

HANOI UNIVERSITY OF AGRICULTURE
FACULTY OF EDUCATION & FOREIGN LANGUAGES
DEPARTMENT OF LANGUAGE SKILLS



ENGLISH IN
VETERINARY SCIENCE

Lời nói đầu

Bài giảng “English in Veterinary Science” được tổ chức biên soạn nhằm đáp ứng yêu cầu đổi mới nội dung chương trình đào tạo của trường Đại học Nông Nghiệp Hà Nội trong giai đoạn hiện nay. Bài giảng này được hoàn thành với hy vọng phần nào đáp ứng nhu cầu về tài liệu nghiên cứu và giảng dạy cho giảng viên và sinh viên; giúp sinh viên rèn luyện được kỹ năng đọc hiểu, dịch thuật và cung cấp thêm kiến thức về tiếng Anh chuyên ngành chăn nuôi thú y.

Bài giảng do các giảng viên tiếng Anh thuộc bộ môn Thực hành tiếng, khoa Sư phạm & Ngoại ngữ biên soạn. Đây là kết quả của quá trình lao động nghiêm túc, các tác giả đã cố gắng hoàn thành bài giảng với nội dung và kết cấu hợp lý và phù hợp với quy trình đào tạo chuyên ngành Chăn nuôi thú y tại trường Đại học Nông Nghiệp Hà Nội. Tuy nhiên, đây là lần biên soạn đầu tiên nên bài giảng không tránh khỏi thiếu sót. Chúng tôi rất mong muốn nhận được nhiều ý kiến đóng góp chân thành của các đồng nghiệp, các bạn sinh viên để bài giảng được hoàn thiện hơn ở lần biên soạn sau.

Chúng tôi cũng chân thành cảm ơn các giảng viên trong và ngoài nhà trường đã có những ý kiến đóng góp quý báu cũng như đã cung cấp nguồn tư liệu phong phú để nâng cao chất lượng của bài giảng này.

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UNIT 1: ORGANS AND ORGAN SYSTEMS

Organs and organ systems. The body of any animal consists of several organ systems, each specialized by structure and function to perform some essential physiological processes such as *digestion, circulation, respiration*, etc. Those systems are integrated to work *harmoniously* with each other. Each system is composed of several organs, **which** individually perform some parts of the general function; in the digestive system, the mouth is for food taking, the stomach is for storage and digestion and so on. An organ is formed of several layers or parts known as tissues, and each tissue is composed of many microscopic cells, usually of like kind. The wall of the stomach contains four principle tissue layers; including digestive and gland cells, muscle cells, connective tissues, and the others. The ultimate living substance in the cells is called protoplasm.

Body covering. In higher animals the body covering is a skin, or integument consisting of an outer epidermis over an underlying derma that contains blood vessels, nerves and pigment. The land vertebrates have a stratified epidermis of several cells layers. The outmost layer becomes hardened or cornified, as a more resistant covering and is continually renewed by growth of new layers from the base of epidermis.

On reptiles, birds and mammals the cornified part is dry and tougher the better to resist wear in dry environments. Birds are covered by feathers; **those** are dry, non-living cornified products that insulate the body, provide streamlined exterior contours of bodily form, and make the broad surfaces of wings and tails used for flight.

The skin of animals is covered by hairs, another type of cornified epidermal product, also serving for insulation. Both feather and hair are replaced by moult of the old and growth of new coverings.

Only the birds and mammals with **their** heat-conserving body covering are “warm-blooded”, with regulated body temperatures are essentially at those of the environments in which they live.

Evaporation of the watery perspiration secreted by the sweat glands helps to regulate the body temperature in hot environments.

Other cornified epidermal products include the horn of the cattle and sheep, the claws, nails, hoofs and horny pads on the foot of various vertebrates, the beak and shank coverings on birds. Cornified materials are all highly insoluble proteins that are quite resistant to wear and chemical disintegration.

I. Technical vocabulary and expressions

<i>Words and phrases</i>	<i>Phonetics</i>	<i>Explanation</i>	<i>Meaning</i>
physiology (n)	/fizi'ɔlədʒi/	science of the normal function of living things, esp animals	Sinh lý học
digest (v)	/dai'dʒest/	(of food) change, be changed in the stomach	Tiêu hoá
digestion (n)	/dai'dʒestʃən/	Digesting	Sự tiêu hoá
circulation (n)	/səkju:'leɪfn/	movement of the blood around the body	Sự tuần hoàn

respiration (n)	/ˈrespəˈreɪʃn/	the act of breathing	Sự hô hấp
integrate (v)	/ɪntəɡreɪt/	to make into a whole by bringing all parts together; unify	Hợp thành một thể thống nhất
harmonious (adv)	/hɑːˈmouəsli/	arranged together in a pleasing way so that each part goes well with the other.	Hài hoà
Moult (n)	/məʊlt/	(of birds) lose (feathers) before a new growth	Sự rụng lông
perform (v)	/pəˈfɔːm/	to do sth such as a piece of work, task or duty	Thực hiện
storage (n)	/ˈstoːrɪdʒ/	the process of keeping sth in a particular place until it is needed.	Sự dự trữ
contain (v)	/kənˈteɪn/	have or hold within itself	Chứa đựng
layer(n)	/ˈleɪə/	A quantity or thickness of sth that lies over a surface or between surfaces	Lớp
connective (adj)	/ˈkənektɪv/	serving as a link or binding	Liên kết
Gland (n)	/ɡˈlænd/	organ that separates from the blood substances that are to be used by or expelled from the body.	Tuyến
integument (n)	/ɪntəˈɡjuːmənt/	(usu natural) outer covering	Màng
cornified (adj)	/ˈkɔːnɪfaɪd/	converted into horny tissue	Bị sừng hoá biểu bì
epidermis (n)	/ˈepɪdəmɪs/	the outer layer of skin, consisting of a layer of dead cells	Biểu bì
Tissue (n)	/ˈtɪʃjuː/	A mass of cells that form the different parts of humans, animals and plants.	Mô
muscle (n)		A piece of the body tissue that you tighten and relax in order to move a particular parts of the body.	Cơ
Derma (n)	/dəmə/		bì, da
resistant (adj)	/rɪˈzɪstənt/	not affected by sth; able to resist sth	Bền
Reptile(n)	/ˈreptail/	cold-blooded, egg-laying animal that creeps or crawls such as a snake, lizard..	Động vật bò sát
Tough(adj)	/tʌf/	not easily cut, broken, torn...	Bền, cứng

feather(n)	/'feðə/	one of the light coverings that grow from bird's skin	Lông vũ
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II. Grammar:

1. The Active Voice and The passive voice.

The Active voice

Subject + verb + object

(p2)

-They house 80 animals in the same barn.
 -People move pigs into groups to control infectious diseases.

The Passive voice

Subject + verb (to be) + past participle

-80 animals **are housed** in the same barn.
 -Pigs **are moved** into groups to control diseases.

Note that **The passive voice** is used when it is not necessary to mention the doer of the action (or when it is not so important who or what does/did the action) as we are more interested in what is/was done.

Examples:

- An organ **is formed** of several layers or parts known as tissues.
- Both feathers and hairs **are replaced** periodically by the moult of the old and growth of the new coverings.
- If stocking rate **is doubled**, the ventilation rate should **be increased** tenfold.

2. Relative Clauses (introduced by **which/ that**).

A clause is a part of a sentence. A **relative clause** tells us which person or thing (or what kind of person or thing) the speaker means. A clause of this kind is essential to the clear understanding of the noun preceding it.

In the sentence:

-Sensory function is affected through specialized receptors **that (which) convert environmental stimuli into electrical impulses**.

'that (which) convert environmental stimuli into electrical impulses' is the **relative clause**. If we omit this, it is not clear what receptors we are talking about.

Examples:

- The feathers are non-living cornified products **which (that) insulate the body**.
- Cornified materials are all highly insoluble proteins **that (which) are quite resistant to wear**.
- One of several factors contributing to their development is feeding of finely ground food **which (that) induces increased secretion and increased mixing of the gastric content**.

Note that sometimes we can omit **which** or **that** if it is the object of a verb:

- The number of animals **which (that) we place in the same space** significantly affects the incidence of diseases.
 Or: -The number of animals **we place in the same air space** significantly affects the incidence of diseases.
- Bulky food **which (that) we feed animals in large portions** will distend their stomach.
 Or: -Bulky food **we feed animals in large portions** will distend their stomach.

Sometimes you can use a comma before or after the relative clause (introduced by **which**) if the noun is definite already.

Examples:

-Pasteurella mulloida, which is a common inhabitant of the pig's nasal flora, is extremely difficult to eradicate and can be found in most high-health herds.

-Piglets sucking from sows in a conventional farm environment usually acquire a gastric population of lactobacilli, which produces lactic acid and inhibits the multiplication of other bacteria by lowering the pH.

III. Reading tasks

A. Decide if the following statements are true or false

1. Each organ system in the body of any animal has its own structure and function to perform some essential physiological processes such as *digestion, circulation, respiration*, etc.
2. The Epidermis is the thick outer layer of skin
3. Tissue is a collection of similar cells that group together to perform a specialized function.
4. The skin of animals helps to insulate the body
5. Warm-blooded creatures keep the inside of their bodies at a constant temperature

B. Comprehension Questions

1. What does the body of an animal consist of?
2. What is an organ system composed of?
3. What is an organ formed of?
4. What does the skin or integument in higher animals consist of?
5. What is the ultimate living substance in the cells?
6. How are the feathers covering on birds and hairs covering on animals replaced?
7. Are the birds and mammals 'warm-blooded'?
8. Are the cornified products resistant to wear?

C. Add words or phrases from the text to complete the following argument

1. The skin of animals is covered by hairs, another type of cornified epidermal products that serve for insulation
2. Cornified materials are all highly insoluble proteins that
3. Each organ system is composed of several organs which
4. In higher animals the body covering is a skin, or integument which consists of an outer epidermis
5. An organ is formed of several layers or parts that are composed of many microscopic cells

D. Contextual reference

1. In paragraph 1, **which** refers to:
 - (a) Each system
 - (b) Several organs
2. In paragraph 3, **those** refers to:
 - (a). dry environments
 - (b). birds
 - (c). feathers
3. In paragraph 5, **their** refers to:

- (a). birds only
- (b). mammals only
- (c). both birds and mammals

IV. Use of English

Task 1: Match a word (line X in the text) with its appropriate definition.

- | | |
|-----------------------------|--|
| 1. consist (v) –line 1 | a. have or hold within its self |
| 2. vertebrate (n) –line 11 | b. animals, birds etc. having a backbone |
| 3. storage (v) –line 5 | c. make up, be made up of |
| 4. compose (v) –line 6 | d. bring in, as part of the whole |
| 5. contain (v) –line 7 | e. space used for, place where something is kept |
| 6. include (v) –line 8 | f. offering resistant |
| 7. resistant (adj) –line 13 | g. be made of |
| 8. insulate (v) –line 15 | h. cover or separate (sth) with non-conducting materials to prevent |
| 9. product (n) –line 15 | to prevent the loss of heat. |
| | i. something produced (by nature or by man) |
| 10. mammal (n) –line 14 | k. any of the class of animals which feed their young with milk from |
| | the breast. |

Task 2. Fill in each blank with the right form of a suitable word in task 1.

1. This atlas contains fifty maps.....six of North America.
2. Wethe houses so that they'll be warm in winter and cool in summer.
3. The committeeten members.
4. Our party was.of teachers, pupils and their parents.
5. We must put our furniture in.....
6. Insects have becometo DDT.
7. Whisky.....large percentage of alcohol.
8. We've got a lot of farm
9. Cats, dogs and pigs are
10. Land have two pairs of limbs.

Task 3: Complete the following text by filling in the blank spaces with the expressions given below

epidermis	Layers	organization	beneath
dermis	Cells	above	systems

Organs are the next level of (1)..... in the body. An organ is a structure that contains at least two different types of tissue functioning together for a common purpose. There are many different organs in the body: the liver, kidneys, heart, even your skin is an organ. In fact, the skin is the largest organ in the human body and provides us with an excellent example for explanation purposes. The skin is composed of three (2).....: the epidermis, dermis and

subcutaneous layer. The (3)..... consists of epithelial tissue in which the cells are tightly packed together providing a barrier between the inside of the body and the outside world. The dermis contains blood vessels that nourish skin cells. It contains nerve tissue that provides feeling in the skin. And it contains muscle tissue that is responsible for giving you 'goosebumps' when you get cold or frightened. The subcutaneous layer is (4)..... the dermis and consists mainly of a type of connective tissue called adipose tissue.

V. Grammar exercises

Task 1: *Make one sentence from two using which/ that:*

1. The body covering of a higher animal is a skin or integument. It consists of an outer epidermis over an underlying derma.
2. An organ is formed of several layers or parts known as tissues. They are composed of many microscopic cells, usually of like kind.
3. Feather covering birds insulate the body which are.....; provide streamlined exterior contours of bodily form. They are dry, non-living cornified products.
4. The small intestine is a slender elongated, usually coiled tube. It is subdivided into duodenum, jejunum and ileum.
5. Herbivorous mammals chew their food thoroughly before it is swallowed. They subsist upon plant materials.

Task 2: *Sentence transformation*

1. Several layers or parts known as tissues form an organ.
An organ
2. Feathers that are dry, non-living cornified products cover birds.
Birds
3. The pectoral and pelvic girdles support limbs of land vertebrates.
Limbs of land vertebrates.....
4. Several authors have reviewed the management techniques that result in decreased pneumonia.
The management techniques that result in decreased pneumonia.....
5. Respiratory problems are difficult to control if we house more than 200-300 animals in the same barn.
Respiratory problems are difficult to control if

Task 3: *Turn the following sentences into passive or vice versa:*

1. Biodiversity is often used as a measure of the health of biological systems.
2. Biologists most often define "biological diversity" or "biodiversity" as the "totality of genes, species, and ecosystems of a region".
3. In the year 2006 large numbers of the Earth's species were formally classified as rare or endangered or threatened species;
4. People derive a significant proportion of drugs, directly or indirectly, from biological sources.
5. Scientists have subdivided anatomy into gross anatomy (or macroscopic anatomy) and microscopic anatomy.
6. Human anatomy can be taught regionally or systemically.
7. Physiology has traditionally been divided between plant physiology and animal physiology
8. We can classify animals based on their similarities.

VI. Extra Challenge:

1. Translate the text in Reading Comprehension into Vietnamese.
2. Write a reflection on what you have learned:
 - What did you learn from it?
 - What part of the unit you like best?
 - What was difficult for you?
 - What do you want to improve?
3. Match the skin structure with its function.

Structure	Function
A. Epidermis	a. Insulation
B. Hair erector muscle	b. Water proofing
C. Fat cells	c. Protection from sun's rays
D. Sebaceous gland	d. Heat retention
E. Dermis	e. Heat loss
F. Melanin	f. Protection from infection
G. Hair	g. Makes hairs stand on end
H. Sweat gland	h. Secretes oily substance to coat hairs
I. Blood capillaries in the dermis	i. Makes skin tough
J. Keratin	k. Constrict or dilate to control heat loss

4. Match the tissue type with the function.

Tissue type	Function
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a. Connective Tissue	A. Communicating
b. Muscle Tissue	B. Supporting & communicating
c. Epithelial Tissue	C. Contracting
d. Nervous Tissue	D. Covering and lining

5. Which is the thinnest layer
 - A. the dermis
 - B. the epidermis
6. The inner layer of the skin is
 - A. the dermis
 - B. the epidermis
 - C. fat layer
7. Sense organs for touch, pressure, pain and temperature are found in the:
 - A. epidermis
 - B. subcutaneous fat layers
 - C. dermis?
8. Which of the following is NOT a function of the skin?
 - A. holding in the organs
 - B. temperature regulation
 - C. protection
 - D. water proofing
 - E. sensing stimuli
 - F. excretion of waste products

VII. Optional Reading

Introduction to Veterinary Science

Veterinary medicine is the branch of science that deals with the application of medical, surgical, dental, diagnostic and therapeutic principles to pet, domestic, wildlife and livestock animals.

Veterinary science is vital to the study and protection of animal production practices, herd health and monitoring the spread of disease. It requires the acquisition and application of scientific knowledge in multiple disciplines and uses technical skills directed at disease prevention in both domestic and wild animals.

The field of **veterinary medicine** is a highly competitive yet under employed field of medicine. Today's veterinarians are doctors who are highly educated to protect both the health of animals and humans. The skills of highly qualified veterinarians are in constant demand and job opportunities within this field are endless. In order to be considered a qualified veterinarian there are many preparations to complete, the road is long and treacherous, and the competition is steep. Additionally, the career continues to change in dynamic, from income trends to gender distribution, these changes impact the field as a whole.

UNIT 2: THE DIGESTIVE SYSTEM

The food utilized by animals for life and growth are obtained by eating plants and other animals. Cattle, deer, rodents, etc. that eat leaves and stems of plants are said to be herbivorous; cats, shanks and many other animals **whose** food is entirely or largely other animals are termed carnivorous; and those such as man, bears, rats and others that utilize a variety of plant and animal sources are called mixed feeders, or omnivorous. The digestive system in various animals differs in general form, structure details, and physiological processes according to the nature of the food, the manner of life, and other factors.

The digestive system of almost every vertebrate has the following essential parts:

- * The mouth and mouth cavity, commonly with teeth to grasp, tear or chew food, and a tongue that may help in capturing, grinding and swallowing food. The cavity also contains salivary glands to lubricate the food.

- * The pharynx, which has no digestive function.

- * The esophagus, which is an elastic tube carrying food past the region of heart and lungs.

- * The stomach, which is an enlarge sac or pouch where food is stored and digestion begins.

- * The small intestine, which is subdivided into duodenum, jejunum and ileum, is a slender elongated, usually coiled tube, which is the principal region for digestion and absorption of food.

- * The large intestine, consisting of the caecum, colon and rectum, completes absorption and undigested residues are formed into masses or faeces, for expulsion through.

- * The anus is at the end of the trunk.

The two large digestive glands, the liver and pancreas, joined by ducts to the small intestine, are present in all vertebrates. The teeth are differentiated into special types for shearing, crushing or grinding according to food habits.

Food and digestion. The plant and animal foods taken by animals consist of protoplasm, which is made up of proteins, carbohydrates, and fats, together with vitamins and water. The water and inorganic salt can be absorbed from the digestive tract without change, but protoplasmic materials must be altered before **they** can be utilized. Many animals use food that must be reduced physically before chemical digestion can proceed effectively. **This** is accomplished by teeth in mouth. Some flesh eaters bold down their food entire or in large pieces and its physical reduction is accomplished by muscular action in the stomach. Herbivorous mammals that subsist upon plant materials chew their food thoroughly before it is swallowed.

I. Technical vocabulary and expressions

carnivorous (adj)	/ka:'nivɔrəs/	Flesh eating animal	Ăn thịt (động vật)
herbivorous (adj)	/hə'bivərəs/	(of animals)feeding on grass or other field plants	Ăn cỏ (động vật)
omnivorous (adj)	/om'nivərəs/	(of animals) eating all kinds of food	Ăn tạp (động vật)
manner (n)	/'mænə/	Way in which a thing is done or happens as if knowing how to do with a situation, custom ...from birth, natural fitted	Cách, lối, tập quán
Vertebrate (n)	/'vɛtibrət/	(animal, bird etc.) having a	Động vật có xương

		backbone	sống
cavity (n)	/'kæviti/	empty space, small hole within a solid body, e.g. Nasal cavity	Lỗ hổng, khoang ổ
lubricate (v)	/'lju:brikeit/	do something that make action, etc. easier	Làm trơn, bôi trơn
esophagus (v)	/i'sɔfəgəs/	passage from the pharynx to the stomach	Thực quản
pharynx (n)	/'færŋks/	cavity(with the muscles etc. that enclose it) at the back of the mouth, where the passage to the nose, mouth and larynx begin	Hầu, họng
intestine (n)	/in'testin/	lower part of the food canal from below stomach to the anus	Ruột
reduce (v)	/re'dju:s/	make less, make smaller in size, number, degree etc.	Biến đổi, làm nhỏ
residue (n)	/rezi'dju:/	that which remains after a part is taken, or used	Bã, phần còn lại
flesh (n)	/fleʃ/	soft substance, esp. muscle, between the skin and bones of animals	Thịt
subsist (v)	/sʌb'sist/	Exist, be kept in existence	Sống, tồn tại

II. Grammar:

1. The participles

a. The present participle (P1)

+ Form: the infinitive + ing e.g. *working, cleaning, eating*

+ Use: 1- To form the continuous tenses

Examples:

-She is **feeding** the chickens.

-The investigator has **been examining** the piglets for an hour.

2 - The present participle (P1) can sometimes replace a relative pronoun + verb

Examples:

-The skin of animals is covered by hairs, another type of cornified products (**which serve for insulation**) **serving for insulation**).

- The large intestine **consisting of the caecum, colon and rectum** completes the absorption.

(that consists)

-The esophagus is an elastic tube **carrying** food past the region of the heart and lungs.
(that carries)

b- The past participle (P2)

+ Form: - The past participle of regular verbs is formed by adding **ed** or **d** to the infinitive, e.g. *worked, loved, watched*.

-The past participle of irregular verbs: e.g. *given, brought, written*

+Use: 1-As an adjective:

a *stratified* epidermis *cornified* parts *specialized* receptors

2-To form the perfect tenses:

Examples:

-*The investigator has examined all the pigs' feet .*

-*Those animals have eaten a lot of the stems of that plant.*

3- After a noun or a pronoun to replace a relative pronoun + a passive verb:

Examples:

-*The plant and animal foods **taken** (which are taken) by animals consist of protoplasm.*

-*Evaporation of the watery perspiration **secreted** (that is secreted) by the sweat glands helps to regulate the body temperature in hot environments.*

-*Sensory neurons have cell bodies **located** (that are located) in the cranial or spinal ganglia and specialized receptors at the end of their terminal axons.*

2- Relative clauses (introduced by whose):

Please remember that **whose** is the only possible form.

Examples:

-*Cats, sharks and many other animals **whose** food is entirely or largely other animals are termed carnivorous.*

-*Those **whose** food is a variety of both plants and animals are called mixed feeders.*

III. Reading tasks

A. Decide if the following statements are true or false

1. The pharynx belongs to the digestive system but has no digestive function.
2. The esophagus helps carry food through the region of heart and lungs.
3. The liver and pancreas also have digestive function but are not considered as parts of digestive systems.
4. The digestive system in various animals differs in general form, structure details but not physiological processes.
5. All animals chew their food thoroughly before chemical digestion can proceed effectively.

B. Comprehension Questions

1. What do herbivorous animals eat?
2. What do carnivorous animals eat?
3. What do omnivorous animals eat?
4. What are the parts of the digestive system?
5. What is the small intestine subdivided into?
6. What does the large intestine consist of?
7. What are the two large digestive glands in all vertebrates?
8. Can protoplasm materials absorbed from the digestive tract without change?

C. Add words or phrases from the text to complete the following argument

1. Carnivorous animals eat
2. The teeth are used for.....
3. Food is stored in
4. Liver and pancreas are joined by ducts to.....
5. The principal region for digestion and absorption of food is.....

D. Contextual reference

1. In paragraph 1, the word **whose** refers to:
 - (a). herbivorous
 - (b). carnivorous
 - (c). omnivorous
2. In the last paragraph, the word **they** refers to:
 - (a). The water and inorganic salt
 - (b). The digestive tract
 - (c). Protoplasmic materials
3. In the last paragraph, the word **this** refers to:
 - (a). Physically reduced food
 - (b). The chemical digestion
 - (c). The tooth in mouth

IV. Use of English

Task 1: Match a word (line X in the text) with its appropriate definition.

- | | |
|------------------------|--|
| 1. utilize (v) line 1 | a. work (food etc.) about between teeth in order to crush it |
| 2. obtain (v) line 1 | b. collect and keep for future use |
| 3. grasp (v) line 8 | c. get, secure for oneself |
| 4. tear (v) line 8 | d. make use of, find a use for |
| 5. chew (v) line 8 | e. seize firmly with the hands (teeth) |
| 6. absorb (v) line 8 | f. pull sharply apart or to piece |
| 7. sac (n) line 13 | g. take or suck in (e.g. a liquid) |
| 8. stomach (n) line 13 | h. bag- like membrane enclosing a cavity in an animal or plant |
| 9. cavity (n) line 9 | i. a bag in which food passes to be digested |
| 10. store (v) line 13 | k. empty space, small hole |

Task 2: Fill in each blank with the right form of a suitable word in task 1.

1. Where can Ithe book?
2. Paper thatink is called blotting-paper.
3.a sheet of paper into small pieces.
4. He isa rope in his hands.
5.your food well before you swallow it.
6. Mixed feedersa variety of both plant and animal sources.
7. It is unwise to swim on a full
8. Do all squirrelsup food for the winter?
9. There is a smallin the tooth.
10. Animals haveor pouch to store their food.

Task 3: Complete the following text by filling in the blank spaces with the expressions given below

includes	food	reduce	water
consists	stomach	which	where
small intestine	maximize	esophagus	rabbits

The basic mammalian digestive system (1)..... of the oral cavity (mouth), the esophagus, the stomach, the small intestines, the caecum, the large intestines and the rectum. The mouth functions in obtaining (2).....and beginning the mechanical and chemical breakdown of the food. The (3).....is in essence a tube directing the food bolus from the mouth to the stomach. The stomach takes various forms in mammals and may actually consist of several chambers although there is only a single chamber in rabbits (this is known as being mono-gastric). The (4).....is a major site of chemical and mechanical breakdown of food in many mammals. The stomach releases its contents in pulses to the small intestine where pancreatic juices are added to further (5).....the food. Absorption of nutrients and water also begins in the small intestine. At the end of the small intestine (6).....it intersects with the large intestine is a sac like structure known as the caecum that houses bacteria. It is relatively small and of little importance in humans but large and very significant in the rabbit. Absorption is completed by the large intestine and the remaining material is held in the rectum until its release as fecal material.

V. Grammar exercises:

Task 1: Make one sentence from two using relative pronouns.

- 1.Cattle, deer, rodents etc. are said to be herbivorous. Their food is leaves and stems of plants. (whose)
- 2.Those such as man, bears, rats and others are termed carnivorous. Their food is a variety of both plant and animal sources. (whose)
- 3.The esophagus carries food past the region of the heart and lungs. It is an elastic tube (which/that)
- 4.The sternum completes the skeleton of the thorax ventrally. It is a median segmented bone. (which/ that)
- 5.The vertebral column extends from the skull to the end of the tail. It consists of a chain of unpaired irregular bones. (which/ that)

Task 2. Sentence transformation

- 1.Neurons are very large cells *consisting* of cell body, dendrites (receivers of information), and axons (transmitters of information).

Neurons are very large cells.....

- 2.The ribs are arranged in pairs *corresponding* in number to the thoracic wall.

The ribs are arranged in pairs.....

- 3.The two large digestive glands, the liver and pancreas, *joined* by ducts to the small intestine are present in all vertebrates.

The two large digestive glands, the liver and pancreas.....

- 4.The segments of the cord *involved* in these reflexes in the pig are not known.

The segments of the c.....

- 5.Irritative lesions of the sensory cortex *associated* with sensation of pain are manifested by grinding the teeth and closing the eyes tightly.

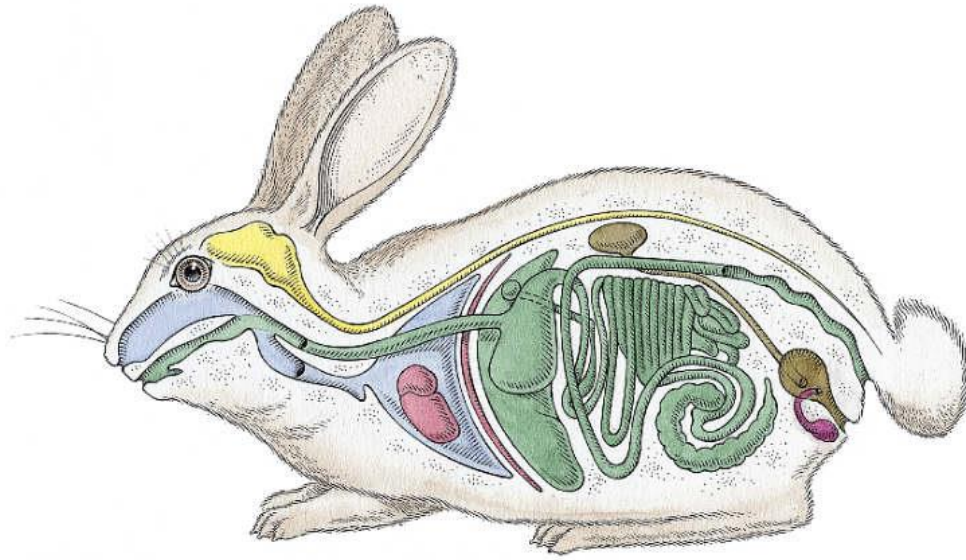
Irritative lesions of the sensory cortex.....

Task 3: *Combine the following sentences using the relative pronouns:*

1. Practising agriculture means selecting a few species of plants or animals that are useful or edible, and modifying their environment to provide them nutrients/food, water and air, so that they grow in the best conditions.
2. There are many non-material benefits that are obtained from natural ecosystem processes. These include spiritual and aesthetic values, knowledge systems and the value of education.
3. Biodiversity provides many ecosystem services. These services are often not readily visible.
4. A genetically modified organism (GMO) is an organism. Its genetic material has been altered using the genetic engineering techniques generally known as recombinant DNA technology.
5. Anatomy should not be confused with anatomical pathology (also called morbid anatomy or histopathology). Anatomical pathology is the study of the gross and microscopic appearances of diseased organs.
6. Ibn al-Nafis (1213-1288) was a well-known physician. He was the first physician to correctly describe the anatomy of the heart, the structure of the lungs, and the relationship between the lungs and the aeration of the blood.
7. There are millions or more animal species in the world. More than 98% of them are invertebrates.
8. Anatomy is the branch of biology. It deals with the structure and organization of living things.
9. There are thousands of plant species that can be used for food. Only few of them are of major economic importance.
10. In India, there will soon be only 30-50 rice varieties covering a large area. In the area 30,000 rice varieties once flourished.

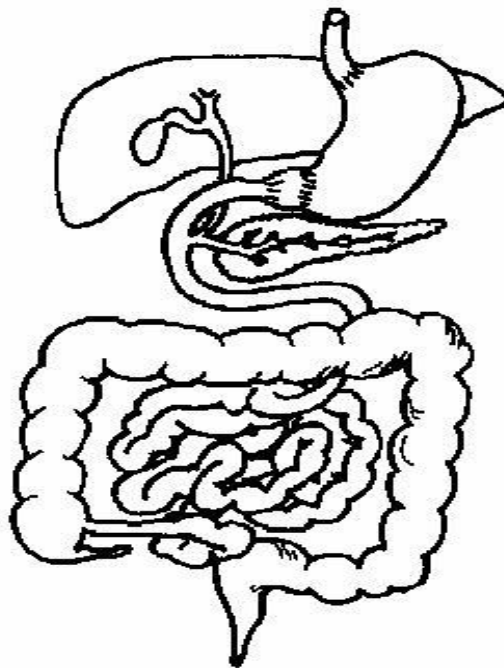
VI. Extra Challenge:

1. Translate the text in Reading Comprehension into Vietnamese.
2. Write a reflection on what you have learned:
 - What did you learn from it?
 - What was difficult for you?
 - What do you want to improve?
3. Identify organ of the rabbit's digestive system



4. Add the following labels to the diagram of a mammal's gut below.

pancreas; caecum; stomach; rectum; gall bladder
pyloric sphincter; small intestine; colon; liver; oesophagus; bile duct



5. Match the region of the digestive system in the list below with the correct function.

A. Rectum, B. Pancreas, C. Functional caecum, D. Pharynx, E. Stomach, F. Gall bladder, G. Colon, H. Tongue, I. Liver, J. Small intestine, K. Oesophagus, L. Salivary glands, M. Pyloric sphincter, N. Rumen

Region/ organ	Function
	Produces the enzymes to digest proteins, fats and carbohydrates in the small intestine. Also produces the hormone insulin
	Organ that mixes food in the mouth and makes swallowing happen
	Micro-organisms digest cellulose in this modified part of the stomach
	Produce saliva containing salivary amylase
	Carries the food from the mouth to the stomach
	Stores bile
	This muscle controls the passage of food out of the stomach
	Both food and air pass along this
	Indigestible matter held here before defecation
	Produces bile
	A bag made of muscle where food is held. Gastric juice and hydrochloric acid are added here.
	Where food is mixed with bile and digestion of proteins, fats and carbohydrates takes place
	Water and salt are absorbed here
	Where micro-organisms digest fibre in rabbits and horses

6. True or False?

- a) Carnivores eat meat, herbivores eat plants and omnivores eat both. T / F
- b) These are all herbivores: cows, horses, goats, giraffes, rabbits and guinea pigs. T / F
- c) Plant material has high food value and animals need to eat only a little to get all the nutrients they need. T / F
- d) Herbivores have well developed teeth for crushing and grinding plant cell walls. T / F
- e) Herbivores have glands that produce enzymes to digest plant material. T / F
- f) The rumen holds micro-organisms that digest cellulose. T / F

7. Match the terms in the list below with the descriptions in the table

Canines, Diastema, Dentine, Incisors, Open rooted, Enamel, Molars, Premolars, Carnassial teeth, Dental formula

Term	Description
	Hardest substance in the body; covers the tooth
	Found under the enamel of the tooth
	Chisel-shaped teeth at the front of the mouth

	The way in which the number of the different kinds of teeth of mammals can be expressed
	A space in the mouth of rodents and herbivores where the canines would normally be.
	These teeth keep growing through the life of the animal. (E.g. in rodents).
	These teeth are used for grinding food.
	These teeth are also used for grinding food.
	Long cone shaped teeth, well developed in carnivores, form tusks in male pigs (boars).
	These teeth are found in carnivores. They are formed from premolars and molars and are used for shearing flesh

8. Some of these are functions of the liver: (Circle seven)

- Making bile
- Producing heat
- Storing bile
- Making digestive enzymes
- Storing vitamin A
- Making insulin
- Storing glycogen
- Storing copper
- Storing iron
- Removing toxic molecules like alcohol from the blood
- Making blood proteins

9. Arrange the following parts of the digestive system in the order in which food passes through on the way from the mouth to the anus.

A. pharynx, B. pyloric sphincter, C. rectum, D. stomach
E.caecum, F. small intestine, G. colon, H. oesophagus

m	.....	.....	.....	.....	.....	.....	.....	.....	a
ou	.....	.....	.....	.....	.....	.....	.....	.....	n
th	....	....	....	....	....	....	....	....	u
									s

VII. Optional Reading

Branches of Anatomy

Anatomy (from the Greek *ἀνατομία anatomia*, from *ἀνατέμνειν anatemnein*, to cut up, cut open), is the branch of biology that deals with the structure and organization of living things. It can be divided into animal anatomy (zootomy) and plant anatomy (phytonomy). **Furthermore**, anatomy can be covered either regionally or systemically, that is, studying anatomy by bodily regions such as the head and chest for **the former**, or studying by specific systems. For **the latter**, the major body systems include circulatory system, digestive system, endocrine system, excretory system, immune system, integumentary system, lymphatic system, muscular system, nervous system, reproductive system, respiratory system, skeletal system.

Major branches of anatomy include comparative anatomy, histology, and human anatomy. Animal anatomy may include the study of the structure of different animals, when it is called comparative anatomy or animal morphology, or it may be limited to one animal only, in which case it is spoken of as *special anatomy*. Pathological anatomy (or *morbid anatomy*) is the study of diseased organs, while sections of normal anatomy, applied to various purposes, receive special names such as medical, surgical, gynaecological, artistic and superficial anatomy. The comparison of the anatomy of different racess of humans is part of the science of physical anthropology or anthropological anatomy.

Discussion

Discuss the importance of anatomy in animal and veterinary sciences. Use some of the language and grammar you have learned in this lesson. The following questions may help you get started.

UNIT 3: THE SKELETAL SYSTEM

The firm framework or skeleton gives physical support and protection for the body and often provides surfaces for the attachment of muscles. Parts of the skeleton form limbs that serve as levers in locomotion. There is a close mutual relation of structure and function between the skeletal parts and muscles, whereby their interaction is more efficient.

Although there are many differences in the size and form of component parts and in the presence or absence of certain elements, the essential features in the land vertebrates are the same. The skeleton supports the body, provides for attachment of muscles, and houses the brain and nerve tube. The skeleton consists of cartilage in the embryos of all higher vertebrates, but in the adults it is largely of bones with cartilage over joint surfaces and a few other places. The skeletal parts increase gradually in size by growth at the ends or margins.

The first skeletal element to appear is a slender unsegmented and gelatinous rod, the notochord, which extends the body axis between the digestive system and the nerve cord. **It** is later surrounded and supplanted by the “back bone”, or spinal column, of separate vertebrae. On the centrum of each vertebra is a dorsal neural arch to enclose the nerve tube. The centrum bears a pair of transverse processes as points of attachment for the ribs. At the either end of the centrum are two articular processes by which the vertebra may turn sideways on those directly before and behind.

The vertebral column is the fundamental part of the skeleton. It consists of a chain of unpaired irregular bones, which extends from the skull to the end of the tail. The column is subdivided into five regions, which are named according to the parts of the body in which the vertebrae are situated. Thus the vertebrae are designated as cervical, thoracic, lumbar, sacral, and caudal. The number in vertebrae in given species is fairly constant in each region except the last. The caudal vertebrae are reduced in man and birds.

The ribs are elongated curved bones that form the skeleton of the lateral thoracic wall. **They** are arranged in pairs that correspond in number to the thoracic vertebrae. The sternum or breastbone is a median segmented bone that completes the skeleton of the thorax ventrally.

Land vertebrates have two pairs of limbs and these are supported by the pectoral and pelvic girdles. Each limb ends in five toes or digits. The component bones of the girdles and limbs are homologous in different vertebrates, although variously modified in adaptation to special modes of life. Reduction in number of the toes occurred in many mammals, the horse being an extreme case, with only one function toe on each foot.

The term skull is usually understood to include all the bones of the head. The head consists of the cranium and the face, and it is therefore convenient to divide the bones into cranial and facial groups. The cranial bones enclose the brain with **its** membranes and vessels and the essential organs of hearing. They join with the facial bones in forming the orbital and nasal cavities, in which the peripheral organs of sight and of smell are situated.

The facial bones form the skeleton of the oral and nasal cavities, and also support the pharynx, the larynx, and the root of the tongue. Most of the bones of the skull are flat bones. Only two form permanent movable joints with other parts of the skull. The other bones form immovable sutures, most of which disappear with age.

I. Technical vocabulary and expressions

skeleton (n)	/s'keletən/	long-framework of an animal body	Bộ xương
muscle (n)	/mʌskl/	(band or bundle of) elastic substance in an animal body that can be tightened or loosened to produce movement	Cơ, bắp thịt
Surface (n)	/'səfis/	the outside of any object	Bề mặt
attach (v)	/ə'tætʃ/	fasten or join (one thing to another)	Gắn, dán
attachment (n)	/ə'tætʃmənt/	act of attaching	Sự gắn, sự dán
brain (n)	/brein/	(in a man or animals) the mass of soft grey matter in the head, center of the nervous system	Não
component (adj)	/kəm'pounənt/	helping to form (a complete thing)	Hợp thành, cấu thành
Interact (v)	/intə'ækt/	act on each other	Tác động qua lại
interaction (n)	/int'ækjən/		Sự tác động qua lại
cartilage (n)	/'ka:tilidʒ/	(structure, part, of) tough, white tissue attached to the joints, in animal bodies	Sụn
nerve cord (n)	/nə:v kɔ:d/	fiber or bundle of fibers carrying feelings and impulses between the brain and all parts of the body	Dây thần kinh
vertebra (n)	/'vətibrə/	any of the segments of the backbone	Đốt sống
dorsal (adj)	/'dɔ:səl/	of, on, near the back	(thuộc) lưng

II. Grammar:

1. **though/ although** and **in spite of** (preposition phrase), **despite** (preposition)

Two opposing or contrasting statements, such as *The pig is not a very cooperative subject for neurologic examination* and *this aspect of diagnosis should not be neglected*, could be combined as follows:

*-The pig is not a very cooperative subject for neurologic examination **but** this aspect of diagnosis should not be neglected.*

*-The pig is not a very cooperative subject for neurologic examination ; **however** this aspect of diagnosis should not be neglected.*

*-The pig is not a very cooperative subject for neurologic examination; **nevertheless** this aspect of diagnosis should not be neglected.*

With **though** and **although**:

-Although (Though) the pig is not a very cooperative subject for neurologic examination, this aspect of diagnosis should not be neglected.

*-This aspect of diagnosis should not be neglected **though (although)** the pig is not a very cooperative subject for neurologic examination.*

Please read some more examples:

*-Both vertical and horizontal transmission probably occurs **although** this has not been proven.*

*-External sources of the organism include mice and other rodents **although** chickens and chicken manure have also been postulated.*

-Although there are many differences in the size and form of component parts or in the presence or absence of certain elements, the essential features in the land vertebrates are the same. (This sentence is in the text.)

Note that **though** and **although** requires *subject + verb*

We can sometimes use **in spite of/ despite** + *noun/ pronoun/ gerund/ in spite of the fact that* instead of **though/ although** + *subject + verb*

Examples:

-In spite of (Despite) many differences in the size and form of component parts or in the presence or absence of certain elements, the essential features in the land vertebrates are the same.

-In spite of (Despite) being a part the digestive system, the pharynx has no digestive function.

-In spite of (Despite) having been investigated for many years, leg weakness represents no more than the broad concept of lameness.

2. It + to be + infinitive (*It*: unreal subject, *Infinitive*: real subject)

It is convenient to divide the bones of the head into cranial and facial groups. (in the text)

Unreal S

Real S

Or you can say: *The bones of the head are convenient to divide into cranial and facial groups.*

It is necessary to know the relative size or weight of each lobe.

Or you can say: *Knowing the relative size or weight of each lobe is necessary.*

III. Reading tasks

A. Decide if the following statements are true or false

1. The notochord, which extends the body axis between the digestive system and the nerve cord, is later replaced by the “back bone”, or spinal column.
2. The vertebral column of all animals is subdivided into five regions, which are named according to the parts of the body in which the vertebrae are situated.
3. The ribs, which are elongated curved bones, are often arranged in pairs that correspond in number to the thoracic vertebrae.
4. The cranial bones join with the facial bones in holding the essential organs of hearing.
5. Most of the bones of the skull disappear with age.

B. Comprehension questions

1. What are the functions of the skeleton?
2. What does the skeleton consist of?
3. How do the skeletal parts increase?

4. Is the first skeletal element to appear segmented?
5. What is the notochord later surrounded and supplanted by?
6. How many regions is the column subdivided into?
7. How many limbs does a land vertebrate have?
8. What does the head consist of?

C. Add words or phrases from the text to complete the following argument

1. The vertebrae are designated into five regions as:
2. The is a median segmented bone that completes the skeleton of the thorax ventrally.
3. In many mammals, occurred in adaptation to special modes of life; for example, the horse has only one function toe on each foot.
4. The bones of the head are subdivided into two groups: the and the
5. Most of the bones of the skull are bones.

D. Contextual reference

1. In paragraph 3, the word **It** refers to:
 - (a). The notochord
 - (b). The digestive system
 - (c). The nerve cord
 - (d). The spinal column
2. In paragraph 5, the word **They** refers to:
 - (a). The ribs or the elongated curved bones
 - (b). The lateral thoracic wall.
 - (c). The thoracic vertebrae.
3. In paragraph 7, the word **its** refers to:
 - (a). The cranial bones
 - (b). The brain
 - (c). The essential organs of hearing.

IV. Use of English

Task 1: Match a word (line X in the text) with its appropriate definition.

- | | |
|-------------------------|--|
| 1. skeleton (n) –line 1 | a. fasten or join (one thing to another) |
| 2. attach (v) –line 2 | b. bony - framework of an animal body |

- | | |
|----------------------------|---|
| 3. muscle (n) –line 2 | c. (band or bundle of) elastic substance in an animal body |
| 4. feature (n) –line 6 | d. make or become greater in size , number.... |
| 5. increase (v) –line 9 | e. one of the named part of the face/ body |
| 6. separate (v) –line 13 | f. divided, not joined or united |
| 7. designate (v) – line 20 | g. going on all the time, unchanging |
| 8. constant (adj) –line 21 | h. give a name or title to |
| 9. reduce (v) –line 21 | i. make smaller in size, number, degree.... |
| 10. permanent – line 36 | k. not expected to change, going on for long time |

Task 2: Fill in each blank with the right form of a suitable word in task 1:

-labels to the luggage.
- Her eyes are her best.....
- The.....houses the brain and nerve tube.
- When you walk you exercise your leg.....
- The population hasby 200.000 to 50.000.000.
- Cut it into threeparts.
- They have..... the boundaries.
- He remains his.....complaints.
- You are driving too fast. You mustspeed.
- I would like to know his.....address.

Task 3: Complete the following text by filling in the blank spaces with the expressions given below

combined	within	protection	conservation
divided	among	constructed	bone
worked	external	internal	skeleton

Skeletons can be (1).....into two main types based on the relative position of the skeletal tissues. When these tissues are located (2).....to the soft parts, the animal is said to have an exoskeleton. If they occur deep (3).....the body, they form an endoskeleton. All vertebrate animals possess an endoskeleton, but most also have components that are exoskeletal in origin. Invertebrate skeletons, however, show far more variation in position, morphology, and materials used to construct them. The vertebrate endoskeleton is usually (4).....of bone and cartilage; only certain fishes have skeletons that lack bone. In addition to an endoskeleton, many species possess distinct exoskeletal structures made of bone or horny materials. This dermal skeleton provides support and (5)..... at the body surface. Various structural components make up the human skeleton, including collagen, three different types of cartilage (hyaline, fibrocartilage, and elastic), and a variety of (6).....types (woven, lamellar, trabecular, and plexiform). The vertebrate skeleton consists of the axial

skeleton (skull, vertebral column, and associated structures) and the appendicular skeleton (limbs or appendages). The basic plan for vertebrates is similar, although large variations occur in relation to functional demands placed on the skeleton.

V. Grammar exercises

Task 1: *Make one sentence from two using the words in brackets.*

1. The pharynx is the part of the digestive system. It has no digestive function. (Though)
2. Leg weakness has been investigated for many years. It represents no more than the broad concept of lameness. (Although)
3. The animals are protected against infection. They may still easily develop clinical disease. (In spite of)
4. The pig is not very cooperative subject for neurologic examination. This aspect of diagnosis should not be neglected. (In spite of the fact that)
5. Most reports suggest that swine die within 72 – 96 hours following development of clinical signs. There is indication of a wide variation in the incubation period. (Though)

Task 2: *Sentence transformation*

1. It is necessary to keep animals warm in cold weather.
Keeping.....
2. It is important to recognize that neurons are very large cells consisting of cell body, dendrites, and long axons.
That neurons.....
3. It is convenient and important to distinguish between neurogenic myopathies, which are secondary, and the primary myopathies.
To distinguish.....
4. Blood activity is easy and inexpensive to measure.
It is.....

Task 3: *Complete the following sentences with **in spite of/ despite or though/ although***

1.almost all warm-blooded animals are susceptible, it is not well defined that long held concepts of the fatal termination of the disease in humans is so for all species.
2.the ancient history of the disease, many aspects of rabies are not clearly understood.
3.food is mixed in the stomach, layers of distinct pH and specific enzymatic conditions are maintained.
4. The capacity of the colon in adult pigs is similar to the intestine.....being only 25 % of its length.
5. Differences in environmental and managemental conditions explain why the incidence of clinical disease may be low in some herds and high in others.....the herds are exposed to the same microorganisms

VI. Extra Challenge:

1. Translate the text in Reading Comprehension into Vietnamese.
2. Write a reflection on what you have learned:

- What did you learn from it?
 - What part of the unit you like best?
 - What was difficult for you?
 - What do you want to improve?
3. Identify parts of the cow's skeleton

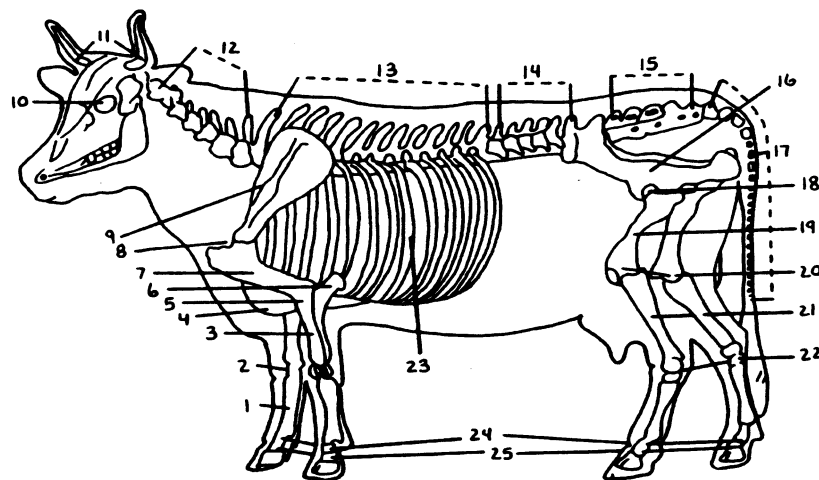
1. Cannon
2. Shoulder joint
3. Knee joint
4. Shoulder blade
5. Radius
6. Sternum
7. Elbow joint
8. Cervical vertebrae
9. Ulna
10. Dorsal vertebrae
11. Humerus
12. Lumbar vertebrae
13. Knee joint

14. Sacrum
15. Tibia
16. Hip Bone
17. Hock joint
18. Caudal vertebrae
19. Ribs
20. Hip Joint
21. Pasterns
22. Femur
23. Coronar
24. Eye socket
- 25.

Horn

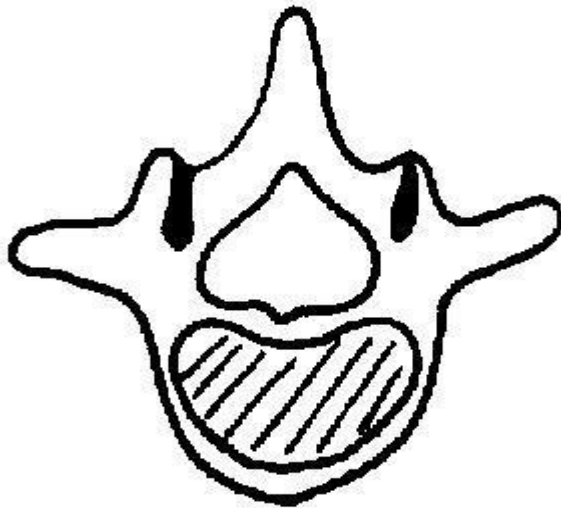
cones

Skeleton of a Cow



4. Add the following labels to the diagram of the vertebra shown below:

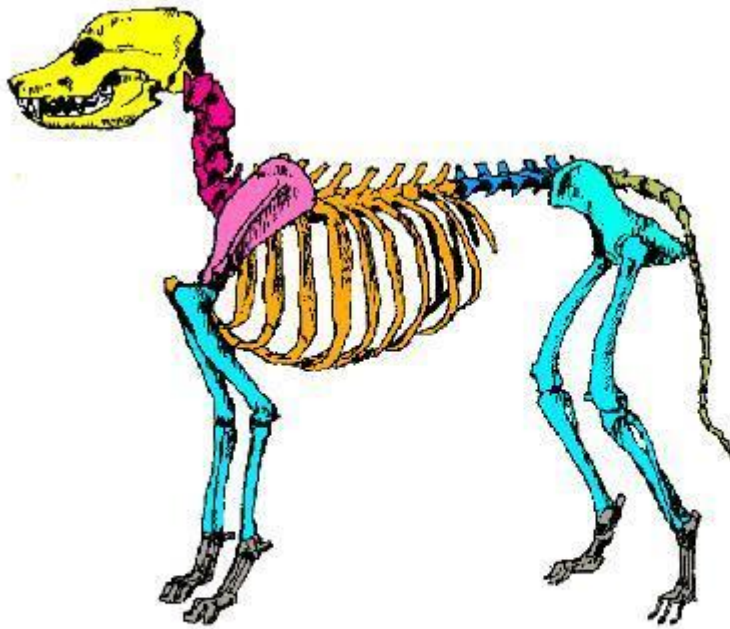
- a) Spinous process
- b) Transverse process
- c) Body of vertebra
- d) Neural (central) canal



5. Add the following labels to the diagram of the dog skeleton shown below:

- a) Atlas vertebra
- b) Cervical vertebrae
- c) Lumbar vertebrae
- d) Sacrum
- e) Thoracic vertebrae
- f) Scapula
- g) Mandible
- h) Tibia
- i) Fibula
- j) Femur
- k) Carpals
- l) Metacarpals
- m) Tarsals
- n) Metatarsals

- o) Hip bone or pelvis
- p) Humerus
- q) Radius
- r) Ulna
- s) Ribs
- t) Sternum



6. Cross out the statement(s) that are NOT true.

The skeleton:

- supports and protects the organs of the body
- provides a means of locomotion
- grows throughout the life of the animal
- helps keep the level of calcium ions in the body constant
- develops from the cartilage laid down in the fetus

7. True or False. If false indicate the correct answer.

- The elbow joint is a synovial joint
- The patella is a compact bone
- The joints in the skull are fixed (immovable joints)

- Unguligrade locomotion is walking on the toenails or hoofs
- Flexion means increasing the angle between two bones
- The joint between the axis and the atlas is a hinge joint
- The articular surface of a joint is covered with spongy bone
- Ligaments join two bones together at a joint
- Plantigrade locomotion is walking on the digits only.
- The hip joint is a hinge joint.

VII. Optional reading:

Animal Physiology

Physiology (in Greek *physis* = nature and *logos* = word) is the study of the mechanical, physical, and biochemical functions of living organisms.

Physiology has traditionally been divided into plant physiology and animal physiology but the principles of physiology are universal, no matter what particular organism is being studied. For example, what is learned about the physiology of yeast cells can also apply to human cells.

Animal physiology is the study of how animals' bodies function in their environment. An understanding of the physiological problems animals face and how they solve those problems can be achieved only in an **evolutionary context**. Knowledge of certain aspects of the natural history, morphology, behavior, and environment of an animal is necessary to fully appreciate the importance of its physiological mechanisms.

The study of animal physiology includes topics such as: gas exchange, feeding and digestion, circulation, metabolic rate, water and solute regulation, temperature regulation, excretion of wastes, and movement. The comparative approach can help us to develop a general evolutionary framework in which to address physiological problems. By comparing how different animals solve related problems in various environments, we can begin to gain insight into physiological principles that apply across levels of organisms and environments.

Discussion

Discuss the importance of the study of animal physiology in animal and veterinary sciences. Use some of the language and grammar you have learned in this lesson. The following questions may help you get started.

- What is physiology?
- What is animal physiology?
- What are the main topics of the study of animal physiology?

UNIT 4: THE EXCRETORY SYSTEM

Excretion is usually defined as the process of ridding the wastes of the body resulting from metabolism.

The protoplasm and fluids of an animal comprise a delicately balanced physiological system, and it is the function of excretion to maintain this constant internal environment. Excess water, salts, or organic materials, including metabolic wastes are excreted, whereas substances essential for normal function are conserved. As the excreted materials are usually in solution, excretion is essentially a process of selective filtering.

The principal excretory organs in every vertebrate are two kidneys. The adult kidneys of birds and mammals drain wastes only from blood. From each kidney, a common excretory duct, or urethra, discharges to the exterior. The interrelated excretory and reproductive system of vertebrates is commonly called the urogenital system.

Wastes from the body are brought in the blood stream by the arteries to the arterioles. Proteins – free fluid passes from the arterioles of the kidneys into the renal tubules; then certain materials are returned by selective re-absorption from the tubules to the surrounding capillaries and join the blood stream to leave in the renal veins.

The fluid urine comprises water, various salts, urea and other organic wastes. Urea and sulphates are greatly concerned in the urine, whereas useful constituents such as glucose are conserved in the body. The excretion or retention of water depends upon the states of hydration of the body as a whole; an excess is quickly excreted, but **less** with a deficient intake. An excess of sodium chloride in the diet is soon excreted, but if the intake is scant or if much is being lost in perspiration, the kidney conserves the remainder and little enters the urine. The kidney deals selectively with a great variety of materials.

Normal kidney function is essential to health, and any irregularity or disease in the kidneys is serious. Certain salt may crystallize to form “kidney stones” in the pelvis of the kidneys and sometimes require removed surgery.

Other excretory organs. Air expired from the lungs contains water vapour, carbon dioxide, and small amounts of excretory wastes. The sweat glands of the skin give off water, salts, and some organic wastes. The liver forms urea, which is excreted by kidneys. **It** also produces the pigment derived from the hemoglobin with the death of the red cells; **this** colours the bile and is passed into the intestine to be eliminated by the faeces. The liver also disposes of certain drugs and metallic poisons.

I. Technical vocabulary and expressions

excrete (v)	/eks'kri:t/	(of an animal or plant) discharge from the system, e.g. waste matter, seat	Bài tiết, thải ra
discharge (v)	/dis'tʃa:dʒ/	give or send out (liquid, urine...)	Tuôn ra, chảy ra
conserve (v)	/'kənsə:v/	keep from change, loss or destruction	Gìn giữ, duy trì
filter (v)	/'filtə/	(cause to) flow through	Lọc
kidney (n)	/'kidni/	one of a pair of organs in the abdomen that separate wastes liquid (urine) from the blood	Thận

drain (v)	/drein/	(away/ off) (cause to) run or flow away	Dẫn, dẫn lưu
duct (n)	/dʌkt/	tube or canal through which liquid is conveyed, esp. in the body	Ống dẫn, ống mật
renal (adj)	/'rinəl/	of or in the (region of the) kidneys	(thuộc) thận
tubule (n)	/tju: bju:l/	small tube	Ống nhỏ
absorb (v)	/əb'sɔb/	take or suck in, e.g. liquid, food, heat, light	Hấp thu
concentrate(v)	/kən'sentreit/	bring or come together at one point	Tập trung
deficient (adj)	/di'fɪʃn/	not having enough of	Thiếu hụt
irregular (adj) irregularity (n)	/i'regju:lə/	contrary to rules, to what is normal	Không theo quy luật
eliminate (v)	/eli'mineit/	take or put away (because unwanted)	Vứt bỏ, khử đi

II. Grammar

As meaning when/ while or because/ since

1. As (reason):

As often means **because/ since**

Please read the following sentences:

-As (=Because/ Since) the excreted materials are usually in solution, excretion is essentially a process of selective filtering. (This sentence is in the text.)

-As (=Because/ Since) bone and growth cartilages are dynamic tissues, they are subject to the effects of various deficiencies and insults throughout the life of the pig.

2. As (time): two things happening together

You can use **as** when two things happen at the same time or over the same period of time:

-As (=When) the ribs are raised, the thoracic space is thus enlarged.

-As (=While) transported into the large intestine, partly digested or undigested ingesta will contribute to osmotic diarrhea.

III. Reading tasks

A. Decide if the following statements are true or false

1. Through the process of excretion, all water, salts, or organic materials absorbed by the body, including metabolic wastes are excreted.
2. The wastes from each kidney are discharged to the exterior through a common excretory duct, or urethra.
3. The excretion or retention of water depends upon the states of hydration of the body as a whole; an excess is quickly excreted, but more with a deficient intake.
4. Normal kidney function is essential to health, but any irregularity or disease in the kidneys is not too serious.
5. The sweat glands of the skin is considered as part of the excretory system because they give off water, salts, and some organic wastes.

B. Comprehension questions

1. How is the excretion defined?
2. What are usually excreted from the body of an animal?

3. What are the principal excretory organs in every vertebrate?
4. What does the fluid urine comprise?
5. How does the kidney deal with a great variety of materials?
6. Is normal kidney function essential to health?
7. What may form 'kidney stones'?
8. What does the liver form?

C. Add words or phrases from the text to complete the following argument

1. The interrelated excretory and reproductive system of vertebrates is commonly called
2. Wastes from the body are brought in the blood stream by to
3. Water, various salts, urea and other organic wastes are all considered as
4. The excretion or retention of water in the body depends upon
5. One function of the sweat glands of the skin is

D. Contextual reference

1. In paragraph 5, the word **less** refers to:
 - (a). the states of hydration of the body
 - (b). the excretion or retention of water
 - (c). the speed of water excretion
2. In the last paragraph, the word **It** refers to:
 - (a). the liver
 - (b). the urea
 - (c). the kidney
3. In the last paragraph, the word **this** refers to:
 - (a). the death of the red cells
 - (b). the urea excretion
 - (c). the pigment derived from the hemoglobin

IV. Use of English

Task 1: Match a word (line X in the text) with its appropriate definition.

- | | |
|-----------------------------|---|
| 1. excrete (v) –line 4 | a. make free |
| 2. rid (v) –line 1 | b. (of an animal or plant) discharge from the system, |
| 3. comprise (v) –line 3 | e.g. waste matter, sweat |
| 4. maintain (v) –line 4 | c. keep up, continue |
| 5. discharge (v) – line 10 | d. (cause to) run or flow away |
| 6. drain (v) –line 9 | e. do business, have relation with |
| 7. conserve (v) –line 16 | f. be composed of, have as parts or members |
| 8. deal (with) (v) –line 20 | g. useless, thrown away because not wanted |
| 9. intestine (n) –line 28 | h. lower part of the food canal from below the |
| stomach to the | |
| 10. waste (n) –line 1 | anus. |
| | i. keep from change or loss. |
| | k. give or send out (liquid, gas, urine...) |

Task 2: Fill in each blank with the right form of a suitable word in task 1.

1. We mustour friendly relation with them.
2. We were glad to be.....of our overcoats.
3. Water will soon.....away.
4. The committeemen of widely different views.
5. The wound is stillpus.
6. The small.....is the principal region for digestion and absorption of food.
7. I've stoppedwith that shop – their prices are too high.
8. We mustour health.
9. An excess water is soon
10. We find no place to leave theseproducts.

Task 3: Complete the following text by filling in the blank spaces with the expressions given below

excretion	liver	organs	more
retention	kidneys	balance	less
removes	expelled	tissues	filter

Excretion by land animals

As in aquatic animals, the excretory system in land animals (1).....nitrogenous waste and helps establish a (2).....between salt and water in the body. Terrestrial animals, however, also run the risk of drying out by evaporation from the body surface and the lungs. The elimination of feces and the (3).....of urine also bring about water loss. Drinking, foods containing large amounts of water, and producing water during cellular respiration help overcome the loss. Animals that produce uric acid need (4).....water than those excreting urine. Flame cells in flatworms, the nephridia in segmented worms, Malpighian tubules in insects, and (5).....in vertebrates are all examples of excretory systems.

The vertebrate excretory system works with circulatory system to remove wastes and water from blood, and convert them to urine. The urine is stored in a urinary bladder before it is expelled from the body. Kidneys are the main (6).....of excretion in vertebrates. Within the kidneys, working units called nephrons take in the liquid portion of the blood, (7).....out impurities, and return necessary substances to the blood stream. The remaining waste-containing portion is converted to urine and (8).....from the body.

V. Grammar exercises:

Task 1: Make one sentence with *as* (time) or *because* (reason).

1. The practice of feeding swine the offal from abattoirs or feeding uncooked garbage is obviously unwise. Such material may contain tuberculous material from beef carcasses.
2. The pressure about the lungs is lessened. Air then passes down the trachea and into the lungs.

3. Microorganisms necessary for fermentative processing of digesta require a highly buffered fluid environment. The colon of a pig is presented with large fluid volumes.
4. The muscles are stimulated. They shortened in length or contract.
5. The viruses are very small. We can't see them with our own eyes.

Task 2: Sentence transformation

Write the second sentence so that it is similar to the first:

1. They should examine all age groups or categories of pigs and their respective environments to determine whether or not there are clinical signs or lesions in them.
All age groups.....
2. We should hold sucking and weaned piglets by the hind legs with the head downward to minimize squealing.
Sucking and.....
3. Swine affected by the disease may be unable to squeal, and elevation of body temperature may be absent.
Swine which.....
4. Piglets sucking from sows in a conventional farm environment usually acquire a gastric population of lactobacilli.
Piglets which.....
5. Rabies virus may enter the host via many routes, but the importance of the oral and respiratory transmission is uncertain.
Though.....

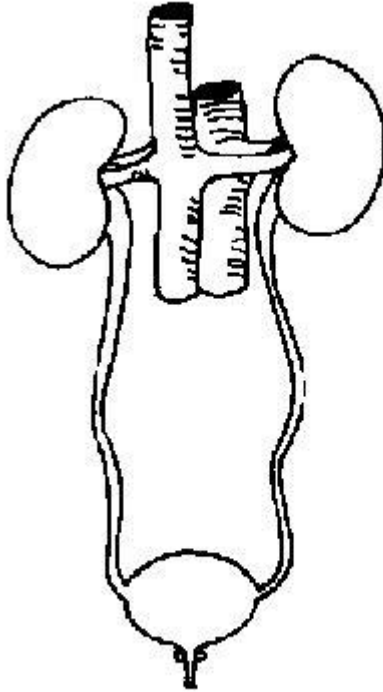
Task 3: Complete the following sentences using *as* (time) or *since* (reason).

1. Few animals survive long without oxygennone is stored in their body.
2.neural control of muscular contraction is impeded, ingesta are not transported from stomach to intestine and the stomach becomes distended.
3. Infectious agents usually cause diarrhea in animals of three weeks or older the colon is functionally developed.
4.normal kidney function is essential to health, any irregularity or disease in the kidney is serious.
5. The articular-epiphyseal cartilage complex becomes thinner.....the epiphysis matures and the epiphyseal growth component becomes redundant.

VI. Extra Challenge:

1. Translate the text in Reading Comprehension into Vietnamese.
2. Write a reflection on what you have learned:
 - What did you learn from it?
 - What part of the unit you like best?
 - What was difficult for you?
 - What do you want to improve?
3. Add the following labels to the diagram below of the urinary system of a mammal.

kidney; bladder; ureters; urethra, renal artery and vein, caudal vena cava, sphincter.



4. These are functions of the kidney: (Circle 4)

- a. breaking down damaged blood cells
- b. controlling the concentration of water in the blood
- c. Removing urea from the blood
- d. Removing carbon dioxide from the blood
- e. Removing glucose from the blood
- f. Keeping the blood at the right pH (acidity/alkalinity)
- g. Digesting food
- h. Controlling the concentration of salts like sodium and potassium chloride in the blood

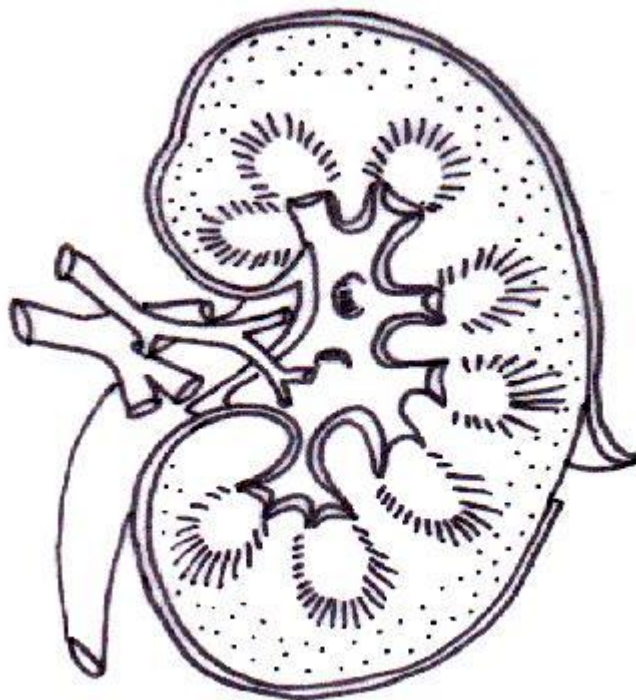
5. Match the organ with the function in the table below.

Kidney; cortex; ureter; bladder; renal vein; urethra; capsule; medulla; renal pelvis; renal artery; sphincter

Organ	Function
	Carries urine from the bladder to the outside of the body

	Carries deoxygenated blood away from the kidney
	The inner region of the kidney
	Muscle that opens to allow urine to be removed from bladder
	The outer region of the kidney
	Carries oxygenated blood to the kidney
	The part of the kidney that collects the urine before it passes down the ureter
	The tough fibrous coat around the kidney
	Stores urine before it is removed from body
	The tube that carries urine away from the kidney
	Converts blood to urine

6. Add the following labels to the diagram of a kidney below. If you like you can also colour in the diagram as indicated. :**capsule- turquoise; renal artery – red; renal vein – blue; cortex - brown; medulla - pink; pelvis - yellow; ureter – green; pyramids - purple**



7. Arrange these parts of the kidney tubule in the order in which the fluid that is being converted into urine passes through them.

collecting duct (CD); loop of Henle (LH); distal convoluted tubule (DCT); glomerulus (G); proximal convoluted tubule (PCT); Bowman's capsule (BC)

8. Match the part of the kidney tubule with its function.

collecting duct; loop of Henle; distal convoluted tubule; glomerulus; proximal convoluted tubule; renal artery; Bowman's capsule; Antidiuretic hormone or ADH.

Part of tubule	Function
	Carries blood to the kidney
	The hormone that is involved in producing concentrated urine
	Cup shaped structure through which the fluid part of the blood is filtered
	Where the majority of water is extracted from the urine
	Looped portion of the tubule. Important for helping concentrate the urine
	Where hydrogen and potassium ions are secreted into the urine
	Glucose, salts, water and amino acids are reabsorbed into the blood capillaries here
	Tuft of capillaries carrying high pressure blood

VII.Optional Reading

The Goals of Biochemistry

Biochemistry is **a science which** seeks to describe the structure, organization, and functions of living matter in molecular terms. What are the chemical structures of the components of living matter? How do the interactions of these components give rise to organized super-molecular structures, cells, multi-cellular tissues, and organisms? How does living matter extract energy from its surroundings in order to remain alive? How does an organism store and transmit the information it needs to grow and to reproduce itself accurately? What chemical changes accompany the reproduction, aging, and death of cells and organisms? How are chemical reactions controlled inside living cells? These are the kinds of questions being asked by biochemists; the research for the answer is the study of the chemistry of life.

Biochemistry can be divided into three principal areas: (1) the structural chemistry of the components of living matter and the relationship of biological function to chemical structure; (2) metabolism, the totality of chemical **reactions that** occur in living matter; and (3) the chemistry of processes and **substances that** store and transmit biological information. The third area is also the province of molecular genetics, a field that seeks to understand heredity and the expression of genetic information in molecular terms.

Biochemistry is an experimental science, and the remarkable recent advances in biochemistry are due in large part to the development of powerful new laboratory techniques.

Biochemistry has had major impacts on medicine, agriculture, nutrition, ecology, and many other facets of life.

Discussion

Discuss the aim of biochemistry and its importance in animal and veterinary sciences. Use some of the language and grammar you have learned in this lesson. The following questions may help you get started.

- What is 'biochemistry'?
- What is the aim of biochemistry?
- What are the common questions being asked by biochemists?
- What are the main areas of biochemistry?

UNIT 5: THE CIRCULATORY SYSTEM

The life processes of an animal require that food and oxygen be available continually for metabolism in its protoplasm and that wastes be removed promptly. The circulatory system serves for internal transport. Its essential parts are: 1/. The blood consisting of fluid plasma and free cells or corpuscles; 2/. The heart, with muscular walls that contracts periodically to pump the blood through the body; and 3/. A system of tubular blood vessels through which the fluid is moved.

The blood. In all vertebrates the blood comprises 1/. Lemon plasma; 2/. White blood cells (leucocytes) and corpuscles, several kinds; and 3/. Red cells (erythrocytes) coloured by hemoglobin, which serve to transport oxygen. The plasma carried dissolved food, wastes, some gases and internal secretions. Human plasma consists about 92% of water, protein, and other organic compounds and about 0.9% of inorganic salts, chiefly sodium chloride.

Each red cell may live 25 to 100 days and make 50,000 or more circuits in the blood stream. Red cells are more numerous in infants and in the persons living in high mountains. Red cells are produced chiefly in the red bone marrow, and an excess supply is often stored in the spleen. Old cells are destroyed chiefly in the spleen.

Several kinds of white cells have their principal activities in the tissues, **those** seen in the blood stream. Many of them can act as phagocytes and protect the body by destroying bacteria that invade wounds. In an acute infection such as appendicitis or pneumonia they increase markedly to battle the infection. The whitest pus of an infected area consists of dead leucocytes, tissue cells, and blood serum.

Lymph consists of blood plasma. **It** contains white cells but no red cells. Lymph diffuses through the wall of capillaries, circulates about the tissues and enters the system of lymph capillaries, which join in larger lymph vessels. Scattered along the system are many lymph nodes. Besides producing lymphocytes, the nodes defend the body from infection.

Heart. The circulatory system in any vertebrates comprises the heart, the blood system of arteries, arterioles, capillaries, veins and the lymphatic system. The heart comprises chambers with slight or heavy muscular walls that receive blood from the veins and pump it through arteries. In birds and mammals the four-chambered heart really consists of two parts, the right side pumping only from the body to the lungs, and left side from the lungs to the body.

The human heart in a quiet adult contracts or beats 72 times per minute, the rate is increased by exercise, emotional excitement, and some diseases. In some small birds and mammals the heart beats about 200 to 400 times per minute. Blood moves from the heart in the series of spurts.

Blood vessels. The heart and vessels are lined throughout with a glassy-smooth endothelium. The walls of the aorta and larger arteries contain heavy layers of elastic and muscle fibres, but the small arterioles are covered by smooth muscle fibres only. The capillary walls where exchanges of nutrients, gases and wastes occur between the blood stream and tissues consist only of endothelium. Veins are thin-walled, with connective tissue fibres but muscles; unlike the arteries **they** collapse when empty. The walls of all blood vessels are elastic; vasomotor nerve fibres control the muscle fibres, causing arterioles to dilate or contract so as to alter the amount of blood passing to any organ.

I. Technical vocabulary and expression

circulate (v)	/'sækju:leit/	Go around continuously, move from place to place freely	Tuần hoàn
circulation (n)	/,sækju:leɪʃn /	circulating or being circulated	Sự tuần hoàn
available (adj)	/ə'veɪləbl/	capable of being used; that may be obtained	Có sẵn để dùng
essential (adj)	/i'senʃəl/	necessary; most important	Cần thiết, chủ yếu
corpuscle (n)	/'kɔ:pʌsl/	one of the red or white cells in the blood	Tiểu cầu
bone-marrow	/bəʊn 'mærou/	soft, fatty substance that fills the hollow parts of bone	Tủy xương
leucocytes (n)	/'lju:kəsait/	white blood cells	Bạch cầu
erythrocyte (n)	/eriθ'rɔ:sait/	red blood cells	Hồng cầu
dissolve (v)	/di'zɒlv/	(of a liquid) soak into a solid so that the solid itself become liquid	Hoà tan
circuit (n)	/'sə:kit/	journey around, from place to place	Vòng
excess (n)	/'ɪkses/	amount by which sth is more than is expected or proper	Sự thừa thãi
lymph (n)	/lɪmf/	colourless fluid in animal matter, like blood but without colouring matter	Bạch huyết
capillary (n)	/kə'pɪləri/	with a hair-like diameter (joining the arteries and veins)	Mao mạch, mạch quản
artery (n)	/a:təri/	one of the tubes carrying blood from the heart to all parts of the body	Động mạch
delay (v)	/di'lei/	make or be slow or late	Làm chậm lại

II. Grammar: Purpose

1. Purpose can be expressed by the infinitive

We use *to* + infinitive to talk about the purpose of doing something:

-Most animals have various kinds of specialized receptor to receive stimuli.

-Most animals have nervous system to perceive stimuli.

Note that you can also use **in order to/ so as to** +infinitive

-Some animals store food in their bodies in order to (so as to) exist for months.

-Standard veterinary physiology and biochemistry text should be consulted in order to (so as to) get more information.

-We should lift the foot of the pig in order to (so as to) check the sole for contusions.

2.Sometimes you have to use **so that/ in order that** to talk about the purpose of doing something.

We use **so that/ in order that** + S + can/ will/ may/ could/ would/ might

-Ideally, the individual pig should be walked around on a firm, flat surface so that (in order that) specific observations can be made about its gait.

-If the pig is unwilling to be handled after its gait has been evaluated, it is appropriate to apply

one of the restraint methods so that (in order that) the physical examination can progress.

III. Reading tasks

A. Decide if the following statements are true or false

1. The circulatory system serves for internal transport as well as external transport.
2. Erythrocytes are red since they contain hemoglobin
3. In an acute inflection such as appendicitis or pneumonia white cells rise markedly to battle the inflection.
4. In all creatures the four-chambered heart really consists of two parts, the right side pumping blood and water only from the body to the lungs, and left side from the lungs to the body.
5. The walls of the aorta and larger arteries are heavy layers of elastic and muscle fibres, whereas the small arterioles are covered by smooth muscle fibres only.

B. Comprehension questions

1. What does the life of an animal require?
2. What are the essential parts of the circulatory?
3. What does the blood in all vertebrates comprise?
4. What does the plasma carry?
5. How do phagocytes protect the body?
6. What does the circulatory system in a vertebrate comprise?
7. What does the heart comprise?
8. How many times does the human heart contract per minute?
9. What are the small arterioles covered by?
10. What do the arteries do when they are empty?

C. Add words or phrases from the text to complete the following argument

1. The function of the heart is to
2. 0.9% of human plasma are and about 92% are
.....
3. The nodes not only produce lymphocytes but also
4. The human heart beats faster in case
5. The number of red cells is found higher in

D. Contextual reference

1. In paragraph 4, the word **those** refers to:
 - (a). several kinds of white cells
 - (b). activities in the tissues,
 - (c). the blood stream
2. In paragraph 5, the word **it** refers to:

- (a). lymph
- (b). blood plasma
- (c). white cells
- (d). red cells.

3. In the last paragraph, the word **they** refers to:

- (a). the veins
- (b). the connective tissue fibres
- (c). the arteries

IV. Use of English:

Task 1: Match a word (line X in the text) with its appropriate definition

- | | |
|--------------------------------------|--|
| 1. circulate (v) –line 2 | a. clear yellowish fluid in which the blood cells are carried |
| 2. plasma (n) –line 3 | b. carry (things, goods, persons) to somewhere |
| 3. dissolve (v) –line 7 | c. move from place to place freely |
| 4. transport (v) –line 8 | d. (of a liquid) soak into a solid so that the solid itself becomes liquid |
| 5. numerous (adj) –line 12 | e. great in number, very many |
| 6. infect (v),infection (n) –line 22 | f. contaminate, give disease |
| 7. diffuse (v) –line 19 | g. move up and down regularly |
| 8. beat (v)- line 28 | h. (of gases and liquids) (cause to) mix slowly |
| 9. collapse (v) –line 35 | i. break down, lose physical strength |
| 10. alter (v) –line 37 | k. make or become different |

Task 2: Fill in each blank with the right form of a suitable word in task 1.

1. Watersalt .
2. Bloodthrough the body.
3. The blood consists ofand free cells or corpuscles.
4. The wound is badly.....
5. My car is being repaired so I am withoutat present.
6. She likes being with herfriends.
7. These clothes are too large; they must be
8. Her heart waswith joy.
9. The roof.....under the weight of the snow.
10. Waterthrough the cloth.

Task 3: Complete the following text by filling in the blank spaces with the expressions given below

higher	blood	through	sustains
flows	closed	across	percentage

lower	open	pressure	reduces
-------	------	----------	---------

An open circulatory system is a system in which the heart pumps (1).....into the hemocoel which is positioned in between the ectoderm and endoderm. The fluid described in the definition is called hemolymph, or blood. Hemolymph (2).....into an interconnected system of sinuses so that the tissues receive nutrients, fluid and oxygen directly. In animals that have an open circulatory system, there is a high (3).....of the body that is blood volume. These animals have a tendency to have low blood (4)....., with some exceptions. In some animals, the contractions of some species' hearts or the muscles surrounding the heart can attain higher pressures.

In a closed circulatory system, blood flows from arteries to capillaries and (5).....veins, but the tissues surrounding the vessels are not directly bathed by blood. Some invertebrates and all vertebrates have (6).....circulatory systems. A closed circulatory system allows more of a complete separation of function than an open circulatory system does. The blood volume in these animals is considerably (7).....than that of animals with open circulatory systems. In animals with closed circulatory systems, the heart is the chambered organ that pushes the blood into the arterial system. The heart also (8).....the high pressure necessary for the blood to reach all of the extremities of the body.

IV. Grammar exercises:

Task 1: *Make one sentence from two using the word in bracket.*

- Several kinds of white cells have their principal activities in the tissues. They are seen in the blood stream. (which)
- The ribs are arranged in pairs. These pairs correspond in numbers to the thoracic vertebrae. (that)
- Normally kidney function is essential to health. Any irregularity or disease in the kidneys is serious. (so)
- There are many differences in the size and form of component parts, and in the presence or absence of certain elements. The essential features of the bones in land vertebrates are the same. (though)
- Birds are covered by feathers. The feathers serve for insulation of their bodies. (which)

Task 2: *Sentence transformation*

- To maintain an acceptable relative humidity, it is necessary to use forced ventilation in confined facilities.

It is necessary to use forced ventilation in confined facilities.....

2. Respiratory problems are difficult to control if more than 200 –300 animals are housed in the same barn
To control.....
3. It is good to recirculate room air with fresh air.
Room air.....
4. It is difficult to obtain full compensation for overcrowding.
Full compensation.....
5. The smooth muscles fibers cover the small arterioles.
The small.....

Task 3: Complete the sentences with *so that* or *in order to*.

- Very large herds are forced to subdivide facilities and move pigs into groups control infectious diseases.
- Housing 80 animals together in the same barn is advisedthe risk of contracting respiratory disease can lower.
- It is necessary to use ventilation in confined facility.....avoid massive air pollution.
- Animals should be housed in buildings under pressure ventilation where polluted air is removed and changed by totally fresh airrespiratory diseases can be better controlled.
-convert a susceptible animal to a diseased one, a stress is required.

VI. Extra Challenge:

- Translate the text in Reading Comprehension into Vietnamese.
- Write a reflection on what you have learned:
 - What did you learn from it?
 - What part of the unit you like best?
 - What was difficult for you?
 - What do you want to improve?
- Matching the words or phrases in column A with words or phrases in column B

Column A	Column B
1. Animal physiology	a. the study of diseased organs
2. Warm-blooded” creatures	b. a science which seeks to describe the structure, organization, and functions of living matter in molecular terms.
3. Pathological anatomy	c. the application of medical, diagnostic, and therapeutic principles to companion, domestic, exotic, wildlife, and production animals
4. carnivorous	d. the study of how animals’ bodies function in their environment
5. Biochemistry	e. the study of the mechanical, physical, and biochemical functions of living organisms

	f. Animals that take on the temperature of their surroundings
	g. Animals that keep the inside of their bodies at a constant temperature
	h. the branch of biology that deals with the structure and organization of living things
	i. Animals that eat leaves and stems of plants
	j. animals whose food is entirely or largely other animals
	k. Animals that utilize a variety of plant and animal sources

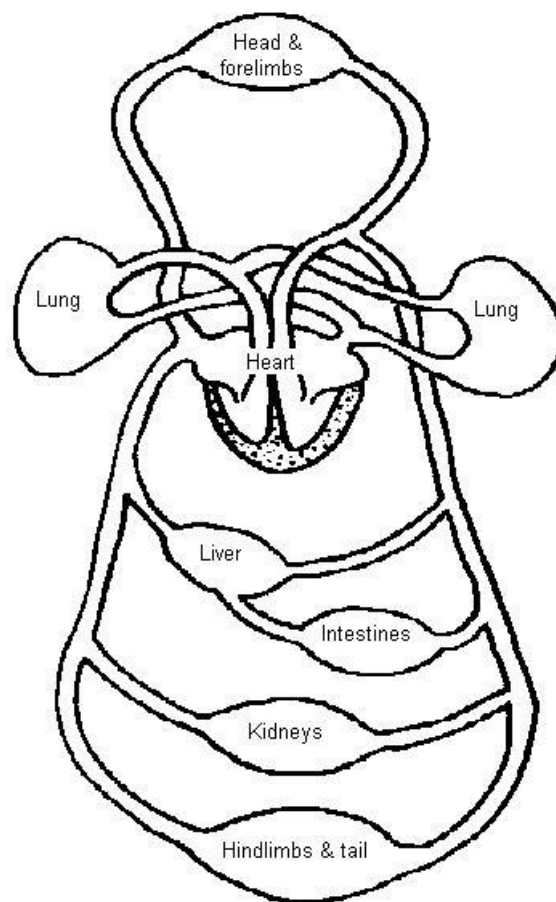
4. The diagram below shows the main vessels of the blood circulation system of a mammal.

a) Add the following labels to the diagram below:

**caudal vena cava; cranial vena cava; aorta; hepatic portal vessel
pulmonary artery; pulmonary vein; renal artery**

b) Add arrows to show the direction in which the blood flows

c) Colour the vessels that carry oxygen rich blood "red" and oxygen poor blood "blue".



5. Arrange the following types of blood vessel in the correct order as blood would flow down them from the heart to the body and back to the heart again.

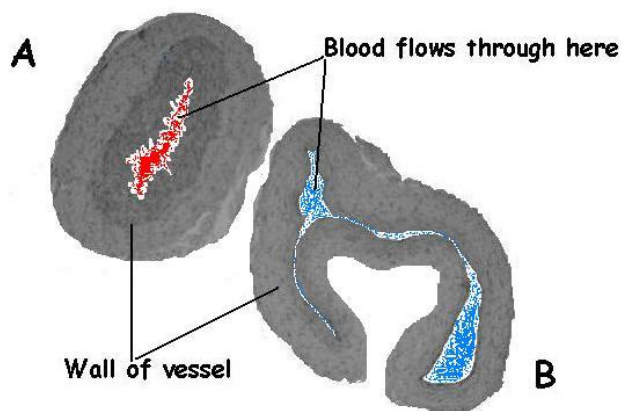
A. other veins; B. venules; C. capillaries; D. arterioles; E. other arteries. F. vena cava; G. aorta

Heart	Heart
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6. Fill in the blanks in the following table on arteries, veins and capillaries.

	Arteries	Capillaries	Veins
Structure of wall	3 layers		
Thickness of wall	.....	Very thin	.....
Retain shape or collapse when no blood passes	.....	.....	.....
Direction of blood flow	.....	.....	Towards heart
Speed of blood flow?	.....	.....	.....
Blood pressure	High	.....	.....
Valves present?	.....	No	.....
Pulse present?	.....	.....	.....
Carry oxygenated/deoxygenated blood?	.....	.....	.....

7. The photo below shows cross sections through an artery and a vein.



a. Label which vessel is the artery and which the vein.

b. Give 2 reasons for your answer.

Reason 1.....

Reason 2.....

8. True or false? If false give the correct answer.

- Mammals have a double open blood system. T / F
- Arteries only carry oxygenated blood. T / F
- Artery walls have many more layers of tissue in them than the walls of veins. T / F
- The pulse is only felt in arteries. T / F
- Capillaries have valves in them to stop the blood flowing backwards. T / F
- Blood leaks out of capillaries so that the oxygen and glucose etc. can reach the cells. T / F
- Diastole is the phase between pulses. T / F
- Blood flows along veins back to the heart because of gravity. T / F

9. As there is no pulse in veins, what moves the blood along them? (Give at least 2 methods)

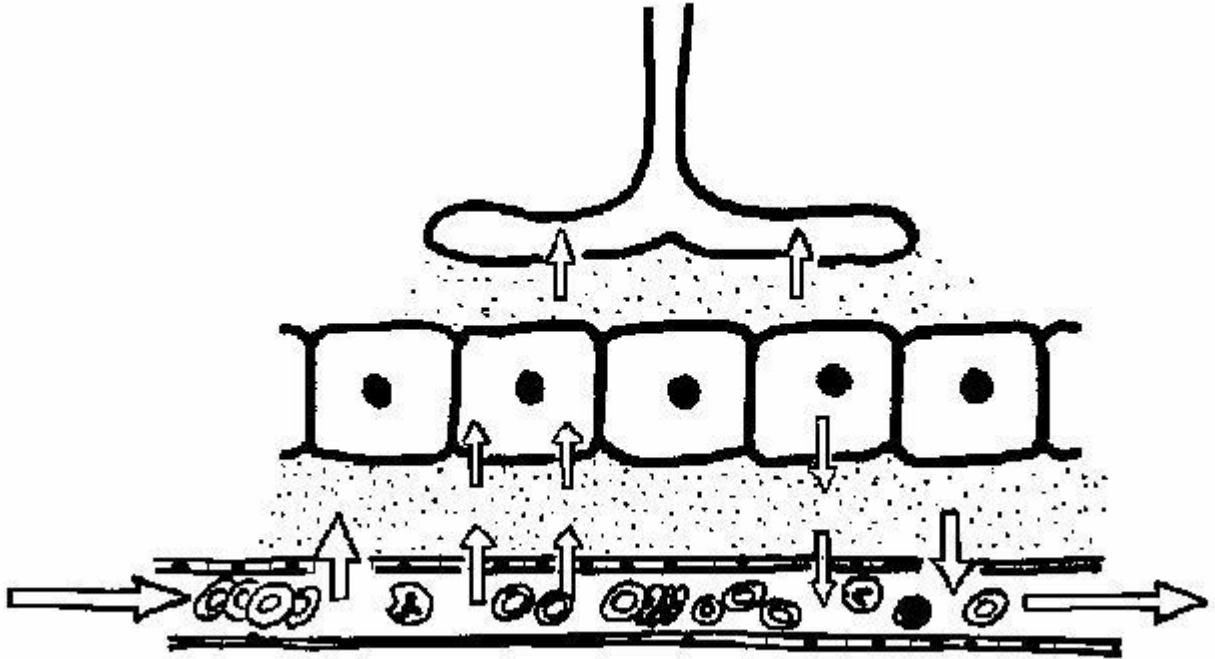
1.

2.....

10. Name the vessel that:

- Carries oxygenated blood to the heart muscle.....
- Supplies the brain with oxygenated blood.....
- Carries deoxygenated blood to the lungs.....
- Carries blood from the intestines to the liver.....
- Carries deoxygenated blood away from the kidneys.....

9. Look at the diagram below and then answer the following questions.



- Which is the blood capillary?
- How thick is the wall of the capillary?
- What is happening to the blood pressure as the blood flows along the capillary?
- What substances pass out of the capillary walls to surround the tissues?
- What is tissue fluid?
- Which vessel is the lymphatic vessel?
- How do lymphatic vessels differ from capillaries?
- What passes into the lymphatic vessel?
- How does lymph differ from tissue fluid?
- Why does the fluid leave the capillary at the beginning of the capillary bed and flow back in at the other end?

VII. Optional Reading

Macronutrients and Micronutrients

Macronutrients (carbohydrates, proteins, and lipids) are required in relatively large quantities in the diets of animals. **If meeting the energy needs of the organism were the only reason for eating, carbohydrates alone would probably be a sufficient diet, but since other of life's**

processes require other materials (and since animals are notable among organisms for their inability to synthesize many of the materials required to sustain such processes), numerous types of macro- and micronutrients are required. Micronutrients include vitamins and minerals and are necessary but required in relatively small quantities. They have a variety of roles in the metabolism of animals. Vitamins generally serve as coenzymes for metabolism. Minerals, including "trace" minerals have various functions in the tissues.

For humans living in industrialized countries, the main difficulties relating to macronutrients are excessive intake, particularly ingestion of processed carbohydrates and fats, which leads to obesity. In other regions of the world, dietary problems relative to macronutrients are often due to inadequate quantities of essential amino or fatty acids to allow for protein synthesis. Note that "essential" in this context relates to the necessity for the material in the diet, not essential for the organism (all amino acids are essential for life for all organisms). Nine are essential for most animals (histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, and valine). Care should be exercised in diet selection: vegetarians should balance various types because plant tissues vary widely in composition. For example, bean proteins are deficient in methionine and wheat in lysine (hence, they are complementary with respect to these two essential amino acids; both should be eaten simultaneously since proteins can't be stored and it would be futile to eat one at one meal and one at the next).

Discussion

Discuss the importance of animal nutrition in animal and veterinary sciences. Use some of the language and grammar you have learned in this lesson. The following questions may help you get started.

- What is nutrition?
- What are macronutrients and micronutrients?
- What does "essential" mean in animal nutrition?
- What are the essential amino acids?
- What were the roles of minerals and vitamins in animal nutrition?

UNIT 6: THE RESPIRATORY SYSTEM

All animals need oxygen for the metabolism in their cells and must dispose of the resulting carbon dioxide. The exchange of these gases is termed respiration. Some animals can exist for months on fats or other foods stored in their bodies, many can live in a shorter time without water, and few survive long without oxygen, since none is stored in the body.

Ordinary respiration in different animals is performed by various respiratory organs and systems, such as the body covering, gills, lungs or tracheae. These are unlike in appearance but fundamentally the same in function; each comprises a moist permeable membrane through which molecules of oxygen and carbon dioxide diffuse readily. When a difference in diffusion pressure exists on the two sides of membrane more molecules pass towards the region of lesser pressure than in the opposite direction. The partial pressure of oxygen in the air or water is greater than within an animal body, where it is constantly being used up, so that oxygen tends to enter any suitable membrane surface. The partial pressure of carbon dioxide is greater within the animal, so that it tends to pass outward. These exchanges occur simultaneously.

External respiration is the exchange between the environment and the respiratory organs, internal respiration, or the exchange between the body fluids and tissue cells, is the part of general metabolism.

All higher animals, including man, have lungs as their main respiratory organ. The glottis is an opening in the floor of pharynx and is supported by a cartilaginous framework, or larynx that connects to a flexible tube or trachea. The trachea extends into the thorax and forks into two bronchi, one to each lung. The bronchi end in microscopic thin-walled sacs or alveoli surrounded by many blood capillaries, where the respiratory exchanges occur. The larynx in mammals contains two muscular vocal cords over which air is forced to produce sound.

The high rate of metabolism in birds and mammals requires a rapid respiratory exchange. The diaphragm separates the thorax containing the heart and lungs from the abdominal cavity. The thoracic cavity is an airtight chamber, and the ordinary atmospheric pressure of air in the alveoli keeps the elastic lungs expanded against the inner wall of the cavity. At inspiration the ribs are raised and the thoracic space is thus enlarged, and the pressure about the lungs is lessened; air then passes down the trachea and into the lungs. Expiration results from lessening the volume of the thorax by relaxing the muscles that control the ribs and diaphragm.

In an hour the body at rest uses about 15 litres of oxygen. The rate of breathing is controlled mainly by a respiratory centre in the medulla of the brain. The respiratory rate increases during vigorous exercise because of the greater production of carbon dioxide in muscular metabolism.

I. Technical vocabulary and expressions

metabolism (n)	/me'tæbɒlɪzm/	process by which food is built up into living matter	Sự trao đổi chất
respiratory (adj)	/'respirətɔːri/	of breathing	(thuộc sự) hô hấp/thở
respiration (n)	/,respə'reɪʃn/	of breathing	sự hô hấp, sự thở
Survive (v)	/sə'vai/	continue to live or exist longer	Sống lâu hơn, sống qua
gill (n)	/gil/	organ with which a fish breathes	Mang (cá)

Trachea (n)	/trə'kiə/	Windpipe	Khí quản
fundamental (adj)	/,fʌndə'mentəl/	of great important	Cơ bản, chủ yếu
permeable (adj)	/'pəmiəbl/	soft, pliable skin-like covering or lining	Thấm được, thấm qua được
molecule (n)	/'mɒlikju:/	smallest unit into which a substance could be divided without a change in its chemical nature	Phân tử
simultaneous(adj)	/simju:l'teinəs/	happening or done at the same time	Cùng một lúc, đồng thời
glottis (n)	/'glɒtis/	opening between the vocal cords at the upper part of the windpipe	Thanh môn
fork (v)	/fɔ:k/	divide into two or more parts	Chia nhánh
bronchi (n)	/'brɒŋkai/	the branches into which the windpipe divides before entering the lungs	cuống phổi
breathe (v)	/brið/	take air into the lungs and send it out again	Thở, hô hấp

II. Grammar

1. Clauses of result introduced by **so/ so that**

-The partial pressure of oxygen in the air or water is greater than within an animal body where it is constantly being used up so that oxygen tends to enter any suitable membrane surface. (This sentence is in the text.) Adverbial clause of result

-The partial pressure of carbon dioxide is greater within the animal, so that it tends to pass outward. (This sentence is in the text.) Adverbial clause of result

+ Note: You must know the difference between ‘*so that*’ (purpose) and ‘*so that*’ (result).

+ Sometimes you can use **so/ therefore** beginning the adverbial clause of result:

-Tissues of this group later become of diverse forms and usually produce much intercellular substance, so the cells themselves are less conspicuous.
Adverbial clause of result

-During the lifetime of the majority of commercial pigs, the skeleton does not mature and, therefore, bony component nerves achieve their potential strength.
Adverbial clause of result

+Notice possible positions of therefore:

-The head consists of the cranium and the face, and it is therefore convenient to divide the bones into cranial and facial groups.

-The head consists of the cranium and the face, and therefore it is convenient to divide the bones into cranial and facial groups.

2. We can say **so +adj/ adv +that**

The viruses are so small that we can't see them with our own eyes.
Adverbial clause of result

The out most layer of epidermis becomes so hard that it is quite resistant to wear.

III. Reading tasks**Comprehension questions**

1. What do all animals need for the metabolism in their cells? And what must they dispose of?
2. What can animals exist on for months?
3. Can many animals survive long without oxygen? Why?
4. How is ordinary respiration in different animals performed?
5. What is the main respiratory organ of all higher vertebrates?
6. What is the glottis supported by?
7. What does the larynx in mammals contain?
8. Is the thoracic an airtight chamber?

IV. Use of English

Task 1: Match a word (line X in the text) with its appropriate definition.

- | | |
|-----------------------------|---|
| 1. dispose (v) –line 1 | a. remain alive, continue to live |
| 1. exist (v) –line 2 | b. finish with, get rid of |
| 2. survive (v) –line 3 | c. slightly wet |
| 3. moist (adj) –line 7 | d. continue living |
| 4. use up (v) –line 11 | e. consume |
| 5. expand (v) –line 24 | f. make or become larger |
| 6. lessen (v) –line 25 | g. cause or allow to become less tight, stiff or strict |
| 7. relax (v) –line 27 | h. make or become less |
| 8. raise (v) –line 24 | i. move from a lower to a higher (level), (cause to rise) |
| 9. result from (v) –line 26 | k. come about, happen, as a natural consequence |

Task 2: Fill in each blank with the right form of a suitable word in task 1.

1. Only some people.....after the earthquake.
2. He hasall his strength.
3. Her eyes are stillwith tears.
4. We have toof rubbish.
5. Metals.....when they are heated.
6. You must use the herbicide carefully in order not tothe effect of it.
7. We can'twithout food and water.
8. Her voicein anger.
9. Let's stop working andfor an hour.
10. The borrower must pay for any damagefrom negligence.

Task 3: Complete the following text by filling in the blank spaces with the expressions given below

biology	demand	depend	organisms
biodiversity	bodies	spend	supply

Biodiversity (short for "biological diversity") is a notion, a representation of the complexity or web of life, in all its forms. The Convention on Biological Diversity (CBD) defines biodiversity as "the variability among living (1)..... from all sources, including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and ecosystems". (2) provides food for humans. Although about 80 percent of our food (3)..... comes from just 20 kinds of plants, humans use at least 40,000 species of plants and animals a day. Many people around the world (4)..... on these species for their food, shelter, and clothing. There is untapped potential for increasing the range of food products suitable for human consumption, provided that the high present extinction rate can be stopped.

V. Grammar exercises:

Task 1: *Make one sentences from two using so.....that.*

- 1.The tuberculosis occurring in cattle is increasing very quickly. The infection may be transmitted to swine by the feeding.
- 2.The percentage of swine with tuberculous lesions continued to increase very long. It results in significant economic losses.
- 3.Pneumonia in pigs appears very common. Even well managed herds may be affected.
- 4.The animal couldn't recover from its wound. Its leg was hurt very badly.
- 5.In 0.2 % disease was very extensive. The entire carcass was condemned.

Task 2: *Sentence transformation*

Write the second sentence so that it is similar to the first:

1. Ingesta entering the small intestine are mixed with duodenal and pancreatic secretions to raise the pH.

Ingesta that.....

- 2.The viruses are so small that we can't see them with our own eyes.

The viruses are too.....

- 3.The cornified materials of birds and mammals are so dry and tough that they can resist wear in dry environments very well.

The cornified materials of birds and mammals are dry and tough enough.....

- 4.Fluids will be drawn into the small intestine lumen by the undigested hygroscopic substances in the small intestinal ingesta.

Undigested hygroscopic.....

- 5.It is important to collect samples in such a way that muscle tissues is not penetrated or allowed to contaminate the sample.

Collecting.....

Task 3: *Complete the sentence with so that (purpose) or so that (result).*

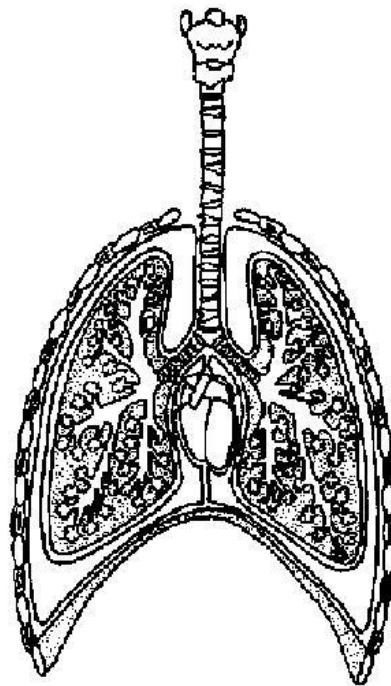
- 1.An understanding of their economic impact is essential to verify the costs to individual swine units.....investigative, treatment, control, and preventive steps can be justified.
- 2.If muscle cells are damagedtheir cell membrane is broken or leaky, enzymes normally with the cell are released and enter the blood stream.
- 3.The nervous system serves to coordinate and integrates the function of the cells, tissues and organ systemsthey act harmoniously as a unit.
- 4.If stocking rate is doubled, the ventilation rate should be increased tenfoldthe same clearance of air contaminants can be maintained.

5. The fluids passing from the small intestine into the colon will exceed its absorption capacity especially in the neonatediarrhea results.

VI. Extra Challenge:

1. Translate the text in Reading Comprehension into Vietnamese.
2. Write a reflection on what you have learned:
 - What did you learn from it?
 - What did you do well?
 - What part of the unit you like best?
 - What was difficult for you?
 - How do you feel about your performance?
 - What do you want to improve?
3. Add the following labels to the diagram of the respiratory system of a dog below:

trachea; bronchioles; diaphragm; bronchi; ribs; larynx; pleural membranes; pleural cavity; rings of cartilage around trachea; alveoli.



4. List the structures below in the order in which air passes them as it travels from the nose to the lungs

alveoli; trachea; bronchi; bronchioles; larynx; pharynx.

5. Which is the odd one out?

trachea; oesophagus; nasal cavity; larynx; bronchi; bronchioles

6. Add the correct terms from the list below to the following descriptions.

A. Alveoli; B. Trachea; C. Bronchioles; D. Palate; E. Pleura; F. Diaphragm; G. Pharynx; H. Expiration; I. Epiglottis; J. Tidal volume.

- a) Smallest respiratory passageways.
- b) Separates the mouth from the nose.
- d) Windpipe.
- e) Where gas exchange takes place.
- f) Stops food “going the wrong way” ie choking during swallowing.
- g) Both air and food pass through this.
- h) The movement of air out of the lungs.
- i) The main muscle involved in inspiration.
- j) Membranes that cover the lungs and line the pleural cavity.
- k) The volume of air inhaled or exhaled at each normal breath.

7. Arrange these statements in the right order to describe inspiration.

- A. The air pressure in the air tight pleural cavities decreases
- B. The muscles between the ribs contract to move the ribs cranially and laterally
- C. Air is drawn down the trachea into the lungs
- D. The diaphragm contracts and flattens
- E. The lungs expand to fill the space created

8. Add the following labels to the diagram of a section cut across lung alveoli shown below.

alveoli; thin layer of water; area of high oxygen concentration; area of high carbon dioxide concentration; movement of oxygen; movement of carbon dioxide; air flowing in and out of alveoli; blood flowing along capillary.



9. Which of the statements below gives the best definition of gas exchange?

- a) swapping oxygen for digested food in the gut capillaries.
- b) using energy to breathe.
- c) exchanging inhaled air for exhaled air in the lungs.
- d) exchanging oxygen for carbon dioxide in the lung alveoli.

10. Which of the following help the lungs to be such good gas exchange organs? (Choose at least 4).

- They are close to the heart.
- They are surrounded by pleural membranes.
- They have a large surface area.
- The air in the alveoli and blood in the capillaries are separated by a 2 very thin layers of cells.
- The blood flows more slowly in the lung capillaries as they are so narrow.
- The haemoglobin carries lots of oxygen.
- Breathing constantly changes the air in the alveoli.
- Active transport increases the rate at which the two gases move.

VII. Optional Reading

Nutrition

Nutrition deals with the composition of food, its energy content, and slowly (or not at all) synthesized organic molecules. Chemotrophs are organisms (mostly bacteria) deriving their

energy from inorganic chemical reactions. Phototrophs convert sunlight energy into sugar or other organic molecules. Heterotrophs eat to obtain energy from the breakdown of organic molecules in their food.

Macronutrients are foods required on a large scale each day. These include carbohydrates, lipids, and amino acids. Water is essential, correct water balance is a must for proper functioning of the body.

About 60% of the diet should be carbohydrates, obtained from foods such as milk, meat, vegetables, grains and grain products. The diet should contain at least 100 grams of carbohydrate every day. Recently, however, new recommendations have been developed that suggest a lowering of the amount of carbohydrate.

Proteins are polymers composed of amino acids. Proteins are found in meat, milk, poultry, fish, cereal grains and beans. They are needed for cellular growth and repair. Twenty amino acids are found in proteins, of which humans can make eleven. The remaining nine are the essential amino acids which must be supplied in the diet. Normally proteins are not used for energy, however during starvation (or a low-carb diet) muscle proteins are broken down for energy. Excess protein can be used for energy or converted to fats.

Lipids and fats generate the greatest energy yield, so a large number of plants and animals store excess food energy as fats. Lipids and fats are present in oils, meats, butter, and plants (such as avocado and peanuts). Some fatty acids, such as linoleic acid, are essential and must be included in the diet. When present in the intestine, lipids promote the uptake of vitamins A, D, E, and K.

Vitamins are organic molecules required for metabolic reactions. They usually cannot be made by the body and are needed in trace amounts. Vitamins may act as enzyme cofactors or coenzymes. Some vitamins are soluble in fats, some in water.

Minerals are trace elements required for normal metabolism, as components of cells and tissues, and for nerve conduction and muscle contraction. They can only be obtained from the diet. Iron (for hemoglobin), iodine (for thyroxin), calcium (for bones), and sodium (nerve message transmission) are examples of minerals.

UNIT 7: THE NERVOUS SYSTEM

All living organisms are excitable or irritable. Because of this, every organism is sensitive to changes or stimuli from both its external and internal environments; to these it responds or reacts in various ways. Every type of organic response results from this fundamental characteristic of excitability. To perceive stimuli, to transmit these to various body parts and to effect responses, most animals have nerve system. This system serves also to co-ordinate and integrates the function of the cells, tissues and organ systems so that they act harmoniously as a unit.

A stimulus is any physical or chemical change capable of exciting an organism or its parts. Common external stimuli derive from temperature, moisture, light, contact, pressure, oxygen supply, salt concentrations and odour. Internal stimuli result from the quantity of food, water, oxygen, or wastes in the body and from fatigue, pain, disease or other condition.

Some stimuli act directly upon cells or tissues and elicit a direct response, but most animals have various kinds specialized receptors to receive stimuli. A receptor is a cell or an organ having a special sensitivity to some particular kinds of stimulus, as eye to light and ear to sound.

Exterreceptors receive stimuli from the internal environments and interreceptors from within the body, as with hunger and thirst.

Receptors induce the transmission of nerve impulse through the nervous system, which in turn excites effectors and bring about response. Some stimuli are gradual and elicit a slow response, as the chill that precedes a sneeze; other abrupt and produce a quick response, as the jab of a pin.

The nerve system consists of 1/. The central nervous system comprising the brain, the spinal cord and nerve ganglia in the brain; 2/. The peripheral nervous system comprising the axons of nerve cells and nerve fibres.

The brain. In higher vertebrates the brain consists of two main parts: the cerebrum and cerebellum. The out most grey matter or cortex of the cerebrum is thickened and also increased in area, so that it becomes folded or convoluted. The cortex is the seat of all conscious sensations and actions, memory, the will and intelligence.

The spinal cord and nerves. The outer or white matter of the spinal cord consists of bundles of fibres connecting to various parts of the brain with the nuclei of spinal nerves and adjuster neurons and the nuclei of motor neurons. The nuclei of sensory neurons are in the dorsal root ganglia of the spinal nerve. If the dorsal root of the spinal nerve is cut, any sensory impulses from the entering fibres will fail to reach the cord and brain.

The vegetative nervous system. This is a system of ganglia and fibres that connect to all smooth muscles, glands and the internal viscera. It regulates the rate of metabolism, muscular action in organs and components of the blood, body fluid and tissues. In birds and mammals, it closely regulates the body temperature by increasing metabolism and ruffling out the feathers or fur in cold weather and by prompting the loss of heat in warm environment.

The vegetative nervous system consists of two parts: the sympathetic system and the parasympathetic system, which are somewhat antagonistic. Some organs are innervated by both.

I. Technical vocabulary and expressions

organism (n)	/'ɔɡənɪzm/	living being with parts which work together; individual animal or plant	Sinh vật
excite (v)	/ɪk'saɪt/	stir up the feelings	Kích thích
excitable (adj)	/ɪk'saɪtəbl/	easily excited	Dễ bị kích thích
sensitive (adj)	/'sensɪtɪv /	quickly or easily receiving impression	Nhạy, có cảm giác
irritable (adj)	/'ɪrɪtəbl/	easily annoyed or make angry	Dễ cảm ứng
derive (v)	/'dɛraɪv/	get; (drive from) have a starting source or origin	Bắt nguồn từ
moisture (n)	/'moɪstʃə/	condensed vapour on a surface; liquid in the form of vapour	Độ ẩm
odour (n)	/'ɒdə/	smell pleasant or unpleasant	Mùi vị
fatigue (n)	/fə'tɪɡ/	condition of being very tired	Sự mệt mỏi
response (n)	/rɪs'pɒns/	answer	Sự phản ứng
impulse (n)	/'ɪmpʌls/	push or thrust	Sự thúc đẩy, xung
elicit (v)	/ɪ'lɪsɪt/	draw out, cause to come out	Khêu ra, gọi ra
antagonistic (adj)	/,æntægə'nɪstɪk/	opposed; contrary	Trái ngược
cortex (n)	/'kɒteks/	layer of grey matter of the brain	Vỏ não

II. Grammar

Conditional Sentences

Conditional sentences have two parts: The *if-clause* and the *main clause*.

If cows are well fed, they will give better milk.

If-clause

main clause

1. Conditional sentence Type 1: + The verb in the *if-clause* is in the present tense; the verb in the

main clause is in the simple future (will) or you can use these modal verbs: can/may/ must/ should/ought to/ had better. It doesn't matter which clause comes first.

Examples:

-If the dorsal root of the spinal nerve is cut, any sensory impulses from the entering fibers will fail

to reach the cord and brain. (This sentence is in the text.)

-Respiratory problems can be expected if pigs with low health status are introduced into a healthy herd.

-If a diet containing carbohydrates of low digestibility is fed, significant amounts of carbohydrates may reach the colon.

+ Sometimes the verb in *if-clause* is in the present tense and the verb in main clause is also in the present tense:

Examples:

-Respiratory problems are difficult to controlled if more than 200- 300 animals are housed in the same barn control.

- Large air-cleaning equipment is necessary if a significant effect on the dust concentration is to be achieved

Note that this type of sentence implies that the action in the *if-clause* is quite probable, and the meaning here is present or future.

2. Conditional sentence Type 2: The verb in the *if-clause* is in the past; the verb in the main clause: would/ could/ might.

Examples:

-If the viruses were much bigger, we could see them with our own eyes. (But they are very small.)

-There wouldn't be any diseases if there were no bacteria. (But there are a lot.)

Note that Type 2, like Type 1, refers to the present or future, and the past tense in the *if-clause* is not a true past but a subjunctive, which indicates unreality or improbability.

III. Reading tasks

A. Decide if the following statements are true or false

1. A few animals have nervous system to perceive stimuli.
2. The functions of the cells, tissues and organ systems are co-coordinated and integrated to act harmoniously as a unit.
3. A stimulus is capable of exciting an organism or its parts.
4. Most animals have various kinds of specialized receptors to receive stimuli.
5. Temperature is an internal stimuli.

B. Comprehension questions

1. What is every organism sensitive to?
2. What does the nervous system do?
3. What is a stimulus?
4. What do most animals have in order to receive stimuli?
5. What does the nervous system consist of?
6. What are the main parts that the brain consists of?
7. What is the cortex?
8. How does the vegetative nervous system regulate the body temperature in birds and mammals?

IV. Use of English

Task 1: Match a word (line X in the text) with its appropriate definition.

- | | |
|----------------------------|---|
| 1. excite (v) –line 1 | a. react (to), be affected |
| 2. sensitive (adj) –line 1 | b. stir up the feeling of, cause to feel strongly |
| 3. respond (v) –line 3 | c. pass, allow through or along |
| 4. perceive (v) –line 4 | d. quickly or easily receiving impression |
| 5. transmit (v) –line 4 | e. bring or put into proper relation |
| 6. co-ordinate (v) –line 5 | f. become aware of |
| 7. elicit (v) –line 16 | g. bring about |
| 8. induce (v) –line 16 | h. control system actively |
| 9. regulate (v) –line 30 | i. draw out, cause to come out |
| 10. ruffle (v) –line 32 | k. disturb the peace or smoothness |

Task 2: Fill in each blank with the right form of a suitable word in task 1.

1. The illness quicklytreatment.
2. Ironheat.
3. Everybody isby the news of the victory.
4. When swimming we must the movements of the arms and legs.
5. The policeman isthe traffic,
6. Who's beenyour hair?
7. We mustthe truth.
8. On entering his house, we at once.....him
9. Her illness was.....by overwork.
10. The eyes are.....to light.

Task 3: Complete the following text by filling in the blank spaces with the expressions given below

which	ends	throughout	over
digested	completed	digestive	where

Food and drink must be changed into smaller molecules of nutrients to be absorbed into the blood and carried to cells (1)..... the body. Digestion is the process by (2)..... food and drink are broken down into smaller parts so that the body can use them to build and nourish cells, and to provide energy. Digestion involves: the mixing of food; the movement of food through the (3)..... tract; a chemical breakdown of large molecules of food into smaller molecules. Digestion begins in the mouth, where food and drink is taken in, and is (4)..... in the small intestine.

VI. Grammar exercises

Task 1: Sentence transformation

1.It is difficult to control respiratory problems if more than 200 – 300 animals are housed in the same barn.

Respiratory.....

2.To perceive stimuli, most animals have nervous system.

Most animals.....

3.Animals have hairs, another type of epidermal product also serving for insulation.

Animals have hairs, another type of epidermal product

4.It is easy to divide the bones of the head into cranial and facial groups.

The bones of the head.....

5.The diet influences the relative proportions of volatile fatty acids.

The relative

Task 2: Complete the following sentences with the word in bracket.

1. If I had a large garden, I(raise) a lot of chickens.

2. There(be) a risk if animals with a high health status are introduced in to herds with a lower health status without taking any precautions to protect healthy animals against infection.

3. If muscle cells are damaged, the cell membrane(be) broken or leaky.
4. It may be important, however to learn if animals(become) infected from the same sources.
5. All animals would hold down their food if they(have) no teeth in their mouths.

VI. Extra Challenge:

1. Translate the text in Reading Comprehension into Vietnamese.
2. Write a reflection on what you have learned:
 - What did you learn from it?
 - What part of the unit you like best?
 - What was difficult for you?
 - What do you want to improve?
3. There are three different kinds of neurone or nerve cell. Match each kind with its function.

A. Motor neuron; B. Sensory neuron; C. Relay neuron;

Kind of neurone	Function
	The nerve cell that carries impulses from a sense receptor to the brain or spinal cord.
	The nerve cell that connects sensory and motor neurons
	The nerve cell that transmits impulses from the brain or spinal cord to a muscle or gland

4. Match the descriptions in the table below with the terms in the list.

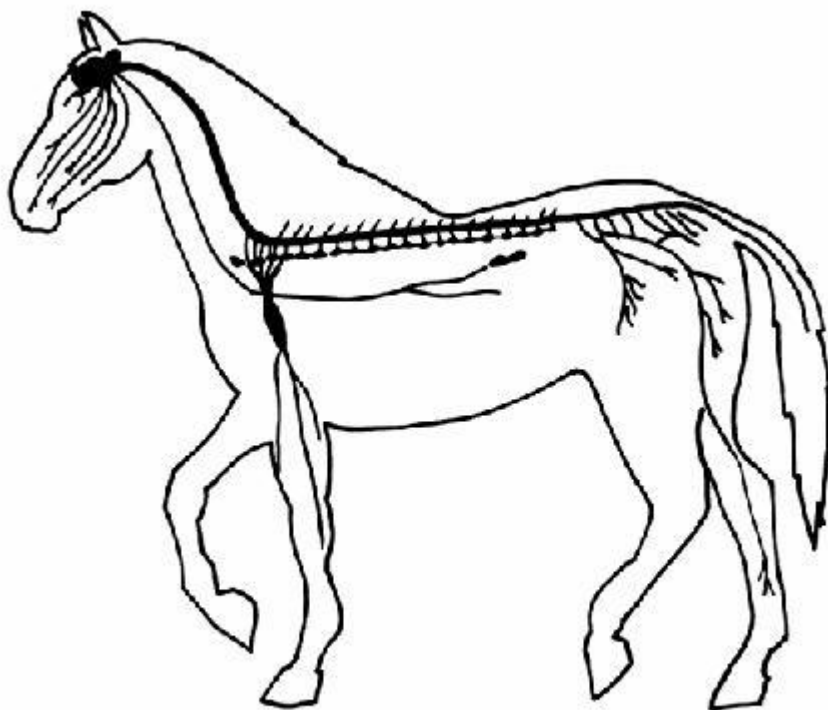
A. Synapse; B. Axon; C. Myelin sheath; D. Nerve impulse; E. Sense receptor; F. Response; G. Reflex; H. Cell body; I. Dendrite; J. Nerve; K. Neurotransmitter; L. Axon terminal

Term	Function
	1. The long fibre that carries the nerve impulses.
	2. A bundle of axons.
	3. The connection between adjacent neurons.
	4. The chemical secreted into the gap between neurons at a synapse.
	5. A rapid automatic response to a stimulus.
	6. The covering of fatty material that speeds up the passage of nerve impulses.
	7. The structure at the end of an axon that produces neurotransmitters to transmit the nerve impulse across the synapse.
	8. The high speed signals that pass along the axons of nerve cells.

	9. The branching filaments that conduct nerve impulses towards the cell.
	10. The sense organ or cells that receive stimuli from within and outside the body.
	11. The reaction to a stimulus by a muscle or gland.
	12. The part of the nerve cell containing the nucleus.

5. The diagram below shows the nervous system of a horse. Add the following labels.

Brain; Spinal cord; Cranial nerves; Spinal nerves; Sciatic nerve; Nerves of the autonomic nervous system; Vagus nerve; Network of nerves to forelimb.



6. Indicate whether the following parts of the nervous system are part of the **Central Nervous System CNS**) or the **Peripheral Nervous System (PNS)**.

Part of nervous system	CNS or PNS?
Brain
Autonomic nervous system
Spinal nerves

Spinal cord	.....
Cranial nerves	.....

7. Match the descriptions below with the parts of the nervous system in the list. You may need to use some terms more than once.

A. Autonomic nervous system; B. Central nervous system; C. Peripheral nervous system; D. Parasympathetic nervous system; E. Sympathetic nervous system

Description	Part of the nervous system
1. Part of the nervous system that is composed of the brain and the spinal cord.	
2. Part of the nervous system that is composed of the cranial and spinal nerves.	
3. The part of the peripheral nervous system that regulates the activity of the heart and smooth muscle.	
4. The part of the autonomic nervous system that increases heart and respiratory rates, increases blood flow to the skeletal muscles and dilates the pupils of the eye.	
5. The part of the autonomic nervous system that increases gut activity and decreases heart and respiratory rates.	

8. Name the nerves described below using the choices in the list.

Olfactory nerve; Sciatic nerve; Vagus nerve; Optic nerve; Vestibular nerve

Nerve	Description
	1. The 8th cranial nerve that carries impulses from the organs of balance and hearing to the brain.
	2. The 2nd cranial nerve that carries nervous impulses from the retina of the eye to the brain.
	3. The largest nerve in the body serving the muscles of the leg.
	4. The 1st cranial nerve that carries impulses from the organ of smell in the nose to the brain.
	5. The 10th cranial nerve that supplies the pharynx, lungs, heart, stomach and most of the abdominal organs.

VII. Optional Reading

There are six basic classes of nutrients that must be considered in formulating diets; water, protein, carbohydrates, fats, vitamins and minerals. In Frank B. Morrison's Feeds & Feeding, a nutrient is defined as "Any feed constituent or group of feed constituents of the **same general chemical composition** that **aids in support of animal life**." A number of factors can make an understanding of livestock nutrition very confusing.

- Many (most) feedstuffs or ingredients in a ration contain more than one of the six basic nutrients. For instance, a kernel of corn contains all six basic nutrients:
 - Water -- 13-15% when dried for storage
 - 20-35% field moisture at harvest or if stored as high moisture corn
 - Protein -- 7-9% crude protein is a typical value
 - Carbohydrate -- mainly in starch portion of the kernel
 - Fat -- mainly in the oil portion
 - Vitamins
 - Minerals
- Commonly used feed ingredients may vary considerably in the content of the six basic nutrients. The example of corn from above demonstrates that the water content can vary widely, as can other perimeters. Some varieties of corn contain high levels of specific nutrients, such as lysine or oil.
- The unique physiology and metabolism of different animals enables some to utilize some feed ingredients to their benefit while other animals of a different species cannot.
 - Nonprotein nitrogen sources can be converted to amino acids and from amino acids to protein by ruminants and hindgut fermenters; monogastric animals cannot utilize these feedstuffs.
 - Fiber (roughages - hay, grasses) can be broken down by ruminants and hindgut fermenters to provide an energy source; monogastric animals cannot utilize these feedstuffs.
 - Some feed constituents are **essential** for certain species, but not for others. Proline and glycine are essential amino acids and must be added to poultry diets; other species can synthesize them from other amino acids.
- There are "linkages" or relationships between different basic nutrients.
 - Selenium (a mineral) is linked to Vitamin E; they share many "duties" in the body and one can often be substituted for the other.
 - Fats, carbohydrates and proteins can all be used to provide energy to the body and can be additive in meeting the energy requirements of an animal. (Protein will be converted to energy producing subunits if fed in excess of it's basic metabolic needs.)
 - Calcium and Phosphorus must be fed at the appropriate "ratio" for maximal utilization and to prevent interference with other mineral metabolism.
- No single feed ingredient can supply all 6 basic nutrients an animal needs to survive and be productive.
 - One must "**balance**" the ratio of different feed ingredients to meet the individual animal's needs.

- The nutrient needs of an animal varies depending upon the species, age, stage of lifecycle, etc.
- In addition to meeting an animal's basic nutrient requirements, a diet must also meet the "3 P's" to be useful as a livestock feed.
 - **Palatable** -- must be edible, accepted, and eaten by the animal
 - **Profitable** -- if the livestock producer cannot make a profit feeding certain ingredients, he/she won't be in business very long. Approximately 75% of the out-of-pocket costs in livestock production is feed costs.
 - **Productive** -- animals eating the diet must be productive. The **least cost ration** may just barely meet the animal's nutrient requirements, but not allow the animal to function at it's most productive level. The **optimal ration** is the ration that can be produced for the least cost for the benefit returned in animal performance (growth, productivity, longevity, reproductive performance, etc.)

UNIT 8: GASTRIC FUNCTIONS

Inappropriate diet, inadequate feeding patterns, or abrupt changes in food easily disturb the gastric functions and may cause lesions. The part esophagea of the stomach is known to be a site of high vulnerability. Ulcers at this site are the most common type of porcine gastric ulceration. One of several factors contributing to their development is feeding of finely ground food, which induces increased secretion and increased mixing of the gastric contents. If the pH gradient between the different gastric compartments is not maintained, the pH in the pars esophagea may drop and cause epithelial damage.

Extremely bulky food given in large portions will distend the stomach and result in the fast release of small portions of the stomach contents into the duodenum; thus, the pH will not drop sufficiently to have bactericidal effects. Bacterial overgrowth and multiplication of pathogens in the intestine may result.

Gastric functions of piglets are different from those of adult pigs. During the first hours of life there is no gastric acid production. This allows bacteria to pass through the stomach into the intestine. Piglets sucking from sows in a conventional farm environment usually acquire a gastric population of lactobacilli, which produces lactic acid and inhibits the multiplication of other bacteria by lowering the pH. Lactic acid substitutes for as well as suppresses hydrochloric acid secretion until about 3 weeks of age. In early weaned pigs lactobacilli disappear. Until the adult secretory capacity for hydrochloric acid is developed at about 5 weeks of age, bacteria will pass through the stomach into the intestine. Feeding of high-protein diets, which are commonly used for early-weaned pigs, will further post weaning diarrhea by their high buffering capacity.

In vomiting and wasting disease intramural ganglia are altered by infection with a corona virus. Since neural control of muscular contraction is impeded, ingesta are not transported from stomach to intestine and the stomach becomes distended. Infection may cause mucosal lesions and impair the function of the gastric mucosa. Acute gastric dilatation and volvulus have been observed in adult pigs. Gastric dilatation may occur as a significant cause of death when housed, pregnant sows are fed only once a day.

I. Technical vocabulary and expressions

inappropriate (adj)	/inə'proupriət/	not suitable	Không thích hợp
abrupt (adj)	/ə'brʌpt/	unexpectedly sudden	Bất ngờ
gastric (adj)	/'gʌstrɪk/	of the stomach	(thuộc) dạ dày
lesion (n)	/'leʃn/	harmful change in the tissues of a body organ, caused by injury or disease	Thương tổn
vulnerability (n)	/,vʌlnərə'biliti/	not being protected against attack	Tính chất dễ bị tổn thương
ulcer (n)	/'ʌlsə/	Open sore forming poisonous matter (on the outside or inside surface of the body)	Sự loét, ung nhọt

bulky (adj)	/'bʌlki/	taking much space	To kênh càng
Distend (v)	/'distend/	(cause to) swell out	Làm phình (sung) lên
Acquire (v)	/ə'kwaɪə/	gain by skill or ability	Thu được, giành được
inhibit (v)	/in'hibit/	Restrain, hinder	Ngăn cản, ngăn chặn
substitute (v)	/sʌbs'tɪtju:t/	Acting or serving for another	Thay đổi, thay thế
suppress(v)	/sə'pres/	Prevent from being known or seen	Chặn (bệnh), triệt tiếng ồn
conventional (adj)	/kən'venʃnəl/	following what has been customary; traditional	Theo tập quán
impair (v)	/'impɛə/	Weaken, damage	Làm suy yếu, làm sút kém
pregnant (adj)	/'pregnənt/	a woman or female animal having in the uterus offspring in a stage of development before birth	Có thai, có chửa

I. Grammar

When + the Past participle (p2)

The past participle can replace a subject + passive verb:

Examples:

*-Pigs must be restrained **when examined**. = Pigs must be examined **when they are restrained**.*

*-**When transported** into the large intestine ,partly digested or undigested ingesta will contribute to osmotic diarrhea. = **When partly digested or undigested ingesta are transported** into the large intestine, it will contribute to osmotic diarrhea.*

III. Reading tasks

A. Decide if the following statements are true or false

1. Gastric functions of piglets are similar to those of all adult pigs.
2. The stomach may be easily distended if it is given bulky food in large portions.
3. During the first two hours of life bacteria can easily pass through the stomach into the intestine.
4. In early weaned pigs lactobacilli disappear.
5. Feeding early weaned pigs with high-protein diets will easily cause diarrhea.

B. Comprehension questions

1. What easily disturb the gastric function and cause lesions?
2. What is known to be a site of high vulnerability?
3. What may cause epithelial damage?
4. What can distend the stomach?
5. Are the gastric functions of piglets different from those of adult pigs?
6. Is there gastric acid production during the first hours of life?
7. What do piglets sucking from sows in a conventional farm environment usually acquire?
8. Why can't ingesta be transported from stomach to intestine?

C. Add words or phrases from the text to complete the following argument

1. Gastric functions of piglets are different from those.....
2. During the first hours of life there is no.....
3. The fluid urine comprises..... water, various salts, urea and other organic wastes
4. Excretion is usually defined asthe process of riding the wastes of the body resulting from metabolism.....
5. The large intestine is divided into.....

IV. Use of English

Task 1: Match the word (line X) in the text with its appropriate definition

- | | |
|---------------------------|--|
| 1. feed (v) –line 4 | a. bring back from the stomach through the mouth |
| 2. contribute (v) –line 4 | b. give food to |
| 3. induce (v) –line 4 | c. weaken, damage |
| 4. release (v) –line 7 | d. get in the way of; hinder |
| 5. acquire (v) –line 13 | e. allow to go ; set free; unfasten |
| 6. vomit (v) –line 20 | f. persuade or influence; lead or cause (sb to do sth) |
| 7. impede (v) –line 21 | g. take place, happen |
| 8. impair (v) –line 22 | h. (of disease) coming sharply to a crisis |
| 9. acute (adj) – line 23 | i. join with others in giving help,...(to a common cause or purpose) |
| 10. occur (v) –line 24 | k. gain by skill or ability, by one's own efforts or behavior. |

Task 2: Fill in each blank with the right form of a suitable word in task 1.

1. He studies hard toa good knowledge of English.
2. Have youthe chickens?
3. Whatyour making an early start?
4. A lot of peoplefood and clothing for the refugees.
5. Whatyou to do such a thing?
6. He wasfrom prison two years ago.
7. The patient has reached thestage of the disease.
8. While I was walking an ideato me.
9. She got carsick andeverything she had eaten.
10. He needed money and..... his health by overwork.

Task 3: Complete the following text by filling in the blank spaces with the expressions given below

Epidermis	layers	organization	beneath
dermis	cells	above	systems

Organs are the next level of (1)..... in the body. An organ is a structure that contains at least two different types of tissue functioning together for a common purpose. There are many different organs in the body: the liver, kidneys, heart, even your skin is an organ. In fact, the skin is the largest organ in the human body and provides us with an excellent example for explanation purposes. The skin is composed of three (2).....: the epidermis, dermis and subcutaneous layer. The (3)..... consists of epithelial tissue in which the cells are tightly

packed together providing a barrier between the inside of the body and the outside world. The dermis contains blood vessels that nourish skin cells. It contains nerve tissue that provides feeling in the skin. And it contains muscle tissue that is responsible for giving you 'goosebumps' when you get cold or frightened. The subcutaneous layer is (4)..... the dermis and consists mainly of a type of connective tissue called adipose tissue.

V. Grammar exercises:

Sentence transformation

Write the sentence again using **when+p2** so that it is similar to the first:

1. In transverse section, when contracted cells are relaxed, they are more rounded and have a larger caliber.

In transverse section, contrasted cells.....

2. The stomach will be distended when it is given bulky food in large portions.

When.....

3. Swine may be unable to squeal when it is affected, and elevation of body temperature may be absent.

When.....

4. When myelin of the peripheral nervous system is damaged it is also under different genetic control and behaves differently.

Myelin of the peripheral.....

5. Pigs are easy to observe when they are walked around a firm, flat surface.

Pigs are easy to observe when.....

VI. Extra Challenge:

1. Translate the text in Reading Comprehension into Vietnamese.

2. Write a reflection on what you have learned:

- What did you learn from it?
- What part of the unit you like best?
- What was difficult for you?
- What do you want to improve?

3. Matching the words or phrases in column A with words or phrases in column B

Column A	Column B
1. Anthropological anatomy	a. Substances that are required in relatively small quantities in the diets of animals
2. Biodiversity	b. Animals that utilize a variety of plant and animal sources
3. An organ	c. the study of similarities and differences in the anatomy of organisms
4. omnivorous	d. Substances that are required in relatively large quantities in the diets of animals
5. Micronutrients	e. the branch of biology that deals with the structure and organization of living things
	f. relating to the comparison of the anatomy of different races of

	humans.
	g. totality of genes, species, and ecosystems of a region"
	h. Animals with a Backbone or Spinal Column
	i. animals whose food is entirely or largely other animals
	j. A structure that contains at least two different types of tissue functioning together for a common purpose

4. Fill in the blank:

- Major Roles of the body systems:
- The main role of is to provide support for the body, to protect delicate internal organs and to provide attachment sites for the organs.
 - The main role of is to provide movement. Muscles work in pairs to move limbs and provide the organism with mobility. Muscles also control the movement of materials through some organs, such as the stomach and intestine, and the heart and circulatory system.
 - The main role of is to transport nutrients, gases (such as oxygen and CO₂), hormones and wastes through the body.
 - The main role of is to relay electrical signals through the body. The nervous system directs behaviour and movement and, along with the endocrine system, controls physiological processes such as digestion, circulation, etc.
 - The main role of is to provide gas exchange between the blood and the environment. Primarily, oxygen is absorbed from the atmosphere into the body and carbon dioxide is expelled from the body.
 - The main role of is to breakdown and absorb nutrients that are necessary for growth and maintenance.
 - The main role of is to filter out cellular wastes, toxins and excess water or nutrients from the circulatory system.
 - The main role of is to relay chemical messages through the body. In conjunction with the nervous system, these chemical messages help control physiological processes such as nutrient absorption, growth, etc.
 - The main role of is to manufacture cells that allow reproduction. In the male, sperm are created to inseminate egg cells produced in the female.
 - The main role of is to destroy and remove invading microbes and viruses from the body. The lymphatic system also removes fat and excess fluids from the blood.

VII.Optional Reading

The Science of Animal Breeding

The science of animal breeding is defined as the application of the principles of genetics and biometry to improve the efficiency of production in farm animals. These principles were applied to change animal populations thousands of years before the sciences of genetics and biometry were formally established. The practice of animal breeding dates back to the Neolithic period (approximately 7000 BC), when people attempted to domesticate wild species such as reindeer, goats, hogs and dogs.

Domestication was performed through controlled mating and reproduction of captive animals **which** were selected and mated based on their behavior and temperament. Judging from cave paintings **that** have survived, selection was also applied to some qualitative traits such as coat color and the absence or presence of horns. Without written records, there is no certain knowledge of the evolution of animal breeding practices, but written documents dating back more than 4000 years indicate that humans appreciated the significance of family resemblance in mating systems, recognized the dangers of intense inbreeding, and used castration to prevent the reproduction of undesirable males. Progress in the performance of domesticated animals through these selection practices was very slow; improvements were mainly due to animals adapting better to their environments.

Robert Bakewell, who was an English animal breeder of the 18th century, is considered the founder of systematized animal breeding. He was the first to emphasize the importance of accurate breeding records, introduced the concept of progeny testing to evaluate the genetic potentials of young sires, and applied inbreeding to stabilize desired qualitative traits. He also promoted concepts such as "like begets like," "prepotency is associated with inbreeding" and "breed the best to the best." Bakewell and his contemporaries in Europe pioneered the development of diverse breeds of beef cattle, dairy cattle, sheep, hogs and horses.

Most livestock breeds with pedigree herd books and breed associations were established between the late 18th century and the second half of the 19th century. Color, conformation, geographical origin and some production characteristics were the main factors **that** differentiated these breeds. Wide geographical redistribution of animal populations was also an important factor in the formation of new breeds, as invading armies, migrating people and traders transported livestock to new lands.

Animal breeding as a modern science belongs to the 20th century. Although numerous geneticists and biometricians have made significant contributions to the development of this science, J.L. Lush of Iowa State University is considered the father of the modern science of animal breeding. Lush and his students developed major scientific procedures applicable to the genetic improvement of farm animals.

UNIT 9: NUMBER OF ANIMALS IN HERD/ ROOM

Most epidemiological studies have revealed that the risk of contracting respiratory disease increases significantly with increasing herd size. However, a very large herd might have somewhat lower level of respiratory disease than simply a big herd. The probable explanation is that very large herds are forced to subdivide facilities and move pigs into groups to control infectious diseases. In other herds it is, by more reasons, not cost effective to divide the facilities for an all-in /all-out production. Therefore, the health status of middle-size and big herds often is surpassed by that of large enterprises.

The number of animals placed in the same airspace significantly affects the incidence of disease even in enterprises with all-in/ all-out production. Experiences from several investigations indicates that respiratory problems are difficult to control if more than 200-300 animals are housed in the same barn; In the Netherlands housing only 80 fatteners) together is advised. Theoretically, for pigs sharing airspace, the risk of exchanging suspended particles vi khuẩn trong không khí increases substantially. The same effect is seen by lowering floor space per pig.

Ventilation

To avoid massive air pollution and to maintain an acceptable relative humidity, it is necessary to use forced ventilation in confined facilities. The lower the airspace per pig the higher the air exchange is necessary. However, it is difficult to obtain full compensation dap ung thoa dang for overcrowding. For example, if stocking rate is doubled, the ventilation rate should be increased tenfold to maintain the same clearance loại trừ of air contaminants; large air-cleaning equipment is necessary if a significant effect on the dust concentration is to be achieved.

Ventilation systems often recirculate room air with fresh air. This mixing of air contributes to a spread of respiratory pathogens. Accordingly, the level of the respirable dust is increased in high speed recirculation systems. Respiratory diseases can be better controlled in buildings under pressure ventilation where polluted air is removed and changed by totally fresh air.

I. Technical vocabulary and expressions

epidemiological (n)	/epi,dimi'olədʒikəl/	science of diseases	Khoa nghiên cứu bệnh dịch học.
contract (v)	/kən'trækt/	catch (an illness)	Mắc bệnh
significant (adj)	/'signi'fikənt/	important, worth to pay attention to	Đáng chú ý
infectious (adj)	/in'fekʃəs/	(of disease) that can be spread by means of bacteria	Lây nhiễm
incidence (n)	/in'sidəns/	range or extent of its (disease) effect	tỷ lệ mắc phải (bệnh)
barn (n)	/ba:n/	building for sheltering cattle or horse	chuồng (trâu, bò)
ventilate (v)	/'ventileit/	cause air to move in and out freely	Làm thông gió

contaminant (n)	/kəntæ'minənt/	dirty, impure or diseased things	chất bẩn, nhiễm bệnh
circulate (v)	/'sækju:leit/	go round continuously, move from place to place freely	Lưu thông, tuần hoàn
pathogen (n)	/pa:θə'tʃəns/	diseases	bệnh
Avoid (v)	/ə'void/	keep or get away from	Tránh
share (v)	/ʃɛə/	divide and distribute	Chia, phân chia
massive (adj)	/'ma:siv/	large, heavy and solid	To lớn, đồ sộ, chắc nặng
subdivide (v)	/sʌb'divɪd/	divide into further divisions	Chia nhỏ ra
humidity (n)	/hju:'miditi/	(degree of) moisture (in the air)	độ ẩm

II. Grammar:

Comparison of adjectives: Comparative form

Please read these examples:

*-A very large herd might have somewhat **lower** lever respiratory disease than simply a big herd.*

*-In the Netherlands lesions in lungs, pleura, and pericardium were also **more prevalent** in castrated males than in females.*

Note that **lower** and **more prevalent** are comparative forms.

a. We use **-er** for the comparative of short adjectives:

low/ lower cheap/ cheaper large/ larger high/ higher

*-The maximum prevalence of rhinitis occurs in autumn, being 75% **higher** than minimum, which occurs in spring.*

*-There is also a risk when introducing animals with a high health status into herds with a **lower** health status without taking any precaution to protect the healthy animals against infection.*

b. We use **-er** with some two-syllable adjectives, especially adjectives ending in **-y**. For examples:

easy/ easier heavy/ heavier simple/ simpler narrow/ narrower

*-It is by far **simpler** to control respiratory diseases in breeding herds marketing all growers and feeders than in herds that also finish the pigs.*

*-This pig are ten kilos **heavier** than that one.*

c. We use **more...**(not **-er**) for other two syllable adjectives and longer adjectives:

more resistant more serious more contaminated more important

- If the samples are **more contaminated**, they can be serially diluted tenfold in brain-heart infusion broth, grown overnight and then plated.*

*-Large granules of mucus are contained within these cells, which are **more frequent** in crypts than on villi.*

d. Some adjectives have irregular comparative forms:

good/ better bad/ worse much -many/ more (before noun) little/ less
(before noun)

*-Cattle have been affected by **more diseases** this year.*

*-**Less water** enters the urine if the intake is scant.*

*-This was easier and **less time** consuming than trying to use the ear.*

*-It's **better** to house 80 animals in the same barn.*

*-Its wound is **worse** today.*

III. Reading tasks

A. Decide if the following statements are true or false

1. Very large herd might have somewhat higher level of respiratory disease than a simple big herd.
2. Pigs should be moved into small groups to control infectious diseases.
3. It is advisable that 80 animals should be housed in the same barn.
4. It's easy to control respiratory problems if more than 200-300 animals are housed in the same barn.
5. Ventilation system often recirculate room air with polluted air.

B. Comprehension questions

1. Does a very large herd have a lower level of respiratory disease than simply a big herd?
2. Should a large big herd be moved into groups to control infectious diseases?
3. Are respiratory problems difficult to control if more than 200-300 animals are housed in the same barn?
4. How many fatteners should be housed together?
5. What should be use in order to avoid massive air pollution and to maintain an acceptable relative humidity?
6. Is it difficult to obtain full compensation for overcrowding?
7. What can recirculate room air with fresh air?
8. How can respiratory diseases be better controlled?

IV. Use of English

Task 1: Match the words (line X in the text) with its appropriate definition

- | | |
|----------------------------|--|
| 1. surpass (v) –line 6 | a. do or be better than |
| 2. effective (adj) –line 5 | b. examine, make a careful study |
| 3. investigate (v) –line 8 | c. keep, hold |
| 4. confine (v) –line 15 | d. having an effect, able to bring about the result intended |
| 5. circulate (v) –line 19 | e. go around continuously, move from place to place freely |
| 6. avoid (v) –line 13 | f. divide and distribute |
| 7. share (v) –line 10 | g. keep or get away |
| 8. overcrowd (v) –line 15 | h. (cause to) become more widely extended or distributed |
| 9. spread (v) –line 20 | i. crowd too much |
| 10. pollute (v) –line 22 | k. make dirty, destroy the purity of |

Task 2: Fill in each blank with the right form of a suitable word in task 1.

1. They arethe causes of the railway accident.
2. The beauty of the scenery.....my expectation.
3. It's cruel to birds in a cage.
4. You can hardlymeeting her if you work in the same office.
5. In many buildings hot waterthrough pipes to keep the room warm.
6. The firefrom the factory to the houses nearby.
7. Pleaseout \$ 100 among five men.
8. The bus wasthis morning.
9. The riverswith filthy wastes from factories.
10. The government havemeasures to cure unemployment.

Task 3: Complete the following text by filling in the blank spaces with the expressions given below

ended	for	plants	animals
began	breeding	mixing	with

Selective breeding is the process of (1)..... plants and animals for particular genetic traits. Typically, strains which are selectively breed are domesticated, and the breeding is sometimes done by a professional breeder. Bred (2)..... are known as breeds, while bred plants are known as varieties, cultigens, or cultivars. The cross of animals results in what is called a crossbreed and crossbred plants are called hybrids. The term selective breeding is synonymous (3)..... artificial selection.

Plant breeding has been used for thousands of years, and (4)..... with the domestication of wild plants into uniform and predictable agricultural cultigens. High-yielding varieties have been particularly important in agriculture. Selective plant breeding is also used in research to produce transgenic animals that breed "true" for artificially inserted or deleted genes.

V. Grammar exercises:

Task 1. Sentence transformation

Write the second sentence so that it is similar to the first:

1. It may be appropriate to isolate individuals for a cursory examination.
To isolate.....
2. Acutely, we should select affected, untreated pigs for necropsy and examine different components of the locomotor system.
Acutely, affected.....
3. To obtain a definitive diagnosis, it is simpler and less expensive to euthanatize one or more pigs and perform a necropsy.
It is.....
4. Bacteria may delaminate proteins and amino acids that reach the colon.
Proteins.....
5. Though such animals are protected sufficiently, they may still easily develop diseases.
In spite of.....

Task 2: Complete the following sentences using the comparative form of adjectives:

1. In herds with an inadequate separation between pigs of different ages, there remains a continuous transmission of microbes from(old) to(young) pigs, with a subsequently continuous replication of pathogens.
2. This was.....(easy) and(little) time consuming than to use the ear.
3. Bacteria invade beneath the epithelial layer into the(deep) layers of the intestinal wall and cause a pronounced inflammatory response.
4. The outmost stratified epidermal layer is a.....(resistant) covering than those under it.
5. The(high) the relative risk, the(strong) the association between the disease factor and disease.

VI. Extra Challenge:

1. Translate the text in Reading Comprehension into Vietnamese.
2. Write a reflection on what you have learned:
 - What did you learn from it?
 - What part of the unit you like best?
 - What was difficult for you?
 - What do you want to improve?
3. Matching the words or phrases in column A with words or phrases in column B

Column A	Column B
1. Microscopic anatomy	a. Animals with a Backbone or Spinal Column
2. Comparative anatomy	b. the study of anatomical structures that can be seen by unaided vision.
3. Veterinary medicine	c. the study of minute anatomical structures assisted with microscopes
4. Vertebrates	d. relating to the comparison of the anatomy of different races of humans.
5. Cold-blooded creatures	e. the study of the mechanical, physical, and biochemical functions of living organisms
	f. Animals without a Backbone or Spinal Column
	g. the study of similarities and differences in the anatomy of organisms.
	h. the application of medical, diagnostic, and therapeutic principles to companion, domestic, exotic, wildlife, and production animals
	i. Animals that keep the inside of their bodies at a constant temperature
	j. Animals that take on the temperature of their surroundings

VI. Optional Reading:

Animal breeding

Animals with homogeneous appearance, behavior, and other characteristics are known as particular breeds, and they are bred through culling particular traits and selecting for others. Purebred animals have a single, recognizable breed, and purebreds with recorded lineage are called pedigreed. Crossbreeds are a mix of two purebreds, while mixed breeds are a mix of several breeds, often unknown. Animal breeding begins with breeding stock, a group of animals used for purpose of planned breeding. When individuals are looking to breed animals, they look for certain valuable traits in purebred stock for a certain purpose, or may intend to use some type of crossbreeding to produce a new type of stock with different, and presumably superior abilities in a given area of endeavor. For example, to breed chickens, a typical breeder intends to receive eggs, meat, and new, young birds for further reproduction. Thus the breeder has to study different breeds and types of chickens and analyze what can be expected from a certain set of characteristics before he or she starts breeding them. Accordingly, when purchasing initial breeding stock, the breeder seeks a group of birds that will most closely fit the purpose intended.

Purebred breeding aims to establish and maintain stable traits, that animals will pass to the next generation. By "breeding the best to the best," employing a certain degree of inbreeding, considerable culling, and selection for "superior" qualities, one could develop a bloodline superior in certain respects to the original base stock. Such animals can be recorded with a breed registry, the organization that maintains pedigrees and/or stud books.

The observable phenomenon of hybrid vigor stands in contrast to the notion of breed purity. However, on the other hand, indiscriminate breeding of crossbred or hybrid animals may also result in degradation of quality.

UNIT 10: GENERAL ASPECT OF EXAMINATION OR EVALUATION

For any productivity or disease problems, it is important to consider all the animals within an affected group to determine the frequency of the problem. Logically, an investigator should briefly examine all age groups or categories of pigs and their respective environments to determine whether or not there are clinical signs or lesions in pigs in groups other than those that were identified initially.

Within the groups of pigs examined during a walk-through, it may be appropriate to isolate individuals for a cursory examination. Before any hand-on examination is considered, each pig should be examined from distance, preferably while they were either stand or move about freely in their pen. However, to examine the pig closely, the nature of the animal is such that restraint often is necessary. Minimal restraint that is compatible with humane and safe handling, an efficient examination process, and safety of the handler is required.

Restraint methods fall into three major categories: manual restraint, mechanical restraint, and chemical restraint. A method of restraint or control of a placid sow is the simple process of stroking the udder while talking softly to her. Lively, fractious, or timid animals will need to be restrained, since this allows a more thorough examination. Sucking and weaned piglets are best held by the hind legs with the head downward to minimize squealing. Hind feet can be examined easily with the animal held in this position. However, if all four feet are to be considered, it is possible for a person to sit and hold the piglet on the lap in a supine position with a thoracic and pelvic limb in each hand. Weaned and growing pigs can be restrained in lateral recumbency by firmly grasping the thoracic limb and flexing and slightly adducting the carpal joint. Growing and finishing pigs can be cast with a robe and restrained. Place a loop around the snout; the free end of the rope is then passed around the leg above the tarsus in a half hitch and pulled so that the snout and tarsus are drawn together as the pig is pulled off balance. A simple slipknot is used to secure the ropes while the pig's feet are examined. Larger finishing pigs, sows, and boars can be restrained by using the criss-cross or half-hitch methods of casting.

I. Technical vocabulary and expressions

isolate (v)	/ˈaɪsəleɪt/	separate, put or keep apart from others	Cô lập, cách ly
cursory (adj)	/ˈkɜːsəri/	(of work, reading, etc.) quick; hurried; done without attention to details	Lướt qua, liếc nhanh
pen (n)	/pen/	small enclosure for cattle, sheep, poultry, etc.	Trại, bãi rào kín để Nhốt trâu, bò, gà....
restrain(v)sb/sth from	/rɪsˈtreɪn/	hold back; keep under control	Cầm giữ, giam
restraint (n)	/rɪsˈtreɪnt/		Sự cầm giữ
placid (adj)	/ˈplæsid/	calm; untroubled	Điềm tĩnh
sow (n)	/saːu/	fully grown female	Lợn cái
boar (n)	/bɔː/	uncastrated male domestic pig	Lợn đực

stroke (v)	/s`trouk/	pass the hand along the surface, usually again and again	Vuốt ve
timid (adj)	/timid/	easily frightened, shy	Nhút nhát
suck(v)sth from/out of etc.	/s^k/	draw (liquid) into the mouth by the use of the lip muscles	Bú
wean (v)	/win/	accustom (a baby, a young animal) to food other than it's mother's milk	Thôi bú
piglet (n)	/'piglət/	young pigs	Lợn con
squeal(v)	/s'kwil/	cry or sound longer and louder	kêu to
flex (v)	/fleks/	bend, eg. a limb, one's muscles	Làm cong, uốn cong

II. Grammar

Noun clauses

1. Noun clauses (**that** –clauses) as subject of a sentence

Sentence with noun clause subjects usually begin with **it**: **It + be + adjective + noun clause**

Examples:

-It is understandable that respiratory tract must be equipped with a potent and specialized defense apparatus. Noun clause (subject)

-It is not surprising that apparently similar disorder may have quite different causes.

Noun clause (subject)

-It is clear that the true incidence of rabies in swine is difficult to assess.

Noun clause (subject)

Note that **It** in these sentences is the unreal subject and the **noun clause** is the real subject. When you translate the sentence you have to translate the real subject first.

2. Noun clause (**that** –clause) as object s of verbs

Examples:

-Several investigations indicate that respiratory disorders are to some extent influenced by heredity. Noun clause

-Most reports suggest that swine die within 72 – 96 hours following development of clinical signs.

Noun clause

-Evidence also indicates that some animal species are more resistant to the infection than others.

Noun clause

3. Verbs can also be followed by noun clauses beginning with **wh**-words: **what, where, why, when, who, whether** or with **how** .

Examples:

-Do you know what the central nervous system regulates?

Noun clause

-Can you tell me where the food is stored and digested?

-The investigator should examine all age groups of pigs and determine whether or not there are clinical signs or lesions in pigs. (This sentence is in the text.)

Noun clause

-They have found how they can restrain all age groups of pigs.

Noun clause

III. Reading tasks

A. Decide if the following statements are true or false

1. For any disease problems, considering all the animals within an affected group is sometimes necessary to determine the frequency of the problem.
2. Within the groups of pigs examined during a walk-through, it may be inappropriate to isolate individuals for a cursory examination.
3. A hand-on examination is essential after each pig is examined from distance, especially while they were either stand or move about freely in their pen.

B. Comprehension questions

1. What should an investigator do to determine whether or not there are clinical signs or lesions in pigs?
2. What are the three major categories that restraint methods fall into?
3. What should be done to restrain or control a placid sow before a hands-on examination?
4. How are sucking and weaned piglets best held when examined?
5. What should a person do if the four feet of a piglet are to be considered?
6. What can growing and finishing pigs be cast with?
7. What is used to secure the ropes while the pig's feet are examined?
8. How can larger finishing pigs, sows and boars be restrained?

C. Add words or phrases from the text to complete the following argument

1. It has long been known that the spinal column extends.....
2. They have indicated that restraint methods fall.....
3. They have pointed out that the small intestine is divided into.....
4. It is advisable that 80 animals should be.....
5. It is very easy to understand that well-fed cows will give.....

IV. Use of English

Task 1: Match the words (line X) in the text with its appropriate definition.

- | | |
|-----------------------------|---|
| 1. isolate (v) –line 5 | a. suited to, able to exist together with |
| 2. timid (adj) –line 13 | b. (of sound) subdued, not loud |
| 3. suck (v) –line 14 | c. done with the hands |
| 4. compatible (adj) –line 9 | d. develop, increase in size, height, length etc. |
| 5. manual (adj) –line 11 | e. look at carefully in order to learn about or from |
| 6. soft (adj) –line 13 | f. throw, allow to fall or drop |
| 7. grow (v) –line 18 | g. easily frightened, shy |
| 8. examine(v) –line 5 | h. draw (liquid) into the mouth by the use of the lip muscles |
| 9. cast (v) –line 19 | i. separate, put or keep apart from others |
| 10. hold (v) –line 17 | k. keep fast or steady in or with the hands |

Task 2: Fill in each blank with the right form of a suitable word in task 1

1. You must drive a car at a speedwith safety.
2. People who do.....labor don't need to do physical exercise.
3. They are talking in.....voice.
4. Plants.....from seeds.

5. I must have my eyes
6. The fishermanhis net into the water.
7. They areeach other's hands
8. When a person has an infectious disease, he is usually isolated.
9. That fellow is as as a rabbit.
10. The baby is.....its mother's breast.

Task 3: Complete the following text by filling in the blank spaces with the expressions given below

amount	diseases	Therefore	infectious
number	illness	cause	However
infection	herds	identify	measures

Zoonoses are infectiousthat are transmissible from animals (i.e. non-humans) to man. Humans may acquire zoonotic infections through aof routes, including food, water, direct contact and insect vectors. Transmission of certain diseases through food remains an importantof illness in both developing and developed countries.

The recent Foot and Mouth Disease (FMD) crises in Europe and the Avian Influenza crisis in Asia have heightened public concerns over the safety of foods of animal origin. In some cases, the mere presence of disease inor flocks of food-producing animals is perceived by consumers as a risk that undermines their confidence in derived food products., the risks for human health associated with some of these diseases may be negligible or non-existent.

In industrialized countries, potential risks associated with foodborne pathogens are minimised through stringent animal health control..... Diseased animals cannot be used to produce human food. For instance, milk from cows with an uddercannot be sold or delivered to the dairy plant. Animals arriving at the abattoir to be slaughtered are first inspected for signs of clinical illness before they enter the premises. Throughout the slaughter process, meat inspection procedures are carried out by trained personnel tosigns of disease in the carcass. Needless to say, any deviation from normality leads to rejection of the carcass for further use.

V. Grammar exercises:

Task 1: Sentence transformation

Make a new sentence from these questions.

1. How can larger finishing pigs, sows and boars be restrained?
We must know.....
2. What can growing and finishing pigs be cast with?
It is also important to find out.....
3. When should a pig be examined from distance?

- They have indicated.....
4. What do herbivorous animals eat?
Please tell us.....
5. Where does the food taken by animals stored and digested?
Do you know.....?

Task 2: Make one sentence using *that*-clause.

1. Rabies is a highly infectious viral disease of humans and animals which dates to antiquity.
We are certain
2. Pigs born from gilts had a significantly higher prevalence of lung lesions than those born from older sows.
An examination revealed
3. Garbage may contain the offal of tuberculous human patients is not properly disposed of.
It was concluded.....
4. Some muscles have a multiple nerve supply.
It is important to recognize.....
5. Muscles do not change in volume when they contract.
It has long been known.....

VI. Extra Challenge:

1. Translate the text in Reading Comprehension into Vietnamese.
2. Write a reflection on what you have learned:
- What did you learn from it?
 - What part of the unit you like best?
 - What was difficult for you?
 - What do you want to improve?
3. Matching the words or phrases in column A with words or phrases in column B

Column A	Column B
1. Gross anatomy	a. Animals that eat leaves and stems of plants
2. Physiology	b. the study of anatomical structures that can be seen by unaided vision.
3. Invertebrates	c. the study of minute anatomical structures assisted with microscopes.
4. herbivorous	d. the study of the mechanical, physical, and biochemical functions of living organisms
5. Macronutrients	e. the study of how animals' bodies function in their environment
	f. Animals without a Backbone or Spinal Column
	g. relating to the comparison of the anatomy of different races of humans.
	h. Animals with a Backbone or Spinal Column

	i.Substances that are required in relatively large quantities in the diets of animals
	j.animals whose food is entirely or largely other animals

VII. Optional Reading

BACTERIAL DISEASES

Salmonella

Salmonellosis is the disease caused by one of the many serotypes of the bacterium, *Salmonella enterica*. It is one of the most common causes of bacterial foodborne illness worldwide, second only to campylobacteriosis. All species, including humans, may be infected by *Salmonella* bacteria, which live in the intestine and may be shed in faeces. However, *Salmonella* can survive and multiply very well outside the intestinal tract, which makes eradication impossible. Moreover, faecal contamination of carcasses, milk and eggs cannot be completely prevented.

In animals, the disease may manifest as one or more of three major syndromes: septicaemia, acute enteritis and chronic enteritis. Some serotypes of *Salmonella*, such as *S. Choleraesuis* in pigs, *S. Dublin* in cattle and *S. Pullorum* in poultry, can cause severe disease in animals, but livestock can also be carriers without showing clinical signs of infection. The most common serotypes involved in human foodborne illness are *S. Enteritidis* and *S. Typhimurium*, but these often cause only mild, if any, disease in livestock.

In humans, salmonellosis causes fever, headache, nausea, vomiting, abdominal cramps and diarrhoea. Symptoms usually develop within 12-72 hours after ingestion, and last for 4-7 days. Most cases are self-limiting, but severe cases require hospitalisation, and may be fatal. The more severe cases are associated with septicaemia, when the organism spreads, via the blood stream, to other body sites. Particularly vulnerable groups include the elderly, infants and people with impaired immune systems. Some people may become carriers following infection and in some cases, there may be long term complications, such as reactive arthritis. ‘Typhoid fever’ is caused by *S. Typhi*, which only infects humans and is not spread by animals.

Food sources of animal origin include poultry and other meats, eggs and raw milk. However, infection may also be acquired from vegetables that have been irrigated with, or washed in, contaminated water. Although the organism can survive at refrigeration temperatures, it is destroyed by proper cooking and pasteurisation. Cooked foods may, however, be cross-contaminated by raw foods or other unhygienic practices.

Poultry and eggs are particularly high risk foods. Egg-associated salmonellosis is usually transmitted through faecal contamination of the shell, but *S. Enteritidis* may, rarely, also infect the ovaries of apparently healthy chickens and contaminate their eggs before the shells are formed.

Control measures and voluntary codes of practice for the control of *Salmonella* are implemented at national and European levels. Compulsory measures are currently in place through EU

regulations to control *S. Typhimurium* and *S. Enteritidis* in breeding poultry flocks, and these are due to be extended to other groups of poultry and other species.

Humans that are carriers may inadvertently spread infection if they handle food without washing their hands after using the toilet. Direct contact with infected animals, including pets, can also be a source of infection. Reptiles are particularly likely to harbour *Salmonella* and hands should always be washed after handling pets e.g. reptiles.

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Collective nouns of animals

A

A herd of antelope
A colony or an army of ants
A shrewdness of apes
A herd or pace of asses

B

A culture of bacteria
A cete of badgers
A shoal of bass
A sleuth or sloth of bears
A colony of beavers
A swarm, grist or hive of bees
A flock, flight, congregation or volery of birds
A sedge or siege of bitterns
A sounder of boars
A herd of buffalo
A brace or clash of bucks

C

An army of caterpillars
A clowder or clutter of cats
A herd or drove of cattle
A brood or peep of chickens
A clutch or chattering of chicks
A bed of clams
A quiver of cobras
A rag of colts
A cover of coots
A kine of cows (twelve cows are a flink)
A band of coyote
A sedge or siege of cranes
A float of crocodiles
A murder of crows
A litter of cubs
A herd of curlews
A cowardice of curs

D

A herd of deer
A pack of dogs

K

A troop or mob of kangaroos
A kindle or litter of kittens

L

An ascension or exaltation of larks
A leap (leep) of leopards
A pride of lions
A plague of locusts

M

A tiding of magpies
A sord of mallards
A stud of mares
A richness of martens
A labour of moles
A troop of monkeys
A barren or span of mules

O

A parliament of owls
A yoke, drove, team or herd of oxen
A bed of oysters

P

A company of parrots
A covey of partridges
A muster or ostentation of peacocks
A litter of peeps
A nest, nide (nye) or bouquet of pheasants
A flock or flight of pigeons
A litter of pigs
A wing or congregation of plovers
A string of ponies
A pod of porpoises

Q

A covey or bevy of quail

R

A nest of rabbits

A dule of doves
A brace, paddling or team of ducks

E

A clutch of eggs
A herd of elephants
A pod of elephant seals
A weaner pod is yearling elephant seals
A gang of elks
A mob of emus

F

A business or fesnyng of ferrets
A charm of finches
A school, shoal, run, haul, catch or draught of fish
A swarm of flies
A skulk or leash of foxes
An army or colony of frogs

G

A flock, gaggle or skein (in flight) of geese
A cloud or horde of gnats
A herd, tribe or trip goats
A charm of goldfinches
A band of gorillas
A leash of greyhounds

H

A down or husk of hares
A cast or kettle of hawks
A brood of hens
A hedge of herons
A drift, or parcel of hogs
A team, pair or harras of horses
A pack, mute or cry of hounds

J

A smack or fluther of jellyfish

A pack or swarm of rats
A rhumba of rattlesnakes
An unkindness of ravens
A crash or herd of rhinos
A bevy of roebucks
A building or clamour of rooks

S

A herd or pod of seals
A drove or flock of sheep
A nest of snakes
A walk or wisp of snipe
A host of sparrows
A dray of squirrels
A murmuration of starlings
A mustering of storks
A flight of swallows
A bevy, herd, lamentation or wedge of swans
A flock of swifts
A sounder or drift of swine

T

A spring of teal
A knot of toads
A hover of trout
A rafter of turkeys
A pitying or dule of turtledoves
A bale of turtles

W

A pod of walrus
A school, gam or pod of whales
A nest of vipers
A pack or route of wolves
A fall of woodcocks
A descent of woodpeckers

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