Definition of food

- Resources that are used as food, or provide food for organisms are called food resources
- Materials, usually of plant or animal origin, that contain or consist of essential body nutrients.
- Food is the basic material which the body need for its survival and well being.
- Good food is indispensable for health at all stages of life and for satisfactory growth during infancy, childhood, adolescence and adulthood.
- Human diet not restricted to any special category of food.
- Man eats a variety of foods of plant and animal origin as no single food provides us with all the nutrients that we need.

• Sources of food:

We obtain food from mainly two types of natural sources :

- Plants
- Animals
- **PLANTS AS FOOD SOURCES**
- Plants serve as food resources for herbivores and omnivores.
- In India, the main source of food is agriculture.
- Main kinds of agricultural products :
- Cereals
- Pulses
- Spices
- Beverages
- Vegetables
- Fruits
- 2,50,000 of plant identified

- 3,000 species tried as agricultural crop
- 300 species are grown for food
- 100 species used on a large scale
- 20 crops is provides world 60 % of calories requirement
- **Cereals**
- They are grasses which are cultivated for their edible grains.
- They provide more food energy than any other crop.
- They are staple crops.
- **Pulses**
- Pulses are edible seeds of leguminous plants.
- They are important food crops due to their nutritional value.
- Examples : Grams, Peas, Dal, etc.
- **Spices**
- A spice is a dried vegetative substance used as a food additive for flavour, colour, or as a preservative.
- India is one of the greatest spice producers of the world.
- India is also one of the greatest consumers of spices.
- Examples : Cumin, cardamom, cinnamon, etc.
- **Beverages**
- Beverages are drinks meant for human consumption. They are also cultivated as crops.
- They form a very important part of human culture.
- Examples : Tea, coffee, etc.
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ANIMALS & BIRDS AS FOOD RESOURCES

Animals and birds are a huge source of food for many organisms who are carnivores and omnivores. They are of the following origin:

- **Animal meat** *(Sheep,Goats,Rabbit,deer*)
- **Bird Meat**
- **Aquatic**

(*Fish and sea food contribute about 70 MMT of high quality protein to the world's diet. Aquatic food contain high quality of protein***)**

- Eggs are bird products that form part of bird reproduction. They are very nutritious and a very viable source of food.
- Milk is an animal product that forms the food for the offspring of the particular animal. Very nutritious and widely accepted.
- Honey is the product of nectar collected by honey bees from flowers. They are also believed to be very rich in nutrients.
- Certain animals also give things like oils, that has nutritional value. For instance, cod liver oil from fishes.

World Food Problems

- During the last 50 years world grain production has increased almost three times.
- The per capita production is increased by about 50%.
- At the same time population growth increased at such a rate in less developed countries.
- Every 40 million people die of ***Undernourishment*** and **Malnutrition.**
- This means that every year our food problem is killing as many people as were killed by the atomic bomb dropped on Hiroshima during World War II.
- This statistics emphasize the need to increase our food production, and also to control population growth.

It is estimated that 300 millions are still ***undernourished.***

UNDERNOURISHMENT

Undernourishment occurs when the body does not consume enough food or enough calories to support its needs. As a result the body begins to breakdown its own stored fats and proteins.

MALNOURISHMENT

Malnourishment is the lack of the minimum amount of fluids, proteins, carbohydrates, lipids, vitamins, minerals and other nutrients essential for sound health and growth.

Faulty nutrition may result from poor diet, lack of appetite or abnormal absorption of nutrients from gastrointestinal tract.

HUNGER HOTSPOT

Many countries in the world face food emergency problems and require international food assistance. The countries or regions that face Food Emergencies are referred as Hunger Hotspots.

BALANCED DIET

A Balanced Diet includes a variety of foods from all 5 food groups. It should provide enough calories to ensure desirable weight and should include all the necessary daily nutrients

- **FRUIT & VEGETABLES 33%**
- **MILK & DAIRY FOODS 15%**
- **GRAINS & POTATOES 33%**
- **MEAT, FISH & ALTERNATIVES 12%**
- **SUGAR & FATS 7%**

Impacts of overgrazing and agriculture

Overgrazing

- Overgrazing can limit livestock production. Over grazing occurs when too many animals graze for too long and exceed the carrying capacity of a grass land area.

Impact of overgrazing

- **Land degradation:** Overgrazing removes the grass cover. The humus content of the soil is decreased and it leads to poor, dry, compacted soil.
- **Soil erosion:** The soil roots are very good binders of soil. When the grasses are removed, the soil becomes loose and susceptible to the action of wind and water.
- **Loss of useful species:** Due to overgrazing the nutritious species like cenchrus, panicum etc. are replaced by thorny plants like Parthenium, Xanthium etc. These species do not have a good capacity of binding the soil particles and, therefore, the soil becomes more prone to soil erosion.

Modern Agriculture and its impacts:

- High yielding variety
- Fertilizers
- Pesticides
- Water logging
- Salinity

• Impacts related to high yielding varieties (HYV):

- The uses of HYVs encourage monoculture i.e. the same genotype is grown over vast areas. In case of an attack by some pathogen, there is total devastation of the crop by the disease due to exactly uniform conditions, which help in rapid spread of the disease.

• Fertilizer related problems:

- **Micronutrient imbalance:**
- Chemical fertilizers have nitrogen, phosphorus and potassium (N, P and K) which are essential macronutrients. Excessive use of fertilizers cause micronutrient imbalance. For example, excessive fertilizer use in Punjab and Haryana is affecting productivity of the soil.
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- **Nitrate Pollution**:

- Nitrogenous fertilizers applied in the fields often leach deep into the soil and ultimately contaminate the ground water.

- The nitrates get concentrated in the water and when their concentration exceeds 25 mg/L, they become the cause of a serious health hazard called "**Blue Baby Syndrome**" or methaemoglobinemia. This disease affects the infants to the maximum extent causing even death.

Pesticide related problems:

Thousands of types of pesticides are used in agriculture. The first generation pesticides include chemicals like sulphur, arsenic, lead or mercury to kill the pests. They have number of side effects as discussed below:

a) Creating resistance in pests and producing new pests:

About 20 species of pests are now known which have become immune to all types of pesticides and are known as "Super pests".

b) Death of non-target organisms:

Many insecticides not only kill the target species but also several non-target species that are useful to us.

c) Biological magnification:

Many of the pesticides are non-biodegradable and keep on accumulating in the food chain, a process called biological magnification. This is very harmful.

- **Water Logging**: Over irrigation of croplands by farmers for good growth of their crop usually leads to water logging. Inadequate drainage caused excess water to accumulate underground and gradually forms a continuous column with the water table. Under water-logged conditions, pore-spaces in the soil get fully drenched with water and the soil- air gets depleted.

  Preventing excessive irrigation, sub-surface drainage technology and bio-drainage with trees like Eucalyptus are some of the remedial measures to prevent water-logging.

  Salinity Problem: At present one third of the total cultivable land area of the world is affected by salts. Saline soils are characterized by the accumulation of soluble salts like sodium chloride, sodium sulphate, calcium chloride, magnesium chloride etc. in the soil

profile. Their electrical conductivity is more than 4 ds/m. So dic soils have carbonates and bicarbonates of sodium, the pH usually exceed 8.0.

Management of Agriculture:

- Use of Bio-fertilizer (Plant and animal origin)
- Scientific used of irrigation and checked over flow of water.
- The most common method for getting rid of salinity is to flush them out by applying more good quality water to such soils.
- Another method is laying underground network of perforated drainage pipes for flushing out the salts slowly.