



Class 9

IMPROVEMENT IN FOOD RESOURCES

Ch 13 | Class 9th (Science)

Handwritten Notes



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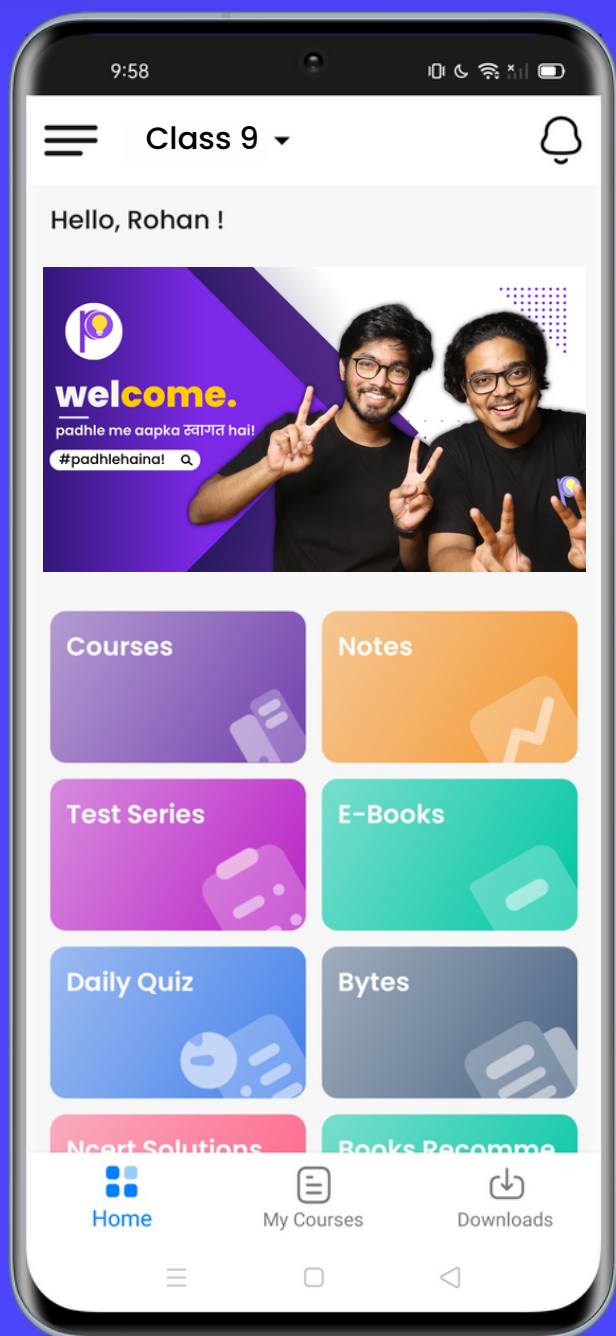
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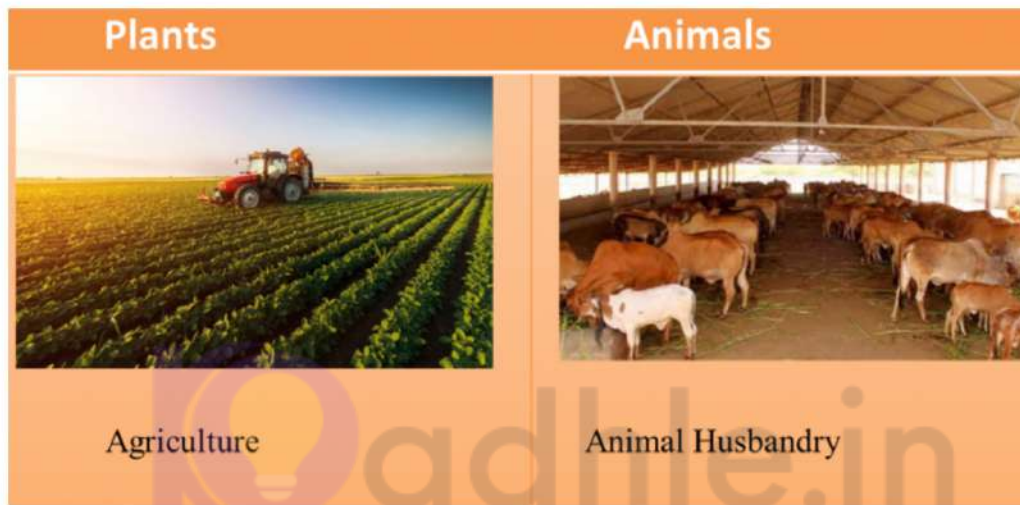


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IMPROVEMENT IN FOOD RESOURCES

- What do we need to get energy?
- What is that thing without we cannot survive?


FOOD



- * Why is this necessary to improve production from agriculture and animal husbandary?
- * Why we cannot make do with the current levels of production?

Efforts made so far ..

1. Green Revolution : Contributed to increase food grain production.
2. White Revolution : Has led to better and more efficient use as well as availability of milk.



There is a need for sustainable practices in agriculture and animal husbandry

What needs to be done ?

1. People should have money to purchase food.
2. Increasing the incomes of people working in agriculture is therefore necessary to combat the problem of hunger.
3. Scientific management practices should be undertaken to obtain high yields from farms.
4. For sustained livelihood, one should undertake mixed farming, intercropping and integrated farming practices, e.g. livestock, poultry, fisheries.

Improvement in crop yields

Different crops for different energy requirements

Carbohydrates →

Proteins →

Vitamins &
Minerals →

Fats →

Fodder →

* Different crops require :

- different climatic conditions (seasons).
- temperature and
- photoperiods for their growth and completion of their life cycle.

1. Different climatic conditions :



NEWS

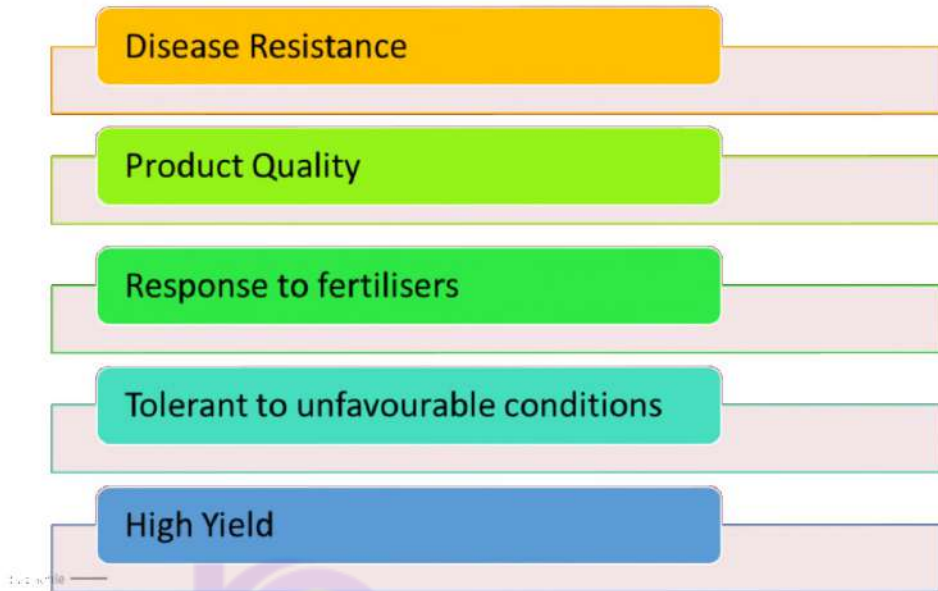
- In India there has been a four times increase in the production of food grains from 1960 - 2004 with only 25% increase in the cultivable land area.

How has this increase in production been achieved?

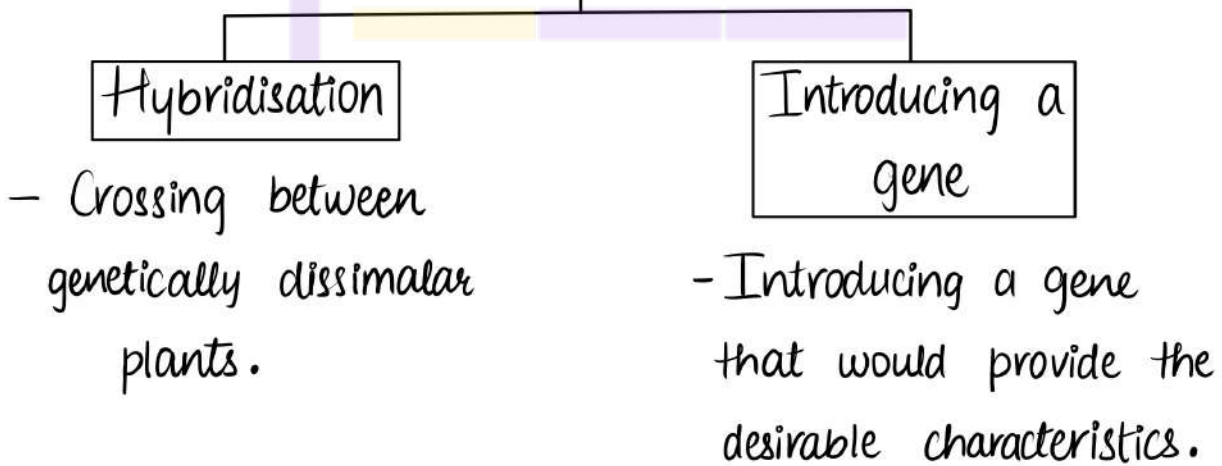
- Crop variety improvement
- Crop production improvement
- Crop protection management

Improvement in Food Resources

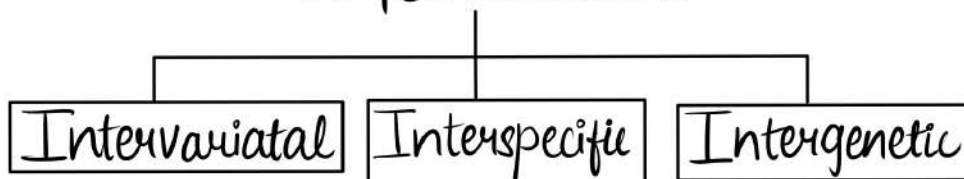
Crop Variety Improvement






Ways to Improve Crops



Hybridisation



2. Introducing a new gene to the plants:

GMO	Description	Picture
Golden Rice	Rice modified with daffodil genes to have more beta-carotene, which the body converts to Vitamin A	
Flavr Savr Tomatoes	Tomatoes modified by the removal of genes responsible for the softening of fruit, meaning the tomatoes spoil more slowly	
Bt Corn	Corn modified with a bacterial insecticide gene so that it produces insect toxins within its cells, protecting it from pest species	

- i. Higher Yield : To increase the productivity of the crop per acre.
- ii. Improved Quality : Baking quality is important in wheat, protein quality in pulses, oil quality in oilseeds and preserving quality in fruits and vegetables.
- iii. Biotic and abiotic resistance : Crops production can go down due to biotic (insects, diseases and nematodes) and abiotic (drought, salinity, heat, cold, water logging and frost) stresses under different situations.
- iv. Change in maturity duration :
→ The shorter the duration of the crop from sowing to harvesting, the more economical is the variety.

- Such short durations allow farmers to grow multiple rounds of crops in a year.
- Short Duration also
Reduces the cost of crop production
- Uniform maturity makes the harvesting process easy and reduces losses during harvesting.

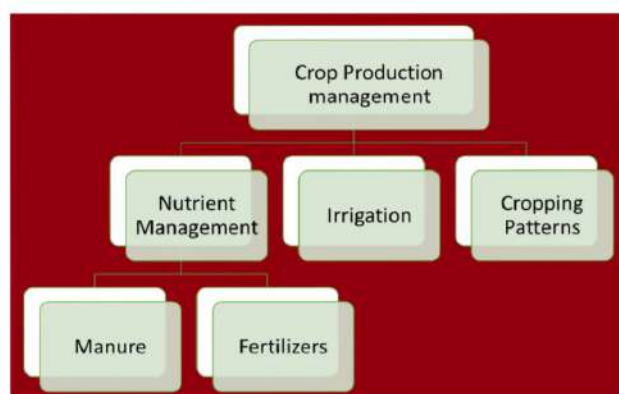
v. Wider Adaptability :

- Developing varieties for wider adaptability will help in stabilizing the crop production under different environmental conditions.
- One variety can then be grown under different climatic conditions in different areas.

vi. Desirable Agronomic Characteristics :

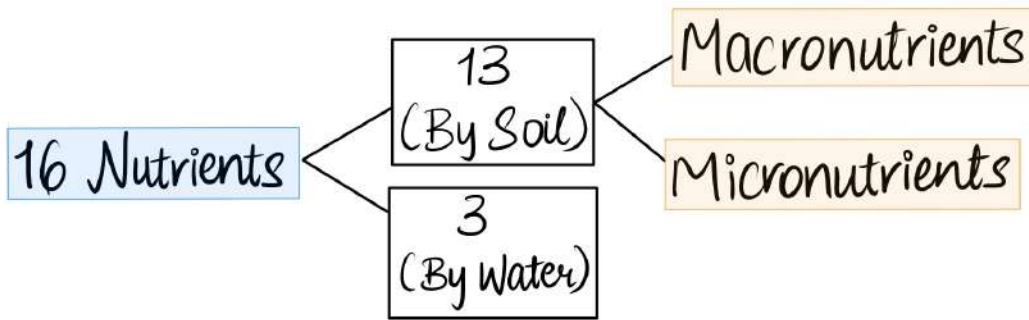
- Tallness and profuse branching are desirable characters for fodder crops.
- Dwarfness is desired in cereals, so that less nutrients are consumed by these crops.

Crop Production Management



1. Nutrient Management :

- There are 16 nutrients required by the plants.



Source	Nutrients
Air	carbon, oxygen
Water	hydrogen, oxygen
Soil	(i) <i>Macronutrients:</i> nitrogen, phosphorus, potassium, calcium, magnesium, sulphur (ii) <i>Micronutrients:</i> iron, manganese, boron, zinc, copper, molybdenum, chlorine

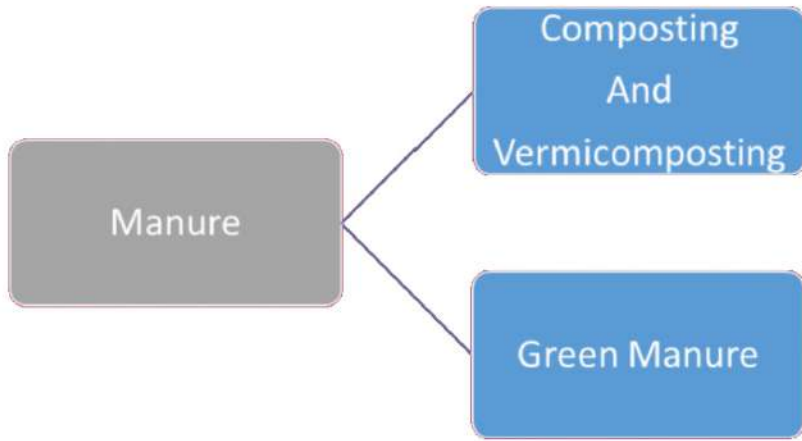
Deficiency of these nutrients affects :

- Reproduction
- Growth and susceptibility to disease.

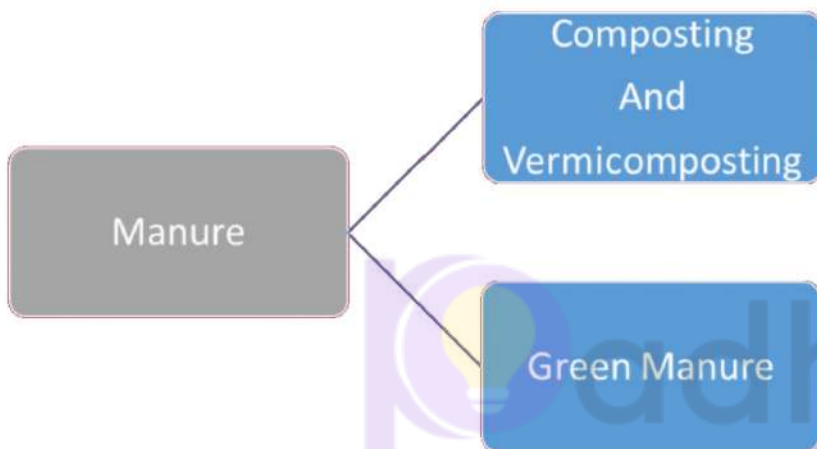
* How to add these nutrients to the soil ?

a. Manure :

- ▷ Manure is prepared by the decomposition of animal excreta and plant waste.
- ▷ Manure contains large quantities of organic matter and also supplies small quantities of nutrients to the soil.
- ▷ The bulk of organic matter in manure helps in improving the soil structure.



Livestock excreta, vegetable waste, animal refuse, domestic waste, sewage waste, straw, eradicated weeds etc. is decomposed in pits is known as composting.



Some plants like sun hemp or guar are grown and then mulched by ploughing them into the soil.

- These green manure which helps in enriching the soil in nitrogen and phosphorus.

b. Fertilizers :

- ▷ Fertilizers supply nitrogen phosphorus and potassium.
- ▷ Continuous use of fertilizers in an area can destroy soil fertility.
- ▷ Short-term benefits of using fertilizers and long-term benefits of using manure for maintaining soil fertility have to be considered while aiming for optimum yields in crop production.

Organic Farming

► Organic farming is a farming system with minimal or no use of chemicals are :

- Fertilizers
- Herbicides
- Pesticides etc.

and with a maximum input of organic manures, recycled farm-wastes (livestock excreta), use of bio-agents such as culture of blue green algae in preparation of biofertilizers, neem leaves or turmeric specifically in grain storage as bio-pesticides, with healthy cropping systems.

2. Irrigation :

- Dug Well — Water is collected from water bearing strata.
- Tube Well — Water is collected from deeper strata.
- Canal — The main canal is divided into branch canals having further distributaries to irrigate fields.

→ River Lift System :

- In areas where canal flow is not sufficient or irregular due to inadequate reservoir release.

→ Tanks :

- There are small storage reservoirs which intercept and store the run-off of smaller catchment areas.

→ Check dams :

- It leads to an increase in ground water level.
- The check dams stop the rainwater from flowing away and reduces soil erosion.

Improvement In Food Resources

Improvement In Crop Yields	
Crop Variety Improvement	
Crop Production Management	
Crop Protection Management	
Animal Husbandry : Cattle Farming	
Poultry Farming, Fish Production	
Bee Keeping , NCERT Questions	
Intext Questions	

Cropping Patterns

1. Mixed Cropping :

- Mixed cropping is growing two or more crops simultaneously on the same piece of land.
- This reduces risk and gives some insurance against failure of one of the crops e.g. wheat + gram, Wheat + Mustard.

2. Inter-Cropping :

- Inter-cropping is growing two or more crops simultaneously on the same field in a definite pattern.

- The crops are selected such that their nutrient requirements are different.
 - a. This ensures maximum utilisation of the nutrients supplied.
 - b. Prevents pests and diseases from spreading to all the plants belonging to one crop in a field.

3. Crop Rotation:

- The growing of different crops on a piece of land in a pre-planned succession is known as crop rotation.
- Depending upon the duration, crop rotation is done for different crop combinations.
- The availability of moisture and irrigation facilities decide the choice of the crop to be cultivated after one harvest.

Threats to the crops:



Weeds



Insect attack



Diseases

a. Weeds:

- Weeds take up nutrients and reduce the growth of the crop.
- Therefore, removal of weeds from cultivated fields during the early stages of growth is essential for a good harvest.

b. Insect Attack :

- Insect pests attack plants in following ways :

- i. they cut the root, stem and leaf,
- ii. they suck the cell sap from various parts of the plant,
- iii. they bore into stem and fruits.

- They thus affect the health of the crop and reduce yields.

c. Diseases :

- Diseases in plant are caused by pathogens such as bacteria fungi and viruses.

- These pathogens can be present in and transmitted through the soil, water and air.

What needs to be done ?

- ▷ Chemicals like pesticides can be sprayed on crop plants or used for treating seeds and soil.
- ▷ Weed control methods also include mechanical removal.
- ▷ Preventive methods such as proper seed bed preparation, timely sowing of crops, intercropping and crop rotation also help in weed control.
- ▷ The use of resistant varieties, and summer ploughing, in which fields are ploughed deep in summers to destroy weeds and pests.

Storage of Grains :

- Losses of the grains are :

- degradation in quality
- loss in weight
- poor germinability
- discolouration of produce

All leading to poor marketability.

- Factors responsible for losses are :

- Biotic — insects, rodents, fungi, mites and bacteria
- Abiotic — inappropriate moisture and temperatures in place of storage.

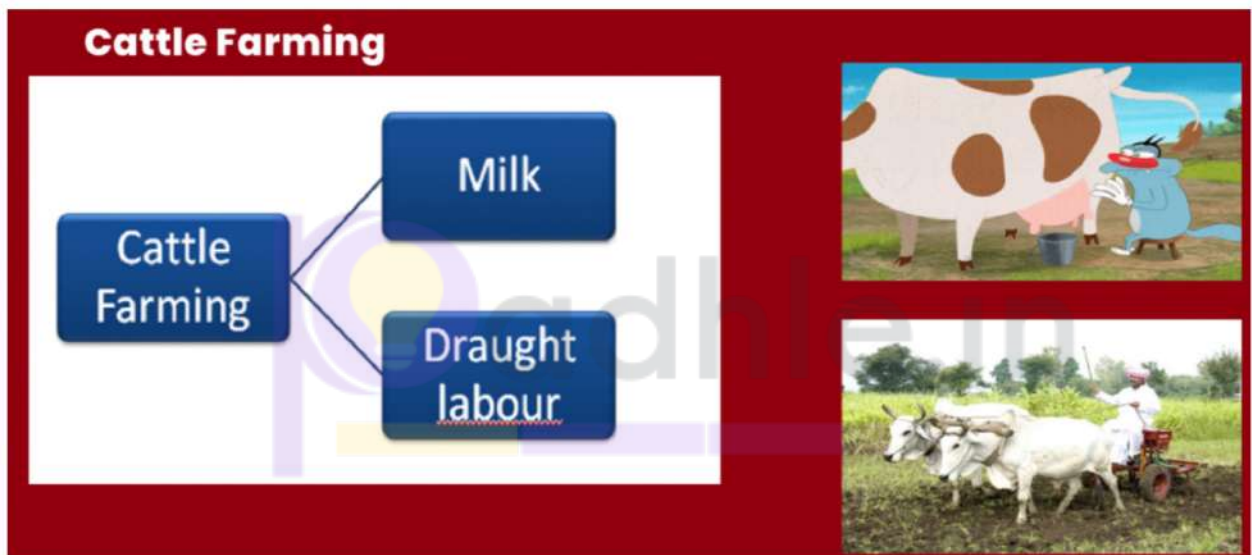
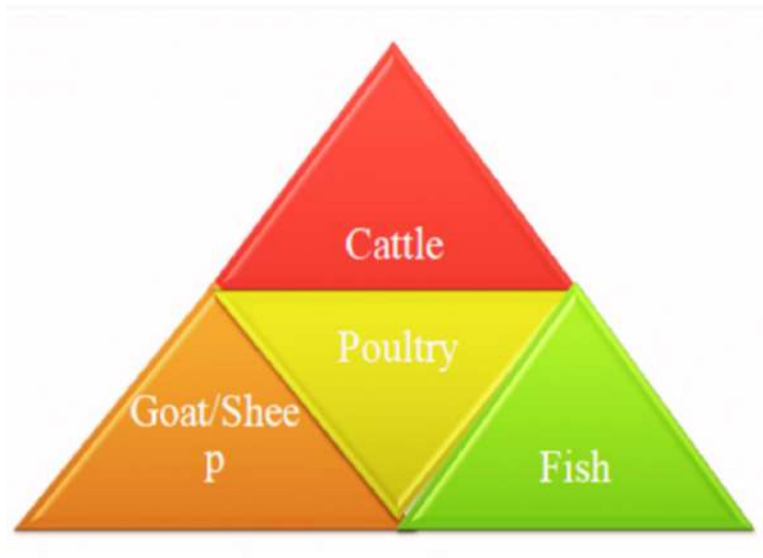
- Preventive and control measures :

- Strict cleaning of the produce before storage
- proper drying of the produce first in sunlight and then in shade
- fumigation using chemicals that can kill pests.

Animal Husbandary

- Animal husbandary is the scientific management of animal livestock, it includes various aspects like :

- feeding
- breeding
- disease control



→ Indian Cattle :

- Cows (*Bos indicus*) , Buffalo (*Bos bubalis*)



- ▶ Milk production depends, on some extent, on the duration of the lactation period.
- ▶ Exotic or foreign breeds (e.g. Jersey, Brown Swiss) are selected for long lactation periods, while local breeds (e.g. Sahiwal, Red Sindhi) show excellent resistance to diseases.

Shelter for Cattle

- ▶ Proper cleaning and shelter facilities for cows and buffaloes are required for humane farming, for production of clean milk as well.
- ▶ Animals require regular brushing to remove dirty and loose hair.
- ▶ They should be sheltered under well-ventilated roofed sheds that protect them from rain, heat and cold.
- ▶ The floor of cattle shed needs to be sloping so as to stay dry and to facilitate cleaning.
- ▶ Animal feed includes :
 - ① roughage, which is largely fibre,
 - ② concentrates, which are low in fibre and contain relatively high levels of proteins and other nutrients.

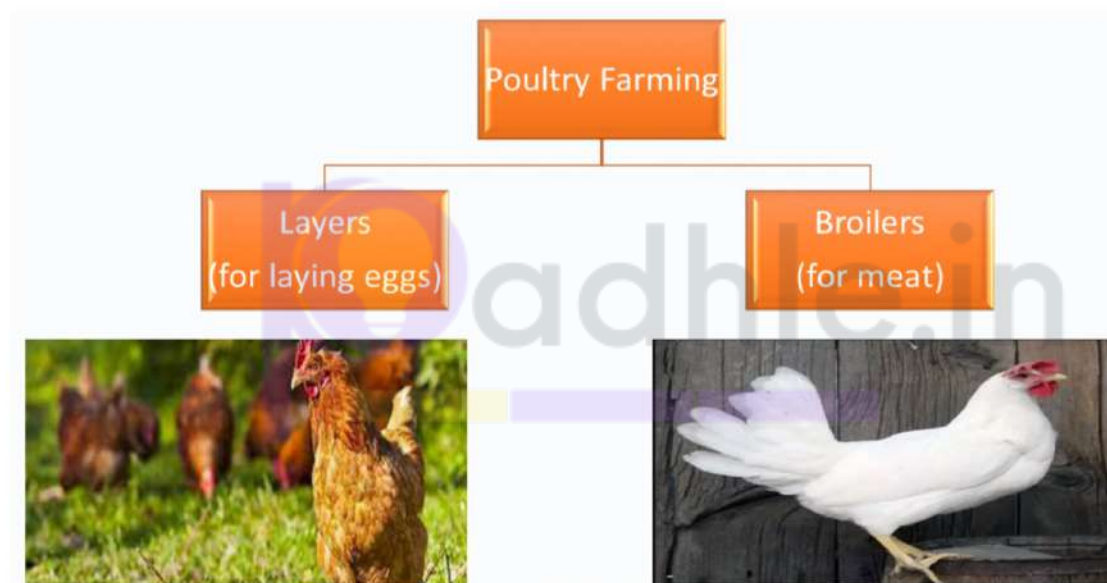
→ Food requirements of Cattle :

- Cattle need balanced rations containing all nutrients in proportionate amounts.

- Besides such nutritious food material, certain feed additives containing micronutrients promote the health and milk output of dairy animals.

Poultry Farming

→ Poultry farming is undertaken to raise domestic fowl for egg production and chicken meat.



1. Rearing :

- For good production of poultry birds, good management practices are important.
- These include maintainance of temperature and hygienic conditions in housing and poultry feed.

2. Breeding :

→ Breeding is done to develop new varieties for the below desirable traits —

- 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
- ⑤ reduction in the size of the egg-laying bird with ability to utilise more fibrous cheaper diets formulated using agricultural by-products.

3. Nutrition :

Broilers	Layers
1. Broiler chickens are fed with vitamin-rich supplementary feed for good growth rate and better feed efficiency.	1. Sufficient nutrients, minerals and vitamins have to be provided.
2. Vitamin A and K are provided in larger quantities. Also, the feed should be protein rich with adequate fat.	2. Layers need more fibre and less proteins & fats in their food.

4. Shelter :

- Shelter for poultry birds should be clean, well-illuminated and well-ventilated.
- Temperature in their living place should be kept between 34°C to 38°C .

→ Birds of different ages should be housed separately.

5. Protection :

- Poultry birds suffer from number of disease caused by virus (Bird flu), bacteria (Tuberculosis, Cholera), fungi (Aspergillosis), parasites as well as nutritional deficiency.
- Appropriate vaccination can prevent the occurrence of infectious diseases and reduce loss of poultry during an outbreak of disease.

