FOOD PRODUCTION AND MANAGEMENT — II

[Animals]

11

SYLLABUS

Sericulture, apiculture, pisciculture, poultry farming, livestock farming —cattle for different uses, sheep — briefly. Protection of animals against diseases.

* Visits to Sericulture farms, apiaries, poultry farms.
* Films about these topics.

You have learnt so far that human beings have been utilising microorganisms and plants to get food and other useful items from them. In this chapter, you will learn that various animals have also been used by humans not only for food, but also for various other useful products, like leather, silk, honey, *etc*.

DOMESTIC ANIMALS

Breeding of wild animals for specific purposes is called **domestication** and such animals are called **domestic animals.** The first domesticated animal was perhaps dog which helped the human beings in hunting and guarding his cattle.

India is predominantly an agricultural country, therefore, domestic animals play an important role, specially in the economy of rural areas.

Animal husbandry. The branch of biology which deals with feeding, shelter, caring and breeding of domesticated animals is called **animal husbandry.**

Animals domesticated for home companionship are called **pets**, while those domesticated for food or work are called **livestock**.

Animals which provide food are of two types :

A. Milk-yielding or **Milch** animals, like cows, buffaloes and goats.

B. Meat and egg-yielding animals, like hen, sheep, goat, fish, pig, *etc*.

[You can add a third category of animals too, which are used for doing heavy work **(Draught animals).** Such animals include bullocks, camels, elephants, horses, donkeys and mules.]

Besides, some animals like sheep, goat, deer, silk worm and honey bee provide us wool, skin, horns, silk, honey, *etc*.

MILK-YIELDING OR MILCH ANIMALS

Milk-producing animals of India are cows, buffaloes, goats and camels. The **milk from goats** is nutritious and is sometimes preferred to cow milk. But the production of goat milk is much less than that of cows and buffaloes. **Cow milk** is quite nourishing and easy to digest, but as compared to buffaloes, cows produce less quantity of milk. Buffaloes are the major source of milk in our country.

Breeds of Cow

There are about thirty different breeds of cows in our country. Considering their males and females together, these are classified into ***three*** categories :

(i) draught, (ii) dual purpose and
(iii) dairy.

(i) Draught breeds are those whose

males are primarily used for drawing bullock carts, ploughing land and transporting material from one place to another. The females of this breed yield less milk.

(ii) **Dual purpose breeds** are quite good milk-yielders (cows), and their bullocks (castrated bulls) are good for draught purposes. The breeds **Haryana** (Fig. 11.1), **Dangi** and **Tharparkar** serve dual purpose. Their females are good milk-yielders, while their males are good for draught work.

Fig. 11.1 "Haryana" bull

(iii) **Dairy breeds** are high milk-yielders (cows) and their bullocks are poor for draught purposes.

In India, we have **three** types of breeds of dairy cows:

(a) *Indigenous* (Indian) breeds. For example, **Red Sindhi, Sahiwal** and **Gir**.

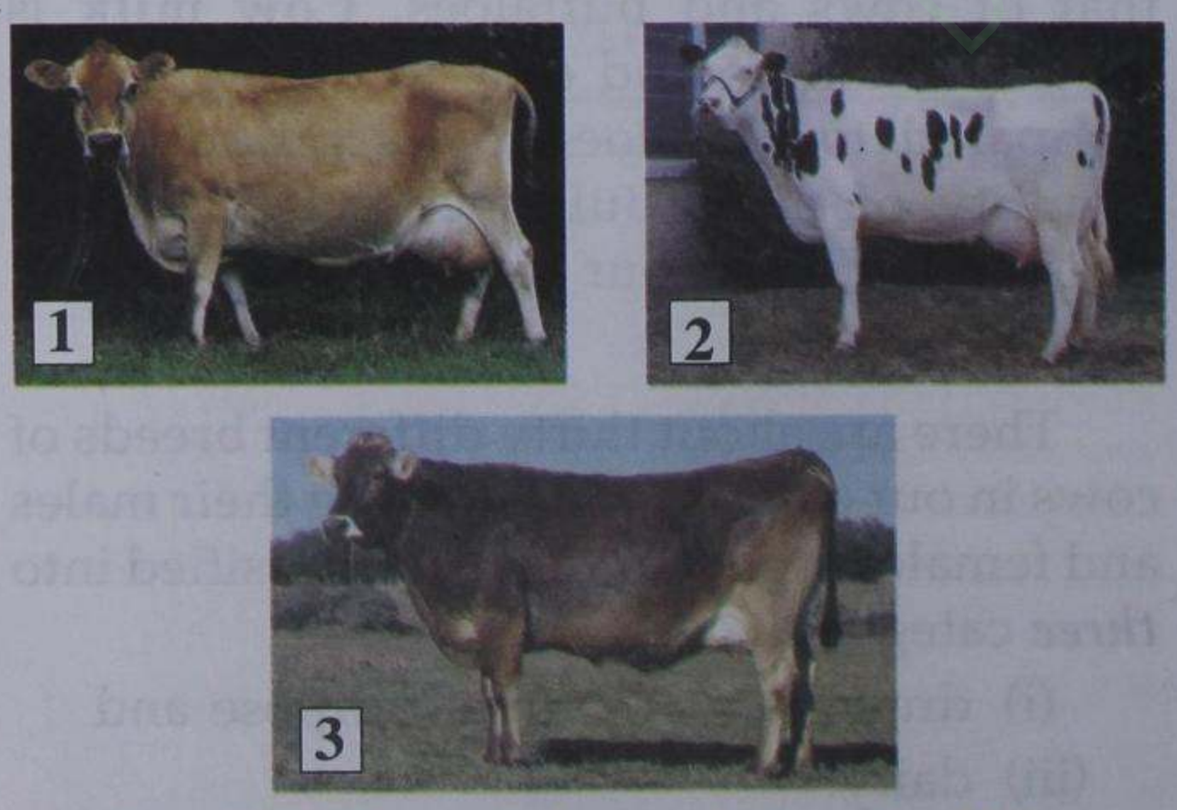


Fig. 11.2 Three of the exotic breeds of Cow
(1) Jersey, (2) Holstein-Friesian, (3) Brown Swiss

(b) *Exotic* (Foreign) breeds. For example, **Jersey, Holstein-Friesian,** and **Brown Swiss**.

(c) *Cross* breeds (developed by mating bulls of exotic breeds with the cows of the indigenous ones). For example, **Karan-Fries** and **Frieswal**.

The yield of milk from these improved varieties of cows has increased 2-3 times more than the indigenous ones.

Breeds of buffaloes

(i) **Murrah :** This is the original breed of Haryana and Punjab (Fig.11.3). Its average annual yield of milk is 1800 to 2500 litres with the fat content up to seven percent.

Fig. 11.3 Fig. Murrah buffalo

(ii) **Mehsana :** This is a breed common in Gujarat. Its average milk yield is about 1200-2500 litres.

(iii) **Surti :** This breed is a native of Kaira and Vadodara districts of Gujarat. Its average milk-yield is 1600-1800 litres. The fat content of the milk is about 8-10 percent.

SHELTER AND FEEDING (MANAGEMENT OF MILCH ANIMALS)

(A) *Shelter* : Animal shelters should be clean, well-lit and well-ventilated.

(1) **Sheds.** Cattle are kept under properly covered cattle sheds. Such sheds protect them from rain, heat and cold.

(2) **The floor** of the cattle shed should be made sloping to facilitate cleaning and keeping their sitting place dry.

(3) The animals should be provided with **feeding troughs** (*"naand"*).

(4) A good animal shelter should be **spacious** so as to allow enough space for each animal to stay comfortably, and avoid overcrowding.

(5) It should have arrangements for clean **fresh drinking water.**

(6) It should have proper arrangement for the **disposal of the animal's urine and excreta.**

(7) It should be **well-protected** from predators.

(8) Shelters should be located far away from the residential areas and waste disposal sites.

(B) *Feeding* : The animal food that contains essential components needed for the growth, development and general maintenance of the body is called **feed**.

The cattle feed consists of *two* types of substances : (a) Roughage and (b) Concentrates.

(a) Roughage : Roughage used in the cattle feed is a coarse and fibrous substance having low nutrient contents. The animals get roughage in their feed from substances like hay (straw of cereals), green fodder, silage, legumes like berseem, lucerne and cowpea.

(b) Concentrates : The concentrates are rich in nutrients with very little fibrous matter. They are rich in carbohydrates, proteins, fats, minerals, and vitamins. Concentrates are provided by :

(i) **Grains and seeds** of *bajra*, maize, rye, *jowar* and barley, which are rich in carbohydrates. Legume seeds are rich in proteins, while oil seeds (e.g. cotton seeds) are rich in fats.

(ii) **Oil Cakes** are formed from the remains of oil seeds after the extraction of oil. The common oil cakes are made from the seeds of cotton, mustard and groundnut.

(iii) **Rice bran, gram chaff, wheat bran** and **molasses** are also rich components of concentrates.

Diseases of Cattle

Like human beings, animals also suffer from various diseases and need caring. Caring means prevention, control and cure of diseases to keep them fit and healthy. In the table given below (Table 1), some common diseases of cattle have been listed.

Table 1 : List of some common diseases of cattle, their symptoms and causative agent

Name of the disease	Symptoms	Causative agent
1. Foot and mouth disease	• Blisters on feet and mouth • Excessive salivation • Reduced appetite • Soreness of mouth • High body temperature	Virus
2. Anthrax	• Swelling on body parts, especially on the neck • High fever,	Bacteria
3. Rinderpest (cattle plague)	• Excessive salivation • Redness of eyes • Loss of appetite • High fever	Bacteria
4. Cow pox	• Appearance of small nodules over the body	Virus
5. Salmonellosis	• Diarrhoea with blood clots	Bacteria

Besides the above diseases, the dairy animals may also suffer from a variety of worms infecting their intestines and other organs. Protection from several diseases is done by vaccination.

Symptoms of sick cattle

The sick cattle show a different behaviour from the healthy ones.

The common symptoms are :

- They stop feeding.
- Milk-yield is reduced.
- Become inactive and looks tired.
- Drooping of lips and ears.
- Passing of loose dung and coloured urine.
- Sometimes, they feel hot and sometimes, they shiver.

POULTRY

The poultry is mainly used for the production of eggs and meat. Poultry farming is very important because of a small investment, quick returns, the requirement of a small area and easy to look after.

The egg-laying chickens are called **eggers** or **layers**, while the chickens reared for obtaining meat are called **broilers**.

Indian poultry includes the following **three** types of breeds — indigenous, exotic and cross breeds :

(a) Indigenous breeds : The most popular indigenous poultry breed of India is **Aseel** (Fig.11.4). This provides high yield of meat, but is not a good egg-layer.

(b) Exotic breeds : Out of many exotic breeds of fowl, the following two breeds are most popular in India :

Fig. 11.4 Two poultry breeds: A-The indigenous (Indian) breed Aseel, and B-An exotic breed (White Leghorn)

(i) **White leghorn** (Fig.11.4) which produces oval white eggs. It is more popular because of its small size and requires less feed for its maintenance. Thus, its farming is more economical.

(ii) **Rhode Island Red** was developed on a farm in Rhode Island, U.S.A. This is a dual type of breed, as it is a fairly good egg-layer and also a good meat provider.

(c) Cross breeds : Some breeds of fowl include **HH-260, IBL-80,** and **B-77.**

Poultry Care

Poultry birds are kept in wire cages or in the poultry sheds. The birds should not be kept in the open because they can be attacked and killed by predators like dogs and cats.

The feed given to poultry birds consists of meshed cereals like *bajra, maize, wheat, jowar, ragi, rice bran* and *groundnut cakes*. The 'fish meal' (prepared from the wastes of meat processing industry) is also used to feed poultry birds.

Poultry Diseases

Birds on poultry farms are very prone to diseases. Some of the important diseases of poultry birds are as follows :

1. **Viral diseases :** Fowl pox, Ranikhet disease.
2. **Bacterial diseases :** Fowl cholera, Salmonellosis, diarrhoea of Chick, Coryze.
3. **Fungal diseases :** Aspergillosis.

Proper sanitation and immunisation help in keeping the birds healthy.

FISH FARMING

Fish is an important source of human food. A large population, especially those living in coastal areas, eat fish as its staple food. Fish and other variety of sea-food (for example, oysters, prawns, lobsters, shrimps, *etc.*) are rich in proteins. Sea food is

Fig. 11.5 Farm

highly nutritious and easily digestible. Fish liver oil is rich in vitamins A and D. In India, edible fishes are abundantly available in seas, rivers, lakes and ponds.

The term **"aquaculture"** is used for the production or farming of useful aquatic animals like fishes, prawns, lobsters, molluscs, *etc.*, in various types of water bodies. The term **"pisciculture"** is used for the production and management of fishes only. In fresh water fish culture, fish eggs (known as fish seeds) are put in nurseries called **hatcheries.** The young ones of fishes hatched from these eggs are fed, tended and nursed, and finally harvested, when fully grown. Marine fisheries include trapping and capturing fishes from the sea coast and from within the sea by using fishing boats.

Some edible fishes of India – Marine water fishes are *Bombay duck, eel, hilsa, pomphret, salmon, sardine, etc.*

Fresh water fishes are *rohu, calbasu, catla, singhara, magur* and *singhi*. They are found in rivers, ponds, lakes, canals, *etc.*

MEAT PROVIDING LIVESTOCK

In India, goat, sheep and pig are the main sources of meat supply besides poultry and fishes.

Goats are mainly used for meat though they also provide milk which is good, especially for children, the sick and the old. Important breeds of goats are *Gaddi, Kashmiri Pashmina, Marwari, etc* (Fig. 11.6).

A. GADDI B. PASHMINA

Fig. 11.6 Two Indian breeds of goat: A. Gaddi, and B. Kashmiri Pashmina

Sheep provide mutton, wool and skin. Goat and sheep breeding is cheaper and therefore, it is a major occupation of many landless labourers in India. Important breeds of sheep are *Nali, Deccani, etc.*

Pig contributes only 5% of the total meat production in India and is a rich source of protein and that too, at a low cost.

Pig farming (piggery) is common among people from weaker sections and pigs are reared for meat (pork) and animal fat (lard). Pork is known differently according to the part of the body; bacon (back and sides), ham (back of the thigh), and sausages (minced pork). Lard (fat) is used as a cooking medium and in the manufacture of soaps, lubricants, candles and grease. Stiff body hair are used for making painting brushes.

The indigenous breeds of pigs are **Desi** and **Ghori.** The **exotic breeds** are Berkshire, large white Yorkshire, *etc.*

Care of Sheep, Goats and Pigs

Sheep do not require any formal well-structured shelter. Many flocks of sheep live under natural shades of trees and hills. **Goats** require a dry and safe shelter. They should be protected from excessive heat and cold.

Sheep feed on green grass, weeds and other farm wastes. **Goats** feed on the leaves of a variety of plants.

When sheep and goat are reared only for wool, they are fed with grass and foliage. But when they are reared to obtain meat, they are

to be fattened by giving them more nutritive feed which includes gram chaff, oil cakes and mineral mixtures.

Pigs are not very fussy about their food. They feed on garbage, kitchen wastes, vegetables, and even human excreta (but excreta should be prevented to minimise the risk of infections). The domesticated pigs usually feed on grains.

Diseases of Sheep and Goat

The common diseases of sheep and goat are either (a) viral or (b) bacterial.

(a) Viral diseases include *Sore mouth, Goat pox* and *Rinderpest.*

(b) Bacterial diseases are *Black quarter, Brucellosis* and *Vibriosis.*

Proper sanitation and regular vaccination prevent these diseases.

SERICULTURE

The production of silk from silk worms, and artificial rearing of the silk worm is called **sericulture.** Four varieties of silk — *mulberry, tassar, eri* and *mugga*–are produced in India. Silk is obtained from an insect's cocoon (pupa stage).

To obtain commercial silk, cocoons are treated with boiling water to kill the living pupa inside. Thread is recovered from the killed cocoons (reeling).

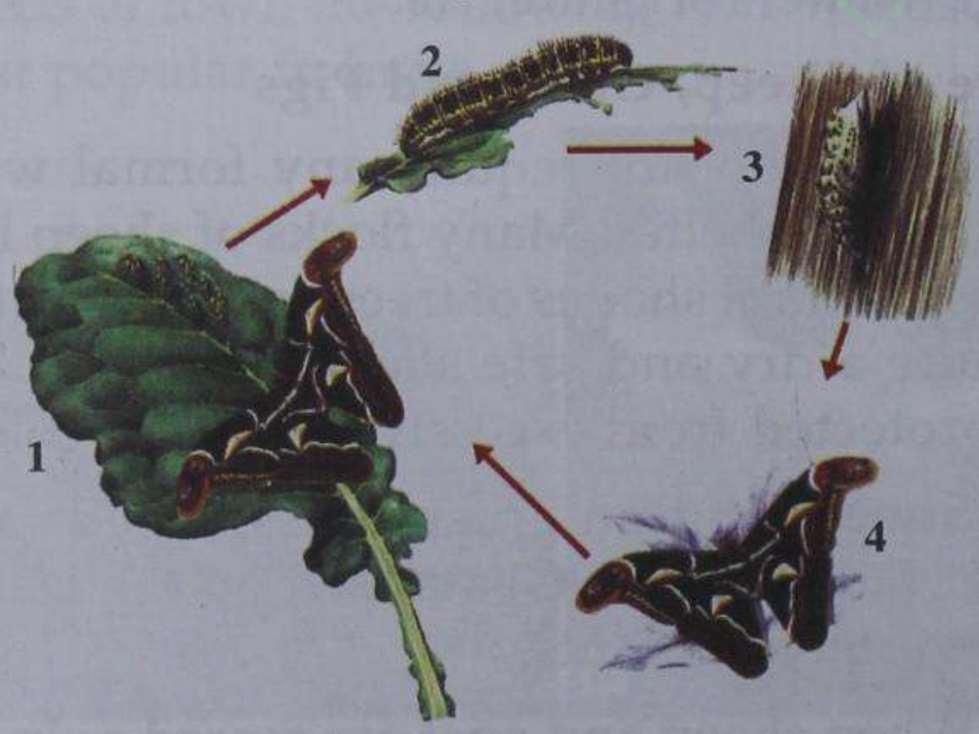


Fig. 11.7 Life cycle of silk moth: 1- Female lays eggs on a leaf; 2- Caterpillar (larva); 3- Chrysalis (pupa); 4- An adult moth

APICULTURE

The rearing of honey bee to obtain honey and other commercially important products is known as **apiculture.** The species is **Apis indica** (honey bee, Indian variety). There are 40–50 thousand bees in one hive including one queen (egg-laying female), some drones (males) and mostly, the workers (sterile females, which means, incapable of laying eggs). Hexagonal cells of the hive are made up of wax to store honey and pollen grains in the upper part. Honey is rich in carbohydrates (sugar, dextrose and levulose). Bees-wax is used in the manufacture of candles, polishes, cosmetics, *etc.*

Activity 1

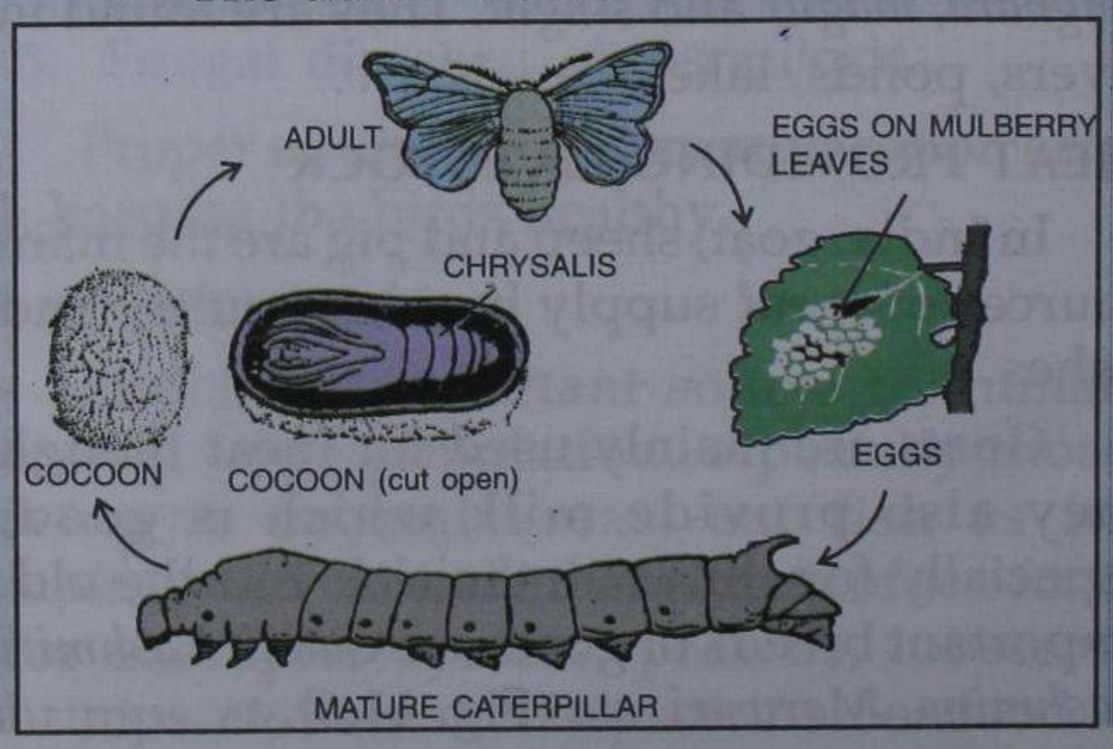
To visit centres of silk-rearing, bee-keeping and poultry.

Ask your school authorities if any one or more of these industries exist in your town or elsewhere. You can contact the officers of such places to allow you to visit them for educational purpose. You may read your books beforehand to be familiar with some information about them. These may be verified when you visit these places.

What you should try to observe ?

(a) Sericulture :

- The adult moths.



- Eggs laid on the mulberry leaves.
- Various growth stages of the larvae that feed on the leaves.
- Silken cocoons.
- Treatment of cocoons in boiling water, and reeling of the thread.

(b) Apiculture :

- A complete modern bee-hive with the vertical sequence of different box chambers.
- Watch the honey bees entering and leaving the hive.
- Ask the bee-keeper to demonstrate how the bee swarm is collected and introduced into the hive.
- Observe the manner in which honey is extracted.

(c) Poultry :

- Observe the various types of cages and the birds kept inside them.
- Enquire about the feeds given to the birds.
- Ask about the names of some of the local and foreign poultry breeds and their speciality.

REVIEW QUESTIONS

Multiple Choice Questions :

1. Put a tick mark (✓) against the correct alternative in the following statements :

(i) Which *one* of the following is an indigenous breed of dairy cows ?
(a) Jersey (b) Frieswal (c) Sahiwal (d) Dangi

(ii) Which *one* of the following is the common breed of buffalo found in Gujarat ?
(a) Surti (b) Murrah (c) Gir (d) Mehsana

(iii) Which *one* of the following is a bacterial disease of cattle in which the animal gets swelling on body parts, especially on the neck ?
(a) Cow pox (b) Anthrax (c) Salmonellosis (d) Rinderpest

(iv) Name the indigenous breed of poultry of India :
(a) White leghorn (b) HH-260 (c) Aseel (d) B-77

(v) Which *one* of the following is a viral disease of poultry ?
(a) Ranikhet disease (b) Cholera (c) Coryze (d) Aspergillosis

(vi) One of the following is a bacterial disease of sheep and goat. Identify it.
(a) Sore mouth (b) Rinderpert (c) Goat pox (d) Brucellosis

Short Answer Questions :

1. Answer the following questions :

(i) Name any *four* animals which provide us food.

.....

(ii) Name any *two* dual purpose breeds of cattle.

.....

(iii) Name any *two* diseases of cattle caused by viruses.

.....

(iv) Name any *two* bacterial diseases of cattle.

.....

(v) What are the symptoms of foot and mouth disease ?

.....

(vi) Give *two* examples of milch animals.

.....

(vii) Name any *two* high-yielding indigenous breeds of cow.

.....

(viii) Name *four* varieties of edible fishes of India.

.....

(ix) Name *two* breeds of buffaloes.

.....

(x) Name *two* bacterial diseases of poultry.

.....

2. Fill in the blanks :

(i) Cattle feed made from cereals and wheat is called .....

(ii) Rearing of birds for egg and meat is called .....

(iii) Animal food is rich in .....

3. Define the following terms :

Animal husbandry : .....

Sericulture : .....

Aquaculture : .....

Hatcheries :.....

Pisciculture :.....

4. Name the following :

(i) *Three* edible fishes of India ....

(ii) Rearing of honey bee .....

(iii) A cross-breed of hen .....

(iv) A kashmiri goat which gives expensive wool .....

Long Answer Questions (*Write the answers in your note-book*) :

1. Give any *five* features of good shelter for milch animals.
2. What type of food you would suggest for cattle in order to get good quality of milk ?
3. Write any *five* symptoms of sick cattle.
4. Differentiate between an egger and a broiler.
5. Name any *two* exotic breeds of fowl in India.