

**ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ БЮДЖЕТНОЕ ОБРАЗОВАТЕЛЬНОЕ
УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ
СТАВРОПОЛЬСКИЙ ГОСУДАРСТВЕННЫЙ АГРАРНЫЙ УНИВЕРСИТЕТ**

УТВЕРЖДАЮ

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ФОНД ОЦЕНОЧНЫХ СРЕДСТВ (ОЦЕНОЧНЫХ МАТЕРИАЛОВ)

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Разведение, генетика и селекция животных

бакалавр

очная

1. Перечень планируемых результатов обучения по дисциплине, соотнесенных с планируемыми результатами освоения образовательной программы

Процесс изучения дисциплины направлен на формирование следующих компетенций ОП ВО и овладение следующими результатами обучения по дисциплине:

Код и наименование компетенции	Код и наименование индикатора достижения	Перечень планируемых результатов обучения по дисциплине
УК-4 Способен осуществлять деловую коммуникацию в устной и письменной формах на государственном языке Российской Федерации и иностранном(ых) языке (ах)	УК-4.2 Демонстрирует умение вести обмен деловой информацией в устной и письменной формах не менее чем на одном иностранном языке	знает 1. наиболее употребительные (базовые) грамматические явления, характерные для профессиональной речи 2. лексический минимум общего и профессионального характера.
		умеет находить, воспринимать и использовать информацию на английском языке
		владеет навыками технологиями построения профессиональной коммуникации на английском языке

2. Перечень оценочных средств по дисциплине

№	Наименование раздела/темы	Семестр	Код индикаторов достижения компетенций	Оценочное средство проверки результатов достижения индикаторов компетенций
1.	1 раздел. ANIMAL SCIENCE			
1.1.	ANIMAL HUSBANDRY	1		Контрольная работа
1.2.	ANIMAL PHYSIOLOGY	1		Контрольная работа
1.3.	ANIMAL NUTRITION	2		
1.4.	ANIMAL FEEDS	2		Контрольная работа
1.5.	ANIMAL BREEDING	2		Контрольная работа
1.6.	ANIMAL ECOLOGY	2		Контрольная работа
	Промежуточная аттестация			Эк

3. Оценочные средства (оценочные материалы)

Примерный перечень оценочных средств для текущего контроля успеваемости и промежуточной аттестации

№ п/п	Наименование оценочного средства	Краткая характеристика оценочного средства	Представление оценочного средства в фонде (Оценочные материалы)
Текущий контроль			
Для оценки знаний			
Для оценки умений			
1	Контрольная работа	Средство проверки умений применять полученные знания для решения задач определенного типа по теме или разделу	Комплект контрольных заданий по вариантам
Для оценки навыков			
Промежуточная аттестация			
2	Зачет	Средство контроля усвоения учебного материала практических и семинарских занятий, успешного прохождения практик и выполнения в процессе этих практик всех учебных поручений в соответствии с утвержденной программой с выставлением оценки в виде «зачтено», «незачтено».	Перечень вопросов к зачету
3	Экзамен	Средство контроля усвоения учебного материала и формирования компетенций, организованное в виде беседы по билетам с целью проверки степени и качества усвоения изучаемого материала, определить необходимость введения изменений в содержание и методы обучения.	Комплект экзаменационных билетов

4. Примерный фонд оценочных средств для проведения текущего контроля и промежуточной аттестации обучающихся по дисциплине (модулю) "Иностранный язык"

Примерные оценочные материалы для текущего контроля успеваемости

I семестр

Контрольная точка 1

Тема 1. Animal husbandry

Перечень вопросов к устному опросу

Вариант 1

1. Употребление глаголов to breed, to develop, to grow, to raise, to rear
2. Видовременные формы глагола в действительном залоге (Present Simple).
3. Проверка знания лексических единиц по теме "Animal Husbandry"

Вариант 2

1. Конструкция there is/are.
2. Видовременные формы глагола в действительном залоге (Present Continuous).
3. Проверка знания лексических единиц по теме "Animal Husbandry"

Контрольная точка 2

Тема 2. Animal physiology

Контрольная работа

Вариант 1

1). Раскройте скобки, употребляя глаголы в Present Perfect, Present Continuous, Present Simple, Past Simple или Future Simple

1. What you (to do) here at such a late hour? You (to write) your essay? – No, I (to write) it already. I (to work) on my report. – And when you (to write) your essay? – I (to finish) it two days ago.
2. Let's have dinner. – No, thank you, I already (to have) dinner.
3. What the weather (to be) like? It still (to rain)? – No, it (to stop) raining.
4. Please, give me a pencil, I (to lose) mine.
5. I (not to meet) Peter since Monday.

Вариант 2

1) Раскройте скобки, употребляя глаголы в Present Perfect, Present Continuous, Present Simple, Past Simple или Future Simple

1. Nina just (to finish) work.
2. Where Ann (to be)? – She (to go) home. She (to leave) the room a minute ago.
3. She (to go) to the library tomorrow? – No, she usually (to go) to the library on Friday.
4. They (to go) to the Hermitage last week.
5. Where (to be) your brother? – He just (to come) home. He (to take) a shower in the bathroom now.

Контрольная точка 3

Тема 3. Animal nutrition

Контрольная работа

Вариант 1

Раскройте скобки, употребляя глаголы в Present Perfect, Present Continuous, Present Simple, Past Simple или Future Simple

1. What you (to read) now? – I (to read) "Ivanhoe" by Walter Scott. – I never (to read) it.
2. My watch (to stop). There (to be) something wrong with it.
3. You (to see) Jack today? – Yes, I (to see) him at the institute.
4. With whom you (to discuss) this question yesterday?
5. What he usually (to do) on Sunday?

Вариант 2

Раскройте скобки, употребляя глаголы в Present Perfect, Present Continuous, Present Simple, Past Simple или Future Simple

1. Where you (to go) next summer? – I (not to decide) yet, maybe to Paris.
2. Yesterday afternoon he (to come) home, (to have) dinner, (to read) an article from the latest magazine and (to begin) doing his homework.
3. You ever (to be) to London? – Yes, I (to spend) two weeks in London last summer.
4. When your friend (to return) from the south? – She (to return) yesterday. – You (to go) to the sta-

tion to meet her? – No, I (to be) too busy.

5. In four years she (to become) a veterinarian. She (to like) animals and (to want) to help them.

II семестр

Контрольная точка 1

Тема 4. Animal feeds

Вопросы к устному опросу по теме «Animal feeds»

Вариант 1

1. Вопросительные предложения в различных временах в действительном и страдательном залогах.

2. Косвенные вопросы. Числительные: правила чтения чисел

Вариант 2

1. Степени сравнения прилагательных и наречий. Придаточные предложения сравнения.

2. Употребление слов most, much. Способы выражения сравнения.

ТЕСТ

Выберите из предложенных глаголов (a-d) тот, который больше всего подходит к данному предложению

1. What ... we see on this map?

a) can b) must c) may d) want

2. I ... from Mexico.

a) come b) comes c) is d) are

3. The sun ... in the east.

a) rising b) rises c) is rise d) rise

4. People in France French.

a) are speaking b) did speak c) speak d) speaks

5. When ... you get up yesterday?

a) do b) are c) did d) have

6. He never ... TV in the morning.

a) watching b) watch c) watches d) watched

7. I ... forget to post the letter my mother gave me.

a) shouldn't b) mustn't c) don't have to d) cannot

8. If you want to be fit, you ... eat so many sweets.

a) don't have to b) shouldn't c) mustn't d) cannot

9. Where do you live? – I ... in Paris.

a) lives b) living c) am live d) live

10. I come in?

a) may b) can c) cannot d) must

Контрольная точка 2

Тема 5. Animal breeding

Тема 6. Animal ecology

Перечень вопросов к устному опросу

Вопросы к устному опросу

Вариант 1

1. Предложения времени и условия. Разные значения слов before, after.

2. Придаточные предложения времени и условия.

Вариант 2

1. Употребление существительных environment, habitat, surroundings

2. Лексический минимум по теме

Тест

Выберите из предложенных глаголов (a-d) тот, который больше всего подходит к данному предложению

1. Last month they in the Hermitage.
a) are b) were c) is d) have
 2. Hea pupil twenty years ago.
a) is b) are c) were d) was
 3. Ian English exercise now.
a) write b) have written c) am writing d) wrote
 4. Ito the cinema yesterday.
a) go b) went c) will go d) have gone
 5. Where..... youyesterday?
a) do/go b) are/going c) did/go d) did/went
 6. Tombreakfast every morning.
a) eating b) eats c) eat d) eaten
 7. She neverto Paris.
a) has/been b) wasn't/be c) haven't/been d) did/was
 8. When I come home, I call you.
a) am b) don't c) will d) cannot
 9. What are you doing? – I am a book.
a) read b) reads c) will read d) reading
 - 10 Itoday yet.
a) eat b) will eat c) didn't eat d) haven't eaten
- Тема 7. Veterinary science

Контрольная точка 3

Контрольная работа

Вариант 1

Вставьте глагол to be в Present Simple, Past Simple или Future Simple.

1. The students ... in the Russian Museum.
2. Last month they ... in the Hermitage. There ... an interest-ing exhibition there.
3. In two weeks they ... in the Tretyakov Gallery. They ... lucky.
4. My father ... a teacher. 5. He ... a pupil twenty years ago.
6. I ... a doctor when I grow up.
7. My sister ... not ... at home tomorrow.
8. She ... at school tomorrow.
9. ... you ... at home tomorrow?
10. ... your father at work yesterday?
11. My sister ... ill last week.

Вариант 2

Вставьте глагол to be в Present Simple, Past Simple или Future Simple.

1. My sister ... ill last week.
2. She ... not ill now.
3. Yesterday we ... at the theatre.
4. Where ... your mother now? — She ... in the kitchen.
5. Where ... you yesterday? — I ... at the cinema.
6. When I come home tomorrow, all my family ... at home.
7. ... your little sister in bed now? — Yes, she
8. ... you ... at school tomorrow? — Yes, I
9. When my granny ... young, she ... an actress.

10. My friend ... in Moscow now.
11. He ... in St. Petersburg tomorrow.

**Примерные оценочные материалы
для проведения промежуточной аттестации (зачет, экзамен)
по итогам освоения дисциплины (модуля)**

Примерное задание к зачету

Прочитайте текст и переведите его письменно:

BIRDS

Birds are feathered, winged, two-legged, warm-blooded, egg-laying vertebrates. Modern birds are characterized by feathers, a beak with no teeth, the laying of hard-shelled eggs, a high metabolic rate, a four-chambered heart, and a lightweight but strong skeleton. Wings are evolved forelimbs, and most bird species can fly. Flightless birds include penguins, and diverse endemic island species. Some species of birds, particularly penguins, are adapted to swim.

Birds also have digestive and respiratory systems that are uniquely adapted for flight. Some birds, especially parrots, are among the most intelligent animal species; several bird species make and use tools, and many species culturally transmit knowledge across generations. Many species annually migrate great distances. Birds are social, communicating with visual signals and songs, and participating in such social behaviors as cooperative hunting, flocking, and mobbing of predators. Eggs are usually laid in a nest and incubated by the parents. Most birds have an extended period of parental care after hatching. Many species are economically important, mostly as game or poultry. Some species, particularly songbirds and parrots, are popular as pets.

About 120 - 130 species of birds have become extinct due to human activity since the 17th century. Birds live and breed in most terrestrial habitats and on all six continents. The highest bird diversity occurs in tropical regions. Compared with other vertebrates, birds have a body that shows many unusual adaptations, mostly to facilitate flight. The skeleton consists of very lightweight bones. They have large air-filled cavities which are connected with the respiratory system. Most birds can fly, which distinguishes them from almost all other vertebrate classes. Flight is the primary means of locomotion for most bird species and is used for feeding, predator avoidance and escape.

Выпишите из текста предложение, содержащее ответ на вопрос:
What are birds characterized by?

Какой вопрос можно задать к ответу?

Yes, the highest bird diversity occurs in tropical regions.

Задайте все типы вопросов к предложению (общий, специальный, альтернативный, разделительный):

Flight was the primary means of locomotion for most bird species.

1. Определите, к каким частям речи относятся данные ниже слова и переведите их на русский язык:

rainy _____
metabolic _____
particularly _____
diversity _____
digestive _____
respiratory _____

intelligent _____
economically _____
knowledge _____
migrate _____

2. Подчеркните в предложениях Participle I, Participle II и установите функции каждого из них, то есть укажите, является ли оно определением, обстоятельством или составной частью глагола сказуемого. Переведите на русский язык.

1. Birds are feathered, winged, two-legged, warm-blooded, egg-laying vertebrates.

2. Modern birds are characterized by feathers, a beak with no teeth, a high metabolic rate, a four-chambered heart, and a lightweight but strong skeleton.

3. Flight is the primary means of locomotion for most bird species and is used for feeding, and predator avoidance and escape.

4. Some species of birds, particularly penguins, are adapted to swim.

3. Переведите предложения на русский язык.

1. Parrots are raised as pets.

2. Domestic birds are expected to provide eggs, meat, feather.

3. Protecting rare species of birds we save biological diversity of nature.

4. Flying is used for feeding, predator avoidance and escape by many bird species.

5. Digestive and respiratory systems of birds are uniquely adapted for flight.

6. Mice are hunted by some species of birds.

4. Укажите номер русского предложения, соответствующего данному английскому.

Birds are hunted for their meat.

1. Мы охотимся на птиц из-за их мяса.

2. На птиц охотятся из-за их мяса.

5. Выберите предложение, соответствующее данному русскому предложению:

Мы слышали, как поют птицы.

1. We heard the birds singing.

2. The birds were heard singing.

6. Подчеркните в каждом предложении модальный глагол или его эквивалент. Предложения переведите на русский язык.

1. Most bird species can communicate with signals and songs.

2. Birds annually must migrate great distances.

3. Most birds can fly, which distinguishes them from almost all other vertebrate classes.

7. Определите видо-временную форму глагола сказуемого в следующих предложениях. Предложения переведите на русский язык.

1. About 120–130 species of birds have become extinct due to human activity since the 17th century.

2. People have been hunting birds since the appearance of civilization.

3. Several bird species made and used tools.

4. Flight was the primary means of locomotion for most bird species and was used for feeding, predator avoidance and escape.

5. Using birds as domestic animals has been practiced for thousands of years.

8. Укажите номер русского предложения, соответствующего по смыслу данному английскому предложению:

Some birds have been raised for eggs.

1. Некоторые птицы были выращены для получения яиц.

2. Человек выращивает некоторых птиц для получения яиц.

9. Составьте предложения из данных слов:

flight, birds, digestive, for, respiratory, have, systems, that, and, adapted.

tropical, the, of, birds, occurs, in, regions, highest, diversity.

10. Подчеркните в следующих сложных предложениях придаточные предложения. Предложения переведите на русский язык.

Образец:

The cow which you have examined is our best one.

Which you have examined - придаточное определительное.

1. Birds also have digestive and respiratory systems that are uniquely adapted for flight.

2. They have large air-filled cavities which are connected with the respiratory system.

3. Most birds can fly which distinguishes them from almost all other vertebrate classes.

11. Переведите предложения, обращая внимание на бессоюзное присоединение придаточных предложений.

1. The variety of birds we hunt is great.

2. Microorganisms often ruin the cells they infect.

3. Penguins have wings they do not use to fly.

Темы к экзамену

ANIMAL HUSBANDRY

Agriculture provides people with food, feed and other useful products. All over the world farmers cultivate valuable plants and raise productive domesticated animals. There are two main branches in modern agriculture: crop production (or crop farming) and animal husbandry (or animal farming).

Nowadays, in many countries people are still relying on meat, milk and eggs as main sources of food. Both breeders and farmers have already bred and are still breeding highly productive agricultural animals. Animal farming is a process in which a farmer breeds, raises and cares for livestock either for commerce or private use.

The word "livestock" refers to domesticated animals such as beef and dairy cattle, sheep, goats, swine (hogs), horses, donkeys and mules, buffalo, oxen, rabbits or "exotic" animals, for example, camels, emus, ostriches, or any animal which a farmer keeps and uses either for food or pleasure. Sometimes animal scientists include in this term also poultry, such as chickens, ducks, geese and turkeys, but they include neither honey bees nor fish within the term "livestock". However, poultry farming and beekeeping are important branches of agriculture as well as aquaculture¹.

There are over a hundred large land mammals in the world but man has domesticated only few types into livestock. There are two main requirements for domestication of mammals: 1) the availability² of feed which a farmer can easily control and provide; 2) a rapid rate of reproduction³. As cattle, sheep and horses are herbivorous mammals, farmers try to keep these domestic animals on pastures. However, farmers often grow either cereals or other agricultural crops as additional feed for their animals. Such ruminant animals as cattle, sheep and goats are important for people because they convert large quantities of grasses or other types of feeds, as well as non-protein nitrogen into meat, milk and wool. Poultry also convert feed efficiently into protein.

Historically, livestock and poultry have provided the following benefits to humanity⁴: meat, eggs, dairy products, raw materials, fertiliser, labour, management⁵ of land.

1. Meat and eggs. In many countries livestock replaced wild game⁶ as the main source of animal protein because only livestock convert various food sources into human food. Poultry provide people with white meat as well as with eggs.

2. Dairy products. People process milk of cows, sheep, goats into a variety of valuable dairy products such as yoghurt, cheese, butter, ice cream, kefir, and koumiss.

3. Raw materials. Livestock produce useful raw materials, for example, horses and cows provide leather, poultry produce feather and down⁷, sheep and goats provide wool for textile industry.

4. Fertiliser. Livestock leave behind manure which farmers spread on fields and this increases yields of crops many times. Historically, plant and animal farming have been closely linked.

5. Labour. In modern agriculture neither cattle nor horses are the main source of mechanical energy. However, in some poor countries people are still using livestock as draft cattle.

6. Management of land. Sometimes farmers use the grazing of livestock as a way to control weeds⁸.

When a farmer is planning to rear livestock, he usually chooses the most suitable type for the local conditions. Both climate and type of land, as well as local traditions influence a farmer's choice.

ANIMAL PHYSIOLOGY

The word "physiology" originated from the Greek language and it consists of two parts: physis which means "nature" and logos which is "word". In general, physiology is the study of mechanical, physical, and biochemical functions of living organisms¹. Physiology has traditionally been divided into plant physiology, animal physiology and human physiology but the physiology principles are universal, even if a particular organism is being studied.

Animal physiology is the study of animal functions, that is the study of "how animals work". The rapid development of animal physiology as a distinct discipline began in the 19th century and was stimulated by the requirements of animal husbandry and veterinary science. Animal physiology is subdivided into the four main parts, such as general physiology, special physiology, comparative physiology² and age physiology³. General physiology deals with the analysis of such universal and important processes as blood circulation⁴, metabolism, respiration⁵ etc. Special physiology applies general

physiological principles in order to investigate characteristics of a particular animal species. Comparative physiology concentrates on similarities and differences of physiological functions of various living organisms. The problems of how physiological functions change with animal age are of special interest to age physiology.

The main approach in animal physiology is to study the evolutionary origins of the physiological mechanisms in order to understand the significance of these mechanisms for modern-day animals⁶. Modern physiology which is based on chemical, physical and anatomical methods investigates biological organization of the animal body at different levels, that is, cells, tissues, organs.

One of the parts of special physiology is devoted to farm animal physiology. The aim of this science is not only to study physiological functions of the farm animal body, but to control them in order to increase the production of eggs, offspring, milk, meat and wool. The problem of how to maintain good health of farm animals throughout a long lifetime of high production is of great importance to farm specialists as well.

Farm animal physiology is closely related to veterinary science as it is necessary to know physiological standards and the physiological reactions which take place in the body of a healthy animal in order to cure sick animals⁷ and prevent different animal diseases. The problems of sterility and nutritional disorders⁸ are studied by physiologists as well as by veterinary surgeons.

Animal requirements in nutrients and energy depend on their physiological features, so feeding rations are calculated on the basis of physiological data. The feeding systems for rearing young animals are being developed on physiological parameters as well. Physiological characteristics such as age and weight are considered by the scientists when animals are fed with vitamins, antibiotics, microelements or hormones.

Farmers should take into account some important physiological features of animals in different situations, for instance, when a farmer is going to use artificial insemination⁹ or train sport horses or dogs. Physiological parameters of farm animals are of special value to engineers who design different farm mechanisms, such as milking or feeding machines.

Other major branches of scientific study that have grown out of physiology research include biochemistry, biophysics, biomechanics, pharmacology, cytology as well as genetics which are known as the biological bases for rational animal husbandry.

ANIMAL NUTRITION

Since animal nutrition research began to develop rapidly during the 1930s, many discoveries about animal metabolism and nutrient requirements have been made. Nutrition is interpreted as the study of the organic process by which an organism assimilates¹ and uses food and liquids² for normal functioning. Adequate nutrition for any living organism is necessary for the following reasons: 1) in order to provide adequate energy levels; 2) to maintain proper body structures and processes, for instance, muscle function, immune protection, bone density³ and strength; 3) to ensure the repair and development of all the organism's systems, thus to maintain balance between health and disease. In the case of farm animals, proper nutrition is affected by various factors, such as animal species and breed, animal age, body type and size and other physiological characteristics. The lack of or deficiency in any nutrient may cause animal weakness and even illness.

A nutrient is any element or compound which is necessary for an organism's metabolism, growth, development or other functions. It is essential to provide farm animals with adequate amounts of nutrients which they get from various feeds. In general, animals require the same nutrients as humans. There are six basic nutrients which are important for animals' health and they are classified into the two main groups: 1) substances that provide energy; 2) substances that support metabolism. The former group includes carbohydrates, proteins and fats, the latter comprises minerals (for instance, phosphorus, calcium), vitamins and water.

It has been found that any particular substance can play more than one role in the body. For example, most animals get energy from carbohydrates and fats, which are oxidized in the body. However, protein I supplies energy if other sources are inadequate or if it is supplied in great excess above the requirements of the body. Moreover, proteins provide the building blocks (amino acids) for enzymes and other proteins within the body. Thus, for most living organisms nutrients provide not only the energy necessary for certain vital processes but also the various materials from which all structural and functional components can be made up.

On the one hand, there are so-called non-essential nutrients which are synthesized by the cell if they are unavailable to the living organism with the food or feed. On the other hand, there are essential nutrients which cannot be manufactured within the cell in the body. Consequently, it is important to supply farm

animals with feeds which contain certain essential amino acids as well as essential fatty acids.

The problem of proper feed supply is of great importance to animal husbandry. Thus, various animal feeds are grown or developed for livestock and poultry, selected and prepared in order to provide highly nutritional diets that both maintain the health of the animals and increase the quality of such farm products as meat, milk, or eggs.

Scientists have studied the usefulness of different feeds as sources of essential amino acids, vitamins, and minerals, as well as lipids and carbohydrates. They also have suggested the proper balance of available nutrients in the animal diet and as a result different nutrient supplements and feed-processing technologies have been developed. Since the 1950s, antibiotics and other growth stimulants have been added to feeding rations in order to increase the rate of growth and reduce death loss of farm animals. Antibiotics help to overcome the growth-depressing effects of an inadequate and poor-quality diet or of imperfect management practices, but their effectiveness differs among animal species.

The achievements of animal physiology and special studies of life processes in farm animals have ensured the development of the optimal diet for each animal. Many of the feeds have appeared as the result of research, experimentation, and chemical analyses which were conducted by animal scientists. However, the problem of adequate animal nutrition is still the subject of current studies for farm scientists. Human nutrition has been improved as a result of animal nutrition investigations.

ANIMAL FEEDS

Animal feeds include any feedstuff which is grown or developed for livestock and poultry. The main aim of a farmer is to provide animals with as highly nutritional diets as possible in order to maintain them healthy and ensure the quality of such final animal products as meat, milk, or eggs. Even today the problem of feeds is still a subject of study for agricultural scientists.

Proteins, carbohydrates, fats, minerals and vitamins are known as the basic nutrients that animals require for growth, reproduction, and good health, but the amount of these substances varies greatly with the type of feed. The first effort to evaluate feeds for animals on a comparative basis was made by Albrecht Thaer (1752- 1828), in Germany, who developed "hay values" as measures of nutritive value of feeds. Tables of the value of feeds and of the requirements of animals were first drawn up in Germany; later they were used in other countries as well.

early efforts. The usual chemical analyses of feeds provide information on the total amount of dry matter, protein, fat, fiber, and ash contained in the feed. Energy value, mineral elements, and vitamins are also determined; these values are included in complete tables of feed composition. The better methods for chemical analyses of feeds are developed, the more reliable data are obtained for calculating feeding rations for animals.

Animal feeds are classified according to: 1) the origin, that is, plant or animal origin of feeds; 2) the chemical composition, such as high- protein, high-fiber, high-moisture etc; 3) the nutritional value, as concentrates and bulky feeds.

Generally, animal feeds may be classified into two large groups: concentrates and roughages. The former are higher in energy value than the latter and are subdivided into the following types: 1) cereal grains such as wheat, corn (maize), oats, rye, barley and their by-products which remain after grain has been processed for human use, 2) high- protein oil meals or cakes from soybeans, sorghum, 3) by-products from processing of sugar beets, 4) animal and fish by-products. Roughages include such feeds as: 1) green roughages (clover, timothy, other pasture grasses and legumes), 2) dry roughages or fodder (hays, straws); 3) silage, 4) root crops. Green forage grasses, silage and roots comprise a group of succulent feeds which are high in moisture.

Concentrates are valuable in feeding all classes of animals as they have a high food value relative to volume, that is, they are rich in both protein and carbohydrates as well, they contain a number of microelements, minerals and vitamins. Roughages are bulky feeds with high-fiber content which is poorly digestible. Thus, they are fed in large quantities to cattle and sheep but they are not suitable for feeding pigs. Succulents are known as palatable feeds but contain a lot of water and have a laxative effect. The younger the grass is, the higher it is in vitamins and minerals, so farmers start grazing cattle and sheep as early in spring as possible. The quality of silage and its nutritive value is greatly affected by a number of factors such as the type of a forage crop, the plant age and storage conditions. Roots are low in protein but high in carbohydrates and moisture, so they are often used as supplements to hay and straw in order to provide complete rations for cattle and sheep.

Feeds vary not only in the amount of nutrients but in costs⁶ from season to season. Thus, it is important for a farmer to select feed ingredients for complete rations as economically as possible. Nowadays large-scale⁷ commercial livestock companies as well as small-scale⁷ producers widely use special computer programmes for selecting feed mixtures that will satisfy the nutrient requirements of a specific type of animal at a particular stage of development. The more palatable and nutritious rations are provided for animals on the basis of the lower-cost feeds, the higher profits⁸ a farmer can get.

ANIMAL BREEDING

The aim of farm animals breeding is to improve qualities which are considered desirable by humans. Long before the scientific principles to the selection of superior animals were developed and the planning of mating combinations was introduced in practice, all species of farm animals were subjected to selective breeding to some extent. At present, in order to modify livestock and poultry and control propagation of domestic animals, breeding procedures involve the application of several basic sciences, mainly reproductive physiology¹, genetics and statistics.

Animals are bred for utility, sport, pleasure, and research. The purposes of animal breeding vary with regard to species, local conditions, and time. For instance, early in history horses were bred mainly for riding and as draft animals; and nowadays, to a large extent, horses are being bred for sport (racing and hunting). As to poultry, in the past chickens were bred for the combined production of eggs and meat, but nowadays in most European countries farmers mainly specialise in such breeds and crosses which produce either eggs or meat.

At present, farmers are using special breeding programmes in order to maintain herds and flocks of higher genetic merit. These programmes include such steps as: 1) the estimation of the breeding value of animals; 2) thorough selection of animals for breeding; 3) the application of one of the mating systems.

The problem how to estimate the breeding value of animals has been researched thoroughly by scientists for different kinds of animals. On the one hand, it is necessary to select animals for breeding on the basis of objective measurements of traits that are decisive for the production. On the other hand, it is often impossible to judge animals' productivity only on the basis of their appearance, so farmers started systematic recordings of such individual animal characteristics as milk yields, growth rate and muscle development for bulls etc. Progeny testing and performance testing have been introduced to judge young males (bulls, rams, and boars) that will be used for breeding. Actual measurement of an individual animal's performance is a rather recent innovation in animal breeding and it has established the foundation of breeding programmes.

Special studbooks and herdbooks are maintained by government or private associations or breeding organizations in many countries for the purpose of recording animal pedigree. Studbooks are official records of the pedigree of purebred animals, particularly horses and dogs. Herdbooks are official records of individuals and pedigrees of a well-known breeds of livestock, especially cattle or swine. In modern livestock trade, farmers will rely on the record of an individual animal's ancestors as a decisive factor of its market value.

Nowadays it is known that the breeding value of an animal depends on the genes which it passes on to its offspring, so genetics has become the basis of animal selection and breeding. It has been found that some traits (coat colour, blood type etc) are inherited in accordance with the laws of heredity, while other traits (wool yield, egg production etc) are subjected to variations and are greatly influenced by the environmental factors.

Selection is based on the breeding value of animals and can be carried out in different ways such as mass selection², pedigree selection³, family selection⁴, and progeny selection. There are certain advantages and disadvantages of these systems, thus selection is usually made in a number of steps. With regard to dairy, bulls selection on the basis of pedigree is made soon after birth; a second selection is made later and based on growth rate during the first year of life and fertility in the first series of Inseminations; and, finally, a third selection depends on the results of progeny tests, when offspring are old enough and may be judged.

Animal breeders apply different mating systems such as inbreeding⁵, outbreeding⁶, linebreeding⁷, crossbreeding⁸ as well. The purpose of any method of breeding is to exclude undesirable traits and combine the most essential characteristics in a new animal breed. Along with various breeding methods, the introduction of such techniques as artificial insemination, transplantation of embryo from donor females of high merit has become of great use in breeding all species of farm animals.

ANIMAL ECOLOGY

The word ecology originates from the Greek language and means “the study of the place to live”. In general, ecology as a branch of biology deals with the relationships between living organisms and their environment. Animal ecology began to develop rapidly as an applied area of ecology only in the middle of the 20th century. Animal ecology concerns the study of population dynamics¹, distribution, behaviour, and the interrelations of animals and their environment? In the beginning, animal ecology developed separately from plant physiology. However, animals depend upon plants for food and shelter, so it is impossible to understand animal ecology without plant ecology. This is particularly true in such applied areas of ecology as farm animal ecology as well as ecology of wildlife². Modern ecology considers interrelationship of both plant and animal communities as a whole biotic unit³.

Ecology is mainly based on the ecosystem concept which is applied to units of various sizes such as a pond, a field, a pasture, a forest or a large ecoregion. When an ecologist is going to analyse any ecosystem, he will study the living organisms which inhabit this specific area, the physical environment, and all interrelations in this particular unit of space. The term “environment” includes both physical surroundings and biotic communities. The former means a large variety of local abiotic (nonliving) factors like temperature, sunlight, minerals, soil, and water. Different plants and other organisms that share the organism habitat are known as biotic communities. In farm animal ecology, the emphasis is put on farm animal relationships to human society and the whole economy within a particular ecosystem; For example, before a large commercial hog breeding farm is built, ecologists will study such problems as the pollution of the soil and water resources by the animal wastes⁴, the influence of grazing on the ecology of the nearest pastures etc. Thus, a farm will not be built until the problems of water recycling and utilisation of animal wastes are considered and solved.

Within the ecosystem, species are connected and they depend upon one another in the food chain, and exchange energy and matter between themselves and with their environment. The concepts of the food chain and ecological niche were described in the theses by Charles Sutherland Elton (1900-1991), a British biologist and naturalist. The following food chain “the grass (or other plants) → the herbivore (cattle, sheep) → the man” is of great interest to farm animal ecology.

Human interference in the development of ecosystems is widely spread. Farming is the deliberate maintenance of such an ecosystem which is highly productive but relatively unstable. Consequently, the proper management of ecosystems for optimal food production as well as thorough study and analysis of various natural cycles (such as a water cycle or a nitrogen cycle) are of great importance to ecologists.

Farmers have widely adopted intensive systems of crop and animal production which provide bases for reliable food production. However, there are some advantages and disadvantages of intensive farming. On the one hand, if farmers apply modern cultivation practices and fertilisation in order to increase the soil fertility, yields of forage crops will be higher and farm animals will be provided with enough amounts of feed. Farmers widely use intensive methods for producing animal products which include confinement of poultry in small cages⁵, swine in small pens⁵, and sheep and cattle in small lots⁵. Thus, the study of the relationships between farm animals and their surroundings such as temperature, air and light conditions is of special importance to ecologists. It has been found that proper lighting management may increase both poultry and livestock production, so lightening is controlled on any type of farm now. Furthermore, it has been shown that confinement leads to savings in labour, feed, and other production costs⁶. Besides, when animals are kept in individual pens, it will be easier to ensure proper disease control. So, the introduction of new methods of intensive farming has enabled farmers to satisfy the needs of population in animal food product.

On the other hand, in the long run, such intensive systems of farming may cause serious ecological problems and even ecological crises. It has been shown that cultivation and fertilization result in a disbalance of nutrients, an increase in pollutants, in pesticides accumulation in the soil, or an increase in susceptibility to plant diseases. Moreover, confinement of farm animals has come under attack⁸ as cruel⁹ to the animals, and protective legislation¹⁰ of animal right has been advocated¹¹.

Nevertheless, livestock and poultry farmers claim that if the animals are under any stressful conditions, they will show sharp decreases in productivity, but milk yields and egg production are maintained at high levels on commercial farms. Since the 1970s, the behavioural adaptation of animals to their surroundings and the effects of environmental stress on the immune status of livestock and poultry have been studied thoroughly by ecologists.

At present, ecology is a multi-disciplinary science which involves plant and animal biology, physiology, genetics, behaviour, meteorology, geology, sociology etc. It is often difficult to draw a sharp line between ecology and any of these sciences. The knowledge of ecology provides the necessary basis for proper management and conservation of natural resources as well as for maintenance of essential ecological processes and ecosystems.

Ecology is widely studied as one of the most important aspects of biology as it has become clear that such problems as the increase in population, food scarcity, environmental pollution, and some sociological and political problems are to a great degree ecological.

VETERINARY SCIENCE

Veterinary Science is also called veterinary medicine and includes the prevention, diagnosis, and treatment of the diseases of domestic animals and the management of other animal disorders. The field also deals with those diseases that are intercommunicable¹ between animals and humans.

Persons who serve as doctors to animals have existed since early times, and veterinary practice was already established as a specialty as early as 2000 BC in Babylonia and Egypt and the ancient Greeks had "horse-doctors". The first veterinary schools in Europe were established in the mid-18th century and since that time veterinary science has rapidly developed alongside with² modern medicine.

Animal health is to ensure the efficient production of wholesome animal products. Farm animals are susceptible to various infectious diseases and may suffer from viruses and harmful bacteria, so animals should be examined by veterinary surgeons regularly in order to notice disease symptoms in time and take the necessary preventive and control measures. Such common animal diseases as mastitis, brucellosis, swine fever, erysipelas, anthrax, and leptospirosis can quickly spread and cause major losses among stock animals, so they must be controlled or prevented by veterinary surgeons.

Vaccination and immunisation, sanitary measures, and the severe segregation, or quarantine, of sick animals should be used by farmers and veterinary surgeons to prevent the spread of infectious diseases such as anthrax, bovine tuberculosis, brucellosis, canine distemper, and rabies. Sanitary control of animal housing and proper pasture management are to eliminate any carriers of animal infectious diseases which can be easily transmitted by water and soil.

The government officials must be informed about the outbreak of a notifiable disease in order to prevent the disease spread. If an animal has contracted the infectious disease and cannot be cured, it will have to be slaughtered.

Veterinary surgeons also treat parasitical infections, unsanitary conditions which may cause lower fertility in livestock, and nutritional disorders, and they often have to set broken limbs³ and neuter⁴ domestic pets. Besides, veterinary scientists investigate the chronic infectious diseases associated with high morbidity rates⁵ and various metabolic disorders. The development of vaccine to control Marek's disease in chickens is an example of the economic effect of animal-disease research that was conducted by veterinary scientists.

A veterinary surgeon's training must include the study of the basic preclinical disciplines of anatomy, histology, physiology, pharmacology, microbiology as well as bacteriology, virology, parasitology, and pathology. The clinical subjects of study may be divided into internal medicine, preventive medicine, surgery and clinical practice.

Internal medicine includes the diagnosis and treatment of diseases as they affect animals. Preventive medicine should consider the aspects of disease prevention and control, especially such diseases that can be transmitted between animals and humans or diseases that may influence human health. Generally, several preventive techniques are available for the use in the prevention of disease in an animal population such as quarantine, immunisation, environmental control, various methods of disease control and eradication, early diagnosis of a disease. It has been proved that animal diseases may be prevented to a great extent by ensuring proper hygienic and sanitary conditions on a farm, which include the maintenance of safe water supplies, air sanitation, pest control, the improvement of animal housing etc. Surgery includes wound treatment⁶, fracture repair⁷, the excision⁸ of body parts, and the use of such techniques as radiology,

anesthesiology, obstetrics⁹, treatment of lameness¹⁰ etc. In most veterinary schools, clinical practice enables students, especially future veterinary surgeons, to observe and assist with actual cases of disease or other conditions which require attention. In both medical and surgical treatment, the same techniques are to be used as in medical practice on humans.

In most countries of the world, professional veterinary surgeons must complete a special educational programme. According to this programme students are to study for four or six years at the university and only after such a course of study the degree of doctor of veterinary medicine is to be awarded. Moreover, in many countries veterinary surgeons must obtain a licence to start their practice from some duly constituted authority¹¹. Veterinary surgeons may specialize either in the care of small animals such as pets and work in banian hospitals, while others may treat mainly livestock. A few veterinary surgeons may be employed by zoos or circuses to examine and take care of wild animals.

Темы письменных работ (эссе, рефераты, курсовые работы и др.)