

## Chapter: Strategies for enhancement in Food Production

### Exercise

#### **Question 1. Explain in brief the role of animal husbandry in human welfare.**

**Answer:** The science of livestock management is referred to as animal husbandry. It entails a variety of activities such as feeding, breeding, and disease control in order to increase the population of animal cattle. Cattle, pigs, sheep, poultry, and fish are examples of animals used in animal husbandry. They are beneficial to humans in a variety of ways. These animals are kept for the purpose of producing commercially valuable goods such as milk, meat, wool, eggs, honey, silk, and so on. The demand for these products has expanded as the human population has grown. As a result, scientifically improved livestock management is required.

#### **Question 2. If your family owned a dairy farm, what measures would you undertake to improve the quality and quantity of milk production?**

**Answer:** Dairy farm management is concerned with methods for increasing the quality and quantity of milk produced. Choosing improved cow breeds, providing suitable feed for cattle, keeping proper housing facilities, and cleaning cattle on a regular basis are all important factors in milk output. Cattle management requires the selection of superior cattle breeds. For increased production, hybrid cow breeds are developed.

As a result, hybrid cow breeds must contain a mix of desirable traits, such as high milk output and illness resistance. Cattle should also be fed a nutritious diet that includes roughage, fibre concentrates, and high protein and other nutritional levels.

Cattle should be kept in appropriate cattle-houses with well-ventilated roofs to keep them safe from extreme weather conditions including heat, cold, and rain. Bathing and brushing should be done on a regular basis to keep diseases at bay. In addition, veterinary doctors should be consulted on a regular basis for signs of various diseases.

#### **Question 3. What is meant by the term 'breed'? What are the objectives of animal breeding?**

**Answer:** Within a species, a breed is a distinct group of creatures. Most characteristics, such as general appearance, size, configuration, and features, are identical to those of other members of the same species. Cattle breeds like Jersey and Brown Swiss are examples of foreign breeds. These two breeds of cattle are capable of producing large amounts of milk. This milk is high in protein and is very healthy.

#### Objectives of animal breeding

- Animal breeding goals include increasing animal output
- improving the desirable features of animal products
- To create disease-resistant animal types.

**Question 4. Name the methods employed in animal breeding. According to you which one of the methods is best? Why?**

**Answer:** The practice of marrying closely related individuals is known as animal breeding. In the breeding of animals, there are numerous ways that can be categorised into the following categories:

(a) Inbreeding and outbreeding are two natural breeding processes. Inbreeding occurs when animals of the same breed are together, whereas outbreeding occurs when animals of different breeds breed together.

There are three types of animal outbreeding:

- **Out-crossing:** This sort of out-breeding occurs when animals of the same breed mate. As a result, they share no ancestors in the last 4-5 generations.
- **Cross-breeding:** This sort of out-breeding occurs when various breeds of the same animal mate, resulting in a hybrid.
- **Interspecific hybridization:** This sort of out-breeding occurs when two or more species mate.

(b) Modern breeding procedures are examples of artificial breeding processes. It entails two sorts of well-regulated breeding experiments:

- **Artificial insemination** is the procedure of a breeder inserting sperm (taken from a man) into the oviduct or uterus of a female body. This kind of breeding aids the breeder in overcoming some of the issues associated with aberrant mating.
- **Multiple ovulation embryo technologies (MOET)** is a cattle improvement technique that uses a hormone injection to induce superovulation. After that, artificial insemination is used to achieve fertilisation, and early embryos are harvested.

The artificial method of breeding, which comprises artificial insemination and MOET technology, is the finest way for animal breeding. These are scientifically based technologies. They aid in the resolution of regular mating issues and have a high success rate in crossing adult men and females. It also ensures the creation of hybrids with the required characteristics. This procedure is very cost-effective because only a small amount of the male's sperm can be used to inseminate multiple calves.

**Question 5. What is apiculture? How is it important in our lives?**

**Answer:** Apiculture is the practice of maintaining bees for the purpose of producing honey, beeswax, and other goods. Honey is a nutrient-dense food that is also employed as part of an indigenous medical system. It can be used to cure a variety of ailments, including the common cold, flu, and dysentery. Bee's wax and pollen are two other economic goods obtained from honey bees. Bee's wax is utilised in the production of cosmetics, polishes, and even medicinal medicines. As a result, people have begun to practise beekeeping on a wide scale in order to supply the growing demand for honey. Farmers have turned to it as a source of income because it takes little capital and is labour intensive.

**Question 6. Discuss the role of the fishery in the enhancement of food production.**

**Answer:** Fishery is an industry that deals with the catching, processing, and marketing of high-value fish and other aquatic creatures. Prawns, crabs, oysters, lobsters, and octopuses are all commercially important aquatic species. The Indian economy relies heavily on the fishing industry. This is due to the fact that a substantial portion of the Indian population relies on fish as a source of food because it is both inexpensive and high in animal protein. Fisheries are a source of employment, particularly for

those who live near the ocean. Catla, Rohu, and other freshwater species, as well as tuna, mackerel pomfret, and other marine fishes have considerable commercial importance.

**Question 7. Briefly describe various steps involved in plant breeding.**

**Answer:** Plant breeding is the deliberate crossing of two genetically different kinds to develop a new hybrid variety. As a result, the hybrid plant variety can have features from both parents. As a result, it entails the development of a new variety with desired features such as disease resistance, climatic adaptability, and increased yield. The following are the various steps involved in plant breeding:

- Collection of genetic variety: To maintain a species' genetic diversity, genetic variability from numerous wild relatives of farmed species is collected. The germplasm collection refers to a crop's whole collection of different alleles of a gene.
- Germplasm evaluation and parent selection: The germplasm gathered is then analysed for desired genes. Plants having the appropriate genes are selected and utilised as parents in plant breeding trials, where they are multiplied through the hybridization process.
- Evaluation of germplasm and parent selection: The germplasm is then analysed for desired genes. Plants with the necessary genes are chosen and used as parents in plant breeding trials, where they are multiplied through hybridization.
- Germplasm evaluation and parent selection: After that, the germplasm is analysed for desired genes. Plants having the required genes are selected and utilised as parents in plant breeding studies, where they are hybridised and multiplied.
- Evaluation of germplasm and parent selection: The germplasm is then analysed for desired genes. Plants with the necessary genes are chosen and used as parents in plant breeding experiments, where they are hybridised and multiplied.

**Question 8. Explain what is meant by biofortification.**

**Answer:** The process of breeding crops with higher amounts of vitamins, minerals, proteins, and fat content is known as biofortification. To promote public health, this strategy is used. To boost the content of proteins, lipids, vitamins, minerals, and micronutrients in crops, researchers are breeding crops with improved nutritional quality. It is planned to improve the oil and protein quality. A wheat variety is known as Atlas 66, for example, has a high protein content when compared to other wheat varieties. Furthermore, there are various improved crop plant types, such as rice, carrots, spinach, and others, that have higher nutritional value and contain more nutrients than existing varieties.

**Question 9. Which part of the plant is best suited for making virus-free plants and why?**

**Answer:** Plants apical and axillary meristems are employed to create virus-free plants.

Only this section of a diseased plant is not infected by the virus, as opposed to the remainder of the plant. As a result, the scientists take the damaged plant's axillary and apical meristems and grow them in vitro to create a disease-free and healthy plant. Scientists have used this technology to create virus-free bananas, sugarcane, and potato plants.

**Question 10. What is the major advantage of producing plants by micropropagation?**

**Answer:** Plant tissue culture is used in micropropagation to produce new plants in a short period of time. Some of the most important advantages of micropropagation are as follows:

- Micropropagation allows a huge number of plants to be grown in a short amount of time.
- It also leads to the generation of healthier plantlets that are more resistant to disease.
- Genetically, the children are identical to the mother plant.

**Question 11. Find out what the various components of the medium used for propagation of explants in vitro are?**

**Answer:** Carbon sources such as sucrose, inorganic salts, vitamins, amino acids, water, agar-agar, and specific growth hormones like auxins and gibberellins are all important components of the media used to propagate explants in vitro.

**Question 12. Name any five hybrid varieties of crop plants which have been developed in India.**

**Answer:** The five hybrid varieties of crop plants which have been developed in India are:

Crop plant	Hybrid Variety
Wheat	Sonalika and kalian sona
Rice	Jaya and Ratna
Cauliflower	Pusa shubra and Pusa snowball K-1
Cowpea	Pusa komal
Mustard	Pusa swarnim