OBJECTIVES

At the end of this chapter, students should be able to:

â—† draw and label parts of farm animals.

â—† dissect a farm animal.

â—† identify important organs like heart, liver and lungs.

â—† sketch these parts and mention their

13.1 Introduction

All living organisms have different body parts, and all these parts work together to form the entire body system. Each part of the body is located in different portion of the animal whether internally or externally. Anatomy deals with the study of the structures while physiology deals with the study of the functions of the different parts of the body of the animal.

13.2 External Structure of Farm Animals

Figure 13.1 shows external structure of selected farm animals.

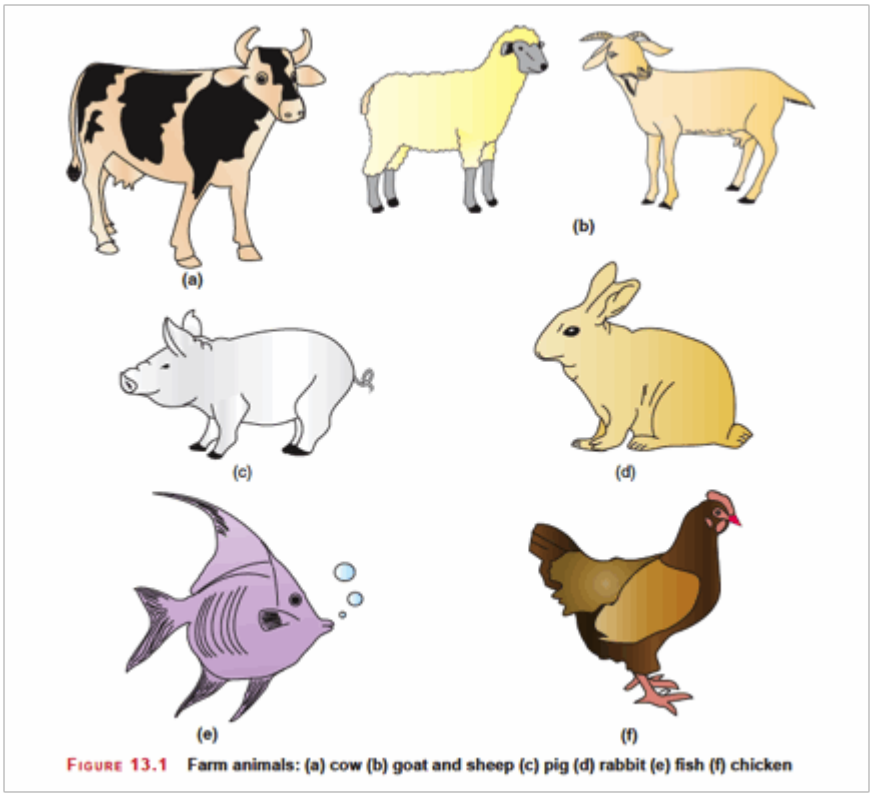


FIGURE 13.1 Farm animals: (a) cow (b) goat and sheep (c) pig (d) rabbit (e) fish (f) chicken

13.3 Internal Structure of Selected Farm Animals

Figure 13.2 shows the internal structure of selected farm animals.

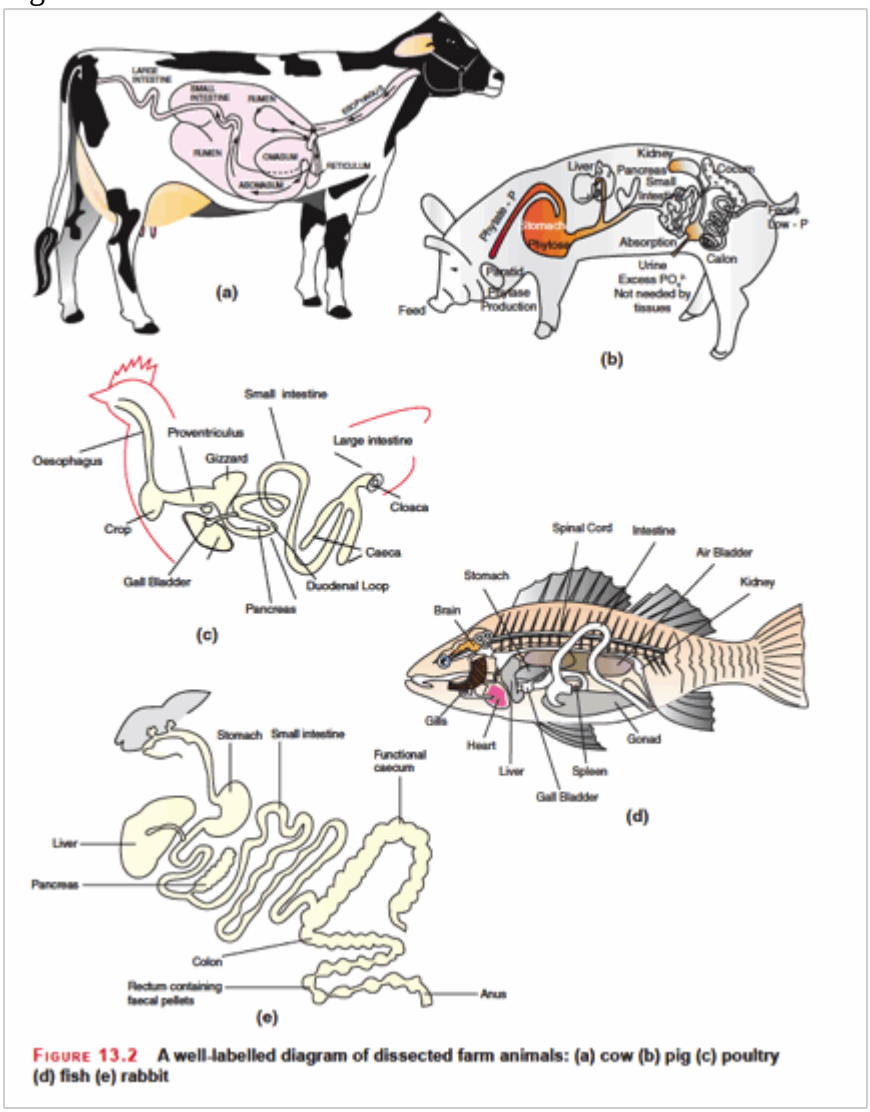
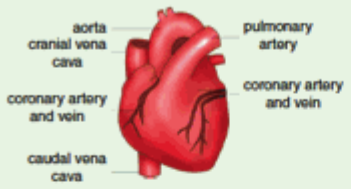
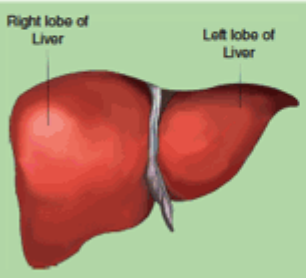
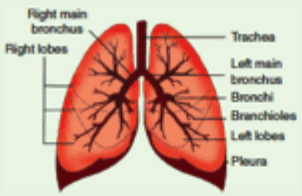
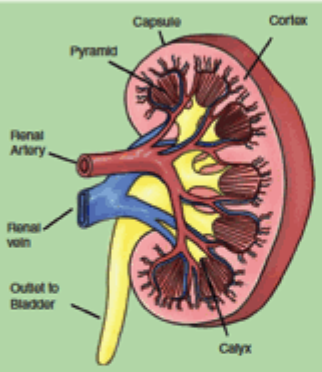


FIGURE 13.2 **A well-labelled diagram of dissected farm animals: (a) cow (b) pig (c) poultry (d) fish (e) rabbit**

13.4 Important Organs of the Farm Animals

The animal body is composed of different organs. Some of these organs are the heart, lung, liver, kidney and stomach.

TABLE 13.1

Animal Organ	Structure (Labelled Diagram)	Description	Functions
Heart		• Most powerful organ in the circulatory system • Located in the thoracic cavity • Heart muscles are called cardiac muscles • The heart has four chambers separated by a thin wall called septum • Right chamber carries de-oxygenated blood • Left chamber carries oxygenated blood	• Pumps blood around the animal body. • Circulates oxygen around the body. • Blood circulation helps to: i. Remove wastes from the body ii. Distribute heat around the body iii. Transport nutrients to body tissues iv. Transport hormones and enzymes around the body v. Remove carbon dioxide from body vi. Maintain body temperature
Liver		• Largest organ in animal body • Brick red in colour • Has two big lobes and three small lobes • Located at the right part of animal's body just below the diaphragm	• Manufacture bile which emulsifies fats in animal diet • It converts glycogen to glucose when the animal needs it • It converts fat to glycogen • It stores iron and vitamins A, D and B12 • It helps to regulate blood glucose level • It helps to breakdown poisonous substances by detoxification • It converts amino acids to carbohydrates • Manufacture of protein • Break down excess amino acids by deamination
Lungs		• Paired organ • Located in the thoracic cavity • Connected to the outside by semes of air tubes • Protected by the rib-cage, intercostal muscles and the diaphragm	• Means of gaseous exchange • Help in the transpiration of oxygen around the body • Help to expel carbon dioxide from the body
Kidney		• Paired organ • Reddish brown, bean shaped structure • Lie asymmetrically to one another • Located around the lumbar upper region of the abdomen • Connected to the urinary bladder through the liver • Blood circulation through the renal artery and renal vein	• Excretion of unwanted nitrogenous wastes like urea and ammonium compounds • Help to eliminate poisonous substances from the body • Removal of excess glucose from body • Osmo-regulatory system • Maintain acid–base balance of the body • Cuds conversion of some useful body material by reabsorbing them during ultra-filtration
Stomach		• This is variable depending on the type of animal • Ruminants have four compartments: rumen, reticulum, omasum and abomasum • Monogastric animals have only one stomach compartment • It retains and digests food	• It retains and digests food • Its movement help to mix food with digestive enzymes • It secrets digestive enzymes • It absorbs some products of digestion, e.g., alcohol

13.5 Differences between monogastric stomach and ruminant stomach

Monogastrics	Ruminants
Have simple stomach system	Have complex four compartment system
They feed mainly on concentrates	They feed mainly on roughages like grasses and legumes
They do not regurgitate	They regurgitate
They cannot ruminate or chew cud	They ruminate and chew cud
They have no rumen	They have rumen
Examples are rabbits, pigs and poultry	Examples are goats/ sheep and cattle
They cannot digest cellulose because microbes are absent	They can digest cellulose and have a lot of microbes in their system
They have incisors and canines	They do not have incisors

Activity

Dissect a rabbit and observe the internal organs. Draw and label the organs fully. List out the difference between monogastric and polygastric animals.

â—† Anatomy deals with the study of the structures while physiology deals with the study of functions of the different parts of the body of animal.

â—† The external and internal structures of farm animals are well presented.

â—† The important organs of farm animals are the heart, the liver, the lungs, the kidney and stomach, each with its anagrams, descriptions and functions.

â—† The differences between monogastrics and polygastrics.

Revision Questions

Essay Questions

1. With the aid of a labelled diagram describe digestion in a named ruminant (SSCE JUNE 1994).

2. (a) Enumerate three major organs in each of the thoracic and abdominal cavities of farm animals.

(b) State two functions of the liver.

3. (a) Describe with the aid of a diagram the stomach of a named ruminant.

(b) State three functions of the first compartment of the stomach of a ruminant (WASSCE JUNE 2001).

4. (a) What are monogastrics and ruminants?

Give two examples each.

(b) In a tabular form, differentiate between monogastric and ruminant digestive system.

5. With the aid of a labelled diagram, describe digestion in a named non-ruminant.

Objective Questions

1. The animals with four compartment stomach are called

(a) monogastrics.

(b) ruminants.
(c) non-ruminants.
(d) cattle.

2. The part of the digestive tract of birds which secretes gastric juice is the
(a) oesophagus.
(b) proventriculus.
(c) gizzard.
(d) crop.

3. The digestive function of the rumen in ruminants is enhanced by the
(a) storage of undigested grass.
(b) presence of microorganisms.
(c) absorption of food nutrient.
(d) regurgitation of food

4. The most glandular portion of the ruminant stomach where enzymatic digestion takes place is the
(a) abomasums.
(b) omasum.
(c) reticulum.
(d) rumen.

5. In the ruminant stomach, the portion where most of the microbial digestion takes place is the
(a) omasum.
(b) reticulum.
(c) rumen.
(d) abomasums.

6. Which of the following is not a digestive enzyme?
(a) Lactase
(b) Maltase
(c) Prolactin
(d) Sucrase

7. Birds temporarily store their food in the
(a) crop.
(b) gizzard.
(c) proventriculus.
(d) duodenum.

Answers

1. b 2. d 3. b 4. c 5. c 6. c 7. a