NCERT Solutions for Class 12 Biology Chapter 9 Strategies for Enhancement in Food Production

EXERCISES PAGE 178

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

   Solution:

   Animal husbandry is a branch of agriculture associated with rearing animals for their meat, eggs, milk, fibre and other products of commercial significance. It includes caring for animals on a day-to-day basis, performing selective breeding and a host of other related activities.

   It became an essential part of human welfare ever since humans moved on from a hunter-gatherer lifestyle. Following are the roles of animal husbandry in human welfare:
   - Production of meat: Meat is a valuable source of energy and dietary proteins.
   - Production of dairy products: Animal husbandry provides a wide range of dairy products such as milk, cheese, butter, ghee and curd. These may be further processed for other commercial products such as ice creams and cottage cheese (paneer).
   - Production of fibre: Animals such as sheep and goat are primarily reared for their wool. Insects such as silkworms are highly valuable from a commercial perspective.
   - Labour: Certain animals such as horses, donkey and buffaloes are well-suited for mechanical labour. They are cost-effective and very efficient. Before industrialisation, it was the only non-human sources of mechanical labour.
   - Production of fertilisers: Fertilizers are quite crucial for plant growth. Furthermore, natural fertilisers provided other benefits such as an alternate source of fuel and insulation.

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

   Solution:

   The quality and quantity of milk are primarily dependent upon the type of breed. Aside from this, the following are a few measures that an individual or a dairy farmer would take to improve the quality and quantity of milk production:
   - Dairy cows or other milk-producing animals have to be kept in a well-ventilated housing.
   - An adequate supply of clean water must be provided.
   - Emphasis should be provided on the quality and quantity of the feed.
   - Ensure stringent hygiene and cleanliness when handling cattle or other dairy animals.
   - Regular visits to the vet also reduce the chance of contracting illnesses.
   - Ensure the animals are regularly vaccinated.

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

   Solution:

   A 'breed' is defined as a group of animals that have a common descent and share standard characteristic features such as size and appearance. The common objectives of animal breeding are:
   - To increase the yield of animals (concerning dairy, fibre, meat)
   - To increase the desirable traits and features (such as cows that are selectively bred for

larger quantities of meat)
- To increase disease resistance
- To produce superior breeds

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

Solution:

Animal breeding can be classified into two types:
- Natural Methods of Breeding
- Artificial Methods of Breeding

Natural Methods of Breeding Involves:
- Outcrossing
- Cross-breeding
- Inter-specific hybridisation

Artificial Methods of Breeding Involves:
- Artificial Insemination
- MOET (multiple ovulation embryo transfer technology)

From a commercial perspective, MOET is considered the best method of breeding as it overcomes the hurdles of natural breeding while ensuring high success rates for crossing between male and female animals. It is also economically viable than the other mentioned techniques.

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

Solution:

Apiculture or beekeeping is defined as the processes and steps necessary to ensure the upkeep and maintenance of honey-bee hives for the production of honey.

Honey is essential for many reasons:
- It is highly nutritious and is used as an ingredient in many dishes.
- It can replace sugar as a healthier alternative.
- Besides culinary applications, honey has also been used to heal wounds due to its antibacterial properties.
- It is also considered to alleviate cold and cough symptoms.
- From a commercial perspective, it is considered as an income-generating activity and is not very labour-intensive.

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

Solution:

Fisheries is defined as a coordinated effort to capture or rear fish through fishing farms and aquaculture. However, fisheries are not just limited to fish; for instance, oysters are selectively bred for pearls, shells

and tissues.

Fisheries play a significant role in food production, especially in India. From a dietary perspective, fish is an affordable source of animal protein. From a commercial perspective, fisheries provide employment opportunities for residents in coastal areas.

7. Briefly describe various steps involved in plant breeding.

Solution:

Plant breeding is defined as the process of changing select traits in order to bring about desired characteristics. It is primarily used for improving the nutritional value of plants.

Following are the steps observed in plant breeding:

- Accumulation of genetic variability
- Germplasm evaluation & parent selection
- Cross hybridisation of selected parents
- Choosing superior hybrids
- Testing viability of new cultivars

8. Explain what biofortification is?

Solution:

Bio-fortification is a process of breeding crops to improve their nutritional value. Biofortification is different from food enrichment as the emphasis is given on plants being nutritious as they are growing rather than adding in the nutrients during food processing.
It is primarily aimed at reducing deficiency disorders in the general public. Examples of biofortified crops involve golden rice, a variety of rice (*Oryza sativa*) genetically engineered to have increased amounts of beta carotene, a precursor to Vitamin A. Micronutrient deficiency is common in developing and under-developed countries. Hence, biofortified crops are a feasible option to tackle this problem.

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

Solution:

Virus-free plants can be made if the axillary and apical meristem are used. These regions are used as they are unaffected by the virus when compared to the rest of the plant.

Scientists have used this method to develop virus-free plants of sugarcane, banana, and potato etc.

10. What is the major advantage of producing plants through micropropagation?

Solution:

Micropropogation is a method wherein new plants are produced in a shorter duration with the help of plant tissue culture methodologies.

The major advantages are as follows:

- Micropropagation helps to propagate large amounts of plants in a relatively short amount of time.
- The resultant plants are identical to the parent plant.
- Production of disease-resistant crops.

11. Find out what the various components of the medium used for propagation of an explant in vitro.

Solution:

The various components of the medium used for propagation of an explant in vitro are sources of carbon such as sucrose, vitamins, minerals, water, agar-agar, auxins and gibberellins, amino acids.

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

Solution:

Name of the crop plant	**Hybrid variety**
Cowpea	Pusa komal
Mustard	Pusa swarnim
Rice	Jaya and Ratna
Wheat	Sonalika &Kalian sona
Cauliflower	Pusa shubra