolenic and arachidonic acids. These acids are not synthesised in the body. In case of vitamin B4 deficiency, hair loss occurs, dermatitis with eczema develops, and growth stops in young animals. In severe cases, there is fatty degeneration of organs, sclerosis of blood vessels, decreased resistance to infectious diseases and ionising radiation.

3. Vitamin B4 is necessary for maintaining normal blood coagulation in animals, it takes part in the synthesis of prothrombin from prothrombinogen in the liver. Prothrombin further under the action of prothrombinase passes into thrombin, which is a proteolytic enzyme that cleaves specific peptide bonds of soluble blood protein fibrinogen to form insoluble fibrin.

4. Vitamin B4 is part of the coenzymes of various cellular enzymes involved in carbohydrate metabolism. If vitamin B4 is deficient, the reactions of the citric acid cycle are inhibited, as a result of which keto acids accumulate in the blood and tissues, which causes severe disorders in tissues, especially those with intensive metabolism (brain, heart).

39. **The importance of vitamin B5 in the nutrition of farm animals?**

1. Vitamin B5 (vitamin PP, nicotinic acid, antipellagic, niacin). Once in the animal body, nicotinamide participates in the metabolism of carbohydrates, fats and many products of intracellular metabolism, catalyses oxidative processes in the body, contribute to the formation of digestive juices of the stomach and pancreas, improves blood circulation, participates in other reactions. Nicotinic acid in animals is synthesised in the gastrointestinal tract by microorganisms and in tissues from tryptophan.

2. Vitamin B5 is necessary to maintain normal blood coagulation in animals, it takes part in the synthesis of prothrombin from prothrombinogen in the liver. Prothrombin further under the action of prothrombinase passes into thrombin, which is a proteolytic enzyme that cleaves specific peptide bonds of soluble blood protein fibrinogen to form insoluble fibrin.

3. Vitamin B5 is part of the coenzymes of various cellular enzymes involved in

carbohydrate metabolism. When vitamin B5 deficiency inhibits the reactions of the citric acid cycle, as a result of which keto acids accumulate in the blood and tissues, which causes severe disorders in tissues, especially those with intensive metabolism (brain, heart).

4. Vitamin B5 is involved in the regulation of phosphorus-calcium metabolism in the body of animals, as well as in the growth and mineralisation of bone tissue. It activates the absorption of calcium and phosphorus from the intestine.

40. **The importance of vitamin B6 in the nutrition of farm animals?**

1. Vitamin B6 (pyridoxine, antineuritic, antidermatitis). It is not directly involved in metabolism. In the body it is converted to pyrodoxal, or pyrodoxamine. Pyrodoxal is phosphorylated into pyrodoxal phosphate, in this form it combines with a specific protein and acts as a coenzyme.

2. Vitamin B6 is involved in the regulation of phosphorus-calcium metabolism in animals, as well as in the growth and mineralisation of bone tissue. It activates the absorption of calcium and phosphorus from the intestine.

3. Vitamin B6 manifests its action by binding to enzymes. It is a member of the active groups of numerous cellular enzymes, which occupy a key position in the processes of energy generation.

4. Vitamin B6 is a member of more than 70 enzymes, is involved in the synthesis of fatty acids, phosphatides, cholesterol, bile acids, steroid hormones, haemoglobin, acetylcholine and others.

PC-9 - Development of recommendations for special feeding of sick animals for therapeutic purposes.

PC-9 ID-1 - To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy.

41. **The importance of vitamin B7 in the nutrition of farm animals?**

1. Vitamin B7 (vitamin H, biotin, coenzyme R, antiseborrhoeic). Vitamin H deficiency is accompanied by characteristic skin lesions (redness, flaking of the whole body, loss of wool and feathers, claw lesions). Dermatitis is accompanied by the secretion of fat by the glands of the skin (seborrhoea).

2. Vitamin B7 is necessary to maintain normal blood coagulation in animals, it takes part in the synthesis of prothrombin from prothrombinogen in the liver.

3. Vitamin B7 in farm animals regulates reproductive function. Vitamin B7 act as biocatalysts in the body and play the role of antioxidants in relation to unsaturated fatty acids.

4. Vitamin B7 is involved in the regulation of phosphorus-calcium metabolism in animals, as well as in the growth and mineralisation of bone tissue. It activates the absorption of calcium and phosphorus from the intestine.

42. **The importance of vitamin B in the nutrition of farm animals?**

1. Vitamin B (folic acid). Avitaminosis of vitamin B is observed in birds. At deficiency of this vitamin anaemia develops and blood composition changes sharply (the process of maturation in the bone marrow of blood form elements is disturbed), depigmentation of feather cover and limb diseases in birds. The formation of erythrocytes, leucocytes and platelets is disturbed. These disorders are especially pronounced if, in addition to folic acid in the diet is insufficient vitamin B12.

2. Vitamin B is involved in the regulation of phosphorus-calcium metabolism in the body of animals, as well as in the growth and mineralisation of bone tissue. It activates the absorption of calcium and phosphorus from the intestine.

3. Vitamin Vs manifests its action by binding to enzymes. It is a member of the active groups of numerous cellular enzymes, which occupy a key position in the processes of energy generation.

4. Vitamin B is necessary for maintaining normal blood coagulation in animals, it is involved in the synthesis of prothrombin from prothrombinogen in the liver.

43. **The importance of vitamin B12 in the nutrition of farm animals?**

1. Vitamin B12 (cobalamin, anti-anaemic). The composition of vitamin B12 includes cobalt. Pigs and chickens show signs of vitamin B12 deficiency only when fed vegetable feed. In pigs, diarrhoea, vomiting, kidney damage and paralysis of the hind limbs are observed along with growth retardation and impaired utilisation of feed nutrients (protein). Poultry react to vitamin B12 deficiency by increased embryonic mortality in the last week of incubation (thereby reducing hatchability of chicks and impairing growth of young); inflammation of the muscular stomach mucosa; and reduced egg production. When broiler chickens are reared, feed consumption increases and perosis diseases appear.

2. Vitamin B12 is involved in the regulation of phosphorus-calcium metabolism in the body of animals, as well as in the growth and mineralisation of bone tissue. It activates the absorption of calcium and phosphorus from the intestine.

3. Vitamin B12 is necessary for maintaining normal blood coagulation in animals, it takes part in the synthesis of prothrombin from prothrombinogen in the liver.

4. Vitamin B12 in farm animals regulates reproductive function. Vitamin B7 act as biocatalysts in the body and play the role of antioxidants in relation to unsaturated fatty acids.

44. **The importance of vitamin C in the nutrition of farm animals?**

1. Vitamin C (ascorbic acid, anti-scurvy factor). Vitamin C in farm animals is synthesised in the liver from carbohydrates in sufficient quantities. Typical avitaminosis C - scurvy - is manifested by bleeding gums, mucous membranes and muscles. Ascorbin deficiency leads to increased permeability and fragility of blood vessels, the loss of their elastic properties. There are haemorrhages on the skin, in the gums. Also appear irritability and insomnia, orthopaedic diseases are noted in large breed dogs. Prolonged vitamin C deficiency leads to a decrease in the immunobiological resistance of the body, contributes to bacterial toxicosis.

2. Vitamin C in farm animals regulates reproductive function. Vitamin C act in the body as biocatalysts and play the role of antioxidants in relation to unsaturated fatty acids.

3. Vitamin C is essential for maintaining normal blood coagulation in animals, it is involved in the synthesis of prothrombin from prothrombinogen in the liver.

4. Vitamin C is primarily required for fat metabolism and nerve excitation transmission. Vitamin C prevents: liver obesity (lipotropic property), liver cirrhosis, hepatitis. In vitamin C deficiency there is increased deposition of fat in tissues and organs.

45. **How is the control of vitamin nutrition of farm animals?**

1. Control of vitamin nutrition is carried out by veterinary and zootechnical and biochemical indicators. Veterinary and zootechnical control includes control over the content of certain vitamins in the diet, accounting of the amount of products produced by the animal; analysis of the reproductive function of the animal, the number and health of offspring; analysis of product quality; external inspection of the animal. Biochemical on certain deviations from the norm judge about the lack or excess of a particular vitamin in the diet.

2. Control of vitamin nutrition is carried out on the gross content in the diet.

3. Control of vitamin nutrition is carried out by the content of vitamins in the blood.

4. Vitamin nutrition is monitored by the amount of vitamins assimilated from the diet.

46. **What nutrients can be called digested nutrients?**

1. Digested nutrients are nutrients eaten by an animal that are converted during digestion into simpler, soluble compounds that are absorbed by the body and used for synthesis, i.e. assimilated.

2. Digested nutrients are defined as - nutrients eaten by the animal.

3. Digested nutrients are - those that have undergone grinding by chewing and then chemical - by enzymes produced by the glands of the alimentary canal.

4. Digested nutrients are those that have undergone grinding by chewing and then biological processing by microorganisms.

47. **What factors affect feed digestibility?**

1. Type of animal; age of the animal; individuality of the animal; nature of feeding during the growth period of the animal; quantity, composition and properties of feed, feeding regime and technique; crude fibre content of the feed; ratios of nitrogenous to non-nitrogenous digestible matter - called protein ratio (PR).

2. Live weight of the animal; season of the year; dry matter content of the feed; motility of the animal.

3. Amount of succulent feed in the diet; ambient temperature; physiological condition of the animal; availability of water.

4. Quantity of concentrated feeds in the diet; humidity of the environment; method of animal housing; method of fodder preparation.

48. **Which formula is used to determine the digestibility coefficient of nutrients in the diet?**

1. . $\frac{A-B}{A} x100$

2. $\frac{A-B}{A}$

3. $\frac{A}{A-B} x100$

4. $\frac{A}{A-B}$

A - the amount of nutrients eaten

B - amount of nutrients excreted in faeces

49. **The concept of nitrogen balance, and what is it?**

1. Nitrogen balance is used to determine the utilisation of feed protein. Positive - when less nitrogen is excreted from the body than the amount taken in the feed. Negative - when more nitrogen is excreted from the organism than is accepted in the feed. Zero - when the amount of nitrogen taken in and excreted from the body is equal.

2. Nitrogen balance is used to determine the protein utilisation of the feed. Full - when less protein is excreted from the body than is taken in the feed. Incomplete - when more protein is excreted from the body than the amount of protein in the feed. Normal - when the amount of protein taken in and excreted from the body is equal.

3. Nitrogen balance is used to determine the utilisation of amino acids in the feed. Positive - when the amount of amino acids excreted from the body is less than the amount taken in the feed. Negative - when more amino acids are excreted from the body than the amount of amino acids in the feed. Zero - when the amount of amino acids taken in the feed and excreted from the body are equal.

4. Nitrogen balance is used to determine the utilisation of feed amides. Full - when the amount of amides excreted from the body is less than the amount taken in the feed. Incomplete - when the amount of amides excreted from the organism is more than the amount of amides in the feed. Normal - when the amount of amides taken in the feed and excreted from the body is equal.

50. **What is the formula for calculating nitrogen balance?**

1. N deposition = N feed - N faeces - N urine - N milk (for lactating animals)
2. N deposition = N feed - N faeces - N milk (for lactating animals)
3. N deposits = N feed - N urine - N milk (for lactating animals)
4. N deposition = N feed - N faeces - N urine - N digestive gases.

51. **What is the formula for calculating carbon balance?**

1. C deposition = N feed -C carbon dioxide -C exhaled air-C faeces - N urine - N intestinal gases
2. C of sediments = Scorma -C of carbon dioxide -C of faeces -Smocha -C of intestinal gases
3. C of sediment = Scorma - C of carbon dioxide - C of exhaled air-C of faeces-C of faeces - C of intestinal gases
4. C of sediment = Scorma - C of exhaled air-C of faeces - Smochi - C of intestinal gases

52. **What is the formula for calculating energy balance?**

1. E feed (gross) = E faeces + E urine + E methane + E heat + E products (milk, gain, etc.).
2. E feed (gross) = E faeces + E urine + E heat + E produce (milk, gain, etc.)
3. E feed (gross) = E faeces + E urine + E methane + E product (milk, gain, etc.)
4. E feed (gross) = E faeces + E urine + E methane + E heat

53. **What is equal to 1 energy feed unit?**

1. An average of 10 thousand kilojoules (kJ) or 10 megajoules (MJ) of metabolic energy is taken as 1 energy feed unit.
2. An average of 100 thousand kilojoules (kJ) or 100 megajoules (MJ) of exchangeable energy is taken as 1 energy feed unit.
3. An average of 1 thousand kilojoules (kJ) or 1 megajoule (MJ) of exchangeable energy shall be taken as 1 energy feed unit.
4. An average of 1000 thousand kilojoules (kJ) or 1000 megajoules (MJ) of exchangeable energy is taken as 1 energy feed unit.

54. **Estimation of feed nutritive value in energy feed units, what are the advantages of this estimation compared to oat feed unit?**

1. The feed unit underestimates crude fat content.
2. Overestimation of the "field of action" of the feed unit.
3. Neglecting the balance of feeding.
4. Neglecting the interaction of feeds in the diet.
5. Underestimation of protein and protein.
6. Underestimating carbohydrate content in the feed unit.
7. Conditionality of the reducing effect of crude fibre.
8. The feed unit cannot be applied to monogastric animals.
9. Feed unit cannot be applied to polygastric animals.
10. Contradictions found in practical animal feeding.
11. The calculation of the feed unit does not take into account the organic matter content of the feed.

55. **What is the gross energy of a feed?**

1. Gross energy is the amount of energy that is released during the complete oxidation (combustion) of the organic matter of the feed.
2. Gross energy is the amount of energy produced during the digestion of feed.
3. Gross energy is the amount of energy produced during the digestion of feed.
4. Gross energy is the amount of energy formed in the process of metabolism in the animal body.

56. **How is metabolic energy determined?**

1. E feed - E faeces - E intestinal gases - E urine = Exchangeable energy.
2. E feed - E intestinal gases - E urine = Exchangeable energy.
3. E digestible matter - E intestinal gases - E urine = Exchanged energy.
4. E feed - E intestinal gases - E urine - E heat = Exchanged energy.

57. **What is forage?**

1. Fodder is a product of plant and animal origin that is used to feed farm animals and does not have a harmful effect on animal health.
2. Fodder is plants grown in fields that can be fed to animals.
3. Fodder is plant and animal products that are consumed by animals.
4. Fodder is plant and animal products.

58. **Which feeds are classified as bulky feeds?**

1. Bulky fodder is such plant fodder that contains less than 0.5 kg of the sum of digestible nutrients and less than 0.65 feed units in 1 kg of fodder: roughage (hay, straw, chaff, etc.), which contains more than 19% of the total digestible nutrients and less than 0.65 feed units in 1 kg of fodder.), which contain more than 19% of fibre; wet, which contain more than 40% of water: succulent - the bulk of water is part of the protoplasm and is physiologically bound water (green grass, silage, root and tuber crops and melons); watery - in them water is in the form of an impurity that appeared during the processing of raw materials (waste from technical industries).
2. bulky fodder is such plant fodder that contains less than 1.5 kg of the sum of digestible nutrients and more than 0.65 feed units in 1 kg of fodder: rough (hay, straw, chaff, etc.), which contain more than 59% of fibre; wet, which contain more than 90% of water.
3. voluminous forages are such vegetable forages that contain less than 2.5 kg of the sum of digestible nutrients and less than 0.05 feed units in 1 kg of feed: succulent - the main mass of water is included in the protoplasm and is physiologically bound water (green grass, silage, root tubers and melons); watery - in them water is in the form of an impurity that appeared during the processing of raw materials (waste from technical industries).
4. Bulky feeds are plant feeds that contain less than 2.5 kg of the sum of digestible nutrients and less than 0.05 feed units in 1 kg of feed.

59. **Which feeds belong to the concentrated group?**

1. Concentrated feeds are plant feeds that contain in their composition more than 0.5 kg of the sum of digestible nutrients and more than 0.65 feed units in 1 kg of feed, or at a lower nutrient content but not more than 19 % fibre or not more than 40 % water.
2. Concentrated feeds are plant feeds that contain more than 1.5 kg of the sum of digestible nutrients and more than 1.65 feed units in 1 kg of feed, or at a lower nutrient content but not more than 49 % fibre or not more than 70 % water.
3. Concentrated feeds are plant feeds that contain more than 2.5 kg of the sum of digestible nutrients and more than 0.05 feed units in 1 kg of feed, or at a lower nutrient content but not more than 69 % fibre or not more than 90 % water.

4. Concentrated feeds are plant feeds that contain more than 0.05 kg of the sum of digestible nutrients and more than 2.65 feed units in 1 kg of feed, or at a lower nutrient content but not more than 79 % fibre or not more than 10 % water.

60. **What are the feed rates of green fodder for farm animals?**

1. The norms of feeding green fodder to farm animals are as follows: cows - 50-70 kg, heifers - 40-50 kg, young cattle over 1 year old - 25-40 kg, under 1 year old - 15-20 kg, horses (adults) - 40-50 kg, pigs (adults) - 8-12 kg, young pigs - 4-7 kg, sheep (adults) - 7-10 kg, lambs - 2-3 kg per day.

2. Norms of feeding green fodder to farm animals are as follows: cows - 90-95 kg, heifers - 70-80 kg, young cattle over 1 year old - 55-60 kg, under 1 year old - 55-70 kg, horses (adults) - 10-15 kg, pigs (adults) - 35-65 kg, young pigs - 45-75 kg, sheep (adults) - 70-80 kg, lambs - 25-30 kg per day.

3. The norms of feeding green fodder to farm animals are as follows: cows - 20-30 kg, heifers - 10-20 kg, young cattle over 1 year old - 55-70 kg, under 1 year old - 10-20 kg, horses (adults) - 5-15 kg, pigs (adults) - 40-55 kg, young pigs - 45-70 kg, sheep (adults) - 45-60 kg, lambs - 25-35 kg per day.

4. The norms of feeding green fodder to farm animals are as follows: cows - 90 kg, heifers - 20-25 kg, young cattle over 1 year old - 55-65 kg, under 1 year old - 15-20 kg, horses (adults) - 10-30 kg, pigs (adults) - 68-72 kg, young pigs - 44-57 kg, sheep (adults) - 7-10 kg, lambs - 52-73 kg per day.

61. **What is haylage?**

1. Haylage is forage prepared from grasses wilted to a moisture content of 45-55%, cut in the early phases of vegetation. Preservation of green mass in the preparation of haylage is carbon dioxide, which is accumulated in the hayed green mass under the condition of the so-called physiological dryness of the environment (inaccessibility of moisture for most bacteria). Hay is prepared from annual and perennial legumes and cereal grasses, as well as from their mixtures in the phase of budding and the beginning of flowering legumes and the beginning of earing cereals.

2. Haying is a method of preserving naturally moist or wilted plant matter by creating an acidic environment and anaerobic conditions in it. The acidic environment is created by the accumulation of organic acids produced by bacteria, mainly lactic acid bacteria, which utilise the sugars contained in the mass for nutrition.

3. Senage is forage prepared from wilted grasses. Preservation of green mass in haylage is done by creating an acidic environment and anaerobic conditions in it.

4. Haylage is a method of preserving naturally moist or wilted plant matter by creating an acidic environment and anaerobic conditions.

62. **What are the standards for feeding haylage to farm animals?**

1. Norms of feeding haylage to farm animals on average are as follows: cows - 20-30 kg, young cattle at the age of 2 to 6 months. - 2-4 kg, at the age of 6 months to 1 year - 6-10 kg; sheep (adults) - 3-4 kg, young sheep - 1-1,5 kg per day.

2. Norms of haylage feeding to snelmeokhozyaystvennyh animals on average are as follows: cows - 80-90 kg, young cattle at the age of 2 to 6 months. - 50-60 kg, at the age of 6 months to 1 year - 60-70 kg; sheep (adults) - 23-30 kg, young sheep - 10-15 kg per day.

3. Norms of haylage feeding to farm animals on average are as follows: cows - 10-15 kg, young cattle aged from 2 to 6 months. - 25-30 kg, at the age of 6 months to 1 year - 30-40 kg; sheep (adults) - 10-20 kg, young sheep - 15-20 kg per day.

4. Norms of haylage feeding to farm animals on average are as follows: cows - 10-15 kg, young cattle at the age of 2 to 6 months. - 1-2 kg, at the age of 6 months to 1 year - 0,5-1 kg; sheep (adults) - 13-14 kg, young sheep - 10-15 kg per day.

63. What is forage silage?

1. Silage is a method of preserving naturally moist or wilted plant matter by creating an acidic environment and anaerobic conditions. The acidic environment is created by the accumulation of organic acids produced by bacteria, mainly lactic acid bacteria, which utilise the sugars in the mass for nutrition.

2. Silage is forage prepared from grasses wilted to a moisture content of 45-55%, cut in the early phases of vegetation. Preservation of green mass during silage preparation is carried out by carbon dioxide, which is accumulated in silage green mass under the condition of so-called physiological dryness of the environment (inaccessibility of moisture for most bacteria). Silage is prepared from annual and perennial legumes and cereal grasses, as well as from their mixtures in the phase of budding and the beginning of flowering of legumes and the beginning of earing of cereals.

3. Silage is forage prepared from wilted grasses. Preservation of green mass during silage preparation is done by creating an acidic environment and anaerobic conditions in it.

4. Silage is a method of preserving naturally moist or wilted plant matter by creating an acidic environment and anaerobic conditions.

64. **What is a sugar minimum?**

1. The sugar minimum is the amount of sugar in the silage that is necessary to produce from it the amount of acid that will acidify a silage of about 80% moisture to a pH of 4.2.

2. Sugar minimum is the amount of sugar in the silage mass that is necessary to produce from it the amount of acid that acidifies the silage mass with a moisture content of about 70% to a pH of 5.0.

3. Sugar minimum is the amount of sugar in the silage mass that is necessary to produce from it the amount of acid that acidifies the silage mass with a moisture content of about 70% to a pH of 5.0.

4. Sugar minimum is the amount of sugar in the silage mass that is necessary to form from it such an amount of acid that acidifies the silage mass with a moisture content of about 50% to a pH of 7.2.

65. **What are the norms for feeding silage?**

1. Norms of silage feeding: cows - 15-30 kg, calves from 3 months of age to 6 months of age - 0,5-7 kg, young cattle at the age of 7-9 months. - 10 kg, 10-12 months. - 14 kg, 13-18 months. - 16 kg, 19-24 months. -18 kg, adult fattening cattle - 30-40 kg, young fattening cattle - 20-30 kg; horses (adults) - 10-15 kg; sheep (adults) - 3-4 kg, young sheep - 0.2-2 kg; pigs (adults) - 5-6 kg, young pigs - 0.5-5 kg per day.

2. Norms of silage feeding: cows - 75-80 kg, calves from 3 months of age to 6 months of age - 25-35 kg, young cattle at the age of 7-9 months. - 20 kg, 10-12 months. - 35 kg, 13-18 months. - 40 kg, 19-24 months. -50 kg, adult fattening cattle - 50-60 kg, young fattening cattle - 40-50 kg; horses (adults) - 20-25 kg; sheep (adults) - 15-20 kg, young sheep - 15-20 kg; pigs (adults) - 50-60 kg, young pigs - 5-15 kg per day.

3. silage feeding norms: cows - 35-40 kg, calves from 3 months of age to 6 months of age - 5-17 kg, young cattle at the age of 7-9 months. - 1,0 kg, 10-12 months. - 1,4 kg, 13-18 months. - 1,6 kg, 19-24 months. -1,8 kg, adult fattening cattle - 3-4 kg, young fattening cattle - 2-3 kg; horses (adults) - 40-55 kg; sheep (adults) - 43-45 kg, young sheep - 25-35 kg; pigs (adults) - 35-45 kg, young pigs - 5-15 kg per day.

4. Norms of silage feeding: cows - 1,5-3 kg, calves from 3 months of age to 6 months of age - 25-45 kg, young cattle at the age of 7-9 months. - 20 kg, 10-12 months. - 30 kg, 13-18 months. - 40 kg, 19-24 months. -50 kg, adult fattening cattle - 60-70 kg, young fattening cattle - 40-50 kg; horses (adults) - 1-1,5 kg; sheep (adults) - 25-40 kg, young sheep - 10 kg; pigs (adults) - 20 kg, young pigs - 25 kg per day.

66. **What is hay?**

1. Hay is the green mass of plants dried during haymaking to a moisture content of 17-18%.

2. Hay is the green mass of plants dried when hay is harvested to a moisture content of 20-25%.

3. Hay is the green mass of plants dried during hay production to a moisture content of 25-30%.

4. Hay is the green mass of plants dried at hay harvest to a moisture content of 30-35%.

67. **What are the norms of hay feeding?**

1. The optimal hay rate for cattle and horses is 2 kg per 100 kg of live weight. Cows and bulls are fed 8-10 kg, calves up to 6 months of age - 0,2-3,5 kg, young cattle up to 1 year - 3-4 kg, from 1 to 2 years - 4-5 kg, when fattening cattle - 4-6 kg; sheep (adults) - 2-3 kg, young sheep - 0,5-2 kg; horses (adults) - 8-10 kg, young horses - 4-6 kg per day.

2 The optimal hay rate for cattle and horses is 5 kg per 100 kg of live weight. Cows and bulls are fed 20-30 kg, calves up to 6 months of age - 5-10 kg, young cattle up to 1 year - 13-14 kg, from 1 to 2 years - 14-15 kg, when fattening cattle - 10-20 kg; sheep (adults) - 5-8 kg, young sheep - 15-20 kg; horses (adults) - 8-10 kg, young horses - 40-60 kg per day.

3 The optimum hay rate for cattle and horses is 20 kg per 100 kg of live weight. Cows and bulls are fed 3-5 kg, calves up to 6 months. Ages - 1-5 kg, young cattle up to 1 year - 8-9 kg, from 1 to 2 years - 6-8 kg, when fattening cattle - 10-16 kg; sheep (adults) - 2-3 kg, young sheep - 8-12 kg; horses (adults) - 8-10 kg, young horses - 25-30 kg per day.

4 The optimal hay rate for cattle and horses is 10 kg per 100 kg of live weight. Cows and bulls are fed 10 kg, calves up to 6 months. Age - 5 kg, young cattle up to 1 year - 13 kg, from 1 to 2 years - 8 kg, when fattening cattle - 13 kg; sheep (adults) - 5 kg, young sheep - 20 kg; horses (adults) - 70 kg, young horses - 40 kg per day.

68. **Specify the main elements of the system of feeding rationing of farm animals?**

1. norm,
2. type of animal
3. ration and its structure,
4. type and mode of feeding,
5. preparation of fodder for feeding
6. methods of controlling the completeness of feeding, etc.
7. fodder procurement system
8. feeding regime
9. feeding frequency
10. housing conditions

69. **What is the feeding rate of an animal?**

1. Feeding rate is the amount of nutrients and energy to satisfy the animal's needs, which are determined by its physiological condition and economic use.

2. Feeding rate is the amount of feed an animal needs per day.

3. Feeding rate is the amount of nutrients and energy contained in the daily ration.

4. Feeding rate is the amount of nutrients and energy eaten by an animal per day.

70. **What is the main objective of rationed animal feeding?**

1 The main objective of animal feeding is to maximise genetically determined productivity while maintaining health and reproductive functions through the rational use of feed.

2) The main objective of rationed animal feeding is to ensure that there is always food in the animal's trough.

3) The main objective of rationed animal feeding is to ensure the appearance of the animal in accordance with the characteristics of the breed through the rational use of feed.

4) The main objective of rationed animal feeding is to maximise the genetically determined productivity of the animal.

71. **What is a ration?**

1. The ration is the necessary quantity and quality of forages, which correspond to the norm of the animal's needs in metabolic energy, nutrients and biologically active substances at a given level of productivity, ensure the preservation of health and production of high quality.

2. The ration is the necessary amount of forage that ensures the preservation of health and production of high quality products.

3. Ration is a set of forages that contains exchangeable energy, nutrients and biologically active substances at a given level of productivity, ensure the preservation of health and production of high quality.

4. A ration is a set of forages, which ensures health preservation and production of high quality products.

72. **What is ration structure?**

1. Ration structure is the ratio of individual groups of feed by nutrient content.
2. Ration structure is the required set of feeds in a ration.
3. Ration structure is the percentage of all feeds in the diet.
4. Ration structure is the ratio of individual feed groups.

73. **What rations are called standard rations?**

1. Standard rations are scientifically substantiated rations of farm animals, made in relation to the physiological needs of the species and group of animals, taking into account the natural-historical and economic-economic characteristics of a certain zone.

2) Typical rations of farm animals are rations of farm animals prepared in relation to the availability of fodder in the farm of a certain zone.

3) Scientifically substantiated rations of farm animals, prepared in accordance with the ration structure and economic and economic peculiarities of a certain zone, are called standard rations.

4) Typical rations of farm animals are rations of farm animals prepared taking into account natural-historical and economic-economic peculiarities of a certain zone.

74. What parts of the stomach of ruminants consist of?

1. The rumen, the reticulum, the reticulum, the book, and the rennet.
2. Rumen, reticulum, rennet, rennet, own stomach.
3. Book, net, rennet, rennet, own stomach.
4. Net, net, book, own stomach.

75. **What are the advantages of rumen digestion?**

1. The fermentation of carbohydrates is accompanied by a loss of energy in the form of gases released (methane, carbon dioxide).
2. Possibility of obtaining energy from complex carbohydrates contained in fibre and fibrous structures of plants.
3. rumen microorganisms have the ability to utilise non-protein nitrogen to form their own cell protein, which is then used by the animal to form milk protein.
4. Protein of high nutritional value is partially broken down with possible loss of nitrogen in the form of ammonia.
5. Synthesis of B vitamins and vitamin K.
6. Neutralisation of some toxic substances in feed.

7. The cow eats large amounts of plant food, some of which, including fibre and fibrous structures, is fermentable very slowly and remains in the stomach for a long time.

76. **What are the disadvantages of rumen digestion?**

1. Fermentation of carbohydrates is accompanied by loss of energy in the form of released gases (methane, carbon dioxide).

1. Possibility of obtaining energy from complex carbohydrates contained in fibre and fibrous structures of plants.

2. Rumen microorganisms have the ability to utilise non-protein nitrogen to form their own cell protein, which is then used by the animal to form milk protein.

3. Proteins of high nutritional value are partially broken down with possible loss of nitrogen in the form of ammonia.

4. Synthesis of B vitamins and vitamin K.

5. The cow eats large quantities of plant food, some of which, including fibre and fibrous structures, ferment very slowly and remain in the stomach for a long time. As a result, if the cow's diet is over saturated with fibrous structures, the animal will be energy deficient even at maximum intake.

6. Neutralisation of some toxic substances in feed.

77. **What is the total nutrient requirement of dairy cows?**

1. The total nutrient intake of a cow averages 0.7-1.0 ECU or 7.5-10 MJ of metabolised energy per 1 kg of milk. Per 1 ECU, a cow requires: 95-110 g digestible protein, 75-120 g sugar, 110-180 g starch, 28-40 g fat, 160-400 g fibre, 7 g calcium, 5 g phosphorus, 7 g table salt, 50 mg carotene, as well as other minerals and vitamins (magnesium, potassium, sulphur, iron, copper, zinc, cobalt, manganese, iodine, vitamin D and vitamin E).

(2) The total feed intake of a cow averages 0.3-0.4 ECU or 3.5-4 MJ of metabolised energy per 1 kg of milk. Per 1 ECU, the cow requires: 55-65 g digestible protein, 15-20 g sugar, 30-40 g starch, 8-14 g fat, 16-40 g fibre, 17 g calcium, 15 g phosphorus, 17 g table salt, 500 mg carotene, as well as other minerals and vitamins (magnesium, potassium, sulphur, iron, copper, zinc, cobalt, manganese, iodine, vitamin D and vitamin E).

(3) The total feeding level of a cow averages 7-10 ECU or 75-100 MJ of metabolised energy per 1 kg of milk. Per 1 ECU, the cow requires: 15-20 g digestible protein, 7.5-12.0 g sugar, 150-180 g starch, 10-20 g fat, 30-40 g fibre, 30 g calcium, 2 g phosphorus, 21 g table salt, 200 mg carotene, as well as other minerals and vitamins (magnesium, potassium, sulphur, iron, copper, zinc, cobalt, manganese, iodine, vitamin D and vitamin E).

4 The total feed intake of a cow averages 0.2-0.4 ECU or 2.5-40 MJ of metabolised energy per 1 kg of milk. For 1 ECU, the cow requires: 295-310 g digestible protein, 155-180 g sugar, 10-18 g starch, 10-20 g fat, 60-80 g fibre, 24 g calcium, 3 g phosphorus, 8 g table salt, 70 mg carotene, as well as other minerals and vitamins (magnesium, potassium, sulphur, iron, copper, zinc, cobalt, manganese, iodine, vitamin D and vitamin E).

78. **What should be the ration structure for lactating cows?**

1. On average, the following ration structure is recommended for lactating cows: coarse fodder 20-25%, succulent fodder 50-60%, concentrated fodder 20-25% of the ECU requirement.

2. On average, the following ration structure is recommended for lactating cows: roughages 40-55%, succulent - 20-25%, concentrated - 10-15% of the EKU requirement.

3. On average, the following ration structure is recommended for lactating cows: coarse fodder 10-15%, succulent fodder 20-30%, concentrated fodder 55-65% of the ECU requirement.

4. On average, the following ration structure is recommended for lactating cows: roughages 60-75%, succulent - 10-15%, concentrated - 30-35% of the ECU requirement.

79. **What should be the feeding frequency for lactating cows?**

1. Feeding frequency of cows depends on their productivity and lactation period. At milk yield up to 4 thousand kg per year and at the end of lactation 2-fold feeding is used, at milk yield over 4 thousand kg per year and new cows are fed 3-4 and more times a day.

2. Feeding frequency of cows depends on productivity and lactation period. At milk yield up to 4 thousand kg per year and at the end of lactation 5-fold feeding is used, at milk yield over 4 thousand kg per year and new cows are fed 6-7 and more times a day.

3. Feeding frequency of cows depends on productivity and lactation period. At milk yield up to 8 thousand kg per year and at the end of lactation apply 1-fold feeding, at milk yield over 8 thousand kg per year and new cows are fed 2 times a day.

4. Feeding frequency of cows depends on productivity and lactation period. At milk yield up to 4 thousand kg per year and at the end of lactation 4-fold feeding is used, at milk yield over 4 thousand kg per year and new cows are fed 2-3 times a day.

80. **How does the ration structure change by phase of the production cycle?**

1. During the first period of lactation and milking of cows (duration 100 days), lactating animals reach maximum daily productivity and require increased levels of energy and nutrients in the diet (the ratio of bulky and concentrated feeds should be 60: 40). In the second period of highest productivity, animals receive concentrated feeds according to their productivity level and bulky feeds according to their consumption (the ratio of bulky to concentrated feeds is 75-85:25-15). In the third period of lactation decline, animals receive diets with limited concentrated feeds (ratio of voluminous to concentrated feeds 93: 7).

2. In the first period of new age and milking cows (duration of 100 days) require increased levels of energy and nutrients in the diet (the ratio of voluminous and concentrated forages should be 40: 60). In the second period of highest productivity animals (ratio of voluminous and concentrated feeds 45-55:45-55). In the third period of lactation decline, animals receive diets with limited concentrated feeds (ratio of voluminous to concentrated feeds 45: 55).

3. In the first period of new age and milking cows (duration of 100 days) require increased levels of energy and nutrients in the diet (the ratio of voluminous and concentrated forages should be 90: 10). In the second period of highest productivity animals (ratio of voluminous and concentrated feeds 85-90:10-15). In the third period of lactation decline, animals receive diets with limited concentrated feeds (ratio of voluminous to concentrated feeds 85: 15).

4. In the first period of new age and milking cows (duration of 100 days) require increased levels of energy and nutrients in the diet (the ratio of voluminous and concentrated forages should be 20: 80). In the second period of highest productivity animals (ratio of voluminous and concentrated feeds 25-35:65-75). In the third period of lactation decline, animals receive diets with limited concentrated feeds (ratio of voluminous to concentrated feeds 25:75).

81. **What is advance feeding?**

1. Advance feeding is usually provided with concentrated feed. In some cases, well-consumed succulent fodder and good quality legume hay may be used. The animals are given 3-4 kg (2-3 ECU) more concentrate feed than the actual milk yield. When the estimated milk yield is reached, concentrate feed is added to the ration again in the amount of 1-2.5 kg.

2 Advance feeding is usually used when there is a surplus of forage on the farm in order to utilise it. In some cases, well-consumed succulent fodder, as well as good quality legume hay, etc., can be used.

3 Advance feeding is usually provided with concentrated fodder when there is a surplus on the farm. In some cases, well-consumed succulent fodder as well as good quality legume hay can be used.

4 Advance feeding is usually provided with concentrated feed. In some cases, well-consumed succulent fodder as well as good quality legume hay can be used. The animals are given 10-15kg more concentrate feed than the actual milk yield. When the estimated milk yield is reached, 10-15 kg of concentrate feed is added to the ration again.

PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.

PC-15 ID-3 - To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.

82. **What is a cow start-up and how many days does it last?**

1. Starting cows 60-70 days before calving so that the dry period is 50-60 days. Start-up is considered complete when milk production stops completely and the udder decreases in size.

2. Start cows 10-20 days before calving, so that the duration of the dry period was 5-6 days.

3. Start cows 100-120 days before calving, so that the duration of the dry period was 90-100 days. Starting is considered complete when milk production stops completely and the udder decreases in size.

4. Start-up of cows is started after calving of the cow with milk formation in the udder and the duration of the lactation period should be 50-60 days.

83. **How to feed cows during the dry period?**

1. After starting cows are fed differentially depending on the dry period. At first they are fed moderately (about 80% of the average norm on feed units), then from the 5th-6th day the amount of feed is consistently increased and at the end of the second decade of the dry period they are brought to the full norm - 12-14 kg of dry matter, including up to 10 kg at the expense of voluminous fodder (silage, haylage, hay). Since III-IV decade the need of animals in energy and nutrients increases, so the level of feeding is brought up to 120% of the average norm. Animals are additionally given up to 1.5-2.5 kg of concentrated fodder, and the level of feeding is close to the level of feeding lactating animals with a daily milk yield of 10-12 kg.

2. After starting cows are fed differentially depending on the dry period. At first they are fed moderately (about 50% of the average rate of feed units), then from the 5th-6th day the amount of feed is consistently increased and at the end of the second decade of the dry period is brought up to 70% of the need. From the III-IV decade, the need of animals in energy and nutrients increases, so the level of feeding is brought up to 90% of the average norm.

3. At first they are fed intensively (about 130% of the average norm on feed units), then from the 5-6th day the amount of feed is consistently reduced and at the end of the second decade of the dry period is brought to 150% of the need. From the III-IV decade the need of animals in energy and nutrients increases, so the level of feeding is brought to 160% of the average norm.

4. At first they are fed moderately (about 50% of the average norm on feed units), then from the 5-6th day the amount of feed is consistently increased and at the end of the second decade of the dry period is brought up to 150% of the need. From the III-IV decade the animals' need for energy and nutrients increases, so the feeding level is brought up to 60% of the average norm.

84. **What is the technology of group rationed feeding of cows?**

1. There are two methodological approaches to the organisation of rationed feeding of dairy cattle: individual - based on electronic recognition device, and group - rationed feeding of animals similar in productivity and physiological state.

2. There are three methods of organisation of rationed feeding of dairy cattle: individual; group; combined.

3. There are four methods of organisation of rationed feeding of dairy cattle: individual; group; combined; seasonal.

4. There are five methods of organisation of rationed feeding of dairy cattle: individual; group; combined; seasonal; quarantine.

85. **What do the feeding rates of breeding bulls depend on?**

1. The nutrient requirements of bulls depend on live weight and sexual utilisation (non-slaughter period, medium load - 1 doublet calf per week, higher load - 2-3 doublet calf per day).

2. Nutrient requirements of bulls depend on the breed of animal and sexual use (non-slaughter period, average load - 3 doublet cages per week, increased load - 5-6 doublet cages per day).

3. nutrient requirements of bulls depend on sexual use (non-slaughter period, average load - 5 doublet cages per week, increased load - 6-7 doublet cages per day).

4. Nutrient requirements of bulls depend on live weight and breed of animal.

86. What should be the ration structure for breeding bulls?

1. In winter, 25-40% of hay, 20-30% of succulent forages and 40-50% of concentrates should be added to bulls' rations; in summer - grass 35-45%, hay 15-20% and concentrates 40% (nutritionally).

2. In winter, bulls are fed rations of 5-10% hay, 50-60% succulent forages and 20-25% concentrates; in summer - grass 5-15%, hay 55-60% and concentrates 20% (by nutritional value).

3. In winter, bulls are fed 65-70% hay, 10-20% succulent forages and 20-25% concentrates; in summer - grass 85-95%, hay 5-8% and concentrates 10% (by nutritional value).

4. In winter, bulls are fed 55-60% hay, 20-30% succulent forages and 70-80% concentrates; in summer - grass 5-25%, hay 45-50% and concentrates 10% (nutritionally).

87. **What amount of forage can be fed to a breeding bull?**

1. It is recommended to feed breeding bulls per 100 kg of live weight per day: in winter - hay - 0,8-1,2 kg, silage or haylage - 0,8-1,0 kg, root crops - 1,0-1,5 kg, grain concentrates - 0,3-0,5 kg; in summer - green fodder - 2,0-2,5 kg, hay - 0,4-0,5 kg, concentrates - 0,2-0,5 kg.

2. It is recommended to feed breeding bulls per 100 kg of live weight per day: in winter - hay - 20-30 kg, silage or haylage - 25-35 kg, root crops - 8-10 kg, grain concentrates - 3-5 kg; in summer - green fodder - 20-25 kg, hay - 4-5 kg, concentrates - 2-5 kg.

3. It is recommended to feed breeding bulls per 100 kg of live weight per day: in winter - hay - 0,1-0,2 kg, silage or haylage - 0,3-0,4 kg, root crops - 1,0-1,5 kg, grain concentrates - 0,1 -0,2 kg; in summer - green fodder - 1,0-1,5 kg, hay - 0,2-0,3 kg, concentrates - 0,1 -0,2 kg.

4. It is recommended to feed breeding bulls per 100 kg of live weight per day: in winter - hay - 8-12 kg, silage or haylage - 40-50 kg, root crops - 10-15 kg, grain concentrates - 40-50 kg; in summer - green fodder - 30-35 kg, hay - 0,4-0,5 kg, concentrates - 0,2-0,5 kg.

88. **What is the feeding regime for a breeding bull?**

1. Breeding bulls are fed 3 times a day. In the morning, half of the daily norm of concentrated fodder, part of beetroot or carrots, 2-3 kg of hay are given; at lunch - silage or haylage and the rest of beetroot and carrots; at night - the rest of hay and concentrates.

2. Breeding bulls are fed 3 times a day. In the morning - silage or haylage and the rest of beetroot and carrots; at lunch - half of the daily norm of concentrated fodder, part of beetroot or carrots, 2-3 kg of hay; at night - the rest of hay and concentrates.

3. Breeding bulls are fed 3 times a day. In the morning - part of hay and concentrates; at lunch - silage or haylage and the rest of beetroot and carrots; at night - the rest half of the daily norm of concentrated fodder, part of beetroot or carrots, 2-3 kg of hay.

4. Breeding bulls are fed 4 times a day. In the morning half of the daily norm of concentrated fodder is given; in the afternoon - part of beetroot or carrots, 2-3 kg of hay; at lunch - the rest of hay and concentrates; at night - silage or haylage and the rest of beetroot and carrots.

89. **What are the main factors that determine the success of fattening?**

1 The main factors determining fattening success are age, breed and type of cattle, growing conditions, condition of cattle at fattening, feed and feeding.

2 The main factors determining fattening success are age, type of livestock, season of the year, sex of livestock at fattening, feeding technique.

3) The main factors determining the success of fattening are availability of feed in the farm, feed distribution technique, growing conditions, colour of the animal when fattening.

4. the main factors determining the success of fattening are season of the year, breed and type of livestock, growing conditions, sex of livestock when fattening, feed distribution technique.

90. What do the feeding norms depend on when fattening cattle?

1. Feeding norms for fattening cattle depend on the breed of cattle (dairy, dairy-meat, beef), age (from 6 to 9 months, from 9 to 12 months, from 12 to 18 months), live weight (from 150 to 500 kg), daily growth (from 800 to 1400 g), fattening period (beginning, middle, end).

2. Feeding norms for fattening cattle depend on the type of fattening, on the availability of feed in the farm, on housing conditions, technology of preparation of feed for feeding, the sex of the animal.

3. Feeding norms for fattening cattle depend on the breed of cattle, on the conditions of housing, technology of preparation of feed for feeding, age.

4. Feeding norms for fattening cattle depend on the type of fattening, availability of feed in the farm, fattening period, ration structure, sex of the animal.

91. **What should be the ration structure for fattening livestock?**

1. In the structure of rations the share of silage, haylage, root crops, cake, bard and pulp is about 40%, roughage - 20-30%, concentrated forages and additives - 30-40% of the need in

feed units. In summer, young animals are fattened on green grass fed from feeders with the inclusion of concentrates (30-40%) and feed additives.

2. In the structure of rations, silage, haylage, root crops, cake, bard and pulp account for about 80%, roughage - 5-10%, concentrated feeds and additives - 10-15% of the requirement in feed units. In the summer period, fattening of young animals is carried out on green grass, which is fed from feeders with the inclusion of concentrates (10-15%) and feed additives in the diet.

3. In the structure of rations, silage, haylage, root crops, cake, bard and pulp account for about 10%, roughage - 60-70%, concentrated fodder and additives - 20-30% of the requirement in feed units. In summer, young animals are fattened on green grass fed from feeders with the inclusion of concentrates (60-70%) and feed additives.

4. In the structure of rations, silage, haylage, root crops, cake, bard and pulp account for about 10%, roughage - 5-8%, concentrated fodder and additives - 70-75% of the need for feed units. In summer fattening of young animals is carried out on green grass, which is fed from feeders with inclusion of concentrates (80-90%) and feed additives in the diet.

92. **What is the feeding technique when fattening cattle on the cake?**

1. For 100 kg of live weight feed 15-20 kg of cake, 1-2 kg of roughage. Concentrated feeds and additives balance the nutritional content of rations. The daily amount of cake for adult cattle is brought up to 60-75 kg per head per day, young cattle - up to 40-45 kg, depending on the period of fattening. Towards the end of fattening, the norm of pulp is reduced and the amount of concentrates and fodder molasses is increased. Feed molasses (molasses) more than 1 kg per head per day do not feed.

2. For 100 kg of live weight feed 45-50 kg of cake, 10-20 kg of roughage. Concentrated feeds and additives balance the nutritional content of diets. Daily amount of pulp cake for adult cattle is brought up to 80-95 kg per head per day, young cattle - up to 70-75 kg depending on the period of fattening. Towards the end of fattening the norm of pulp is reduced and increase the amount of concentrates and fodder molasses. Feed molasses (molasses) more than 5 kg per head per day do not feed.

3. per 100 kg of live weight feed 3-5 kg of cake, 10-20 kg of coarse fodder. Concentrated feeds and additives balance the nutritional content of diets. The daily amount of cake for adult cattle is brought to 10-15 kg per head per day, young cattle - up to 4-4.5 kg, depending on the period of fattening. Towards the end of fattening the norm of pulp is increased and the amount of concentrates and fodder molasses is reduced. Feed molasses (molasses) more than 10 kg per head per day do not feed.

4. For 100 kg of live weight feed 65-70 kg of cake, 1-2 kg of coarse fodder. Concentrated feeds and additives balance the nutritional content of diets. The daily amount of cake for adult cattle is brought to 100-105 kg per head per day, young cattle - up to 10-15 kg, depending on the period of fattening. Towards the end of fattening the norm of pulp is increased and the amount of concentrates and fodder molasses is increased. Feed molasses (molasses) more than 6 kg per head per day is not fed.

93. **What is the feeding technique when fattening cattle on bard?**

1. Cattle per 100 kg of live weight are fed 15-20 kg of bard, roughage 1,5-2,5 kg, concentrates 0,3-0,5 kg. A day of bard is given to adult cattle 70-80 kg, young cattle - 40-50 kg per head. At the beginning of fattening give more bard, at the end - less.

2. Cattle per 100 kg of live weight fed bard 75-80 kg, roughage 15-25 kg, concentrates 3-5 kg. A day of bard is given to adult cattle 7-8 kg, young cattle - 4-5 kg per head. At the beginning of fattening give more bard, at the end - less.

3. Cattle per 100 kg of live weight fed bard 5-10 kg, roughage 1-1.5 kg, concentrates 10-15 kg. In a day of barda give adult cattle 90-95 kg, young cattle - 70-80 kg per head. At the beginning of fattening give less bard, at the end - more.

4. Cattle per 100 kg of live weight fed bard 45-50 kg, roughage 45-50 kg, concentrates 30-35 kg. In a day of barda give adult cattle 30-40 kg, young cattle - 40-50 kg per head. At the beginning of fattening give more bard, at the end - less.

94. **What are the conditions determining the success of fattening?**

1. The most important conditions determining the success of fattening are: selection of cattle in groups (gurts), organisation of pasture use and grazing technique.

2. The most important conditions determining the success of fattening are: selection of fodder for fattening, sanitation of animals before putting them out to pasture and organisation of daily routine.

3. The most important conditions determining the success of fattening are: selection of livestock by sex, preparation of pastures and grazing techniques.

4. The most important conditions determining the success of fattening are: preparation of pastures, sanitation of animals before grazing and organisation of daily routine.

95. **What do you know about the biological and economic characteristics of pigs?**

1. Pigs are multiparous, fast-growing and intensively growing animals. The pig body has the smallest specific mass of bones and tendons. Pigs are characterised by early increased deposition of substances in the body. Pigs are omnivorous animals with intestinal digestion. Lack of amino acid synthesis in their body. Absence or insufficient synthesis of water-soluble B vitamins. Pigs are very sensitive to unbalanced feeding.

2. Pigs are not multiparous, moderately intensively growing animals. Pigs have the smallest specific mass of muscle and tendons in the body. Pigs are omnivorous animals with a ruminant type of digestion. Lack of protein synthesis in their body. Absence or insufficient synthesis of fat-soluble vitamins in the body.

3. Pigs are not fast-growing or intensively growing animals. The pig body has the smallest specific skin mass. Pigs are characterised by early increased deposition of carbohydrate reserves in the body. Pigs are omnivorous animals with gastric digestion. Absence or insufficient synthesis of vitamins in the body.

4. The pig body has the smallest specific mass of fat and tendons. Pigs are characterised by late increased deposition of body stores of substances. Pigs are herbivorous animals with intestinal digestion. Lack of enzyme synthesis in their body. Lack of or insufficient synthesis of vitamins in the body.

96. **What types of pig feeding do you know?**

1. There are three types of pig feeding - concentrate; concentrate-potato; concentrate-root.

2. There are four types of pig feeding - concentrate-volume; concentrate-potato-senade; concentrate-silage-root; concentrate-grain.

3. There are three types of pig feeding - concentrate-grass ; potato; potato; root and grain.

4. There are two types of pig feeding - concentrate-grass; potato-root-grass; potato-root-grass.

97. **What is the ration structure for concentrate type of pig feeding?**

1. In winter period: concentrates 75-80%; succulents 12-17%; grass meal 5%; animal fodder 3%; in summer period: concentrates 85-90%; green fodder 7-12%; animal fodder 3%.

2. In winter: concentrates 25-30%; succulents 45-50%; grass meal 15%; animal feeds 13%; in summer: concentrates 45-50%; green forages 25-30%; animal feeds 10%.

3. In winter: concentrates 85-90%; succulents 20-25%; grass meal 25%; animal feeds 3%; in summer: concentrates 25-40%; green forages 55-60%; animal feeds 20%.

4. In winter: concentrates 45-50%; succulents 65-70%; grass meal 0.5%; animal feed 0.3%; in summer: concentrates 15-30%; green fodder 70-75%; animal feed 3%.

98. **What is the structure of the ration at concentrate-potato type of feeding of pigs?**

1. In winter: concentrates 60-70%; succulents 17-27%; grass meal 8%; animal feed 5%; in summer: concentrates 75-80%; green fodder 15-20%; animal feed 5%.

2. In winter: concentrates 25-30%; succulents 45-50%; grass meal 15%; animal feeds 13%; in summer: concentrates 45-50%; green forages 25-30%; animal feeds 10%.

3. In winter: concentrates 85-90%; succulents 20-25%; grass meal 25%; animal feeds 3%; in summer: concentrates 25-40%; green forages 55-60%; animal feeds 20%.

4. In winter: concentrates 45-50%; succulents 65-70%; grass meal 0.5%; animal feed 0.3%; in summer: concentrates 15-30%; green fodder 70-75%; animal feed 3%.

99. **What is the ration structure for concentrate-root type of feeding of pigs?**

1. In winter period: concentrates 70-75%; succulents 15-20%; grass meal 7%; animal feed 3%; in summer period: concentrates 80-85%; green fodder 12-17%; animal feed 3%.

2. In winter: concentrates 85-90%; succulents 20-25%; grass meal 25%; animal feeds 3%; in summer: concentrates 25-40%; green forages 55-60%; animal feeds 20%.

3. In winter: concentrates 45-50%; succulents 65-70%; grass meal 0.5%; animal feed 0.3%; in summer: concentrates 15-30%; green fodder 70-75%; animal feed 3%.

4. In winter: concentrates 25-30%; succulents 45-50%; grass meal 15%; animal feed 13%; in summer: concentrates 45-50%; green fodder 25-30%; animal feed 10%.

100. **What types of pig fattening do you know?**

1. Meat intensive, bacon fattening, fattening to fat condition.

2. intensive, semi-intensive, moderate.

3. Grain fattening, potato fattening, root fattening.

4. intensive grain, semi-intensive potato, moderate root fattening.

101. **What is the purpose of meat fattening of pigs?**

1. Meat fattening is carried out during the growth period of pigs from about 35 to 110-120kg in order to produce high quality meat carcasses for fresh consumption.

2. To grow pigs to as high a live weight as possible.

3. To maximise average daily live weight gains.

4. Obtain high quality pork.

102. **What is the purpose of bacon fattening of pigs?**

1. Bacon fattening is a type of moderate-intensity meat fattening with rationed feeding to produce high quality meat carcasses with an even layer of blubber on the back and flanks for the preparation of special purpose pork, called bacon.

2. bacon fattening is carried out during the growth period of pigs from about 35 to 110-120kg to produce high quality meat carcasses for fresh consumption.

3. Raise pigs to as high a live weight as possible.

4. To maximise average daily live weight gains.

103. **What is the purpose of fattening pigs to fatty condition?**

1. Fat fattening is carried out with unlimited feeding of carbohydrate feed to maximise live weight gain.

2. fattening to fatty condition is a type of meat fattening, characterised by moderate intensity and rationed feeding, aimed at obtaining high quality meat carcasses with an even layer of blubber on the back and flanks for the preparation of special purpose pork, called bacon.

3. fattening to fatty condition is carried out during the growth period of pigs from about 35 to 110-120kg in order to obtain high quality meat carcasses for fresh consumption.

4. The main objective of fattening is to obtain high quality products.

104. **What do you know about the biological features of sheep when organising proper feeding and fodder use?**

1. good adaptability to different breeding conditions, ability to consume a variety of forages, hardy, eat low-growing, sparse vegetation. Sheep are ruminants with four-chambered stomachs, poorly tolerate high humidity, they are quick-moving, sexual maturity comes already at 6-7 months, mothers are pregnant for 5 months, the instinct of herding is developed, the main products of sheep are wool, meat and milk.

2. sheep are multiparous, fast-growing and intensively growing animals. Sheep body has the smallest specific mass of bones and tendons. Sheep are characterised by early increased deposition of substances in the body. Sheep are omnivorous animals with intestinal type of digestion. Absence of amino acid synthesis in their organism. Absence or insufficient synthesis of water-soluble B vitamins. Sheep are very sensitive to unbalanced feeding.

3. sheep are not multiparous, moderately intensively growing animals. Sheep body has the smallest specific mass of muscles and tendons. Sheep are omnivorous animals with ruminant type of digestion. Absence of protein synthesis in their organism. Absence or insufficient synthesis of fat-soluble vitamins in the organism.

4. sheep are not fast-growing or intensively growing animals. The body of sheep has the smallest specific skin mass. Sheep are characterised by early increased deposition of carbohydrate reserves in the body. Sheep are omnivorous animals with gastric type of digestion. Absence or insufficient synthesis of vitamins in the body.

105. What ration can be fed to a ram during the mating period?

1. During the gestation period, ram rations should be less bulky to avoid sluggishness of rams. The ration during this period includes 1-1,5 kg of excellent hay and 1-1,5 kg of a mixture of concentrated forages - oats, barley, yellow millet, sorghum, peas, yellow corn, etc. In summer period 4-6 kg of green grass is given. In the slaughter period in the rations include animal feeds - obrat (1-2 kg), meat and bone meal (100 g), as well as fodder yeast (50 g), chicken eggs (2-3 pieces per day).

2. During the slaughter period rams are given 1.5-2 kg of cereal-legume hay per day (35-40% of ECU), -1.5-2 kg (20-25%) of succulent fodder - carrots, beetroot, silage, 0.6-0.8 kg (40-45%) of concentrated fodder - oats, barley, wheat, millet, meal, wheat bran in the form of a mixture. In summer, rams on pasture are fed with a mixture of concentrated fodder - 0.5-1 kg per head per day.

3. During the breeding period, rams are fed 4-6.5 kg of excellent hay and 5-6.5 kg of a mixture of concentrated fodder. In the summer period give 10-15 kg of green grass.

4. In the slaughter period rams are given 0.5-1 kg of cereal-legume hay per day (10-15% of EKU), -6.5-7 kg (70-75%) of succulent fodder - carrots, beetroot, silage, 6-8 kg (20-25%) of concentrated fodder - oats, barley, wheat, millet, meal, wheat bran in the form of a mixture. In summer rams on pasture are fed with a mixture of concentrated fodder - 5-10 kg per head per day.

106. **What factors are considered in rationing the feed of ewe lambs?**

1. Feeding of ewe lambs is carried out taking into account breed peculiarities, live weight and physiological state - idle, pregnant, lactating.

2. Feeding of ewe lambs is carried out taking into account the conditions of keeping, type of feed, season.

3. Feeding of ewe lambs is carried out taking into account the age, type of digestion, availability of fodder in the farm and health condition.

4. Feeding of ewe lambs is carried out taking into account the conditions of housing, type of feed, season, age, type of digestion, availability of feed on the farm and health status. 107.

107. What is the approximate ration for ewe lambs during the insemination period?

1. When inseminating ewes in summer, they are given green grass and concentrate feed (barley, wheat, corn, mixed fodder, etc.) in the amount of 0.2-0.4 kg per head per day. When inseminating mothers in winter, their diets consist of good quality hay (1.5-2 kg), silage (1-2 kg) and table salt (10 g per day).

2. At insemination of mothers in the composition of the ration include hay (3-5 kg), silage (7-8 kg), concentrates (barley, mixed fodder, etc.) 1-2 kg, table salt (10-12 g per day). In

the summer period, mothers are fed green grass (at large), fed with concentrates in the amount of 1-2 kg per day and table salt (10-12 g per day).

3. When inseminating uteruses in the diets of lactating mothers include cereal legume or meadow hay (5-6 kg), silage of good quality (5-6 kg), concentrates (barley, mixed fodder, etc.) - 0,4-0,5 kg, root and tuber crops (beetroot, potatoes, carrots, etc.) - 4-5 kg, table salt (15 g per day), as well as other mineral supplements and vitamin preparations.

4. When insemination of mothers in the ration includes hay (5 kg), haylage (5-8 kg), concentrates 1-2 kg, table salt (10-12 g per day). In the summer period, mothers are fed with green grass (in full), fed with concentrates in the amount of 4-5 kg per day and table salt (10-12 g).

108. **What is the approximate ration for ewe lambs during the suyagnostic period?**

1. In the first 12-13 weeks of suyagnostic period in winter the ration includes hay (1-2 kg), silage (1-2 kg), concentrates (barley, mixed fodder, etc.) 0,1-0,2 kg, table salt (10-12 g per day). In the summer period, mothers are fed with green grass (at large), fed with concentrates in the amount of 0,1-0,2 kg per day and table salt (10-12 g). In the second period of suyagnosti as part of the ration, the mothers are fed good quality cereal-legume hay (2-3 kg) and concentrates (0.2-0.3 kg per day), it is possible to include silage (1-2 kg) instead of part of hay, root crops (1-2 kg). In case of lack of minerals and vitamins in the feed, mineral supplements (salt, chalk, bone meal, feed phosphates, elemental sulphur, copper sulphate, cobalt chloride, etc.) and vitamin preparations are included in the ration.

2. In the period of suyagnosis in the summer they are given plenty of green grass and feed concentrates (barley, wheat, corn, mixed fodder, etc.) in the amount of 0.2-0.4 kg per head per day. When inseminating mothers in winter, their diets consist of good quality hay (1.5-2 kg), silage (1-2 kg) and table salt (10 g per day).

3. mothers in the period of suyagnosis in the composition of the diet include hay (3-5 kg), silage (7-8 kg), concentrates (barley, mixed fodder, etc.) 1-2 kg, table salt (10-12 g per day). In the summer period, mothers are fed green grass (at large), fed with concentrates in the amount of 1-2 kg per day and table salt (10-12 g per day).

4. In the period of suyagnosis in the diets of mothers include cereal-legume or meadow hay (5-6 kg), silage of good quality (5-6 kg), concentrates (barley, mixed fodder, etc.) - 0,4-0,5 kg, root and tuber crops (beetroot, potatoes, carrots, etc.) - 4-5 kg, table salt (15 g per day), as well as other mineral supplements and vitamin preparations.

109. What is an approximate ration for ewe lambs during lambing?

1. In the period of winter lambing (calving) in the rations for lactating mothers include cereal-legume or meadow hay (1,5-2 kg), silage of good quality (1,5-2 kg), concentrates (barley, mixed fodder, etc.) - 0,4-0,5 kg, root and tuber crops (beetroot, potato, carrot, etc.) - 0,4-0,5 kg.) - 0,4-0,5 kg, root tubular crops (beetroot, potatoes, carrots, etc.) - 1-2 kg, table salt (15 g per day), as well as other mineral supplements and vitamin preparations. In spring lambing, pasture grass and green feed (6-8 kg per day) are the main feed for lactating ewe lambs. In addition to grass, 0.1-0.2 kg per day of concentrates and 15 g of table salt are given.

2. At lambing of ewes in summer period they are given green grass and feeding with concentrates (barley, wheat, corn, mixed fodder, etc.) in the amount of 0,2-0,4 kg per head per

day. When inseminating mothers in winter, their diets consist of good quality hay (1.5-2 kg), silage (1-2 kg) and table salt (10 g per day).

3) For lambs during the lambing period, the ration consists of hay (3-5 kg), silage (7-8 kg), concentrates (barley, mixed fodder, etc.) 1-2 kg, and table salt (10-12 g per day). In the summer period, mothers are fed green grass (at large), fed with concentrates in the amount of 1-2 kg per day and table salt (10-12 g per day).

4. In the period of lambing, the diets of mothers include cereal-legume or meadow hay (5-6 kg), good quality silage (5-6 kg), concentrates (barley, mixed fodder, etc.) - 0,4-0,5 kg, root and tuber crops (beetroot, potato, carrot, etc.) - 4-5 kg, table salt (15 g per day), as well as other mineral supplements and vitamin preparations.

110. **On what indicators ration ration agricultural poultry?**

1. Feeding of farm poultry is rationed according to the following indicators: general level of feeding is rationed according to metabolic energy, protein nutrition - according to crude protein and amino acids (lysine, methionine+cystine, tryptophan, threonine, phenylalanine, arginine, histidine, valine, leucine and isoleucine), carbohydrate nutrition - according to fibre, mineral nutrition - according to calcium, phosphorus and sodium. The need of poultry in vitamins and trace elements is rationed by guaranteed additions of vitamins A, D3, E, K, B1, B2, B3, B4, B5, B6, B12, Vs, H and C and corresponding salts of manganese, zinc, iron, copper, cobalt and iodine per 1 tonne of mixed feed or per 1 kg of concentrated feed mixture.

2. Feeding of poultry is normalised by the following indicators: amino acids (lysine, methionine+cystine, tryptophan, threonine, phenylalanine, arginine, histidine, valine, leucine and isoleucine), carbohydrate nutrition - by fibre, mineral nutrition - by calcium, phosphorus and sodium. The need of poultry in vitamins and trace elements is normalised by guaranteed additions of vitamins A and D3.

3. Feeding of poultry is normalised by the following indicators: the total level of feeding is normalised by gross energy, protein nutrition - by crude protein and digestible protein, carbohydrate nutrition - by fibre, mineral nutrition - by calcium, phosphorus and sodium.

4. Feeding of poultry is rationed according to the following indicators: vitamins and trace elements are rationed by guaranteed additions of vitamins A, D3, E, K, B1, B2, B3, B4, B5, B6, B12, Vs, H and C and the corresponding salts of manganese, zinc, iron, copper, cobalt and iodine per 1 ton of mixed feed or per 1 kg of concentrated feed mixture.

111. **What factors determine the nutrient requirements of laying hens?**

1. The energy and nutrient requirements of laying hens depend on the direction of poultry production (egg, meat), economic use (breeding, industrial (commercial) hens), age (22-47 weeks, 48 weeks and older) and egg production (less than 70%, 70% and more).

2. The energy and nutrient requirements of laying hens depend on the method of housing, housing conditions, feeding technique, water availability, and egg weight.

3. Energy and nutrient requirements of laying hens depend on bird weight, physiological condition, rearing direction, microclimate conditions.

4. Energy and nutrient requirements of laying hens depend on the method of housing, housing conditions, feeding technique, water supply, egg weight, bird weight, physiological condition, rearing direction, microclimate conditions.

112. **What should be the approximate ration structure for laying hens under dry type of feeding?**

1. Approximate structure of diets for laying hens at dry type of feeding: cereals - 60-75%, wheat bran - up to 7%, cakes, meal - 8-15%, animal fodder - 4-6%, fodder yeast -3-6%, grass meal - 3-5%, fodder fat - 3-4%, mineral supplements - 7-9% by weight.

2. Approximate structure of diets for laying hens at dry type of feeding: cereals - 10-15%, wheat bran - up to 70%, cakes, meal - 18-25%, animal fodder - 1-2%, fodder yeast -3-6%, grass meal - 13-15%, fodder fat - 13-14%, mineral supplements -7-9% by weight.

3. Approximate structure of diets for laying hens at dry type of feeding: cereals - 90-95%, wheat bran - up to 70%, cakes, meal - 8-15%, animal fodder - 24-26%, fodder yeast -3-6%, grass meal - 3-5%, fodder fat - 15-20%, mineral supplements -7-9% by weight.

4. Approximate structure of diets for laying hens at dry type of feeding: cereals - 60-75%, wheat bran - up to 90%, cakes, meal - 80%, animal fodder - 40-60%, fodder yeast -3-6%, grass meal - 30-50%, fodder fat - 30-40%, mineral supplements -7-9% by weight.

113. **What approximate structure of rations should be for laying hens at combined type of feeding?**

1. Approximate structure of diets for hens at combined type of feeding: grain fodder and additives - 80%, succulent fodder - potatoes, beetroot, carrots, silage, cabbage, etc., 20% by weight. - 20% by weight.

2. Approximate structure of diets for chickens at the combined type of feeding: grain fodder and additives - 20%, succulent fodder - potatoes, beetroot, carrots, silage, cabbage, etc. 80% by weight. - 80% by weight.

3. Approximate structure of diets for chickens at the combined type of feeding: grain fodder and additives - 50%, succulent fodder - potatoes, beetroot, carrots, silage, cabbage, etc. 50% by weight. - 50% by weight.

4. Approximate structure of diets for chickens at the combined type of feeding: grain fodder and additives - 60%, succulent fodder - potatoes, beetroot, carrots, silage, cabbage, etc. 70% by weight. - 70% by weight.

114. **What is the feeding regime for laying hens?**

1. Laying hens are fed regularly at a fixed time in winter at least 3 times, in summer - 4-5 times a day with intervals of 3-4 hours.

2. Laying hens are fed regularly at a fixed time in winter at least 5 times, in summer - 1-2 times a day with intervals of 3-4 hours.

3. Laying hens are fed regularly at a fixed time in winter at least 1 time, in summer - 1-2 times a day with intervals of 3-4 hours.

4. Laying hens are fed regularly at a fixed time in winter at least 5 times, in summer - 7-8 times a day with intervals of 3-4 hours.

115. **What methods do you know of to control the completeness of the ration?**

1. Indicators of ration completeness are controlled using zootechnical, veterinary and biochemical methods.

2. Indicators of ration completeness are controlled using economic and physiological methods.

3. Indicators of ration completeness are controlled using the comparative method and the method of control animals.

4. Indicators of ration completeness are controlled using laboratory and production methods.

116. **What is the zootechnical method of controlling ration completeness?**

1. Zootechnical method provides quality control of forages, their compliance with the requirements of standards. The chemical composition and nutrition of forages are determined on the basis of laboratory analyses. The nutritional content of diets is compared with the norms of feeding and determine the lack or excess of energy, nutrients and biologically active substances, as well as the response of animals.

2. Zootechnical methods include the study of blood, urine, milk and other products can establish metabolic disorders and general health of animals.

3. Zootechnical methods provide control of animal housing, habitat, requirements for feeding conditions, feed distribution and preparation of feed for feeding.

4. Zootechnical methods include the study of water, the content of harmful substances in the air of the animal room, room illumination, humidity, air movement, ventilation conditions.

117. **What does the veterinary-biochemical method of controlling the completeness of the ration?**

1. Veterinary-biochemical method of research of blood, urine, milk and other products allow to establish metabolic disorders and general state of health of animals

2. The veterinary-biochemical method provides quality control of fodders, their compliance with the requirements of standards. The chemical composition and nutrition of feeds are determined on the basis of laboratory analyses. The nutritional content of diets is compared with feeding norms and deficiencies or excesses of energy, nutrient and biologically active substances, as well as animal responses are determined.

3. Veterinary and biochemical method provides control of animal housing, habitat, requirements for feeding conditions, feed distribution and preparation of feed for feeding.

4. Veterinary-biochemical method provides for the study of water, the content of harmful substances in the air of the room for animals, room illumination, humidity, air movement, ventilation conditions.

118. **What do you know the methodology of staging scientific and economic experiments on the feeding of farm animals?**

1. Direct method (staging experiments on digestibility), method of inert indicators, method of control animals, balance method, method of labelled atoms.

2. Indirect method, scientific farm method, indicator method, labelled animal method.

3. Reference animal method, nutrient eaten method, scientific and production method.

4. Animal analogues method, nutrients eaten method, scientific and production method, indirect method, scientific and economic method, indicator method, labelled animal method.

119. **The duration of starting cows is?**

1. Start-up of cows is started 100-120 days before calving so that the dry period is 90-100 days. Starting is considered complete when milk production stops completely and the udder decreases in size.

2. Starting of cows is started after calving of the cow with milk formation in udder and duration of lactation period should be 50-60 days.

3. Start cows 60-70 days before calving, so that the duration of the dry period should be 50-60 days. Starting is considered complete when milk production stops completely and the udder decreases in size.

4. Start cows 10-20 days before calving so that the dry period is 5-6 days.

120. **Agricultural poultry rations are rationed according to the following indicators (select the correct answer):**

1. Feeding of farm poultry is rationed according to the following indicators: general level of feeding is rationed by gross energy, protein nutrition - by crude protein and digestible protein, carbohydrate nutrition - by fibre, mineral nutrition - by calcium, phosphorus and sodium.

2. Feeding of poultry is normalised by the following indicators: the total level of feeding is normalised by metabolizable energy, protein nutrition - by crude protein and amino acids (lysine, methionine+cystine, tryptophan, threonine, phenylalanine, arginine, histidine, valine, leucine and isoleucine), carbohydrate nutrition - by fibre, mineral nutrition - by calcium, phosphorus and sodium. The need of poultry in vitamins and trace elements is rationed by guaranteed additions of vitamins A, D3, E, K, B1, B2, B3, B4, B5, B6, B12, Vs, H and C and corresponding salts of manganese, zinc, iron, copper, cobalt and iodine per 1 tonne of mixed feed or per 1 kg of concentrated feed mixture.

3. Feeding of poultry is normalised by the following indicators: amino acids (lysine, methionine+cystine, tryptophan, threonine, phenylalanine, arginine, histidine, valine, leucine and isoleucine), carbohydrate nutrition - by fibre, mineral nutrition - by calcium, phosphorus and sodium. The need of poultry in vitamins and trace elements is normalised by guaranteed additions of vitamins A and D3.

4. Feeding of poultry is rationed according to the following indicators: vitamins and trace elements are rationed by guaranteed additions of vitamins A, D3, E, K, B1, B2, B3, B4, B5, B6, B12, Vs, H and C and appropriate salts of manganese, zinc, iron, copper, cobalt and iodine per 1 tonne of compound feed or per 1 kg of concentrated feed mixture.

121. **Biological and economic features of pigs that ensure high intensity of pig breeding:**

1. Pigs are not fast-growing or intensively growing animals. The pig's body has the smallest specific skin mass. Pigs are characterised by early increased deposition of carbohydrate stores in the body. Pigs are omnivorous animals with gastric digestion. Absence or insufficient synthesis of vitamins in the body.

2. Pigs are not multiple-breeding, moderately intensive growing animals. The pig body has the smallest specific mass of muscles and tendons. Pigs are omnivorous animals with a ruminant type of digestion. Lack of protein synthesis in their body. Absence or insufficient synthesis of fat-soluble vitamins in the body.

3. The pig body has the smallest specific mass of fat and tendons. Pigs are characterised by late increased deposition of body stores of substances. Pigs are herbivorous animals with intestinal digestion. Lack of enzyme synthesis in their body. Absence or insufficient synthesis of vitamins in the body.

4. Pigs are multiple-breeding, fast-growing and intensively growing animals. The pig body has the smallest specific mass of bones and tendons. Pigs are characterised by early increased deposition of substances in the body. Pigs are omnivorous animals with intestinal digestion. Lack of amino acid synthesis in their body. Absence or insufficient synthesis of water-soluble B vitamins. Pigs are very sensitive to unbalanced feeding.

3.1 Model tasks for interim certification

3.1.1. Questions for credit

The competence achieved:

GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.

GPC-2 ID-1 - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.

1. Assessment of feed nutrition and scientific basis of nutritious animal feeding.
2.Aassessment of feed nutrition by chemical composition.
3. Digestibility of forages and assessment of their nutrition by the sum of digestible substances.

GPC-2 ID-2 - To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors.

4. Balance of substances and energy in the animal body and methods of their determination.
5. Assessment of energy nutrition of feeds.
6. Stages of development of the doctrine of assessment of feed nutritive value.
7. Systems of estimation of energy nutritionality of forages.
8. Complex assessment of feed nutrition.

GPC-2 ID-3 - To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.

9. Protein nutrition of feeds.
10. Carbohydrate nutrition of feeds.
11. Lipid nutrition of forages.
12. Mineral nutrition of forages.
13. Vitamin nutrition of forages.

14. Integrated assessment of feed and ration nutrition.

PC-9 - Development of recommendations for special feeding of sick animals for therapeutic purposes.

PC-9 ID-1 - To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy.

15. Principles of classification of feeds and feed aids.
16. Feeds, their composition and classification.
17. The concept of feeds and feed additives.
18. Factors affecting the composition and nutrition of forages.
19. Classification of forages.
20. Characteristics of the main groups of forages and feed additives.
21. Green fodder. Hay. Grass meal and cutting. Their characterisation. Ways and methods of preparation for feeding.
22. Silage. Haylage. Their characterisation. Ways and methods of preparation for feeding.
23. Wastes of field production. Their characterisation. Ways and methods of preparation for feeding.
24. Root tubers and melons. Their characterisation.
25. Wastes of food and industrial crops processing. Their characterisation. Ways and methods of preparation for feeding.
26. Grain fodder. Their characterisation. Ways and methods of preparation for feeding.
27. Feeds of animal origin. Their characterisation. Ways and methods of preparation for feeding.

PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.

PC-15 ID-3 - To be able to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases

28. Feed yeasts. Their characterisation. Ways and methods of preparation for feeding.
29. Mineral feeds. Ways and methods of preparation for feeding.
30. Vitamin preparations. Ways and methods of preparation for feeding.
31. Non-protein nitrogenous additives. Ways and methods of preparation for feeding.
32. Synthetic amino acids. Ways and methods of preparation for feeding.
33. Enzyme preparations. Ways and methods of preparation for feeding.
34. Combined feeds. Types and their characteristics. Ways and methods of preparation for feeding.

3.1.1. Exam questions

The competence achieved:

GPC-2 - Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.

GPC-2 ID-1 - To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some

types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.

1. Brief history of the development of the doctrine of feeding of farm animals.

2. The concept of feed. Requirements for feed. Classification of forages. Factors affecting the composition and nutrition of vegetable forages.

3. Feeding of steely dry cows and its influence on foetal development and subsequent productivity. Feeding norms and level of nutrition of steely dry cows. The norms of feeding of separate forages by terms of dry cows feeding. Ration structure. Approximate ration.

4. Rational feeding as the most important factor of functional and morphological changes in the organism and directed influence on productivity and quality of production of animals.

5. Green fodder, its chemical composition and nutrition. Advantages and disadvantages of green fodder. Norms of feeding. Green conveyor.

6. Influence of level and fullness of feeding of dairy cows on productivity and reproductive abilities. Economic and physiological justification of the level of fullness of feeding of dairy cows. Annual need of cows in forages and nutrients.

GPC-2 ID-2 - To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors.

7. Importance of nutritious feeding in the prevention of metabolic disorders. Importance of limiting nutrition in the occurrence of metabolic disorders.

8. Methods and technology of hay harvesting. Norms of feeding.

9. Feeding of lactating cows during the milking period. Feeding norms and principles of their construction (advance feeding). Types of feeding and structure of rations. Physiological and economic justification of feeding types and ration structures during the milking period. Approximate ration.

10. Carbohydrates, their importance in animal nutrition. Influence of carbohydrates on metabolism of other nutrients. Poor and rich carbohydrate feeds.

11. Straw, its chemical composition and nutrition. Ways and methods of preparation for feeding. Use of straw in winter and summer rations of ruminants.

12. Feeding of bulls-producers. Requirements in nutrients and principles of construction of feeding norms. Feeding technique and norms of feeding of separate forages. Rations of bulls-producers and their structure. Influence of level and fullness of feeding on sperm production.

13. Lipids, their importance in the nutrition of different species and sex and age groups of animals. Indispensable fatty acids, phosphatides, sterols and others. Influence of the quantity and quality of lipids on the quality of livestock products.

14. Silage. Theoretical bases of silage. Silage technique. Methods of evaluation of silage forage. Feeding norms.

15. Feeding calves in the milk period. Directed growing of young animals. Feeding norms and principles of building feeding schemes. Technique of feeding calves in the milk period. Costs of nutrients per 1 kg of gain.

16. Biological fullness (quality) of fodder proteins. Significance of protein quality consideration in the organisation of feeding of ruminants and pigs. Amino acid composition of vegetable and animal feed proteins.

17. Chemical preservation of forages. Chemical preservatives. Factors affecting the quality of feed. Requirements for chemical preservatives.

18. Fattening of cattle. Types and types of fattening. Factors affecting fattening. Structure of rations. Periods and terms of fattening.

19. The problem of eliminating the lack of feed protein in the fodder balance. The main ways of solving the level of protein nutrition of farm animals and increasing the digestibility of protein in farm conditions.

20. Combined silage. Purpose of combined silages. Requirement to nutrition. Raw materials, silage technique. Feeding norms.

GPC-2 ID-3 - To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.

21. Fattening of cattle on by-products of vegetable raw materials processing. The norms of feeding fodder.

22. The role of calcium and phosphorus in metabolism. Factors affecting the content of calcium and phosphorus in forages. Phosphorus-calcium supplements and indicative norms of their feeding.

23. Haying. Scientific bases of haylage. Advantages and disadvantages of haylage preparation technology. Norms of feeding.

24. Biological and economic features of sheep in the organisation of rational use of fodder means. Influence of level and fullness of feeding of sheep on growth and quality of wool. Significance of separate groups of nutrients in sheep feeding. Feeding of rams-producers. Need in nutrients, norms of feeding, forages and norms of their feeding, structure of rations. Approximate ration.

25. Forms of manifestation of calcium and phosphorus metabolism disorders in animal nutrition. Signs of violations of calcium and phosphorus metabolism in animals and methods of their prevention.

26. Grass meal, production technology, raw materials. Factors affecting the safety of nutrients. Norms of feeding to different species and groups of farm animals. The importance of grass meal in the diets of certain groups of animals. Quality requirements.

27. Feeding of sheep sows in the period of their preparation for mating. Feeding of pregnant ewe lambs. Norms and factors determining them. Feeds and norms of their feeding. Technique of feeding. Approximate ration for pregnant ewe lambs.

28. Exogenous and endogenous avitaminosis and hypoavitaminosis. The cause and prevention of their occurrence.

29. Monofodder: definition, technique of preparation of use, their advantages and disadvantages.

30. Feeding of suckling ewe lambs. Norms, factors influencing them. Feeds and norms of their feeding. Technique of feeding. Approximate ration.

31. Vitamins A and D in animal husbandry, their physiological role and influence on the productivity of farm animals. Sources of vitamins A and D.

32. Whole milk replacers (WMR) - their composition, quality requirements, technique of use.

33. Feeding of lambs in the suckling period and after weaning. Timing of weaning. Growth, nutrient requirements, feeds and norms of their feeding. Fattening of lambs and adult sheep. Features of nutrition of fattened sheep in connection with age. Feeds, norms of feeding. Technique of feeding. Feeding of the repair young stock and wool shafts. Give approximate rations for lambs, repair young stock and fattening sheep.

34. B vitamins, their sources. The role of individual vitamins, the need for them in different species of animals.

35. Synthetic nitrogen-containing compounds, rules of their use. Amido-concentrate additive, norms and technique of its feeding.

36. Biological and economic features of pigs. Factors affecting metabolism. Feeding of boars-producers depending on age and intensity of their use. Nutrient requirements. Feeds. Ration structure. Feeding technique. Approximate ration.

37. Nutrients synthesised by microflora in the gastrointestinal tract of animals. The main factors contributing to the active activity of intestinal microflora.

38. Grains of cereals and legumes, their nutrition, preparation for feeding (crushing, cooking, frying, salting, yeasting, extruding). Feeding norms.

39. Feeding of pregnant sows. Influence of complete feeding of sows on their multiple fertility, embryonic development of piglets and subsequent milk yield of sows. Nutrient requirements. Feed, ration structure and feeding technique.

40. Use of hormones, enzymes, antibiotics and other stimulants in the practice of feeding farm animals.

41. Fodder yeast, features of their chemical and amino acid composition. Rules of their use in the diet. Norms of feeding.

42. Feeding of suckling sows. Requirements in nutrients. Feeds and norms of feeding. Ration structure and feeding technique. Approximate ration.

43. The concept of anti-nutritive and toxic substances of certain feeds (antitrypsins, antiextrogens, antivitamins, saponins, alkaloids, goitrogenic substances, etc.).

44. Table salt, its importance in animal nutrition, norms and technique of feeding.

45. Feeding suckling piglets before and after weaning. Growth, changes in nutrient requirements, feed, ration structure, feeding technique. Influence of group size on productivity and feed payment. Factors determining the value of costs per 1 kg of gain.

46. Chemical composition of forages as a primary indicator of their nutrition.

47. Phosphorus-calcium and phosphorus-ammonium feeds. Rules of their use. Technique of feeding.

PC-9 - Development of recommendations for special feeding of sick animals for therapeutic purposes.

PC-9 ID-1 - To know the types of dietary regimes, the principles of feed choice, using digital technologies, norms, feeding regimes in animal diet therapy.

48. Fattening of pigs. Conditions affecting the success of fattening. Types of fattening pigs. The need of fattening pigs in nutrients, feed standards. Factors determining the value of feed costs per 1 kg of body weight gain. Technique of fattening pigs. Plan of fattening. Structure of rations. Feeds, norms of their feeding. Methods of preparing feed for feeding. Frequency of feeding. Group size and feed payment.

49. Conditions affecting the digestibility of fodder, ways to increase the digestibility of fodder in production conditions.

50. Combi-feeds, their types. The requirement for the nutritional content of certain types of mixed fodder. Physiological and economic justification of the use of mixed fodder.

51. Features of feeding of repair pigs. Tasks of feeding. Plan of cultivation, level of nutrition. Features of the structure of rations. Approximate rations for repair pigs with a live weight of 100 kg.

52. Methods of studying the metabolism of substances and energy in the body: the method of control animals, setting scientific, balance and respiratory experiments, the method of labelled atoms.

53. Root crops, tuber crops and melons, their place in the classification of vegetable

forages and their importance in the feeding of farm animals.

54. Feeding of stallions-producers: feed norms and rations, forages, norms of their feeding, feeding technique. Approximate ration.

55. Exchangeable energy as an indicator of energy nutrition of forages. Methods of calculating the content of exchangeable energy in feeds and rations.

56. By-products of oil extraction industry (oilcakes, meal, phosphatides), their importance in feeding farm animals.

57. Feeding of stallion mares. Milkiness of mares and their need in fodder. Approximate ration.

PC-15 - Management of organizational, technical, zootechnical and veterinary measures for the prevention of non-contagiouse diseases in accordance with the preventive plan, analysis of the effectiveness of measures for the prevention of animal diseases for its improvement.

PC-15 ID-3 - **To be able** to carry out veterinary quality control and procurement of animal feed in order to ensure its veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases.

58. Starch equivalents and oat feed unit. Methodology for calculating the energy nutritive value of forage. Methodological and methodological shortcomings of feed nutrition by productive effect.

59. Watery fodder (fresh cake, mesga, barda), the features of their chemical composition, rules of use and norms of feeding farm animals.

60. Theoretical bases of feeding birds. Features of digestion. Features of nutritional assessment of feed for birds. Requirements for energy-protein ratio in connection with the level of productivity and age of the bird. Feeding laying hens. The need for nutrients, the influence of feeding on the composition and hatching qualities of eggs. Feeding norms, feeds, ration structure and feeding technique.

61. Estimation of energy nutrition of forages by energy and oatmeal feed units, their advantages and disadvantages.

62. By-products of fermentation, starch production and sugar industry, their characteristics. Methods of preservation and norms of feeding.

63. Feeding of egg breeds chickens and their young up to 5 months of age. Growth and peculiarities in metabolism, nutrient requirements, norms of feeding, feeds, ration structure.

64. The concept of vitamin nutrition of forages, classification of vitamins.

65. Feeds of animal origin, their characteristics, feed merits and norms of feeding.

66. Feeding of broiler chickens. The need for nutrients, the influence of feeding on the composition of the carcass of broilers. Feeding norms, feeds, ration structure and feeding technique.

67. Significance of microelements in feeding of farm animals.

68. Microbiological processes occurring during silage harvesting, their influence on the quality of harvested silage.

69. Feeding of repair young stock and laying hens. The need for nutrients, the influence of feeding on the subsequent egg production. Feeding norms, feeds, ration structure and feeding technique.

70. Mineral substances of forages, their importance in animal nutrition.

71. Comprehensive assessment of feed and rations nutrition, its importance and advantages.

72. Systems of feeding cows in the summer period. List the precautions of feeding green fodder to cows. Physiological and economic justification of summer feeding and ration structures in summer. Example ration.

73.Importance of macronutrients in feeding of farm animals.

74. Protein-mineral-vitamin additives and premixes, their use in the feeding of different types of farm animals. 75.

75. Features of feeding cows in the phases of lactation. Feeding norms and level of nutrition in the phases of lactation. Norms of feeding of separate forages. Ration structure. Approximate ration.

76. Influence of insufficiency of mineral substances in forages and rations on productivity and health of farm animals. 77.

77. Blood, meat and meat-bone meal, their nutrition and use in feeding different types of animals. 78.

78. Influence of feeding on productivity, quality of milk and milk products. Name the maximum norms of forage feeding to cows when realising milk for different purposes.

79. Fat-soluble vitamins A, D, E, K in animal husbandry, their physiological role and influence on animal productivity. Sources of fat-soluble vitamins.

80. Basic elements of the system of normalised feeding of farm animals. 81.

81. Consequences of incomplete and unbalanced feeding of poultry. Indicators of control of fullness of poultry rations.

4. METHODOLOGICAL MATERIALS DEFINING THE PROCEDURES FOR ASSESSING KNOWLEDGE, SKILLS AND ABILITIES AND WORK EXPERIENCE CHARACTERIZING THE STAGES OF COMPETENCE FORMATION

4.1. Criteria for evaluating students' knowledge during the knowledge survey (written survey)

Mark "**excellent**" - the student clearly expresses his point of view on the issues under consideration, giving appropriate examples.

Mark "**good**" - the student admits some errors in the answer

The mark «**satisfactory**" - the student discovers gaps in knowledge of the basic educational and normative material.

The mark "**unsatisfactory**" - the student discovers significant gaps in knowledge of the basic provisions of the discipline, the inability to obtain the correct solution to a specific practical problem with the help of a teacher.

4.2. Criteria for evaluating students' knowledge during testing

The test result is evaluated on a percentage rating scale. Each student is offered a set of test tasks of 25 questions:

The mark "**excellent**" is 25-22 correct answers.

The mark "**good**" is 21-18 correct answers.

The mark "**satisfactory**" is 17-13 correct answers.

The mark "**unsatisfactory**" is less than 13 correct answers

4.3. Criteria for evaluating students' knowledge in the preparation of reports

The mark "**excellent**" - the problem is identified and its relevance is justified; an analysis of various points of view on the problem under consideration is made and one's own position is logically stated; conclusions are formulated, the topic is fully disclosed, the volume is maintained; the requirements for external design are met, the basic requirements for the report are fulfilled.

The mark "**good**" - mistakes have been made. In particular, there are inaccuracies in the presentation of the material; there is no logical consistency in judgments; the volume of the report is not maintained; there are omissions in the design, there are significant deviations from the requirements for the presentation of materials.

The mark "**satisfactory**" - the topic is only partially covered; factual errors were made in the content of the report; there are no conclusions, the topic of the report is not disclosed.

The mark "**unsatisfactory**" - there is a significant misunderstanding of the problem or the report is not submitted.

1.4. Criteria for evaluating students' knowledge when checking control papers 1.5.

The mark "**excellent**" - the problem is identified and its relevance is justified; an analysis of various points of view on the problem under consideration is made and one's own position is logically stated; conclusions are formulated, the topic is fully disclosed, the volume is maintained; the requirements for external design are met, the basic requirements for the abstract are fulfilled

The mark is "**good**" - mistakes have been made. In particular, there are inaccuracies in the presentation of the material; there is no logical consistency in judgments; the volume of the abstract is not maintained; there are omissions in the design, there are significant deviations from the requirements for abstracting.

The mark "**satisfactory**" - the topic is only partially covered; factual errors were made in the content of the abstract; there are no conclusions, the topic of the abstract is not disclosed

The mark "**unsatisfactory**" - there is a significant misunderstanding of the problem or the abstract is not presented at all.

4.5. Criteria of knowledge during the test

The mark "**accepted** " must correspond to the parameters of any of the positive ratings ("excellent", "good", "satisfactory").

The mark "**not accepted** " rating should correspond to the parameters of the "unsatisfactory" rating.

The mark "excellent" – all types of educational work provided for in the curriculum have been completed. The student demonstrates the compliance of knowledge, skills, and abilities with the indicators given in the tables, operates with acquired knowledge, skills, and applies them in situations of increased complexity. At the same time, inaccuracies, difficulties in analytical operations, transfer of knowledge and skills to new, non-standard situations may be allowed.

The mark "good" – all types of educational work provided for in the curriculum have been completed. The student demonstrates the compliance of knowledge, skills, and abilities with the indicators given in the tables, operates with acquired knowledge, skills, and applies them in standard situations. At the same time, minor errors, inaccuracies, difficulties in analytical operations, transfer of knowledge and skills to new, non-standard situations may be made.

Mark "satisfactory" – one or more types of educational work provided for in the curriculum have not been completed. The student demonstrates incomplete compliance of knowledge, skills, and abilities with the indicators given in the tables, significant errors are made, a partial lack of knowledge, skills, and skills is manifested in a number of indicators, the student experiences significant difficulties in operating with knowledge and skills when transferring them to new situations. –

The mark «unsatisfactory" – the types of educational work provided for in the curriculum have not been completed. demonstrates incomplete compliance of knowledge, skills, and abilities given in the tables of indicators, significant errors are made, a lack of knowledge, skills, and skills is manifested for a large number of indicators, the student experiences

significant difficulties in operating knowledge and skills when transferring them to new situations

4.6. Criteria of knowledge during the examination

The mark "excellent" – all types of educational work provided for in the curriculum have been completed. The student demonstrates the compliance of knowledge, skills, and abilities with the indicators given in the tables, operates with acquired knowledge, skills, and applies them in various situations of increased complexity. At the same time, inaccuracies, difficulties in analytical operations, transfer of knowledge and skills to new, non-standard situations may be allowed. –

The mark "good" – all types of educational work provided for in the curriculum have been completed. The student demonstrates the compliance of knowledge, skills, and abilities with the indicators given in the tables, operates with acquired knowledge, skills, and applies them in standard situations. At the same time, minor errors, inaccuracies, difficulties in analytical operations, transfer of knowledge and skills to new, non-standard situations can be made.

Mark "satisfactory" – one or more types of educational work provided for in the curriculum have not been completed. The student demonstrates incomplete compliance of knowledge, skills, and abilities with the indicators given in the tables, significant errors are made, a partial lack of knowledge, skills, and skills are manifested in a number of indicators, the student experiences significant difficulties in operating with knowledge and skills when transferring them to new situations.

The mark "unsatisfactory" – the types of educational work provided for in the curriculum have not been completed. demonstrate incomplete compliance of knowledge, skills, and abilities given in the tables of indicators, significant errors are made, a lack of knowledge, skills, and skills are manifested for a large number of indicators, the student experiences significant difficulties in operating with knowledge and skills when transferring them to new situations.

5. ACCESSIBILITY AND QUALITY OF EDUCATION FOR DISABLED PEOPLE

If necessary, persons with disabilities and persons with disabilities are given additional, time to prepare an answer for the test.
When conducting the procedure for evaluating the learning outcomes of disabled people and persons with disabilities, their own technical means can be used.

The procedure for evaluating the learning outcomes of disabled people and persons with disabilities in the discipline provides for the provision of information in forms adapted to the limitations of their health and perception of information:

For people with visual impairments:	– in printed form in enlarged font; – in the form of an electronic document.
For people with hearing impairments:	– in printed form; – in the form of an electronic document.
For people with disorders of the musculoskeletal system:	– in printed form, the device; – in the form of an electronic document.

When conducting the procedure for evaluating the learning outcomes of disabled people and persons with disabilities in the discipline, it ensures that the following additional requirements are met, depending on the individual characteristics of the students:

a) instructions on the procedure for conducting the assessment procedure are provided in an accessible form (orally, in writing);

b) an accessible form of assignment of assessment tools (in printed form, in printed form in enlarged font, in the form of an electronic document, assignments are read out by the teacher);

c) an accessible form of providing answers to tasks (written on paper, a set of answers on a computer, orally).

If necessary, for students with disabilities and the disabled, the procedure for evaluating the results of training in the discipline can be carried out in several stages.

The procedure for evaluating the learning outcomes of disabled people and persons with disabilities is allowed using distant learning technologies.