

# NCERT SOLUTIONS

## CLASS IX SCIENCE

### CHAPTER 15- IMPROVEMENT IN FOOD RESOURCES

#### QUESTIONS

1) *What do fruits, vegetables, cereals and pulses provide us?*

**Solution:** Cereals provide us with carbohydrates which supply energy to body. Pulses serve us with proteins which are the building blocks of our body and fruits and vegetables serve us with rich vitamins and minerals.

2) *How is crop production affected by biotic and abiotic factors?*

**Solution:** Factors that are to be blamed for the loss of grains at the time of storage and production are:

1. Biotic factors such as rodents, pests, insects, etc.
2. Abiotic factors such as temperature, humidity and moisture etc.

Cumulative effects of biotic and abiotic combinations are:

1. Insects' infestation
2. Reduction in weight
3. Low germination capability
4. Poor quality
5. Discolouration
6. Dip in market price

3) *What are the ideal agronomic traits for improvement of crops?*

**Solution:** Ideal agronomic traits for improvement of crops are:

1. a) Height and excessive branching are ideal traits for fodder crops
2. b) Dwarfism is ideal in cereals and also their demand for fewer nutrients.

4) *Define macro-nutrients and state your reason for them being named so.*

**Solution:** Macro-nutrients are the necessary elements which are used by vegetation in ample quantities. Since they are required in very large amounts, they are aptly named as macro-nutrients.

5) *From where does a plant procure its essential nutrients?*

**Solution:** Plants procure their nutrients from air, water and soil. A plant's growth is dependent on sixteen nutrients. Out of these carbon and oxygen are provided by water and remaining nutrients are supplied by soil.

6) *Contrast the effect of manure and fertilizers in maintaining the fertility of the soil.*

**Solution:**

Following are the manure's effect on soil quality:

1. Nutrient enrichment of soil
2. They enhance the water retaining capability of sandy soils and drainage in clayey soils
3. They drastically minimize soil erosion
4. They feed soil organisms such as bacteria which are soil friendly.

Following are the fertilizer's effect on soil quality:

1. Fertilizers can make the soil powdery and dry and thus increase the erosion rate of the soil.
2. Fertilizers cause the amount of organic matter to plummet which may lower the porosity of soil and ultimately plant roots won't get proper oxygen.
3. The soil's nature changes to either acidic or basic.

7) *Which among the following will provide maximum benefit? Give your reasons.*

1. a) Good quality seeds are used, fertilizers aren't used and irrigation is not practiced.
2. b) Ordinary seeds are used, fertilizers are used and irrigation is practiced.
3. c) Good quality seeds are used, crop protection measures and fertilizers are used and irrigation is practiced.

**Solution:** (c) Good quality seeds are used, crop protection measures and fertilizers are used and irrigation is practiced

**Reason:** Whatever be the quality of the seed used, it doesn't make any difference unless they are well irrigated, enriched by fertilizers and guarded against biotic factors.

Therefore, option (c) provides maximum benefits

**8)      *How can biological control methods and preventive measures protect the crops?***

**Solution:** Pathogens cause diseases in plants. To obliterate the pathogens, certain preventive measures and biological control methods are adopted as they are simple, economic and reduce pollution without deteriorating the soil quality.

**9)      *List out the factors that should be blamed for spoilage of grains during storage.***

**Solution:**

- i) Abiotic factors such as moisture, humidity and temperature.
- ii) Biotic factors such as rodents, insects, mites, birds, bacteria and fungi.

**10)      *List out the methods usually in practice to enhance the cattle breed. Substantiate your answer with a reason.***

**Solution:** Cross breeding is a process wherein indigenous cattle breeds are crossed with exotic breeds to obtain a high-yielding breed. Ideal characters are expected in these cross breeds. They should be very high yielding, must attain an early maturity and should have immunity to various climatic conditions.

**11)      *Describe how poultry is the most efficient transformer of lower fiber foodstuff, which can't be consumed by humans, into an animal protein food that is highly nutritious.***

**Solution:** The main objective of poultry farming is to raise domestic fowl for eggs and meat. These fowls can efficiently convert low-quality fibrous food materials, which cannot be consumed by humans, into an animal protein food that is highly nutritious. Low-fibre foods can be used as a feed for poultry, which in turn is converted into superior quality of meat, eggs, feathers and manure rich in nutrients. Thus, poultry converts low fibre food into a nutrient-rich animal protein food.

**12)      *What are the common management practices adopted in dairy and poultry farming?***

**Solution:**

**Shelter:** Animals and birds demand a very well maintained, designed and a hygienic shelter

**Food:** Good food should be provided to birds and animals in order to obtain a very quality yield from them.

**Proper care:** Animals and birds should be shielded from the pathogens brought about by microbes such as virus, bacteria and fungi.

**13)      *Compare and contrast broilers and layers and state the differences in their management.***

**Solution:**

Broilers are the poultry birds that are raised for meat. Layers are poultry birds raised for eggs.

The housing and the nutritional requirements of the broilers vary from that of layers'.

The optimum diet for broilers is rich proteins with necessary amount of fat.

Vitamin A and K should be abundant in poultry food whereas layers require only adequate space and lighting.

**14)      *How is fish procured?***

**Solution:** Fishes can be obtained in two ways. While one is a natural way, where fishes are captured, the other is a culturing method, where fishes are cultured, known as culture fishery.

**15)      *Mention the benefits of composite fish culture?***

**Solution:** Composite fish culture is a culture process wherein only a selective species of fishes are raised in a single fish pond. These species are selected in a such a way that they don't have to compete for their feed and this is done by choosing species having different food habits. Ultimately, food will be evenly exhausted in the pond.

**Example:** Catlas fish feed on surface, rohus find its food in the middle zone of the pond, mrigals and common carps feed on the bottom and grass carps eat weeds and therefore together they can consume all food in the pond without having to compete with each other. This drastically improves the fish yield from each pond.



**16) List out the ideal characteristics of bee varieties that are preferred for bee production.**

**Solution:**

1. They should be able to obtain a huge amount of honey.
2. They should remain a particular beehive for a longer period of time.
3. They should have a high breeding capacity.
4. They should possess high immunity to diseases.

**17) Define pasturage. How are they associated with honey production?**

**Solution:** Pasturage means the flowers that are in store for the bees, from where they can obtain their nectar and pollen. Apart from the quantities of the pasturage, the type of flowers in availability also determines the taste of the honey to a greater extent.

**18) Mention and explain one high yield ensuring crop production method.**

**Solution:** Plant breeding is one of the methods used to obtain a high yield. It is a science of enhancing the crop varieties by breeding plants. The plants ailing from various places are chosen and they are sent through the process of cross-breeding to obtain a plant of required traits.

**19) What is the purpose of using manures and fertilizers?**

**Solution:** They are used in order to make sure that there is a good growth of leaves, branches and flowers, thus making the plants healthy and achieving increased crop production.

**20) What are the benefits of using intercropping and crop rotation?**

**Solution:** Benefits provided by inter-cropping:

1. Soil fertility is maintained
2. Productivity per unit area is improved
3. Labor and time are more efficiently used

**Benefits provided by crop rotation:**

1. Soil fertility is enhanced
2. Depletion of nutrients from soil is avoided
3. Pest infestation and pathos are reduced
4. Helps in weed control

**21) Define genetic manipulation. How are they put into use in agricultural practices?**

**Solution:** Genetic manipulation is a method wherein the required traits are blended into the crop varieties by the process of hybridization. It is a process where genetically different plants are crossed. This is done with the motive of obtaining a plant breed with ideal traits such as excessive branching in fodder crops.

**22) How do good animal husbandry practices benefit farmers?**

**Solution:**

1. Enhances the breed of domestic animals
2. Improving the yield of food materials such as milk, meat and egg.
3. Improved management of cultured animals in terms of shelter, food, and care and guarding against pathogens, which consequently aids the farmers in improving their financial condition.

**23) Mention the advantages of cattle farming.**

**Solution:**

Cattle farming are advantageous in the following ways:

1. As good breed of cattle are used, production of milk is hiked
2. Great quality of skin, fibre and meat can be procured.
3. We get a better breed of draught animals.

**24) For increasing production, what is common in poultry, fisheries and bee-keeping?**

**Solution:** The turnover of poultry, fisheries and bee-keeping can be enhanced using the process of cross breeding.

**25) How do you differentiate between capture fishing, mariculture, and aquaculture?**

**Solution:**

Capture fishing: It is the process of fishing where fishes are caught from natural water sources such as pond, marine water and estuaries.

Mariculture: It is the culture of fish in sea water. Varieties of prawns, oysters, bhetki and mullets are raised for fishing.

Aquaculture: It is carried out both in fresh water and in sea water.

**26) Choose the correct option:**

**1. The utilization of fertilizers in farming results in**

- (a) No cost production
- (b) Low cost production
- (c) High cost production
- (d) None of these

**2. Nitrogen, phosphorus, potassium are categorized into**

- (a) micro-nutrients
- (b) macro-nutrients
- (c) Fertilizer
- (d) Both (c) and (b)

**3. Xanthium, Parthenium, Cyperinus are categorized into**

- (a) Diseases
- (b) Pesticides
- (c) Weeds
- (d) Pathogens

**4. Mullet, Bhetki, Pearl spots, prawns, mussels are categorized into**

- (a) Marine fishes
- (b) fresh-water fishes
- (c) Finned fishes
- (d) Shell fish

**5. Apis cerana indica is widely called as**

- (a) Indian cow
- (b) Indian buffalo
- (c) Indian bee
- (d) None of these

6. *The culture of fish is called*

- (a) Pisciculture
- (b) Apiculture
- (c) Sericulture
- (d) Aquaculture

7. *Catla and Rohu are categorized into*

- (a) Freshwater fish
- (b) Marine water fish
- (c) Both (a) and (b)
- (d) None of these

8. *Pasturage is associated with*

- (a) Cattle
- (b) Fishery
- (c) Apiculture
- (d) Poultry

9. *Growing two or more crops in definite patterns is known as*

- (a) Crop rotation
- (b) Inter-cropping
- (c) Organic cropping
- (d) Mixed cropping

10. *Leghorn and Aseel are related to*

- (a) Apiculture
- (b) Dairy farming
- (c) Pisciculture
- (d) Poultry

Short Q&A type:

1) *Mention some fodder crops.*

**Solution:** Berseem, oats or sudan grass are produced as feed for the livestock, known as fodder crops.

2) *What is meant by sunlight's photoperiod?*

**Solution:** Photoperiod is defined as the duration of sunlight plant growth demands.

3) *Mention some kharif crops.*

**Solution:** Paddy and soyabean.



**4) Mention some rabi crops.**

**Solution:** wheat and gram.

**5) What is meant by hybridization?**

**Solution:** – Hybridization is a process, where genetically dissimilar plants are crossed, to get better yielding crops.

**6) What do you mean by genetically modified crops?**

**Solution:** By inserting a gene with desirable traits into a crop for its enhancement is known as a genetically modified crop.

**7) Lesser the time period between sowing and reaping of a crop, the more economical is the variety. Give reason for this.**

**Solution:** Lesser period of crop growth can enable farmers to grow a huge number of crops per year, and thus substantially lowering the cost of crop production.

**8) List out various types of crop production practices carried out in India.**

**Solution:** (a) no cost production, (b) low cost production and (c) high cost production.

**9) From where do the plants obtain their nutrients?**

**Solution:** Air, water and soil supply nutrients required for the plants

**10) Define macro-nutrients?**

**Solution:** The nutrients that are required by the plants in huge quantities are called macronutrients. Sulphur, calcium, nitrogen, phosphorus, potassium, and magnesium are examples of macronutrients.

**11) List some nutrients that plants procure from air and water.**

**Solution:** Carbon and oxygen are obtained from the air.

Hydrogen and oxygen are obtained from water.

**12) Compare compost and vermi-compost.**

**Solution:** The compost is procured by decomposition of organic waste such as animal excreta, plant waste etc. organically, where decomposition is done by bacteria. Vermi-compost expedites the process of decomposition by adding red worms to the organic matter to get compost.

**13) Name any two weeds.**

**Solution:** Parthenium and Xanthium.

**14) What is the reason for disease in plants?**

**Solution:** Pathogens such as bacteria, fungi and viruses are to be blamed for diseases in plants.

**15) Name two Indian cattle.**

**Solution:** Bos indicus — cows

Bos bubalis — buffaloes

**16) Name two exotic breeds of cattle.**

**Solution:** Jersey and Brown Swiss

**17) Name two varieties of food required for milch animals.**

**Solution:** • feed that is essential to keep animal healthy

Milk producing requirement — food required for increased lactation. Animal food includes roughage and concentrate also.

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**18) What is meant by capture fishing and culture fishing?**

**Solution:** Capture fishing: it is carried out in natural resources.

Culture fishing: it is nothing but farming of fishes.

**19) Name four marine fish varieties.**

**Solution:** Pomphret, mackerel, tuna and sardines.

**20) What is apiculture?**

**Solution:** Culturing of bees for the purpose of procuring honey commercially is known as apiculture.

**21) List the products gotten from apiculture.**

**Solution:** Honey and wax are got from apiculture.

**22) What major activities are required to improve the yield of crops?**

**Solution:** Activities required to improve crop yields are:

1. Improvement in crop variety
2. Increase in Crop production
3. Increase in Protection of Crops

**23) What are the techniques of Hybridization?**

**Solution:** The different techniques are:

1. Intervarietal: This is carried out between crops of various varieties
2. Interspecific: This is carried out between the same genus of two species
3. Intergeneric: This technique is carried out between genus of two types

**24) List the important characters that are needed at the time of improvement practices of a crop.**

**Solution:** The important characters are:

1. Immunity to pathogens
2. Reaction to Fertilizer
3. Product quality 4. More yield

**25) Differentiate Macronutrients and micronutrients.**

**Solution:**

Macro-Nutrients	Micro-Nutrients
a) Crops need these nutrients in more quantity	b) Crops need these nutrients in small quantity
c) Nitrogen, Phosphorous, calcium, potassium, magnesium and sulphur are the Six macro nutrients	d) Iron, boron, zinc, copper, manganese, molybdenum and chlorine are the seven micro nutrients

**26) What happens to the crops due to a decrease in the nutrients?**

**Solution:** Decrease in nutrients cause physiological processes in plants which include reproduction, growth and vulnerability to pathogens.

**27) Differentiate manure and Fertilizer?**

**Solution:**

Manure	Fertilizer
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manure	fertilizer
a) Manure contains organic matter.	a) Fertilizer contains inorganic matter.
a) Manure is made from excreta of animals and waste from plants	b) Fertilizers are made from chemicals commercially.
b) The usage manure doesn't cause any pollution.	c) These lead to soil pollution and water pollution.

**28) Mention the dangerous effects of fertilizer?**

**Solution:** Fertilizers are the reason for soil and water pollution. Usage of fertilizers in a continuous manner might destroy the fertility of the soil.

**29) What do you mean by organic farming?**

**Solution:** It is a type of farming technique in which there is no use of pesticides, fertilizers or herbicides. It uses all types of organic matter like manure, neem leaves as pesticides for the growth and for the storage of grain.

**30) What preventive and control measures do we use before the storage of grains?**

**Solution:** The measures used are:

1. Cleaning of grains.
2. Drying of produce in the presence of sunlight and moisture should be avoided.
3. Produce Fumigation with the use of chemicals which kill the pests.

**31) Mention few types of bees that we use for production of honey.**

**Solution:** Apis cerana indica: This is a type of Indian Bee

A.dorsata: This is a type of rock bee (local type)

A.florae: This is a type of little bee

A.mellifera: This is a type of Italian bee

**32) What are the factors that are used to determine the quality and quantity of production of honey in an apiary?**

**Solution:** The honey's quality is determined by the pasturage. Pasturage is the stock of flowers at bee's disposal for their pollen collection, which will ultimately decide the honey's taste.

The honey's quantity is determined by the type of bees used for the purpose of accumulating honey.

**33) How does a crop serve us?**

**Solution:** Crops serves itself as our food, which satisfies our body's nutrient requirement.

- 1) Cereals such as barley, rice, corn.
- 2) Proteins (building blocks of our body) are supplied by pulses such as pea and bean.
- 3) Fats are provided by oil seeds such as sesame and flax.
- 4) Vitamins and minerals are served by fruits and vegetables.
- 5) Fodder crops serve as feed for livestock.

**34) What is the need for the variety improvement of crops?**

**Solution:**

- a) High yield: It improves the number of crops produced.
- b) Biotic and abiotic immunity: Crops must possess the immunity to biotic factors such as diseases, pests and abiotic factors such as drought, cold, heat, frost, and



water stagnation.

- c) Altering the maturity duration: Lesser maturity durations permits the farmers to cultivate more crops per year and thus ultimately lower the cost of crop production.
- d) Comprehensive adaptability: Crops will have the potential to acclimatize to any environment.

**35) Define manures. How are they classified?**

**Solution:** Manures are made of huge quantities of organic matter and provide little amount of nutrients to the soil. It is prepared organically by the decomposition of animal waste, excreta and plant waste. It helps in the soil enhancement with nutrients. It aids in developing the soil structure. It aids in enhancing the water retention capacity of sandy soils. In clayey soils, it facilitates the sinking of water and avoids water stagnation.

Manure is classified based on the kind of biological material used to make it as :

(a) Compost (b) Vermi-compost (c) Green manure

(a) Compost: The farm waste and livestock excreta, along with vegetable waste, sewage waste, weeds, straws etc. are allowed to decompose in a pit is called compost. The compost is rich in nutrients.

(b) Vermicompost: When the above-given matter is allowed to decompose in the pit along with some earthworms, the decomposition speeds up and is called vermicomposting.

(c) Green manure: Some plants like sun-hemp or guar are grown and then mulched by ploughing them into the soil. This is done before the sowing of crop seeds into the field. These green plants present in the soil acts as green manure which enriches the soil in nitrogen and phosphorus.

**36) What is meant by fertilizers? Why is excessive use of fertilizers not recommended?**

**Solution:** Fertilizers are produced artificially on a commercial basis. It is a chemical that possesses the nutrients needed for the crop to grow. Fertilizers provide a wide range of nutrients because they are nutrient specific e.g.- urea gives nitrogen. Mixed fertilizer provides any two mixtures of nutrients. They are costly but their use yields large production and hence are a factor of high-cost farming. Excessive use of fertilizers is not preferable as

- (a) It leads to the pollution of soil and water.
- (b) It could deteriorate the fertility of soil.

**37) What are the different patterns of cropping? Or What are the different cropping systems?**

**Solution:** Different ways/patterns/systems of growing crops are:

- (a) Mixed cropping
- (b) Inter-cropping
- (c) Crop rotation.

Mixed cropping: It is a method in which two or more crops grow simultaneously on the same piece of land. Example: Wheat + grain, wheat + mustard or groundnut + sunflower. This helps in the reduction of risk factor and provides insurance against failure of one of the crops.

Inter-cropping: It is a method of growing two or more crops simultaneously on the same field in definite patterns. A few rows of one crop alternate with a few rows of the second crop. Example: soyabean + maize or bajra + lobia.

Crop rotation: The growing of different crops on a piece of land in a pre-planned succession is known as crop rotation. The availability of moisture and irrigation facility decides the choice of crop to be cultivated after one harvest.

**38) How do insect pests attack the plant and affect it?**

**Solution:** Insect pests attack the plants in three ways:

1. They cut the root, stem and leaf.
2. They suck the cell sap from various parts of the plant.
3. They bore into stem and fruits.

**39) Mention different methods of weed control.**

**Answer:** Weeds can be controlled by different methods:

- (a) Weedicides: These are the chemicals sprayed on the weeds to kill them. Excessive use is poisonous and causes environmental pollution.
- (b) Mechanical removal: In this method, weeds are uprooted by removing manually or by machines.
- (c) Preventive methods: Proper seed bed preparation, timely sowing of crops, intercropping and crop rotation helps in weed control.

**40) What are the new varieties/traits obtained by cross breeding of Indian and exotic breeds of poultry?**

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**Answer:** The new varieties/traits obtained by cross breeding of Indian and exotic breeds of poultry are:

1. Number and quality of chicks
2. Dwarf broiler parent for commercial chick production
3. Summer adaptation capacity/tolerance to high temperature
4. Low maintenance requirements

Long answers

**1) What are the various methods of irrigation in India?**

**Solution:** Most of the agriculture in India is rain-fed, several different kinds of irrigation system are adopted to supply water to agricultural lands. The resources are wells, canals, rivers and tanks.

**Wells:** Dug wells and tube wells. In dug wells, water is collected from water-bearing strata.

**Tubewells:** Can tap water from deeper strata.

**Canals:** Most extensive irrigation system. Canals receive water from reservoirs or rivers. The main canal is divided into branch canals having further distributaries to irrigation fields.

**River lift system:** Water is directly drawn from the river for supplementing irrigation in areas close to rivers.

**Tanks:** These are small storage reservoirs, which intercept and store the run-off of smaller catchment areas.

**2) Large amounts of food grains get spoiled every year in India due to improper storage of food grains. How can this be avoided?**

**Solution:** Food grains get spoiled by insects, fungi, rodents, bacteria, moisture, and temperature in the place of storage. Storage losses can be minimized by following preventive and control measures.

1. The seeds/grains that are to be stored should be dry, with no moisture in it.
2. The grains should be cleaned.
3. The grains should be fumigated using chemicals that kill pest.
4. The storage houses should be water proof.
5. The grains should be stored in sealed gunny bags or metal containers.
6. The bags should be stacked in order i.e. in pile for proper fumigation and should be kept a few centimeters away from the wall.
7. The ventilators if any should be closed tightly, to avoid birds visiting the storage house and destroying the grains.
8. The walls and the floor should be water-proof with no holes in it, to avoid rodents, pests.

**3) Explain different types of fisheries.**

**Answer:** The different types of fisheries are marine fisheries, inland fisheries, capture fishing, mariculture and aquaculture.

1. Marine fisheries: Marine fishes are caught using fishing nets. Large schools of fishes are located by satellites. Some are farmed in sea water.
2. Mariculture: Marine fishes are cultured in seawater this culture of fisheries is called mariculture.
3. Inland fisheries: The fisheries done in fresh water resources like canals, ponds, reservoirs and rivers are called inland fisheries.
4. Capture fishing: It is done in sea-water, estuaries and lagoons.
5. Aquaculture: Culture of fish done in different water bodies is called aquaculture.

**4) What are the practices used for dairy industry?**

**Solution:** The practices required for raising dairy animals to get the optimum yield are:

(i) Shelter (ii) feeding (iii) rearing of animals (iv) breeding.

(i) Shelter: The shelter should be clean, spacious and airy.

(ii) Feeding: Proper food is essential for dairy animals, two types of food are roughage and concentrates. Proper feed at the proper time is required for dairy animals.

(iii) Rearing of animals: Providing them proper health care and protection from pathogens, diseases and proper vaccination.

(iv) Breeding: The crossing of different variety of milch animals to obtain a breed that can produce more yield of milk.