

**Министерство сельского хозяйства РФ
Трубчевский филиал
ФГБОУ ВО Брянский ГАУ**

Зуйкова О. А.

**Иностранный язык
в профессиональной деятельности**

Учебное пособие

на английском языке для студентов СПО,
обучающихся по специальности 36.02.01 Ветеринария



Брянск 2024

УДК 811.111 (07)

ББК 81.2Анг

З 93

Зуйкова, О. А. Иностраный язык в профессиональной деятельности: учебное пособие на английском языке для студентов СПО, обучающихся по специальности 36.02.01 Ветеринария / О. А. Зуйкова. – Брянск: Изд-во Брянский ГАУ, 2024. – 63 с.

Учебное пособие составлено в соответствии с рабочей программой по дисциплине ОГСЭ.03. Иностраный язык в профессиональной деятельности. Настоящее учебное пособие предназначено для специального этапа обучения английскому языку в СПО специальности 36.02.01 Ветеринария. Цель пособия – заложить основы навыков чтения и перевода текстов средней трудности, формирование практических навыков в различных видах речевой деятельности. Пособие состоит из трех разделов: тексты профессионального содержания и контрольно-тренировочные упражнения, тексты для дополнительного чтения и обобщающие задания к ним, фразы для профессионального общения. Основной текст урока направлен на развитие навыков чтения вслух, умения извлекать полную и частичную информацию, основную идею, является основой для монологической и диалогической речи.

Рецензент: Цибуля Т.В. - преподаватель Трубчевского филиала ФГБОУ ВО Брянский ГАУ, высшая категория.

Рекомендовано к изданию решением заседания цикловой методической комиссии зооветеринарных и социально-экономических дисциплин Трубчевского филиала Брянского ГАУ, протокол №5 от 4 марта 2024 года.

© Брянский ГАУ, 2024

© Зуйкова О.А., 2024

PART I

Unit I

Animal nutrition

1. Translate the groups of words into Russian

Animal food, production of livestock, the nature of animal nutrition, a disease of gums and skin, a deficiency of vitamin C, wool or fur production, slow growth, lowered production, feed efficiency, less-than-adequate ration, deficiency diseases, balanced ration, consumed by an animal, essential for body, to maintain good health.

Nutrition in human and animal health

Feed is animal food. It represents the largest single cost item in the production of livestock. Therefore, it is important to understand the complex nature of animal nutrition and how animals use the feed that they eat. Nutrition is the process by which animals eat food and use it to live, grow, and reproduce.

“You are what you eat” is an axiom that is true to a considerable extent, especially as it relates to good health of both humans and animals.

The relationship between proper nutrition and health has long been recognized. Early sailors stocked their sailing vessels with limes when going to sea for long periods. This was to prevent the dreaded disease, scurvy. Scurvy is a disease of the gums and skin caused by the deficiency of Vitamin C in the diet. Even today, the problem of effects of poor nutrition are seen in the human problems of anorexia and obesity. In simple terms, anorexia is a result of too little nutrition, and obesity the result of too much or improper types of food being eaten.

In animals proper nutrition is just as important as it is in humans. Feed efficiency, rate of gain, and days to market weight are all uppermost in the minds of those people who raise livestock for meat. Proper nutrition is just as important for animals being grown for mink and wool or fur production. Slow growth, poor reproduction, lowered production, and poor health are generally the result of less-than-adequate animal rations. The amount and content of food eaten by an animal one day is referred to as animal's ration. When the amount of feed consumed by an animal in 24 hours contains all of needed nutrients in the proper proportions and amounts, the ration is referred to as a balanced ration.

Numerous diseases may result from improper amounts or balances of vitamins and minerals. Such diseases are called deficiency diseases. Vitamins are complex chemicals and minerals elements essential for normal body functions of human and animal alike. Not all types of animals require the same vitamins and minerals to maintain good health.

2. Match two parts of the sentences using the text

Feed	is the process by which animals eat food and use it to live, grow, and reproduce.
Nutrition	represents the largest single cost item in the production of livestock.
Scurvy is	are complex chemicals and minerals elements essential for normal body functions of human and animal alike
The amount and content of food eaten by an animal in one	are generally the result of less-than-adequate animal rations.
“You are what you eat”	result from improper amounts or balances of vitamins and minerals.
Slow growth, poor reproduction, lowered production, and poor health	is an axiom that is true to a considerable extent, especially as it relates to good health of both humans and animals.
Vitamins	a disease of the gums and skin caused by the deficiency of Vitamin C in the diet.
Numerous diseases may	day is referred to as animal’s ration.

3. Find the answers to the questions in the text.

- 1) Why is it important to understand the complex nature of animal nutrition?
- 2) For what reason did early sailors stock their sailing vessels with limes?
- 3) What does scurvy mean as a disease?
- 4) What is the result of poor nutrition?
- 5) What are the causes of numerous diseases?

4. Give the general opinion about the relationship between proper nutrition and health.

5. Put the proper words in the gaps and arrange the sentences in a logical way.

gum, disease(s), minerals, dreaded, limes, sailors, deficiency, animals, vitamin(s), scurvy

- 1) Scurvy is a ... of the ... and skin caused by a deficiency of ... C in the diet.
- 2) Early ... stocked their sailing vessels with ... when going to sea for long periods.

- 3) Such ... are called ... diseases.
- 4) This was to prevent the ... disease,
- 5) Proper nutrition is just as important for ... being grown for mine and wool or fur production.
- 6) Numerous ... may result from improper amounts or balances of ... and

Unit II

Animal physiology

1. Find the phrases in the text, translate them and learn by heart.

Internal functions, vital processes, various body systems, soft organs, bone marrow, blood cells, lean meat, human consumption, lymph glands, waste materials, spinal cord, abnormal levels, higher-than-recommended levels, ductless glands, breathing rate, hypothalamus gland, proper nutrition, basic types.

2. Study the text.

The internal functions and vital processes of animals and their organs are referred to as animal physiology. The various body systems, such as the skeletal, muscular, circulatory, respiratory, nervous, urinary, endocrine, digestive, and reproductive systems, must all be properly fed and working together in order for the animal to be healthy and productive. To this end, proper nutrition is a must.

The *skeletal system* is made up of bones joined together by cartilage and ligaments. The purpose of the skeletal system is to provide support for the body and protection for the brain and other soft organs of the body. Bone is the main component of the skeletal system. It is composed of about 26% minerals. This mineral material is mostly calcium phosphate and calcium carbonate. Another 50% of bone is water, 20% protein, and 4% fat. The material inside bones is called bone marrow, and it produces blood cells. The growth and strength of bones are greatly affected by minerals and vitamins in animal ratios.

The *muscular system* is the lean meat of the animal and the part of the body that is used for human consumption (food). The purposes of muscles are to provide for movement in cooperation with the skeletal system, and to support life. Muscles may be voluntary or involuntary, depending on whether or not they can be physically controlled by the animal. Voluntary muscles can be controlled by animals to do such things as walk and eat food. Involuntary muscles operate in the body without control by the will of the animal and function even while the animal sleeps. Muscles are composed largely of protein. Large amounts are required for the maintenance of the animal and for growth and reproduction. Proteins are nutrients made up of amino acids

and are building blocks of muscles.

The heart, veins, arteries, and lymph glands comprise the *circulatory system*. This system provides food and oxygen to the cells of the body and filters waste materials from the body. Lymph glands secrete disease-fighting materials from the body. Vitamins, minerals, proteins, and carbohydrates are all essential for the smooth running of the circulatory system. Carbohydrates are sugars and starches that supply energy to the animal.

The *respiratory system* provides oxygen to the blood of the animal. It is composed of the nostrils, nasal cavity, pharynx, larynx, trachea, and lungs. This system allows for breathing and makes use of the muscular and skeletal systems to draw air in and out of the lungs. Then oxygen is taken from the lungs and distributed to the cells of the body by the circulatory system.

The *nervous system* of animals is composed of the central nervous system and the peripheral nervous system. The central nervous system includes the brain and the spinal cord. It is responsible for coordinating the movements of animals and also responds to all of the senses: hearing, sight, smell, touch, and taste. The peripheral nervous system controls the functions of the body tissues, including the organs. The nerves transmit messages to the brain from the outer parts of the body. Because the nervous system is composed primarily of soft tissues, proteins are particularly important in maintaining its health.

The function of the *urinary system* is to remove waste materials from the blood. The primary parts are the kidneys, bladder, ureters, and urethra. The kidneys also help regulate the makeup of blood and maintain other internal systems. Abnormal levels of proteins fed to animals have been known to cause stress to the urinary system, which rids the body of excess protein. Similarly, higher-than-recommended levels of minerals may also cause kidney problems.

The *endocrine or hormone system* is a group of ductless glands that release hormones into the body. Hormones are chemicals that regulate many activities of the body. Some of these are growth, reproduction, milk production, and breathing rate. Hormones are needed in only very minute amounts. For example, only 1/100,000,000g of oxytocin hormone will stimulate the almost immediate letdown of milk in females. Oxytocin is a hormone from the hypothalamus gland. Proper levels of all nutrients, especially minerals, are important for the proper functioning of the endocrine system.

The *digestive system* of animals provides food for the body and for all of its systems. The system stores food temporarily, prepares food for use by the body, and removes waste products from the body. There are three basic types of digestive systems in animals of agriscience importance. They are polygastric or ruminant, monogastric and poultry.

Ruminants are classes of animals that have stomachs with more than one

compartment. Cattle and sheep have multicompartiment stomachs called rumens. These rumens can store very large amounts of roughages. A roughage is grass, hay, silage, or other high-fiber feed. Rumens have the ability to break down plant fibers and to use them for food far better than can animals that are not ruminants. Also manufactured in the digestive systems of ruminant animals are B-complex vitamins. Such vitamins needn't be added to the diets of these animals, even though they are required by the body. It should be noted that calves do not develop true rumens until they are several month old and needed to be fed like nonruminant animals.

The digestive system of swine, horses, and many other animals is called monogastric. *Monogastric* means a stomach with one compartment. The stomachs of swine and horses are relatively small and can store only small amounts of food at any one time. Most of the digestion takes place in the small intestines. Monogastric animals are unable to break down large amounts of roughages. Therefore, their rations must be higher in concentrates. Concentrates are grains low in fiber and high in total digestible nutrients. Also included in the diets of monogastric animals must be B-complex vitamins, since they cannot make such vitamins in their digestive systems.

Although *poultry* have monogastric digestive systems, there are enough differences to treat them separately. Chickens have no teeth and must swallow their food whole. The food is stored in a crop and passed on to the gizzard, where it is ground up. It then passes on to the intestine for digestion. Poultry rations must be high in food value because they have no true stomach and have very little room for storage of food that has been eaten.

3. Find the conformity.

internal functions	КОСТНЫЙ МОЗГ
proper nutrition	ОСНОВНОЙ КОМПОНЕНТ
cartilage and ligaments	РАЦИОН ЖИВОТНОГО
soft tissues	КРОВЯНЫЕ КЛЕТКИ
main component	МЫШЕЧНАЯ СИСТЕМА
bone marrow	ПОТРЕБЛЕНИЕ ЧЕЛОВЕКА
animal ration	МЯГКИЕ ТКАНИ
blood cells	ХРЯЩИ И СВЯЗКИ
muscular system	ПРАВИЛЬНОЕ ПИТАНИЕ
human consumption	ВНУТРЕННИЕ ФУНКЦИИ

4. Find the combinations and write them down.

bone	system
voluntary	glands
amino	muscles
involuntary	materials
building blocks of	acids
circulatory	cord
lymph	muscles
multicompartment	stomach
spinal	marrow
waste	muscles

5. Border the words, translate the sentences.

The various body systems such as the skeletal, muscular, circulatory, respiratory, urinary, nervous, endocrine, digestive and reproductive systems must all be properly fed and working together in order for the animal to be healthy and productive.

6. Complete the sentences, using the text.

- a) The central nervous system includes ...
- b) The material inside bones ..., and it produces
- c) The purposes of muscles are
- d) Lymph glands secrete
- e) ... operate in the body without control by the will of the animal.
- f) ... are all essential for the smooth running of the circulatory system.
- g) ... provides oxygen to the blood of the animal.
- h) The nerves transmit messages
- i) ... is to remove waste materials from the blood.
- j) ... that regulate many activities of the body.
- k) ... provides food for the body and for all of its systems.

7. Match two parts of the sentences.

This system stores food temporarily,	in animals of agriscience importance.
Ruminants are classes of animals that	are unable to break down large amounts of roughages.
A roughage	prepares food for use by the body, and removes waste products from the body.
Monogastric animals	is grass, hay, silage, or other high-fiber feed.

Poultry rations must	have stomachs with more than one compartment.
There are three basic types of digestive systems	be high in food value because they have no true stomach and have very little room for storage of food

8. Write down the components of each system and its function.

The *urinary system*:

The *endocrine or hormone system*:

The *digestive system*:

The *skeletal system*:

The *muscular system*:

The *circulatory system*:

The *respiratory system*:

The *nervous system*:

Unit III

Major classes of nutrients

1. Study the text.

Water is the largest component of nearly all living things. Growing plants are usually 70 to 80% water. Similarly, the muscles and internal organs of animals contain 75% or more of water.

Water is the solution in which all nutrients for animals are dissolved or suspended for transport throughout the body. Water reacts with many chemical compounds in the body to help break down food into products usable by the body. Water provides rigidity to the body, allowing it to maintain its shape. The liquid solution in each cell is responsible for this rigidity. Water is also important in regulating the body temperature of animals through perspiration and evaporation. Because of the ability of water to absorb and carry heat, body temperature of animals rise and fall slower than would be possible otherwise. Water is the least expensive nutrient for animals. Yet, most animals can live only a matter of days if they do not have access to it.

Protein is the major component of muscles and tissues. Proteins are very complex materials and are made of various nitrogen compounds called amino acids. Some of them are essential for animals and some are not. Therefore, the quality of proteins fed to animals must be considered. Monogastric animals need very specific amino acids. So, it is important that they receive high quality proteins containing the appropriate amino acids. In ruminant animals, quantity of protein is more important

than quality. They can convert amino acids in their rumens to other amino acids to meet their needs. Animals to maintain the body use protein. Body cells are continually dying and being replaced. In young animals, large amounts of protein are used for body growth. Protein is also important for healthful reproduction.

Carbohydrates is a class of nutrients composed of sugars and starches. They provide energy and heat to animals. They are composed primarily of the elements carbon, hydrogen, and oxygen. The energy obtained from carbohydrates is used for growth, maintenance, work, reproduction, and lactation (milk production). Carbohydrates come in several forms, with the sugars being the simplest. These are glucose, fructose, and galactose. Compound sugars include starch and cellulose. Carbohydrates make up 75% of most animal rations. Yet there is very little carbohydrate in the body at any one time. Carbohydrates in the diet that are not used quickly are converted to fat and stored in the body. Fat has 2 ¼ times as much energy per gram as carbohydrates do.

The function of **minerals** in the animal are many. The skeleton is composed mostly of minerals. They are important parts of soft tissues and fluids of the body. The endocrine system is heavily dependent on various minerals, as are the circulatory, urinary, and nervous systems. There are 15 minerals that have been identified as being essential to the health of animals. These are calcium, phosphorus, sodium, chlorine, potassium, sulfur, iron, iodine, cobalt, copper, fluorine, manganese, molybdenum, selenium, and zinc. In the past, most of these minerals were provided naturally by feeds grown on fertile soils and by contact with the soil itself. Today it is increasingly important to provide additional mineral matter to the diet of animals. Mineral supplements are especially important for animals that spend their lives in confinement. Additional minerals in feed is called a supplement.

Vitamins are acquired by animals in several different ways. Some are available in roughages and concentrates. Some are available in feeds made from animal by-products. Finally, some are made by the body itself. Vitamins are required in only minute quantities in animals. They act mostly as a catalyst in other body processes. There are large variations in the necessity for vitamins in various species of animals important to agriscience. Some of the specific ways that vitamins are used in animals include clotting of blood, forming bones, reproducing, keeping membranes healthy, producing milk, and preventing certain nervous-system disorders.

Only small amounts of **fat** are required in most animal diets. The addition of fat to the diets of animals improves the palatability, flavor, texture, and energy levels of feed. The addition of small amounts of fat to the diet has also been shown to increase milk production and to aid in the fattening of meat animals. Fat are also necessary in the body as a carrier for fat-soluble vitamins.

2. Divide the sentences.

Therefore the quality of proteins fed to animals must be considered carbohydrates come in several forms with the sugars being the simplest vitamins are required in only minute quantities in animals.

3. Match two parts of the sentences, using the text.

Water	provide energy and heat to animals.
Carbohydrates	are important parts of soft tissues and fluids of the body.
Protein	reacts with many chemical compounds in the body to help break down food into products usable by the body.
Mineral	are also necessary in the body as a carrier for fat-soluble vitamins.
Vitamins	are very complex materials and are made of various nitrogen compounds called amino acids.
Fats	are required in only minute quantities in animals, they act mostly as a catalyst in other body processes.

4. Complete the sentences with proper words.

- 1) The skeleton is composed mostly of
- 2) There are large variations in ... for vitamins in various species of ... important to agriscience.
- 3) The addition of ... to the diets of animals improves the palatability, ..., texture, and ... of feed.
- 4) Carbohydrates provide ... and ... to animals.
- 5) Compound sugars include ... and cellulose.
- 6) Water is also important in ... the body temperature of animals through ... and evaporation.
- 7) Animals to ... the body use

5. Say true or false.

- 1) The liquid solution in each cell is responsible for this energy.
- 2) The muscles and internal organs of animals contain 75% or more of fat.
- 3) Body cells are continually dying and being replaced.
- 4) The circulatory system is heavily dependent on various minerals.
- 5) Proteins act mostly as a catalyst in other body processes.
- 6) Additional minerals in feed is called a supplement.

Unit IV

Sources of nutrients

1. Match the antonyms from two columns.

- | | |
|--------------|----------------|
| 1) major | a) unable |
| 2) important | b) little |
| 3) dry | c) inadequate |
| 4) able | d) large |
| 5) many | e) simple |
| 6) adequate | f) unnecessary |
| 7) small | g) moist |
| 8) complex | h) secondary |
| 9) necessary | i) unimportant |

2. Find the definition to each word.

Proteins	orchard grass, timothy, other grasses and molasses, plant materials
Carbohydrates	sunlight, fertile land, high-quality feeds
Fats	soybeans, peanuts, cottonseed, and linseed
Vitamins and Minerals	oil seeds and animal by-products

3. Insert instead of underlined words *some* and *any*.

- 1) *These* seeds are processed by cooking and other procedures to remove the bulk of the oil from them.
- 2) *Cereal* grains provide lesser amounts of protein, but are also important protein sources.
- 3) *Young* ruminants and *all* nonruminants are not able to digest urea.
- 4) *The major sources of* carbohydrates for animal feed are the cereal grains.
- 5) Ruminants manufacture *B-complex* vitamins in the rumens.

4. Translate the sentences using the indefinite pronouns *some* and *any*.

- Некоторые люди считают главным источником белка для животных семена растений.
- Зерновые используются для производства нескольких продуктов.
- Некоторое количество жиров должно присутствовать в рационе животных.
- Другие источники животного белка – это рыба и молоко.
- Существует несколько видов витаминов и минералов.

Обычный рацион животного должен включать в себя некоторые виды углеводов.

5. Make up sentences, write them down.

A source, nitrogen, is, from, and, made, of, air, synthetic, water, carbon, urea.

And, all, ruminants, are, no-ruminants, digest, unable to, young, urea, young, digest.

Sources, of protein, are, most, sources, of fat, also.

Is, true, for, oil, this, the, by-products, seeds, animal, and, especially.

The sources of nutrients for animals are many and extremely varied. Important animal feed components include roughages, concentrates, animal by-products, minerals from mineral deposits, and nutrients made chemically. These are called *synthetic nutrients*.

6. Read the text and say what the major sources of protein for animals.

Proteins. The major sources of protein for animals include oil seeds such as soybeans, peanuts, cottonseed, and linseed. These seeds are processed by cooking and other procedures to remove the bulk of the oil from them. The remainder of the seed content is then dried and ground up for feed. The feed consisting of ground oil seeds with the oil removed is called *oil meal*.

Cereal grains provide lesser amounts of protein, but are also important protein sources. Good quality legume hay, such as alfalfa and clover, is also a good plant source of protein for ruminant animals.

Animal protein is generally of higher quality than plant protein. More specifically, animal protein usually contains more of the essential amino acids than does protein from plants. Sources of animal protein include tank age, fish meal, blood meal, skim milk, feather meal, and meat scrap. Nonprotein nitrogen in the form of urea can be used as a substitute for protein for ruminant animals. Urea is a synthetic source of nitrogen made from air, water, and carbon. The feeding of urea should be limited to not more than 1% of the total dry matter fed. Young ruminants and all nonruminants are unable to digest urea.

7. Analyze the text and tell the sources of carbohydrates and fats.

Carbohydrates are found in all plant materials. The major sources of carbohydrates for animal feed are the cereal grains. Corn is the most important of these in the United States, followed by wheat, barley, oats, and rye.

Other sources of carbohydrates include non-legume hay such as orchard grass, timothy, other grasses, and molasses.

Normal animal rations generally contain adequate levels of carbohydrates.

Fats. Because fats are needed in fairly small amounts in the diets of animals, it is seldom necessary to identify specific sources of dietary fat. Most sources of protein are also sources of fat. This is especially true for the oil seeds and animal by-products.

8. Say about general sources of vitamins and minerals.

Vitamins and minerals are part of all the normal feeds of animals. Ruminants manufacture B-complex vitamins in their rumens. Exposure to sunlight allows the body to manufacture vitamin D. Contact with the soil, coupled with other feeds grown on fertile land, provides most of the mineral requirements of animals that have access to pasture and high-quality feeds.

However, it is sometimes necessary to supplement natural sources of vitamins and minerals. Commercial vitamin and mineral supplements are formulated for specific classes of animals and their special needs. Such supplements are available wherever animals exist in the developed countries of the world.

9. Match two parts of the sentences, using the texts.

The remainder of the seed content is	non-legume hay such as orchard grass, timothy, other grasses, and molasses.
The feeding of urea should be	for animal feed are the cereal grains.
Other sources of carbohydrates include	are also sources of fat.
Contact with the soil, coupled with other feeds grown on fertile land,	limited to not more than 1% of the total dry matter fed.
Most sources of protein	followed by wheat, barley, oats, and rye.
Such supplements are	provides most of the mineral requirements of animals that have access to pasture and high-quality feeds.
Corn is the most important of these in the United States,	available wherever animals exist in the developed countries of the world.
The major sources of carbohydrates	Then dried and ground up for feed.

10. Write out of the text all the sentences with the modal verbs, translate them.

11. Agree or disagree with the statements.

- a) Cereal grains provide lesser amounts of protein, but are also important protein sources.
- b) Protein nitrogen in the form of urea can be used as a substitute for protein for ruminant animals.
- c) Hormone is a synthetic source of nitrogen made from air, water, and carbon.

- d) Carbohydrates are found in all plant materials.
- e) Normal animal rations generally contain adequate levels of carbohydrates.
- f) Exposure to sunlight allows the body to manufacture vitamin C.

12. Answer the questions using the texts.

- a) What are the major sources of protein for animals?
- b) What is generally higher quality animal protein or plant protein?
- c) Where are carbohydrates found?
- d) What are sources of animal protein?
- e) Are fats needed in fairly small amounts in the diets of animals?
- f) How are commercial vitamin and mineral supplements formulated?

Unit V

Symptoms of nutrient deficiencies

1. Translate the group of words in Russian:

Night blindness, poor growth, diarrhea, gum inflammation, slow healing of wounds, weak, deformed young, reproductive failures, degeneration or certain muscles, white muscles disease, observable effects, shortages of nutrients, bone weakness, nasal discharge, digestive troubles, nutrient deficiency, labored breathing, poor blood clotting.

2. Find the correspondences:

loss of	wounds
slow bone	milk production
slow healing of	young
poor egg	disease
lowered	appetite
reproductive	weakness
gum	hatchability
stiff lamb	inflammation
thin egg	failures
poor	shells

3. Make up sentences with the following word combinations:

Retarded growth, unhealthy appearance, digestive problems, poor milk production.

Example: Gum inflammation *is caused (is the reason of) occurs because of) by deficiency of vitamin C.*

4. Make up word combinations:

- 1) Poor, fertility, appetite, poor, coordination, weak, young, lowered, unhealthy, digestive, poor, liver.
- 2) Growth, poor, deformed, milk, poor, reproduction, poor, “Goose-stepping” in pigs, milk production, appearance, problems, health, fatty.

5. Find the diseases because of lack of vitamins and minerals:

labored	of hair
digestive	growth
slow	reproduction
flabby	breathing
loss	problems
muscular	skin
poor	degeneration
poor	blood clotting

Symptoms of nutrient deficiencies

Animals must be fed appropriate types and amounts of feed regularly to remain healthy and produce milk, meat, wool, eggs, fur, work, or healthy young. Shortages or deficiencies of various nutrients will generally produce observable effects on the animal. Some common symptoms of nutrient deficiencies follow.

Vitamin deficiency

Vitamin A: night blindness, loss of young, poor growth, nasal discharge, diarrhea.

Vitamin C: scurvy, gum inflammation, hemorrhages, slow healing of wounds.

Vitamin D: bone weakness and deformities, rickets and osteomalacia, thin egg shell, weak and deformed young, lowered milk production.

Vitamin E: reproductive failures, degeneration of certain muscles, stiff lamb disease, white muscle disease, poor egg hatchability.

Vitamin K: poor blood clotting, internal hemorrhages.

Thiamine: poor appetite, slow growth, weakness, nervousness.

Riboflavin: slow growth, dermatitis or skin disorder, eye abnormalities, diarrhea, weak legs in pigs.

Niacin: dermatitis, retarded growth, digestive troubles.

Pyridoxine: anemia or low red-blooded- cell count, poor growth, convulsions in pigs.

Pantothenic acid: “Goose stepping ” in pigs, unhealthy appearance, digestive problems.

Biotin: dermatitis, loss of hair, retarded growth.

Choline: poor coordination, poor health, fatty liver, poor reproduction in swine.

Folic acid: blood disorders, poor growth.

Vitamin B2: slow growth, poor coordination, poor reproduction.

Mineral deficiency

Calcium: rickets, poor growth, deformed bones, milk fever.

Phosphorus: lameness, stiff joints, rickets, poor milk production.

Sodium chloride: lack of appetite, unhealthy appearance, slow growth.

Potassium: slow growth, joint stiffness, poor feed efficiency.

Sulfur: lack of strong growth, poor growth.

Iron: anemia, labored breathing, swelling of the head and shoulders, flabby and wrinkled skin.

Iodine: enlarged thyroid gland in the neck, weak or dead off spring at birth, hairlessness, infected navels (especially in foals).

Cobalt: delayed sexual development, poor appetite, slow growth, decreased milk and wool production.

Copper: abnormal wool growth, poor muscular coordination, anemia, weakness at birth.

Fluorine: poor teeth.

Manganese: poor fertility, deformed young, poor growth.

Molybdenum: muscular degeneration, heart failure, paralysis, poor growth.

Zinc: poor growth, unhealthy wool or hair, slow healing of wounds, parakeratosis.

6. Don't agree with the following statement “Shortages or deficiencies of various nutriment won't generally produce observable effects on the animal”.

Unit VI

Feed additives

1. Translate the following words:

Nonnutritive, progesterone, potential, antibiotics, substances, controversy, human consumption.

2. Find in the text the English equivalents of the following:

Кормовая добавка, быстрый рост, улучшать здоровье, гормоны, контролировать заболевания, самый высокий потенциал, гормоны роста.

3. Read the text and answer the questions.

- a) What is feed additive?
- b) How are feed additives divided?
- c) What are antibiotics?

A feed additive is a nonnutritive substance that is added to feed to promote more rapid growth, to increase feed efficiency, or to maintain or improve health. Feed additives fall into two major groups: growth regulators (mostly hormones) and antibiotics. Antibiotics are substances used to help prevent or control diseases.

Some common growth regulators include stil-bestrol, progesterone, and testosterone. They increase growth rates and feed efficiency by as much as 5%.

There are a wide range of antibiotics that are added in very low levels to the diets of animals such as swine and poultry. Antibiotics keep certain low-grade infections at bay and added to feed allow growing animals to gain weight at their highest potential.

In recent years there has been a good deal of controversy over including antibiotics and growth hormones in the feed of animals. Of major concern is the possibility of these substances remaining in the meat of animals slaughtered for human consumption. To reduce this possibility, the substances generally must be removed from the feed well before the animal is marketed.

4. Translate the text.

Composition of feed. All feeds are composed of water and dry matter. The material left after all water has been removed from feed is dry matter. Water makes up 70 to 80% of most living things. However, dry feeds generally contain only 10 to 20% water.

Dry matter is made up of organic matter and ash or mineral. The organic-matter portion of animal feeds consists of protein, carbohydrates such as starch and sugar, fat, and some vitamins. The proportion of these materials vary widely with different feeds.

5. Find the answers on the questions in the texts.

- a) What are concentrates?
- b) What do total digestible nutrients include?
- c) What do cereal grains include?
- d) What is a by-product?
- e) What are green roughages?
- f) What knowledge should people have?

Classification of feed materials

In general, feed for animals is classified into two types – concentrates and roughages. Concentrates are low in fiber and high in total digestible nutrients, abbreviated as TDN. Total digestible nutrients include all of the digestible protein, digestible nitrogen-free extract, digestible crude fiber, and digestible fat contained in the ration. On the other hand, roughages are high in fiber and low in TDN.

Concentrates are the feed or cereal grains. These include corn, wheat, oats, barley, rye, and milo, as well as many others. These grains make up the bulk of most concentrates.

Also, grain by-products such as wheat bran, wheat middling, brewers grain, and distillers grain are concentrates. They are materials left over from the production processes used in making flour and alcohol. A by-product is a secondary product left from the production of a primary commodity.

The oil meals are by-products left from making vegetable oil. Both oil meals and sugar in the form of cane molasses and beet molasses are considered concentrates used in animal feeds.

Finally, animal by-products are important concentrates. They include tank age, fish meal, meat scraps, blood meal, feather meal, and dried dairy products. These products are some of the by-products of the food processing industry.

Roughages can be divided into three categories – dry, green, and silage. The most important of the dry roughages is hay. Some types of legume hay are alfalfa, clover, lespedeza, soybean, and peanut. A legume is a plant in which certain bacteria can transform nitrogen in the air to nitrogen that plants can use. Grass hays include timothy, orchard grass, brome grass, Bermuda grass, and others. The hulls of cottonseed, peanuts, and rice also fall into the category of dry roughages.

Green roughages are plant materials with a high moisture content, such as grasses in pastures and root plants, including sugar beets, turnips, and rutabagas. Tubers such as potatoes are also a green roughage.

Silage is the feed that results from the storage and fermentation of green crops. The fermentation takes place in the absence of air. Corn silage is the most important member of this group. Other examples are grass, legume, and small grain silages. The successful production of animals for fun, profit or sport requires proper animal nutrition. A knowledge of animal physiology, feed materials, and nutrition helps keep animals healthy and productive. Further, a knowledge of nutrition deficiency symptoms will permit the animal manager to take corrective steps when the animal suffers from improper nutrition.

6. Match the words from two columns.

dry	of green crops
transform nitrogen in the	roughages
green	corrective steps
animal	roughages
corn	nutrition
nutrition	air to nitrogen that plants can use
grass, legume	nutrition
to take	silage
fermentation	deficiency
improper	and small gram silage

7. Say true or false.

- 1) Antibiotics are substances used to help prevent or control animals.
- 2) Antibiotics added to feed allow growing animals to gain weight at their highest potential.
- 3) Dry matter is made up of inorganic matter and ash or mineral.
- 4) All feeds are composed of sand and dry matter.
- 5) The most important of the dry roughages is hay.
- 6) Green roughages are plant materials with a high moisture content, such as grasses in pastures and root plants.
- 7) A knowledge of animal physiology, feed materials, and nutrition helps keep animals healthy and productive.

8. Translate the sentences into Russian, don't use the dictionary.

- 1) Silage is the feed that results from the storage and fermentation of green crops.
- 2) A legume is a plant in which certain bacteria can transform nitrogen in the air to nitrogen that plants can use.
- 3) Com silage is the most important member of this group.
- 4) Concentrates are the feed or cereal grains.
- 5) The material left after all water has been removed from feed is dry matter.
- 6) Antibiotics keep certain low-grade infections at bay.

Unit VII

Animal health

1. Translate the groups of words into Russian, find them in the texts.

Poor health, healthy environment, animal diseases, good health, body temperature, glassy eyes.

2. Agree with the following: *Maintaining animal health is the key to a profitable and satisfying animal enterprise.*

Maintaining animal health is the key to a profitable and satisfying animal enterprise. These are several considerations that need to be made in dealing with the health of animals. These include being able to recognize signs of good and poor health, maintaining a healthy environment, being able to identify animal diseases and parasites, and knowing how to treat health problems when they occur. Diseases are infective agents that result in lowered health in living things. Parasites are animals that live on other animals and derive their food from their host.

Having the ability to recognize the signs of good health or the symptoms of health problems is the single most important key to being efficient in maintaining good animal health. A keen sense of observation is important, as well as the innate ability to know when something is not right with an animal.

Signs of good health. One of the best signs of good health is simply a contented animal. Of course, a good deal of experience in dealing with animals is necessary to recognize contentment. Alertness and the chewing of the cud in ruminant animals is a good sign. A shiny hair coat, bright eyes, and pink membranes are other signs that an animal is healthy. Normal body discharges of urine and feces are further evidences that animals are not suffering from serious health problems. On the technical side, healthy animals should have a normal body temperature, pulse rate, and respiration or breathing rate.

Signs of poor health. Often it is easier to tell when an animal is sick than when it is healthy. A rough hair coat and dull, glassy eyes are often the first signs that an animal is not well. Sick animals usually stay alone, with their heads down. They may be drawn up and walk slowly when forced to walk. Abnormal feces, either too hard or too soft, as well as discolored urine may also indicate that an animal is suffering from some health problem. Lowered production, especially in dairy cattle, is often the first sign that the animal is not well. High temperatures, labored breathing, and rapid pulse rates are other indications of poor health in animals.

3. Complete the table

Signs of good health	Signs of poor health
_____	_____
_____	_____
_____	_____

4. Find two parts of the sentences

Diseases are	is important, as well as the innate ability to know when something is not right with an animal.
A shiny hair coat, bright eyes, and pink membranes	are other signs that an animal is healthy.
Normal body discharges of urine and feces	are further evidences that animals are not suffering from serious health problems.
A keen sense of observation	animals that live on other animals and derive their food from their host.
Healthy animals should have	infective agents that result in lowered health in living things.
Parasites are	a normal body temperature, pulse rate, and respiration or breathing rate.

5. Find the combinations according to the sense.

health	rate
lowered	animal
contented	health
rapid pulse	sign
good	rates
breathing	of animals

6. Agree or disagree with the statements.

Maintaining animal health is the key to a profitable and satisfying animal enterprise.

Diseases are disincentive agents that result in lowered health in living things.

One of the best signs of good health is simply a uncontested animal.

A shiny hair coat, bright eyes, and pink membranes are other signs that an animal is healthy.

On the technical side, healthy animals should have a normal body temperature, pulse rate, and respiration or breathing rate.

A rough hair coat and dull, glassy eyes are often the first signs that an animal is well.

High temperatures, labored breathing, and rapid pulse rates are other indications of poor health in animals.

Unit VIII

Healthful environments for animals

1. Find the conformity

healthy environment	навозные кучи
poor conditions	хорошая санитария
good sanitation	плохие условия
milking equipment	оборудование по производству молока
manure piles	благоприятное окружение

2. Find in the text the English equivalents of the following

Хорошее здоровье, иголки и шприцы, дезинфекция, пыльные условия, контроль за паразитами, изоляция, заразные заболевания, больное животное, животное-хозяин.

3. Give the answers.

- a) Name some important and useful facts about healthful environment and sanitation.
- b) Prove the importance of good housing for animals.
- c) Name the problems caused by manure.
- d) Why is it necessary to control pests?
- e) Explain, what animals should be isolated?
- f) Explain the necessity of pasture rotation.

Healthful environments for animals. Maintaining a healthy environment for animals is a key factor in a complete animal-health program. It is often much less expensive to maintain a healthy environment for animals than to treat animals that are unhealthy due to poor conditions that occur.

Sanitation. Good sanitation is important to good health. Factors related to good sanitation include keeping facilities for animals clean. Sanitation also requires the use of clean equipment when dealing with animals. This includes milking equipment, artificial breeding equipment, needles and syringes, and surgical equipment. A syringe

is an instrument used to give injections of medicine or to draw body fluids from animals. Simple on-farm surgical procedures should always be performed with the strictest sanitation possible. The liberal use of disinfectants in dealing with animals is also important. A disinfectant is a material that kills disease-causing organisms.

Housing. Maintenance of proper housing is also an important consideration in maintaining good animal health. Housing should be free from cold drafts and clean. Good air circulation throughout the housing is important to help lower high temperatures in the summer and reduce humidity in the cold of winter. Extremely dry and dusty conditions are also to be avoided when possible. Proper maintenance of animal housing is also important. Loose boards, roofing materials, and nails often pose problems in poorly maintained facilities.

Handling manure. Piles of manure, dirty pens, and dirty feedlots are often sources of serious health problems in animals. It is important that manure not be allowed to accumulate in areas frequented by animals. Manure piles often harbor diseases and parasites. They also attract flies, which may spread diseases. Cages and pens soiled continually with animal waste products may also lower the quality of the air that animals breathe. Wet, poorly drained, manure-soiled feedlots usually reduce the rate of gain of beef cattle and swine. Feedlots are areas in which large numbers of animals are grown for food. Feet and leg problems can often be traced to poorly maintained feedlots.

Controlling pests. The control of pests and parasites is also an important consideration in the maintenance of animal health and welfare. Regular use of disinfectants to control parasites such as lice and flies is necessary in a good disease-prevention program. Regular, close observation of animals may be necessary to determine when outbreaks of parasites occur. Prevention of such parasites is preferable to controlling outbreaks that occur. To that end, the development of a good prevention program is a wise decision.

The control of other pests, such as birds and wild animals, is also part of a good animal health program. Many birds carry parasites on their bodies and in their droppings. When they move from infected animals to healthy ones, they often carry diseases and parasites with them. Wild animals and pests may also cause serious health problems when allowed to roam freely around farm animals. Dogs and coyotes will often chase animals and cause them to injure themselves. Bites from these animals may also cause infection and other health problems. Just the presence of pets around farm animals may cause them to be nervous and affect how rapidly they grow and produce.

Isolation. The isolation of animals new to the herd is an important part of any good health-prevention program. Such animals may be harboring disease or parasites that are not readily apparent. It is wise to keep them isolated from other animals for a period of time, usually a minimum of 30 days. This gives the new owner time to

observe the animals closely for health problems.

Similarity, isolation of diseased animals is essential. Animals with contagious diseases that can be spread by contact should never be allowed to come into contact with healthy animals. It is difficult to treat unhealthy animals when they are living with large groups of animals. Healthy animals tend to pick on unhealthy ones, making it especially difficult for such animals to regain health.

Pasture rotation. The rotation of pastures is a consideration in maintaining a healthy environment for animals and in preventing health problems. Many diseases of animals are harbored in the soil and are killed only by not being able to come into contact with host animals for extended periods of time. A host animal is a species of animal in or on which diseases or parasites can live. Moving animals to different pastures on a regular basis also allows for the breakdown of animal wastes and for pasture regrowth.

4. Agree or disagree with the statements. Give explanation.

- 1) The liberal use of disinfectants in dealing with animals is also essential.
- 2) A disinfectant is a material, that develop disease-causing organisms.
- 3) Maintenance of proper housing is also an important consideration in maintaining good animal health.
- 4) Housing should be clean and free from cold drafts.
- 5) Piles of manure, dirty pens, and dirty feedlots are safe for animals.
- 6) It is important that manure not be allowed to accumulate in areas frequented by animals.
- 7) Similarity, isolation of diseased animals is not necessary dealing.
- 8) Animals with contagious diseases should never be allowed to come into contact with healthy animals.
- 9) A host animal is a species of animal in or on which diseases or parasites can live.

5. Complete the sentences, using the texts.

- 1) A host animal is
- 2) Many diseases of animals are
- 3) The isolation of animals new to
- 4) The control of pests and parasites
- 5) Manure piles often harbor
- 6) Housing should be ...
- 7) Sanitation also requires

6. Divide the sentences.

Good sanitation is important to good health. The rotation of pastures is a consideration in maintaining a healthy environment for animals and in preventing health problems. The isolation of animals new to the herd is an important part of any good health prevention program. A disinfectant is a material that kills disease-causing organisms.

7. Find two parts of the sentences.

The rotation of pastures is a	which large numbers of animals are grown for food.
Similarity, isolation of	is also part of a good animal health program.
The control of other pests	consideration in maintaining a healthy environment for animals
Feedlots are areas in	equipment when dealing with animals.
Extremely dry and dusty conditions	diseased animals is essential.
Sanitation also requires the use of clean	are also to be avoided when possible.

8. Answer the following questions.

What does sanitation include?

How are domestic animals maintained?

What are sources of serious health problems in animals?

What are feedlots?

What is isolation for?

Unit IX

Animal diseases and parasites

1. Find in the texts the equivalents for the following words, translate the sentences with them.

Заразные заболевания, незаразные заболевания, отдельное стойло, бактерии и вирусы, зараженная вода и корм, ядовитые растения и животные, распространение инфекционных заболеваний.

2. Match the correspondences.

disease	заметные симптомы
herd	заболевание
infected animals	кровавая моча
insects	зараженные животные

poisonous plants	насекомые
poor growth	отдельное стойло
contaminated feed	ядовитые растения
shared housing	стадо
bloody feces	плохой рост
noticeable symptoms	зараженный корм

Diseases. The diseases of animals can be divided into two major classes, contagious and non-contagious. Contagious diseases are those that can be passed on to other animals. Non-contagious diseases cannot be spread to other animals.

The handling of these two classes of diseases varies somewhat. It is important that animals suffering from contagious diseases must be isolated from other animals in the herd as soon as the disease is identified. Since some contagious diseases of animals can be transmitted to humans, care must be taken when handling animals so infected.

Non-contagious diseases pose no threat to humans or other animals, except to the animals with the disease. Therefore, there is more leeway in dealing with animals suffering with non-contagious diseases. It is still a good idea to isolate these animals from the herd for their own good.

Causes of contagious diseases are caused mostly by bacteria and viruses. They can be spread by direct contact with the infected animals, from shared housing or from contaminated feed or water. In some cases, the spread of infectious diseases takes place through intermediary hosts, such as birds, rodents or insects.

Non-contagious diseases may be caused by nutrient deficiencies or nutrient excesses. Poisonous plants and animals, injection of foreign material and open wounds may cause or lead to non-contagious disease.

General symptoms of disease are extremely varied and may include: 1) poor growth and/or reduced production; 2) reduced intake of feed; 3) rough, dry hair coat; 4) discharge from the nose or eyes; 5) coughing or gasping for breath; 6) trembling, shaking or shivering; 7) unusual discharges such as diarrhea, bloody feces or urine; 8) open sores or wounds; 9) unusual swelling of the body, including lumps and knots; 10) abortion or the loss of a fetus before it is born; 11) peculiar gait or walking pattern or other odd movements.

Some diseases may have little or no external symptoms and may even progress so rapidly that death of the animal occurs before noticeable symptoms occur.

3. Match two parts of the sentences.

The diseases of animals can be	nutrient deficiencies or nutrient excesses.
Contagious diseases can be spread by direct contact	that can be passed on to other animals.
Non-contagious diseases	cannot be spread to other animals.
Contagious diseases are those	pose no threat to humans or other animals
Therefore, there is more leeway in dealing with	divided into two major classes, contagious and non-contagious.
Non-contagious diseases	with the infected animals, from shared housing or from contaminated feed or water.
Non-contagious diseases may be caused by	animals suffering with non-contagious diseases.

4. Join two parts to make up word-combinations.

poor	production
reduced	growth
open sores	or shivering
rough, dry	or gasping for breath
reduced	intake of feed
unusual discharges	including lumps and knots
coughing	or the loss of a fetus before it is born
discharge	or wounds
trembling, shaking,	hair coat
unusual swelling of the body,	such as diarrhea, bloody feces or urine
abortion	from the nose or eyes

Parasites may also be grouped into two general classifications. They are internal-inside the animal and external-living on the outside of the animal.

The most important group of internal parasites infesting animals are the roundworms (slender worms that are tapered on both ends). Other types of internal parasites include flukes and protozoa. Flukes are very small, flat worms and protozoa are microscopic, one-celled animals. Most internal parasites spend at least some of their life cycle outside of the host animal. It is during this period that the parasite may most easily be spread to other animals. Contact with discharges from infested animals, contaminated feed, water, housing or by contact with secondary hosts may result in the spread of internal parasites. A secondary host is a plant or animal that carries a disease or parasite during part of the life cycle. Some internal parasites are also spread by

insects such as flies and mosquitoes.

External parasites include flies, ticks, mites and fleas. They are spread in the same ways as are internal parasites.

Symptoms of parasite infestation may include: 1) poor growth; 2) weight loss; 3) constant coughing and gagging; 4) anemia; 5) lowered production and reproduction; 6) diarrhea or bloody feces; 7) worms in the feces; 8) swelling under the neck; 9) poor stamina; 10) loss of hair and mange, the presence of a crusty skin condition caused by mites; 11) visibility of the parasite itself.

5. Give the answers for the following questions.

How are parasites grouped?

What are they?

What is the most important group of internal parasites?

What are flukes?

Where do most internal parasites spend their life cycle?

What is the result of contact with infested animals?

What is a secondary host?

Whom are some internal parasites spread by?

What does external parasites include?

What are symptoms of parasite infestation?

Unit X

Preventing and treating health problems

1. Translate the following words.

To prevent, health, feed, additives, vaccination, drug, determination, meat, pills, powder, paste, liquid, throat, horses, worms, syringe, injection, intravenous, a vein, intramuscular, intradermal, skin, intraruminal, rumen, intraperitoneal, blood.

2. Find the definitions.

pills	
powders	
paste	
liquids	

3. How must we choose the drug to the animal?

There are a number of activities and procedures that are used to prevent and treat health problems found in animals. Some of these include administering drugs, dipping

and restraining animals. The role of feed additives and vaccination will also be explored. Vaccination is the injection of an agent into an animal to prevent disease.

Administering drugs. There are several factors to be considered before administering drugs to an animal. They include determination of the amount to be administered, type of drug to use, purpose of the drug, site of administration of the drug and type of animal to be treated. Most of this information can be found on the drug container. It is important that the drug manufacturer's recommendations be followed closely. Another factor that needs to be considered is the amount of time that the drug remains in the animal. This is important when determining how long milk from the animal will be contaminated by the drug. Contaminated milk must be discarded. Also, it must be determined how long to wait before a treated animal can be slaughtered for meat.

Drugs may be manufactured and sold as pills, powder, paste and liquid.

4. Study the texts.

Pills. The procedure for giving a pill to an animal is to restrain the animal and lift its head so that the mouth opens. Force the pill as far down the side of the mouth as possible, using either your hand or a balling gun (a device used to place a pill in an animal's throat). Then massage the animal's throat until it swallows the pill.

Powders. These drugs are normally mixed in the feed or water of the animal. Often it is necessary to withhold feed or water for a period of time before administering the drug. Otherwise, the animal may refuse to eat or drink the drugged food.

Paste is normally used for treating horses for worms. The preparation is placed on the back of the horse's tongue with a caulking gum and the horse is forced to swallow. Pastes are used for horses because it is often nearly impossible to treat them for worms by any other method.

Liquids. Liquid drugs administered orally (by mouth) are often placed directly in the animal's stomach by drenching – the process of administering fairly large amounts of liquid to an animal. A syringe or drenching gun is used. In the process, the animal is restrained with the head held level. The upper lip of the animal is lifted and the tube is inserted along the side of the tongue. The drug is released and the animal is allowed to swallow. Care must be taken not to get the drug into the animal's lungs.

The injection of drugs into animals takes many forms based on the location of the injection. Injection is the process of administering drugs by needle and syringe. Some of the injection sites include intravenous (in a vein), intramuscular (in a muscle), subcutaneous (under the skin), intradermal (between layers of skin), intraruminal (in the rumen), intraperitoneal (in the abdominal cavity). One determining factor as to where injections are made is how fast the drug needs to work. A drug injected into the blood is available faster than one injected under the skin. Often it is desirable for drugs

to be released slowly over a long period of time. Growth hormones are generally administered in this way.

The procedure for giving an injection is to: 1) restrain the animal 2) select the location for the injection 3) fill the syringe, making sure that all air is removed 4) disinfect the area to be injected 5) if the injection is to be made intradermally, clip the hair from the area to be injected 6) insert the needle in the desired area without the syringe attached; this prevents the loss of the drug if the animal jumps 7) attach the syringe to the needle and inject the liquid.

5. Match two parts of the sentences using the texts above.

Paste is normally used for	the mouth as possible, using either your hand or a balling gun.
Injection is the process of	one injected under the skin.
Powders are normally mixed in the	treating horses for worms.
Force the pill as far down the side of	administering fairly large amounts of liquid to an animal.
A drug injected into the blood is available faster than	administering drugs by needle and syringe.
Drenching is the process of	feed or water of the animal.

6. Compare the methods of administering, dosage rates and time of withdrawal of several drugs for animals.

Infusion is another method of getting drugs to the site of the infection. It is used most often to treat dairy animals with udder and teat problems. The udder is the milk-secreting glands of the animal. Teats are the appendages of an udder. A sterile cannula (blunt needle) is inserted into the opening of the teat and the drug is forced into the teat canal.

Dipping is a process for treating animals, mostly cattle and sheep, for external parasites. It involves filling a vat with medicated water and forcing the animal to walk or swim through it. This process is also used to treat dogs for ticks and fleas. Dipping is popular where large numbers of animals must be completely covered with the medication.

Taking an animal's **temperature** is basically the same as taking a human's temperature. It is usually taken in the rectum. The rectum is the last organ in the digestive tract. Animal thermometers are normally longer and heavier than ones used in human medicine. They also have an eye at one end and should have a string attached to it to prevent loss of the thermometer into the body cavity.

To use an animal thermometer first shake down the column of mercury. Coat the thermometer with sterile jelly to make insertion easier. Do not force the thermometer

into the rectum. If there is resistance injury may result. Correct the conditions that are causing the resistance and then reinsert the thermometer. After several minutes remove the thermometer and read the temperature on the scale. Thermometers with digital readouts are also available, but are not in general use by livestock managers.

Determining pulse and respiration rates. The pulse rate for large animals can be taken by holding your ear against the animal's chest and listening to the heartbeat. The number of heartbeats in 1 minute is the pulse rate.

The respiration rate of an animal can be determined by watching its rib cage move. Counting the number of breaths that the animal takes in 1 minute will indicate the rate of respiration.

Restraining animals. There are number of ways to restrain animals for observation and treatment of diseases and parasites. These include head gates, squeeze chutes, halters, twitches, nose leads and casting harnesses. Head gates trap the head of large animals, whereas squeeze chutes hold the whole animal. When halters are used they are usually tied to a post or something else substantial to hold the animal. Twitches hold the tender lip of a horse. Nose leads hold cattle by the nose. Sometimes large animals need to be examined lying down. An easy way to do this is with a casting harness.

Vaccination. The prevention of diseases is nearly always less expensive than treating animals once they have the disease. A good disease-prevention program should include vaccination of animals. Vaccination is the injection of an agent into an animal to prevent disease. Immune means not affected by something. Vaccination programs are usually part of the services of a veterinarian. Vaccination programs vary widely with the type of animal and area of the country.

Feed additives. These additives are used primarily to control the incidence of low-level infections in growing animals. The materials used are primarily antibiotics that help increase feed efficiency and rate of gain, as well as control disease. Feed additives are sometimes used to control internal parasites. Caution must be taken to always follow the manufacturer's recommendations concerning the use of these materials. Failure to do so may lead to contamination of animal products used for human consumption.

Veterinary services. The veterinarian is an essential part of any good health program for animals. It is important to know when to call the vet for help and when to deal with the problem yourself. There are no hard and fast rules in this regard and it will vary greatly depending on the experience of the individual. In general, it pays to call the vet any time that you are not absolutely sure of the problem and how to handle it.

A vet should normally be consulted when you are planning and executing a disease-prevention program. Also any time that an animal is having reproductive problems such as failure to conceive, abortion or great difficulty in giving birth. When

an animal dies suddenly and there is no apparent reason a vet should also be consulted to determine the cause of the death. A vet should be contacted when animals have symptoms of a contagious disease. This will help minimize spread of the disease.

7. Translate the sentences into English.

- 1) Вливание- один из методов введения лекарств в организм животного.
- 2) Этот процесс используется для лечения собак от блох.
- 3) Термометры для животных длиннее и тяжелее чем для человека.
- 4) Пульс у больших животных измеряется через шею.
- 5) Существуют несколько способов ограничить животное для осмотра.
- 6) Предотвратить болезнь дешевле, чем вылечить ее.
- 7) Вакцинация используется для предотвращения многих заболеваний.
- 8) Кормовые добавки используются для контроля заболеваний и повышения аппетита.
- 9) Консультации с ветеринаром обязательны.

8. Find the correspondence.

An animal's temperature	is the injection of an agent into an animal to prevent disease.
Dipping	is another method of getting drugs to the site of the infection.
The pulse rate	for large animals can be taken by holding your ear against the animal's chest and listening to the heartbeat.
Restraining animals	of an animal can be determined by watching its rib cage move.
Infusion	is usually taken in the rectum.
Vaccination	are used primarily to control the incidence of low-level infections in growing animals.
The respiration rate	is a process for treating animals, mostly cattle and sheep, for external parasites.
Feed additives	is for observation and treatment of diseases and parasites.

9. Divide the sentences.

Anytimethatananimalishavingreproductiveproblemssuchasfailuretoconceiveabortionorgreatdifficultyingivingbirthwhenananimaldiessuddenlyandthereisnoapparentreasonwhenanimalshavesymptomsofcontagiousdiseaseavetshouldbeconsultedtodeterminecauseofthedeathortominimizepreadofthedisease.

PART II

Tasks for supplementary work

Digestive system. The digestive system provides food for the body and for all of its systems. This system stores food temporarily, prepares food for use by the body and removes waste products from the body.

There are three basic types of digestive systems in animals of agriscience importance. They are polygastric or ruminant, monogastric and poultry.

Ruminant system. Ruminants are classes of animals that have stomachs with more than one compartment. Cattle and sheep have multicompartment stomachs called rumens. These rumens can store very large amounts of roughages. A roughage is grass, hay, silage or other high-fiber feed. Rumens have the ability to break down plant fibers and to use them for food far better than can animals that are not ruminants. Also B-complex vitamins are manufactured in the digestive systems of ruminant animals. Such vitamins need to be added to the diets of these animals, even though they are required by the body. It should be noted that calves do not develop true rumens until they are several months old and need to be fed like nonruminant animals.

Monogastric system. The digestive system of swine, horses and many other animals is called monogastric. Monogastric means a stomach with one compartment. The stomachs of swine and horses are relatively small and can store only small amounts of food at any one time. Most of the digestion takes place in the small intestines. Monogastric animals are unable to break down large amounts of roughages. Therefore, their rations must be higher in concentrates. Concentrates are grain low in fiber and high in total digestible nutrients. Also included in the diets of monogastric animals must be B-complex vitamins, since they cannot make such vitamins in their digestive systems.

Poultry digestive system. Although poultry have monogastric digestive system there is enough difference to treat them separately. Chickens have no teeth and must swallow their food whole. The food is stored in a crop and passed on to the gizzard where it is ground up. It then passes on to the small intestine for digestion. Poultry rations must be high in food value because they have no true stomach and have very little room for storage of food that has been eaten.

Major classes of nutrients

Water is the largest component of nearly all living things. Growing plants are usually from 70% to 80% water. Similarly, the muscles and internal organs of animals contain 75% or more of water.

Water is the solution in which all nutrients for animals are dissolved or suspended for transport throughout the body. Water reacts with many chemical

compounds in the body to help break down food into products usable by the body.

Water provides rigidity to the body, allowing to maintain its shape. The liquid solution in each cell is responsible for this rigidity.

Water is also important in regulating the body temperature of animals through respiration and evaporation. Because of the ability of water to absorb and carry heat, body temperature of animals rise and fall slower than would be possible otherwise.

Water is the least expensive nutrient for animals. Yet, most animals can live only a matter of days if they do not have access to it.

Protein is the major component of muscles and tissues. Proteins are very complex materials and are made of various nitrogen compounds called amino acids. Some amino acids are essential for animals and some are not. Therefore, the quality of proteins fed to animals must be considered.

Monogastric animals need very specific amino acids. So it is important that they receive high-quality proteins containing the appropriate amino acids.

In ruminant animals quantity of protein is more important than quality. They can convert amino acids in their rumens to other amino acids to meet their needs.

Protein is used by animals to maintain the body. Body cells are continually dying and being replaced. In young animals, large amounts of protein are used for body growth. Protein is also important for healthful reproduction.

Career areas: animal nutritionist food formulator animal manager

Nutrition is one of the most critical factors in animal production. Animal nutritionists are frequently called on to evaluate feeds and make feeding recommendations to animal managers. (Courtesy United States Department of Agriculture)

Careers in animal nutrition are varied and interesting. One may work essentially as an organic chemist or technician in a laboratory where complex equipment is used for research, analysis, and discovery of animals' needs and the nutritional values of feedstuffs. Or, one may be a business person selling feeds, may produce feedstuffs, or may raise animals and manage nutrition, along with other management practices.

Certain elements of nutrition are basic, such as the composition of feed grains, animal by-products, and the basic nutrients needed by animals. However, the nutritive content of forages and other feedstuffs vary considerably according to stage of growth, condition, and quality; and, the digestive capabilities of animals vary considerably from species to species. Additionally, nutritional needs of animals vary with age, stage of development, production, pregnancy, and the like.

Careers in nutrition may be predominantly in the basic sciences or may be applied. They may focus on fish, small animals, pets, equines, poultry, livestock, dairy, or wild animals.

Carbohydrates These are a class of nutrients composed of sugars and starches. They provide energy and heat to animals. Carbohydrates are composed primarily of the elements carbon, hydrogen, and oxygen.

The energy obtained from carbohydrates is used for growth, maintenance, work, reproduction, and lactation (milk production). Carbohydrates come in several forms, with the sugars being the simplest. Examples of simple sugars used in animal feeds are glucose, fructose, and galactose. Compound sugars include sucrose, maltose, and lactose. More complex forms of carbohydrates include starch and cellulose.

Carbohydrates make up about 75% of most animal rations. Yet there is very little carbohydrate in the body at any one time. Carbohydrates in the diet that are not used quickly are converted to fat and stored in the body. Fat has 2 ¼ times as much energy per gram as do carbohydrates.

Minerals The functions of minerals in the animal are many. The skeleton is composed mostly of minerals. They are important parts of soft tissues and fluids of the body. The endocrine system is heavily dependent on various minerals, as are the circulatory, urinary, and nervous systems.

There are 15 minerals that have been identified as being essential to the health of animals. These are calcium, phosphorus, sodium, chlorine, potassium, sulfur, iron, iodine, cobalt, copper, fluorine, manganese, molybdenum, selenium, and zinc. In the past, most of these minerals were provided naturally by feeds grown on fertile soils and by contact with the soil itself. Today it is increasingly important to provide additional mineral matter to the diet of animals. Mineral supplements are especially important for animals that spend their lives in confinement. Additional minerals in feed is called a supplement.

Vitamins. Vitamins are acquired by animals in several different ways. Some are available in roughages and concentrates. Some are available in feeds made from animal by-products. Finally, some are made by the body itself.

Vitamins are required in only minute quantities in animals. They act mostly as a catalyst in other body processes. There are large variations in the necessity for vitamins in various species of animals important to agriscience.

Some of the specific ways that vitamins are used in animals include clotting of blood, forming bones, reproducing, keeping membranes healthy, producing milk, and preventing certain nervous-system disorders.

Fat. Only small amounts of fat are required in most animal diets. The addition of fat to the diets of animals improves the palatability, flavor, texture, and energy levels of feed. The addition of small amounts of fat to the diet has also been shown to increase milk production and to aid in the fattening of meat animals. Fats are also necessary in the body as a carrier for fat-soluble vitamins.

Sources of nutrients

The sources of nutrients for animals are many and extremely varied. Important animal feed components include roughages, concentrates, animal by-products, minerals from mineral deposits, and nutrients made chemically. These are called synthetic nutrients.

Proteins. The major sources of protein for animals include oil seeds such as soybeans, peanuts, cottonseed, and linseed. These seeds are processed by cooking and other procedures to remove the bulk of the oil from them. The remainder of the seed content is then dried and ground up for feed. The feed consisting of ground oil seeds with the oil removed is called oil meal.

Cereal grains provide lesser amounts of protein, but are also important protein sources. Good quality legume hay, such as alfalfa and clover, is also a good plant source of protein for ruminant animals.

Animal protein is generally of higher quality than plant protein. More specifically, animal protein usually contains more of the essential amino acids than does protein from plants. Sources of animal protein include tank age, fish meal, blood meal, skim milk, feather meal, and meat scrap.

Nonprotein nitrogen in the form of urea can be used as a substitute for protein for ruminant animals. Urea is a synthetic source of nitrogen made from air, water, and carbon. The feeding of urea should be limited to not more than 1% of the total dry matter fed. Young ruminants and all nonruminants are unable to digest urea.

Carbohydrates are found in all plant materials. The major sources of carbohydrates for animal feed are the cereal grains. Corn is the most important of these in the United States, followed by wheat, barley, oats, and rye.

Other sources of carbohydrates include non-legume hay such as orchard grass, timothy, other grasses, and molasses.

Normal animal rations generally contain adequate levels of carbohydrates.

Fats. Because fats are needed in fairly small amounts in the diets of animals, it is seldom necessary to identify specific sources of, dietary fat. Most sources of protein are also sources of fat. This is especially true for the oil seeds and animal by-products.

Vitamins and minerals are part of all the normal feeds of animals. Ruminants manufacture B-complex vitamins in their rumens. Exposure to sunlight allows the body to manufacture vitamin D. Contact with the soil, coupled with other feeds grown on fertile land, provides most of the mineral requirements of animals that have access to pasture and high-quality feeds.

However, it is sometimes necessary to supplement natural sources of vitamins and minerals. Commercial vitamin and mineral supplements are formulated for specific classes of animals and their special needs. Such supplements are available wherever animals exist in the developed countries of the world.

A **feed additive** is a nonnutritive substance that is added to feed to promote more rapid growth, to increase feed efficiency, or to maintain or improve health. Feed additives fall into two major groups-growth regulators (mostly hormones) and antibiotics. Antibiotics are substances used to help prevent or control diseases.

Some common growth regulators include stilbestrol, progesterone, and testosterone. They increase growth rates and feed efficiency by as much as 5%.

There are a wide range of antibiotics that are added in very low levels to the diets of animals such as swine and poultry. Antibiotics keep certain low-grade infections at bay. Antibiotics added to feed allow growing animals to gain weight at their highest potential.

In recent years there has been a good deal of controversy over including antibiotics and growth hormones in the feed of animals. Of major concern is the possibility of these substances remaining in the meat of animals slaughtered for human consumption. To reduce this possibility, the substances generally must be removed from the feed well before the animal is marketed.

Composition of feeds

All feeds are composed of water and dry matter. The material left after all water has been removed from feed is dry matter. Water makes up 70 to 80% of most living things. However, dry feeds generally contain only 10 to 20% water.

Dry matter is made up of organic matter and ash or mineral. The organic-matter portion of animal feeds consists of protein, carbohydrates such as starch and sugar, fat, and some vitamins. The proportions of these materials vary widely with different feeds.

Classification of feed materials

In general, feed for animals is classified into two types-concentrates and roughages. Concentrates are low in fiber and high in total digestible nutrients, abbreviated as TDN. Total digestible nutrients include all of the digestible protein, digestible nitrogen-free extract, digestible crude fiber, and $2\frac{1}{4}$ times the digestible fat contained in the ration. On the other hand, roughages are high in fiber and low in TDN.

Concentrates. Included under the classification of concentrates are the feed or cereal grains. These include corn, wheat, oats, barley, rye, and mile, as well as many others. These grains make up the bulk of most concentrates.

Also, grain by-products such as wheat bran, wheat middlings, brewers grain, and distillers grain are concentrates. They are materials left over from the production processes used in making flour and alcohol. A by-product is, a secondary product left from the production of, a primary commodity.

The oil meals are by-products left from making vegetable oil. Both oil meals and sugar in the form of cane molasses and beet molasses are considered concentrates used

in animal feeds.

Finally, animal by-products are important concentrates. They include tank age, fish meal, meat scraps, blood meal, feather meal, and dried dairy products. These products are some of the byproducts of the food processing industry.

Roughages can be divided into three categories-dry, green, and silage. The most important of the dry roughages is hay. Some types of legume hay are alfalfa, clover, lespedeza, soybean, and peanut. A legume is a plant in which certain bacteria can transform nitrogen in the air to nitrogen that plants can use. Grass hays include timothy, orchard grass, brome grass, Bermuda grass, and others. The hulls of cottonseed, peanuts, and rice also fall into the category of dry roughages.

Green roughages are plant materials with a high moisture content, such as grasses in pastures and root plants, including sugar beets, turnips, and rutabagas. Tubers such as potatoes are also a green roughage.

Silage is the feed that results from the storage and fermentation of green crops. The fermentation takes place in the absence of air. Corn silage is the most important member of this group. Other examples are grass, legume, and small grain silages.

The successful production of animals for fun, profit, or sport requires proper animal nutrition. A knowledge of animal physiology, feed materials, and nutrition helps keep animals healthy and productive. Further, a knowledge of nutrition deficiency symptoms will permit the animal manager to take corrective steps when the animal suffers from improper nutrition.

Genetics. Probably the fastest growing area of technology in agriscience is genetics. Artificial insemination has allowed for more improvement in milk production in the last 20 years than had occurred in the previous 200 years. Artificial insemination is the placing of sperm cells in contact with female reproductive cells called eggs by a method other than natural mating. Sperm cells are male reproductive units. Embryo transfers have made it possible for superior females to produce far larger numbers of offspring than would be possible otherwise. Artificial insemination allows for use of a superior male to father many times as many offspring than would be possible naturally. Embryo transfer is a process that removes fertilized eggs or zygotes from a female and places them in another female, who carries them until birth. Embryo transfers are even being used to reproduce endangered species of animals faster than would normally be possible.

Genetic engineering has made it possible to increase resistance to diseases, improve production and improve efficiency of animals. Gene splicing, recombinant DNA and biotechnology are “buzz words” of the geneticist of today. A geneticist studies genetics or heredity. Heredity is the passing on of traits or characteristics from parents to offspring.

The role of breeding and selection on animal improvement. Robert Bakewell,

an Englishman, is generally credited with being the father of animal husbandry. His work in selection of Merino sheep for fine wool production and quality encouraged other farmers of his era to try to improve their livestock. Bakewell and others took great pains to always cross the most desirable females with the best males with the expectation that the offspring would be as good as or superior to their parents. These practices have continued through the years and have resulted in advances in animal agriscience that were not imagined even 25 years ago.

By continually selecting animals for a specific type or characteristics, the resulting generations of animals tend to conform to the characteristics for which they were selected. For example, 200 years ago cattle were not separated into dairy and beef types. Through careful selection of those animals with superior milk production and those types with excellent meat production, two distinct types of animals emerged from the same ancestors. The many breeds of animals have also been developed in the same way. A breed is a group of animals having similar physical characteristics that are passed on to their offspring. It should also be noted that selection is an extremely important part of animal agriscience today. This is especially true as consumer demands for products of animal agriscience change and the margin of profit continues to decline in this area.

Principles of genetics. Gregor Mendel, an Australian monk, is generally given credit for having discovered the basic principles of genetics. He did this through keen observation as he raised peas in his garden. These principles have become the foundation of modern genetics. They are summarized as follows: 1) in every living thing there is a pair of genes in every cell that controls the appearance of every trait in that individual. A gene is a unit of hereditary material located on a chromosome. A chromosome is the rodlike carrier for genes; 2) individuals receive one gene for each trait from each parent; 3) genes are transmitted from parent to offspring as an unchanging unit; 4) in the production of reproductive cells gene pairs separate and only one gene for each trait is contained in each gamete. A gamete is a reproductive cell.

Cells. Division cells are the basic of all genetic activity. A cell is a unit of protoplasmic material with a nucleus and walls. It is the basic structure of all living things. Cells are microscopic in size. All plant and animal life begins as a single cell. The nucleus of the cell contains pair of chromosomes on which rests genes at specific locations. The gene for a specific trait is always located in the same place on the same pair of chromosomes in a species of animals.

Animal growth and reproduction takes place by cell division. In simple cell division for growth called mitosis, each chromosome first divides in two. The wall of the cell nucleus disappears and the chromosomes move to opposite sides of the cell. A new nucleus was formed around each of the groups of chromosomes. Finally, the cell

was divides resulting in two new cells complete with nuclei and pairs of chromosomes.

The cell division that results in the formation of gametes is called meiosis. It differs from mitosis primarily in that instead of the chromosomes dividing and moving in pairs to the opposite sides of the cell, they separate and move individually to the cell walls. When the new cells are formed each cell contains only one of each chromosome rather than pairs. Meiosis occurs only in the reproductive organs of animals.

Genes are the units of genetic material that are responsible for all of the traits or characteristics of animals. Genes occur at specific locations on chromosomes. Chromosomes control certain enzyme and protein production that controls some traits in animals. The chromosomes themselves are composed of a protein covering surrounding two chains of DNA, deoxyribonucleic acid. This substance serves as the coding mechanism for heredity.

The two genes, one each of a pair of chromosomes, may be either alike or different. Pairs of genes that are alike are said to be homozygous, whereas those pairs that are different are called heterozygous. When the two genes in pair are different, one gene usually expresses itself and the other remains hidden. The gene that expresses itself is referred to as dominant. The gene that remains hidden and expresses itself in the absence of a dominant gene is called recessive. Sometimes neither gene of a pair expresses itself to the exclusion of the other. When this happens the gene pair is referred to as expressing partial or incomplete dominance. The actual configuration of genes in an animal is called the genotype. On the other hand, phenotype is the term that describes the physical appearance of the animal. All of this is important when exploring the basics of genetics and the use of genetics in animal breeding.

Some traits are controlled by genes that are located on the chromosomes that control the sex of the animal. These are called sex-linked traits. The chromosomes that control sex in most animals are not perfectly matched. The result is that not all of the genes on these chromosomes occur in pairs. When this happens, some traits show only in males and some only in females.

Genes normally duplicate themselves accurately. However, sometimes accidents or changes occur. These genetic accidents or changes in genes are called mutations. Sometimes these mutations result in changes in animals that are desirable. One such example is the polled characteristic in breeds of cattle that are normally horned. Polled is naturally or genetically hornless. In other cases the mutation results in a lethal characteristic which causes an animal to be born dead or to die shortly after birth.

Genetic in the improvement of animals. The improvement of animals through genetics can be either natural or planned. In natural selection the survival of the fittest occurs. In other words, as changes in genes occur naturally in animals, only the animals with changes that make them better adapted to their environment will survive. Popular

examples include protective colorations, ability to digest certain feeds and ability to survive in extreme heat or cold.

In planned or artificial selection people decide which traits they want in animals. They then use the animals with the desirable traits in the breeding program. Over a period of time the animals that result from such selection show more and more of the desired traits.

Unfortunately, most of the traits for which people are selecting animals are the result of a combination of many pairs of genes. Because of this, few traits are 100% inheritable from parents. For example, the extent of inheritability for - size of pigs is 50 %. Inheritability means the capacity to be passed down from parent to offspring. A boar with a 6" lion-eye is crossed with a sow that has a 5" lion-eye. The expected average lion-eye size for resulting offspring would be $5\frac{1}{4}$ " if lion-eye size was 100% inheritable. However, because lion-eye size is only 50% inheritable the offspring can only be expected to have $5\frac{1}{4}$ lion-eye.

Other percent inheritability rates can be found in. these rates should be used as a guide only when attempting to improve animals through genetics.

Environmental factors often play a part in the expression of genetic traits masking to some extent the true potential of the animal. For example, an animal that is improperly fed or cared for may never reach the size or weight that is genetic potential would indicate.

Genetic engineering. This is a new field in agriscience with much potential for improving animals for the use of humans. Genetic engineering is the process of transferring genes from one individual to another individual or organism without mating male or female cells. Geneticists have been able to link specific genes to specific traits. They have also developed procedures for removing the genes from the cells of one animal and inserting them into the cells of another animal.

The potential for change in animals is tremendous using genetic engineering. For example, if a species of animal is genetically resistant to a certain disease genes that make that animal resistant could be inserted into cells of an animal species that is not resistant. Because genes are passed on to offspring from parents, resulting generations of animals would be resistant to that disease. Unfortunately, genetic engineering is still in its infancy and many problems still need to be solved.

Some of the areas being explored by geneticists working on genetic engineering include disease resistance, cancer research, vaccines, increased growth and production and immunology.

REPRODUCTIVE SYSTEMS OF ANIMALS

Male. The male reproductive system functions to produce, store and deposit sperm cells. Secondary functions include production of male sex hormones and

elimination of urine from the body.

The actual structural makeup of the male reproductive system varies widely with different species of animals. The testes are the organs that produce sperm cells. They also produce testosterone, the male sex hormone. The testes are attached to the body by the spermatic cord and are protected by the scrotum. A coiled tube called the epididymis stores and transports the sperm cells. The deferent duct moves the sperm cells to the urethra which extends through the penis. Other glands of the male reproductive system include the seminal vesicles, the prostate and Cowper's glands. The seminal vesicles secrete seminal fluid. The prostate gland provides nutrition to the sperm cells and the Cowper's gland prepares the urethra for the passage of the sperm cells. The penis serves to deposit the sperm cell into the female reproductive tract.

Female. The female reproductive system produces the egg and the female sex hormones estrogen and progesterone. Estrogen regulates the heat period, estrus, whereas progesterone prevents estrus during pregnancy and causes development of the mammary system. The mammary system produces milk.

The parts of the female reproductive system include two ovaries, which produce eggs. Funnel shaped devices called the infundibulums catch the eggs during ovulation (the process of releasing a mature egg from the ovaries). The egg then passes to the fallopian tubes also called oviducts. The fallopian tubes are the site where fertilization of the egg takes place. The fertilized egg or embryo travels to the uterine horn where it attaches to the wall of the uterus and remains until birth, parturition. When the embryo attaches itself to the uterine wall it becomes known as a fetus. The period of time between fertilization of the egg by a sperm cell and birth is called the gestation period. The vagina which is separated from the uterine horn by the cervix serves as the passageway for the sperm cells. The external opening or vulva protects the rest of the female reproductive system from infection from the outside.

Reproductive problems. There are a number of conditions that may result in reproductive problems or failures. Some of these problems are either physical or genetic. Examples include: freemartin, a sterile female born as a twin of a male in cattle, scrotal hernia (a muscle tear), undeveloped or missing ovaries and malformed penis.

Infections and diseases are also important causes of sterility in animals. Sterility is the inability of an animal to reproduce. Physical damage to the reproductive system and nutritional deficiencies may also contribute to reproductive failures.

Systems of breeding

There are a number of breeding systems that are important to animal agriscience. Which system or systems to use depends on many factors. Some of the considerations include type of operation, markets available, resources available, climatic conditions, size of operation, goals of the breeder and personal preference.

Commonly recognized systems of breeding include purebreeding, crossbreeding, grading up, inbreeding and outcrossing.

Purebreeding occurs when a purebred animal is bred to another purebred animal. A purebred animal is an animal of a recognized breed with registration papers. Registration papers are records of ancestry.

Although there are no guarantees, purebred animals are usually considered to be superior to non-purebred. They are used as show animals and are important parts of the crossbreeding and grading-up systems of breeding.

Persons who elect to use the pure breeding system of breeding should have ample resources and a good knowledge of genetics and be a good salesperson.

Crossbreeding is the breeding of one recognized breed of animals to another recognized breed. The resulting offspring are called hybrids.

There are numbers of advantages of hybrid animals. They tend to be faster growing, stronger and higher producing as a result of the combination of desirable traits from the two breeds. This is called hybrid vigor. They also tend to be more fertile and more disease resistant.

Crossbreeding is generally used by commercial producers who are more interested in offspring that are efficient producers than in maintaining a specific breed of animals.

Grading up. Livestock producers who are raising animals that are not purebred often use grading up to improve their herds. When a non-purebred female animal called a grade is mated with a purebred male, the process is called grading up. The idea is that the purebred male should be superior to the grade female and that the resulting offspring should be superior to their mother. Succeeding generations of females are also mated to purebred males.

The purposes of grading up include the improvement of quality and production in the offspring. Offspring are also called progeny. The development of uniformity in the herd is also a reason for grading up animals.

Inbreeding in the simplest terms is the crossing or mating of animals that are related. The purpose of inbreeding is to intensify the desirable characteristics of a particular animal or family of animals. Unfortunately, inbreeding also intensifies the undesirable and abnormal characteristics as well.

There are various degrees of inbreeding based on how closely related the individuals being mated are. When a father or sire is mated with his daughter, a son is mated with his mother or dam, or a brother is mated to his sister, the term closebreeding is used.

Linebreeding is the mating of less closely related individuals that can be traced back to one common ancestor. Normally, the most closely related cross made in Linebreeding is half brother to half sister.

Inbreeding must be used carefully, because inbred animals tend to exhibit more undesirable characteristics than animals produced by other systems. Unless a breeder is willing to carefully select the outstanding individuals resulting from inbreeding this system should be avoided.

Outcrossing is the mating of unrelated animal families in the same breed. This is probably the most popular system of breeding used in purebred herds of animals. It also has many of the advantages of crossbreeding, including increased production and improved type.

Methods of breeding

There are three general methods of breeding animals – natural service, artificial insemination and in vitro. Natural service occurs when the male is allowed to mate directly with the female. There are several ways in which this may be accomplished, depending on the type of operation, amount of labor available, number of animals in the herd, dictates of the breed associations, and personal preference.

Pasture mating is a system of natural service where the male animal is allowed to roam freely with the females in the herd. The male is responsible for detecting the heat period of each female in the herd and for mating with her at the appropriate time. One disadvantage of this system is that one male can mate with only a limited number of females. If more than one female is in heat at the same time, they may not all get bred. Breeding records are also more difficult to keep. Finally, the male may become sterile and the females not get bred at all.

Hand mating is the bringing of the male to the female for mating. More labor and better management is required, because someone has to determine when the female is in heat and get the male to the female so that mating can take place. Advantages of hand mating include being able to keep more accurate breeding records and being able to mate more females to a single male.

There are numerous advantages of mating animals by artificial insemination. There are a few disadvantages as well. It involves collecting semen from a male animal and placing it in the reproductive tract of the female. Semen is the sperm cells and accompanying fluids. The technique of artificial insemination has been responsible for tremendous increases in animal production in recent years.

Advantages include the fact that semen that is collected from the male can be used fresh or stored frozen in liquid nitrogen for later use. One ejaculate, the amount of semen produced at one time by a male, can be diluted and used to breed thousands of females. Because semen can be frozen and stored for long periods of time, the use of an outstanding male can be greatly extended. Artificial insemination also greatly reduces the need to keep male animals and reduces the danger of having males around. Other advantages include less chance of injury to breeders and their animals, reduces spread of reproductive diseases, and improved record keeping.

There are some disadvantages of artificial insemination as a method of mating animals. A person trained to inseminate females must be available when the animal is in heat. Semen collection from the male can be a dangerous activity, requiring the services of a trained technician, special equipment and facilities, and excellent management. Finally, genetic defects of the male can be spread faster.

In vitro mating occurs outside of the animal's body. Mature eggs are flushed from the female and fertilized by sperm cells collected from the male. The fertilized eggs are then placed in a host female for development into offspring. Although this process is very exacting in its requirements for cleanliness and requires special equipment and facilities, there are times when this is the only way that viable fetus can be obtained. This means of mating is often used as part of the new technology of genetic engineering.

Selection of animals

There are a number of methods by which animals may be selected. They fall into two major types-selection based on physical appearance and selection based on performance or production of either the individual or its progeny.

Selection based on physical appearance is generally used when choosing purebred animals. Often the sole criterion for selection of an animal is how well he or she performs in the show ring. This is a very acceptable means of selection when animal breeders are raising animals for show and to sell to others for the same purpose. However, this method often leaves much to be desired when the animals so chosen is expected to produce a product or perform a desired activity. Animals fitted to perform or look their best in the show ring often fall sadly short of expectations at home.

Selection based on production or performance is usually a more reliable means of choosing animals. If you are selecting dairy cows to produce milk, it makes more sense to select cows with high-production records and high-production relatives. In meat animals, progeny testing, or the testing of performance of the offspring, is often the only way to predict the value of the parents. Other measures of production on which various animals may be selected include rate of gain, feed efficiency, butterfat production, back-fat thickness, lion-eye area, yearly egg production, and pounds of wool produced.

Sometimes selection of animals is based on pedigree. A pedigree is a record of an animal's ancestry and is included on registration papers for purebred animals. Although the consideration of pedigrees can be important in the selection process, it should always be used in combination with other methods of selecting animals.

In summary, tremendous gains have occurred in the productivity of animals in the past 100 years. Fewer and fewer animals are providing the needs of an ever-growing human population. Genetics and gains in animal breeding have been responsible for

much of the increase in productivity. This will continue as technology in the field of animal agriscience continues to advance.

STUDENT'S TASKS

1. Define the "Terms to know".
2. Label the parts of the male and female reproductive systems.
3. Sketch and label the various stages in mitosis and meiosis.
4. Study the genetic principles that determine eye color in humans. Compare the factors that control how eye color is passed from parent to child with those that control the tendency toward baldness.
5. Suppose you mate a Hereford bull with horns to six females that were born without horns (polled). If the females were homozygous for the polled characteristic, how many would probably bear a calf without horns? Why?
6. Select a species of animal and determine the origin of the popular breeds in that species.
7. Clip pictures of animals from magazines and newspapers and make a collage of popular breeds for the bulletin board.
8. Develop a bulletin board with the popular breeds of sheep, cattle, horses, swine, dogs, rabbits, and cats in your community.
9. Suppose that you mated a black male rabbit with a white female rabbit and that the female gave birth to eight bunnies. If white is dominant to black and the female is heterozygous for hair color, how many of the bunnies are likely to be black?
10. If a red pig with floppy ears were crossed with a white pig with erect ears and all possible characteristics were homozygous, what is the probability that the offspring will be red with erect ears? In pigs, white hair color and erect ears are dominant.

SMALL ANIMAL CARE AND MANAGEMENT

As our world population continues to expand and there is less and less room for humans and large animals to coexist, the importance of small animals continues to increase. They are more efficient than larger animals are in converting food eaten into usable feed and other products for humans. They are less intrusive on the lives of people and are therefore more readily accepted. You will explore poultry, rabbits, pets, and honeybees and their contributions to our daily lives.

Poultry

History and domestication. The domestication of chickens occurred about 4000 B.C. in Southern Asia. To domesticate means to tame for the use of people. The association of jungle fowl, ancestors of our present-day chickens, with humans

benefitted both. Humans made small clearings in the jungle that attracted insects and other food for the jungle fowl.

The jungle fowl provided some eggs and meat for humans. This association over centuries gradually led to the domesticated chicken of today. Chickens came to the New World with the earliest settlers, and the people of Jamestown settlement had their pens of chickens.

Turkeys are the only domesticated animal of agriscience importance to have originated and been domesticated in the New World. When early explores arrived in the New World, they found that the Indians of Central America had highly domesticated turkeys that were being grown for food for animals and humans. While present-day turkeys are direct descendants of the wild turkey of the United States, they have been domesticated to the point where they are totally dependent on humans and cannot survive in the wild.

The various types and breeds of ducks and geese have originated from places all over the world. Ducks and geese are also known as waterfowl.

Economic importance. The consumption of red meat has declined somewhat in recent years. This is believed to be due to negative publicity regarding fat and cholesterol. Second, the cost of red meat such as beef and pork may have caused a decrease in its demand. As a result, consumption of poultry and poultry products, with the exception of eggs, has been increasing. Poultry is a group name given to all domesticated birds. Present consumption of poultry meat is more than 60 lbs. per person each year. Americans also eat about 225 eggs per person each year. As a result, the poultry industry is and will continue to be an important part of the American agriscience industry. Currently, poultry production ranks third behind beef and swine production in dollar sales of meat. Three of the four largest farms in the United States are poultry operations.

Centers of production in the United States for the more than 4 billion broilers (young chickens grown for meat) produced each year are Arkansas, Georgia, Alabama, North Carolina, and Mississippi. California is the leading producer of eggs by a wide margin.

The production of turkeys is spread over a wide area, with North Carolina, Minnesota, California, Arkansas, and Missouri as the five leading states. Nearly 60 % of the more than 10 million ducks produced in the United States each year come from Long Island, New York. Major producers of geese are New York, Missouri, Iowa, South Dakota, and Minnesota.

Types and uses of poultry. The types of domesticated poultry can be divided into the following general groups: turkeys, chickens, ducks, geese, and captive game birds.

Chickens are usually classified as either layers or broilers, depending on their intended use. Layers are chickens developed to produce large numbers of eggs. They

may produce either white or brown eggs, depending on the breed. Laying chickens are also maintained to produce eggs to be hatched for the production of broiler chicks. Chicks are newborn chickens.

Chickens produced for meat are usually classified according to age. Broilers are young meat chickens usually not more than eight weeks old. Roasters are mature chickens used for meat. Capons are castrated male chickens that are 14 to 17 weeks old when they are marketed. Castration is the removal of the male sex organs. This can be accomplished either surgically or chemically. Game or Cornish chickens are also breeds of chickens raised for meat.

Young male chickens are called cockerels, whereas adult males are called cocks or roosters. These terms also apply to male pheasants. Young female chickens are called pullets, and adult female chickens are called hens. Adult female turkeys, ducks, and pheasants are also called hens.

Other classes of chickens include bantams, or miniature chickens, and ornamental chickens, which are of value strictly for show.

There are more than 200 recognized breeds of chickens in the United States. However, nearly all of the layer and broiler types used are the result of crossbreeding to maximize production. The foundation breed of most laying-type chickens is the White Leghorn. Most boilers can trace their ancestors back to Cornish or game chickens.

Approved practices for poultry production in the most general terms include the following:

1. Purchase young poultry with a specific use in mind.
2. Purchase young poultry or eggs for hatching from reputable hatcheries or breeders only. A heathery is a business that hatches young poultry from eggs.
3. Purchase young poultry at the proper time. Broilers should be 7 to 8 weeks old before marketing them. Layer chicks should be purchased 20 to 22 weeks before you expect them to produce eggs. Ducks should be 7 to 8 weeks old before marketing the,; turkeys, 12 to 14 weeks old; an geese, 12 to 14 weeks old.
4. Ensure that proper housing is available for the type and number of poultry you are planning to raise. Housing considerations include size, ventilation, ease of cleaning, lighting, heating and cooling, feed storage, and maintenance required.
5. Secure and maintain the proper equipment for the type of poultry operation planned. Consider feeder and waterer space, and brooder size.
6. Feed a commercial, balanced ration designed especially for the type of poultry being grown.
7. Plan a flock health program. A flock is a group of birds.
8. Plan for marketing at the optimum time.
9. Properly clean and disinfect facilities between flocks of poultry.

Rabbits

History and domestication. Much of the early history of the rabbit is obscure. It is believed that the Phoenicians brought rabbits to Spain about 1100 B.C. They are also given credit for having introduced rabbits to most of the then-known world.

Romans kept rabbits in special enclosures. Roman women were known to have eaten large quantities of rabbit meat. They felt that it enhanced their beauty.

Early monasteries produced large amounts of rabbit meat and furs. These religious institutions are given credit for having domesticated the rabbit. It is known that great pride was taken in producing good-quality rabbits and that much rabbit trading existed between monasteries.

Rabbit meat has long been an important component of the diets of people in densely populated countries of Europe. Rabbits are efficient converters of feed to meat. They take up relatively little space and reproduce rapidly.

Some rabbits have been raised in the United States since the time of early settlers. But serious rabbit production did not begin until the turn of this century. An intense advertising campaign was conducted for “Belgian Hare” at that time to promote commercial production of rabbits.

Rabbit production also got a boost in the US during the two world wars. At a time when shortages and rationing of food products occurred, rabbits became an inexpensive source of lean, red meat.

Economic importance. Rabbit production is an important agriscience enterprise in the US. Each year, 7 to 10 million rabbits are raised. About 300,000 growers produce more than 50 million lbs. of rabbit meat each year. Also use another 600,000 to 800,000 rabbits in research yearly.

Rabbit production is an ideal enterprise for a young person, because it can be started with limited capital. With only a small investment in housing and equipment, a person with one pair of rabbits can produce 60 to 80 rabbits each year to eat or to sell. Because they are small and generally accepted by people, rabbits are better adapted for production in more urbanized areas than most other types of animals.

The outlook for rabbit production in the future looks promising, as demand for rabbits and their product continues to increase each year. As the competition between humans and animals for grain products increases, the rabbit will play an important role in meeting the protein needs of humans in the future.

Types and use. Rabbits are divided into two families and three genera, with very distinct differences. These types are rabbits, cottontails and hares. Rabbits bear their young in underground burrows in the wild. The young are born blind, hairless and completely helpless. In contrast, cottontails and hares usually give birth in nests above ground. The young are born with their eyes open and with hair. They are able to fend for themselves shortly after birth. Hares also have larger hind legs and longer ears.

Hares and cottontails include the jackrabbit, arctic hare and snowshoe rabbit. Because they belong to a different genera, cottontails, hares and rabbits cannot interbreed.

Domestic rabbits can be divided into a number of groups based on use. These groups include meat, fur, pets, show, and laboratory use. Many of the breeds will fall into several of these use groups.

The primary use of rabbits in the US is for the production of meat, with pelts being a by-products. A pelt is the skin of an animal with the hair attached. Almost 100 million rabbit pelts are used in the US each year. Most of these are imported from other countries because rabbits are slaughtered at too young an age to have desirable pelts.

Although all of the breeds of rabbits will produce meat, some breeds are far more efficient in producing desirable-quality meat. The New Zealand breed of rabbit is the most popular in the US for meat production. This rabbit occurs in three colours: white, red and black. It is of medium size. It may be grown into a 4 lb. rabbit at 8 weeks of age, using about 4lbs. of feed for each pound of rabbit produced.

Some breeds of rabbits are grown for their lustrous fur, used in the manufacture of fur coats and many other rabbit-fur products.

Rabbits have long been important for use in laboratory work. They are used for research in the development of drugs for treating a wide range of diseases. They are also important participants in nutritional studies and in genetic research. Producers who breed rabbits for laboratory work should be aware that many labs will use only white rabbits of a medium size.

The Angora rabbit is used strictly for the production of wool called angora. The wool from Angora rabbits is sheared or pulled from the rabbit about every 10 to 12 weeks. Mature Angora bucks may produce 1 to 1½ lbs. of wool each year. A buck is a male rabbit. Female rabbits are called does.

Approved practices for rabbit production include the following:

1. Select the correct breed for the intended use. Use purebred stock if you plan to sell breeding stock and to maintain uniformity in your herd.
2. Purchase breeding stock only from reputable breeders with accurate records.
3. Build or choose a hutch of the proper size for the breed of rabbit that you are growing. A hutch is a cage or house for a rabbit. For small and medium-sized breeds, provide hutches 30 wide x 36 long x 18 high. For large breeds provide hutches 30 wide x 48 long x 18 high.
4. Place the hutch where the rabbit will have adequate ventilation and be protected from heat, wind, rain, sleet and snow.
5. Provide adequate feeder and waterer space.
6. Rabbits should have access to fresh, clean water at all times.
7. Provide a separate hutch or cage for each mature rabbit.
8. Breed rabbits when does are 5 to 6 months old and bucks are 6 to 7 months

old. It may be wise to delay breeding of large breeds until they are 9 to 12 months old, because they are slower in reaching sexual maturity.

9. Take the doe to the buck's cage for breeding and return her to her own cage immediately after breeding.

10. Maintain one mature buck for every 8 to 10 does.

11. Place a nesting box in the doe's cage 25 days after mating occurs.

12. Keep the handling of rabbits to a minimum to avoid injury. When handling rabbits, hold them by the skin on the back of the neck, with the other hand supporting the weight of the rabbit.

13. Feed a commercial pelleted-feed free choice to does and letters (a group of young born at one time to the same parents). Feed single bucks and does 3 to 6 ounces of feed each day. Rabbits need to be fed only once a day and they should be fed in the evening if possible.

14. Maintain accurate breeding and health records on all rabbits.

15. Tattoo all breeding rabbits for identification. A tattoo is a means of marking rabbits and other animals for identification. Rabbits are tattooed in the ear.

16. Plan for and maintain a strict herd-health program.

17. Dispose of sick and dead rabbits promptly.

18. Market rabbits as soon as they reach market size or weight.

Honeybees

History and domestication. Honeybees have been a part of history for at least 15,000 years. Cavemen drew pictures on cave walls of bees and of collecting honey. Honey is a thick, sweet substance made by bees from the nectar of flowers. In Egypt, mummies were embalmed and stored in a liquid based on honey. Jars of honey have been found in many of the Egyptian tombs.

The Bible makes many references to honey and the use of honey for food. During biblical times, honey was not produce in nice, neat combs as it is today. Rather, in most cases the hive was destroyed in the process of removing the honey and comb. A hive is a home for honeybees. Comb is the wax foundation in which bees store honey.

Greek and Romans were very familiar with honeybees and honey. Pompey used poisoned honey to defeat his enemies in at least one engagement. Aristotle wrote about bees and their production of honey in great detail.

Most early civilizations considered honey to be the food of gods. Athletes competing in Olympic games often ate honey before their events in order to gain extra strength and endurance.

Early beekeepers kept their bees in hollow logs, straw hives, or even in crude clay cylinders. All of these containers had to be destroyed in order to remove the honey.

With the invention in the 1850s of movable combs with wax foundations to

encourage the bees to make neat, straight honeycomb, the whole beekeeping industry changed and honey was finally a commodity to be enjoyed by nearly everyone. Soon after the development of movable comb, the discovery that honey could be whirled out of the comb led to the invention of the honey extractor. It was no longer necessary to destroy the comb in order to get to the honey. The comb, after having been emptied of honey, could now be placed back in the hive to be refilled by the bees.

Today, the production of honey in the US is large and profitable business. Far more important than the production of honey is the work that honeybees do in the pollination of crops that are important to agriscience.

Economic importance

It is very difficult to accurately gauge the true economic importance of the honeybee. It is responsible for about 80% of insect pollination of plants. Without honeybees, many of the crops important to agriscience would simply disappear from Earth.

Pollination of orchard crops such as citrus, peaches, and apples by honeybees is so important that many beekeepers rent their bees to orchardists when their trees are in bloom. With \$10 to \$30 in rent per hive, and flatbed trailers to move hives, commercial beekeepers make more money from bee rental than from honey. Such beekeepers operate from Florida to Maine and from Texas to Washington State.

There are about 300,000 beekeepers in the US, of which about 99% are hobby or part-time beekeepers. These 300,000 people care for about 6 million hives of bees. In a normal year, a hive of bees will produce 100 to 150 lbs. of honey in excess of the approximately 150 lbs. needed for the bees to live on. At \$1.50 to \$2.00 per pound of honey retail, it is easy to see that the production of honey is big business.

Approved practices for beekeeping include the following list:

1. Check local regulations before starting a beekeeping operation.
2. Locate hives out of direct contact with people and neighbor's yards and gardens. It is desirable to locate hives so the bees must fly straight up upon leaving the hive.
3. Place hives facing away from prevailing winds.
4. They should also be protected from hot summer sun. Thoroughly clean and disinfect hives before allowing new groups of bees to use them.
5. Purchase bees from reputable sources. It is usually far more profitable to purchase 3lb. packages of bees with a purebred queen than to rely on swarms to populate new beehives. A swarm is a group of bees with a queen that leaves an overcrowded hive to find a new home.
6. Replace queens every 2 years. A queen bee is the only fertile, egg-laying female in each hive.

7. Have your bees inspected by a federal bee inspector each year for contagious diseases.

8. Make sure that each hive of bees has a store of at least 75 lbs. of honey for the winter. Hives that do not have enough surplus honey stored for winter should be fed a sugar-water mixture to supplement their own honey stores.

9. Always be sure that bees have ample room to store the honey being produced.

10. Remove surplus honey as soon as the bees have capped it over with wax.

11. Remove honey in the evening or at night when nearly all the bees are in the hive. Supers containing surplus honey can be freed from bees by blowing cool smoke over the bees and brushing them off the comb with a bee brush. You can also use a bee excluder between the honey to be removed and the hive body. A super is a box filled with a movable foundation that is used by the bees to store honey.

12. After moving the hive, put a deflector in the entrance of the hive so the bees will notice that they have been moved. Hives must be moved at least 5 miles to prevent bees from returning to the former site of their hive.

13. Inspect beehives at least monthly to determine the strength of the hive and the queen. Be sure to observe the number of eggs being laid by the queen. Also note whether the worker bees are building drone or queen cells in the hive. Drone and queen cells look like peanuts. Such cells should be destroyed. Worker bees are undeveloped females and constitute all of the working force of the hive. Drones are males whose only purpose in life is to fertilize the queen once in her life.

14. Reduce or prevent swarming of bees by providing ample hive space for the bees and eliminating queen cells as they are found. Overcrowding often causes bees to develop a second queen. New queens will attract a group of worker bees and leave the hive to start a new colony. This process is called swarming. Bees will not swarm without a queen because she is their only hope of survival.

15. Be aware of pesticides being used in the area that could kill bees or be stored in the honey being produced.

16. Secure the proper equipment before starting an apiary. An apiary is an area for the keeping of beehives.

17. Keep honey that has been removed from bees in an area that bees cannot get to. Otherwise, they will steal all of the honey in a short time.

18. Extract honey from the comb as soon as possible after harvesting it. Honey stores for long periods of time in the comb may granulate, which makes it impossible to extract.

19. Develop a market for your honey.

Raising small animals provides the opportunity for persons with limited capital and facilities to get a start in animal agriscience. Most small animals are better adapted to production in urban and suburban areas than are larger animals. The same experiences in planning for, caring for, managing, and marketing can be learned with small animal enterprises without the large outlay of cash needed for the production of large animals.

STUDENT'S TASKS

1. Define the "Terms to know".
2. Make a bulletin board display of breeds and types of poultry and rabbits.
3. Attend a fair or show and record the names of the breeds of poultry and rabbits shown there.
4. Interview a local beekeeper about beekeeping practices in your area.
5. Compare the label from a bag of poultry feed with one from a bag of rabbit feed. Determine the differences in ingredients, percentage of protein, additives, and fiber.
6. Set up an observation beehive in the college.
7. Make a list of local crops of importance to agriscience that bees pollinate.
8. Develop a crossword puzzle or word search using the "Terms to know".

PART III

Professional communication

Публичное выступление

Начало лекции, выступления, сообщения, рассказа

In my paper I want to high light ...	В своем докладе я хочу осветить ...
The subject of my lecture (talk) is ...	Тема моей лекции (моего выступления) ...
I'm going to be talking about ...	Я собираюсь рассказать (поговорить) о ...
Let me to begin with ...	Позвольте мне начать с ...
My introduction is going to be very little.	Мое выступление будет очень кратким.
I'll give you one or two sentences.	Я изложу его вам в одном-двух предложениях.

Подчеркивание важного, привлечение внимания аудитории

It should be said that ...	Следует сказать, что ...
It is interesting to note that ...	Интересно отметить, что ...
That's one thing I'd like to stress very heavily ...	На одну вещь мне хотелось бы обратить особое внимание ...
I want to reinforce the following ...	Я хочу подчеркнуть следующее ...
The following is terribly informable (terribly well/ badly needed).	Следующее мне представляется необычайно важным (информативно полезным, необходимым).
I want to call (to draw/ to invite) your attention to ...	Хочу привлечь (обратить/ направить) ваше внимание к (на) ...
It should be kept in mind that ...	Следует помнить, что (не следует забывать, что) ...
First(ly) .../ Second(ly) ...	Во-первых, во-вторых ...
Third(ly) .../ Fourth(ly) ...	В-третьих, в-четвертых ...

Переход от одной мысли к другой

Now I come to ...	Теперь я перехожу к ...
I'm coming on now to speak about ...	А теперь я перехожу к рассказу о ...
Now we may pass to the next item (on the agenda).	Теперь мы можем перейти к следующему пункту (в повестке дня).

Here we can say ...
We may pass these details.

Ту мы можем сказать ...
Мы можем опустить эти детали.

Выражение личного мнения о высказываемом

I don't believe ...

Я не думаю ... Я не считаю ...

In my opinion ...

По моему мнению ...

In my view ...

На мой взгляд ...

What I say (am saying) is that ...

Как я считаю (по-моему) ...

I dare say ...

Осмелюсь утверждать, что ...

I am far from thinking (asserting) that ...

Я далек от того, чтобы думать
(утверждать), что ...

It's no exaggeration to say that ...

Не будет преувеличением сказать, что ...

I'm sorry that ...

К сожалению, я должен сказать, что ...

Сообщение об известных истинах, фактах

They say that/ It's said that ...

Говорят, что ...

It is generally said that ...

Обычно утверждают, что ...

It goes without saying that ...

Само собой, разумеется, что ...

We need hardly mention that ...

Вряд ли нужно упоминать, что ...

Осуществление обратной связи с аудиторией

Any other points?

Будут другие мнения?

Is that clear?

Это ясно (понятно)?

Have I made my point clear?

Я выразился (достаточно) ясно?

If there's anything you don't understand,
please ask me.

Если вам что-то не ясно, пожалуйста,
спрашивайте.

Как избежать категоричности в своих высказываниях

As far as I know ...

Насколько мне известно ...

If I'm not mistaken ...

Если я не ошибаюсь ...

If my memory serves me well ...

Если мне не изменяет память ...

As far as I remember ...

Насколько я помню ...

Пояснение и дополнение к сказанному

I mean to say that ...

Эти я хочу сказать, что ...

In other words ...

Другими (иными) словами ...

That is to say ...

Иначе говоря ...

To all this must be added that ...

Ко всему этому следует добавить, что ...

As I have already mentioned ...

Как я уже упомянул ...

I have forgotten to say that ...	Я забыл(а) сказать, что ...
The following (fact) speaks for itself.	Следующее говорит само за себя (не требует комментариев).

Завершение выступления и выводы из сказанного

We've told a lot today.	Мы сегодня достаточно много обсудили (говорили).
In conclusion ...	В заключении ...
The last part of my talk will be devoted to ...	Последняя часть моего сообщения будет посвящена ...
Now I'm going to sum up what has been said.	А теперь я резюмирую все сказанное.
Summing up all that has been said ...	Суммируя все, что было сказано ...
Hence, it follows that ...	Из этого следует, что ...
This brings us to the conclusion that ...	Это позволяет нам сделать вывод о том, что ...
I thank the audience for your kind attention.	Благодарю присутствующих за понимание.

Диалог, беседа, разговор

Как начать разговор с незнакомым человеком

Please, tell me (something/ a little) about ...	Пожалуйста, расскажите мне (что-нибудь, немного) о ...
Would you tell me about ...	Не могли бы вы рассказать мне о ...

Как согласиться на разговор, если вас попросили об этом

With (great) pleasure.	С (большим) удовольствием
Willingly./ Happily.	Охотно.
Certainly./ Sure.	Конечно. Разумеется.

Как начать разговор со знакомым человеком

Can you tell me anything about ...	Можешь (можете) рассказать мне что-нибудь о ...
What do you know about ...	Что ты знаешь (вы знаете) о ...

Как выразить неуверенность

Am I right in thinking that ...	Я правильно думаю, что ... (А это верно, что ...)
---------------------------------	---

Как выразить согласие со сказанным

Yea (indeed).	Да, в самом деле.
Yes, you are right.	Да, вы правы.
I think you're right.	Я думаю, вы правы.
I think so too.	Я тоже так думаю.
That's my opinion too.	И я того же мнения.
Certainly./ Sure.	Конечно. Несомненно.
I (certainly/ quite) agree (with you).	Я (конечно/ вполне) согласен с вами (тобой).
I have nothing to say to this.	Мне нечего на это возразить.
I have my doubts about that.	У меня на этот счет свои сомнения.
Are you sure?	А ты (вы) уверена(а,ы)?

Как частично согласиться со сказанным

That may be true, but ...	Возможно это и так, но ...
I can share your point of view only up to a certain point.	Я могу разделить вашу точку зрения лишь частично.
I agree with you in a sense, but ...	Я согласен с вами в некотором смысле, но ...

Как выразить сомнение по поводу сказанного

(Is it) really?	Разве это так? (Это правда?)
I doubt it.	Я сомневаюсь в этом.
I don't think so.	Я так не думаю.

Как возразить, или не согласиться со сказанным

I think you are mistaken.	Я думаю, что вы ошибаетесь.
I'm afraid I don't agree/	Боюсь, вы не правы.
I disagree.	Боюсь, что я не согласен.
I don't agree (with you).	Я не согласен.
You're wrong.	Вы не правы.
It (That) can't be true.	Этого не может быть.
I really can't believe you/that.	Я просто не могу в это (вам) поверить.
I find that hard to believe.	Я считаю, что в это трудно поверить.

Как отреагировать на непонятное

Sorry, what did you say?	Простите, что вы сказали?
Would you mind saying that again?	Вы не возражаете (не против) повторить это?

Could you say that again (please)?

Не могли бы вы сказать это снова (пожалуйста)?

I didn't (quite) catch what you said.

Я не (совсем) уловил то, что вы сказали.

Как убедить сомневающегося собеседника

There's no doubt about it.

В этом нет сомнения.

I'm absolutely positive (quite certain/quite sure/convinced) about this.

Я абсолютно (совершенно) уверена (убеждена) в этом.

Что говорить, когда вы не можете подыскать ответ на вопрос собеседника

Well! Um... I'm glad you asked me that.

Ну! М-м ... Вы так обрадовали меня своим вопросом.

What do you think?

А что вы думаете?

I can't help you (there).

Не могу вам помочь (в этом).

I must confess I don't know.

Должен признаться, что я не знаю.

I've no idea.

Понятия не имею.

I'd like to know something about ...

Хотелось бы узнать что-нибудь о ...

Ваше согласие на предложение собеседника

Let's. / I don't mind.

Давай(те). / Я не против.

O. K./ Good./ Excellent!

Ладно. Хорошо. Отлично!

It's a very good idea.

Хорошая мысль.

I think that's wise.

Я думаю, что это разумно.

Agreed.

Согласен.

Как изменить тему разговора

It would be better to discuss ...

Было бы лучше обсудить ...

I'd rather discuss ... (this problem, that is ...)

Я бы предпочел обсудить ... (такую проблему, как ...)

Как спросить о том, что непонятно

What kind of ... is this (are these)?

Что это ...?

What is ..., I wonder?

Интересно, что это?

Если ваше объяснение не удовлетворило собеседника

What is this, then?

Что же это тогда?

What do you think it is?

Как вы думаете, что же это такое?

Вам хочется сообщить собеседнику о чем-либо

I'm going to talk (to tell you) about ...	Я собираюсь говорить (рассказать) о ...
Just a few words about ...	Только пара слов о ...
Here are a few words about ...	Вот немного информации о ...

Вспомнили что-то важное, что было упущено в разговоре

Oh! I (we/you) haven't mentioned ...	О! Я (мы, вы) упустил ...
I (we/you) haven't discussed ...	Я (мы, вы) не обсудили ...

Как поблагодарить собеседника за то, что он сообщил

I see, thank you (very much).	Понятно, большое спасибо.
That was very kind of you.	Это было очень мило с вашей стороны.
How (very) kind of you.	Вы так любезны!
Thank you very much indeed.	Большое-пребольшое спасибо.
I don't know how to thank you.	Не знаю, как вас и благодарить.
I'm very grateful (to you).	Я вам очень признателен.
Thanks (very) much.	Большое спасибо.

ЛИТЕРАТУРА

1. Карпова Т.А. Английский для колледжей: учеб. пособие. М.: Кнорус, 2019. 280 с.
2. Кузьменкова Ю.Б. Английский язык: учеб. и практикум для СПО. М.: Юрайт, 2019. 441 с.
3. Маньковская З.В. Английский язык: учеб. пособие. М.: ИНФРА-М, 2022. 200 с.
4. Вся грамматика английского языка с упражнениями. М.: ООО «Издательство Астрель», ООО «Издательство АСТ», 2000. 512 с.
5. English-Russian Environmental Glossary. EPA Contact Wa-6-99-2679-B. Informatics Inc., Rockville, Maryland, USA.

Учебное издание

Зуйкова О. А.

**Иностранный язык
в профессиональной деятельности**

учебное пособие

Специальность 36.02.01 Ветеринария

Редактор Лебедева Е.М.

Подписано к печати 09.04.2024 г. Формат 60x84 1/16.
Бумага печатная. Усл. п. л. 3,66. Тираж 25 экз. Изд. № 7662.

Издательство Брянского государственного аграрного университета
243365 Брянская обл., Выгоничский район, с. Кокино, Брянский ГАУ