Introduction to Food Microbiology: -

Food Microbiology: The science that deals with the microorganisms involved in the spoilage, contamination, and preservation of food.

Reasons to study Food Microbiology:

- ✓ Provide Clean, Safe, Healthy Food.
- ✓ Control Microbial Growth.
- ✓ Prevent Food Spoilage.
- ✓ Prevent Food-borne Illnesses.
- ✓ Food Preservation.
- ✓ Food Production

Principles of Food microbiology:

1. The effect of environment on growth of various microorganisms in food.
2. The microbiology of food spoilage and food manufacture.
3. The physical and chemical destruction of microorganisms in foods.
4. Explain Microbiological quality of foods and food ingredients by using appropriate techniques
5. The study of microorganisms which have both beneficial and harmful effects on the quality of raw and processed meat, poultry and egg products.
6. Focuses on the general biology of the microorganisms that are found in foods including: their growth characteristics, identification, and pathogenesis.
7. The most interested subjects which studied in food microbiology are food poisoning, food spoilage and food preservation.

Sources of microorganisms in food:

The primary sources of microorganisms in food include:

- ✓ Soil and water.
- ✓ Plant and plant products.
- ✓ Food utensils.
- ✓ Intestinal tract of man and animals.
- ✓ Food handlers.
- ✓ Animal hides and skins.
- ✓ Air and dust.

Factors affecting microbial growth in food

(a) Intrinsic factors:

These are the conditions naturally present in food, include:

- **Hydrogen ion concentration (pH).**
- **Moisture content**
- **Nutrient content of the food.**
- **Antimicrobial substances in the food.**
- **Oxidation–Reduction Potential.**

(b). Extrinsic factors

These are the environmental conditions that affect microbial growth, include:

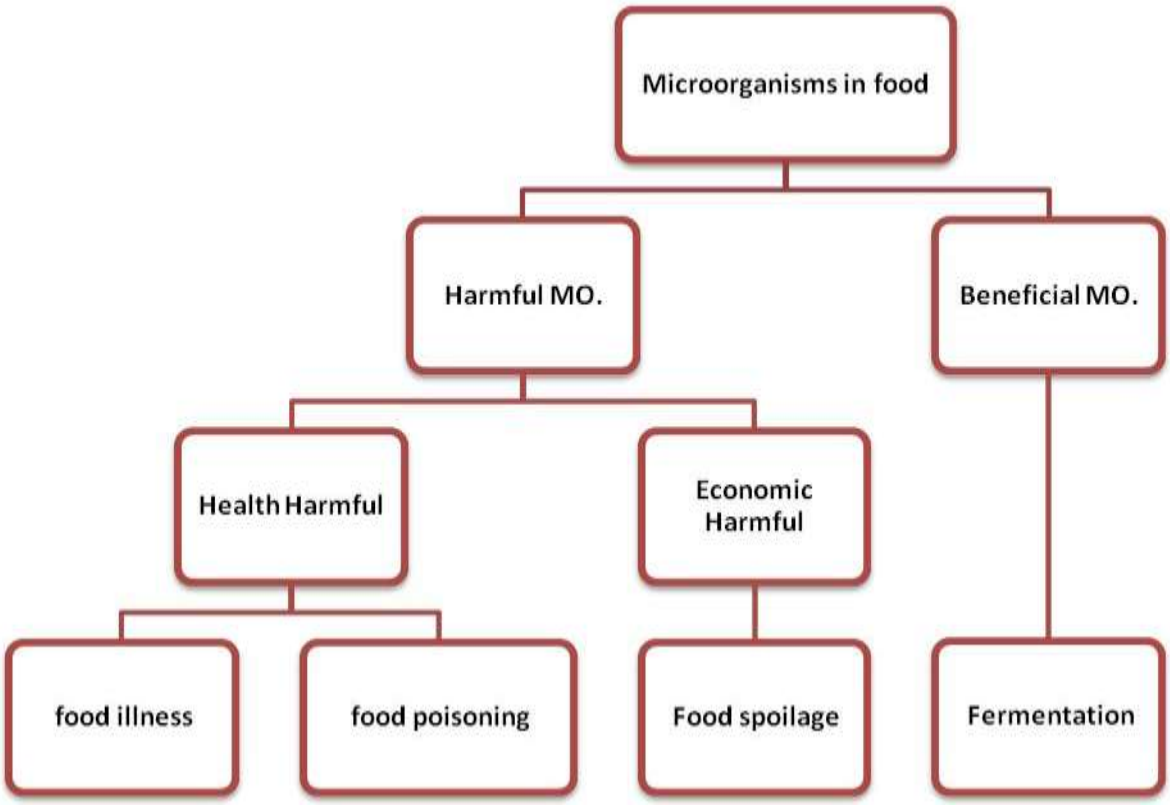
- **Temperature of storage.**
- **Presence and concentration of gases in the environment.**
- **Relative humidity of food storage environment.**

Microorganisms in food:

In general, there are two types:

1. **Harmful microorganisms**: which include:
   a) Health harmful: ex. Those microorganisms that causes **food illness** and **food poisoning.**
   b) Economic harmful: ex. Those microorganisms that causes **Food spoilage**.

2. **Beneficial microorganisms:** ex. Those microorganisms that causes **Fermentation**



❖ Important Groups of microorganisms in food microbiology:

Bacteria	**Yeast**	**Molds**	**Others**
Lactic acid group (*Streptococcus acidophilus, Lactobacillus bulgaricus*)	*Candida tropicalis* (grain and rice)	*Penicillium* (fruit)	Algae
Acetic acid group (*Acetobacterium woodi*)	*Candida lipolytica* (meat)	*Aspergilus oryzae* (meat)	Protozoa
Lipolytic group (*Psedomonas fluorescence, Alcaligens faecalis*)	*Saccharomyces rouxii* (dry food)	*Aspergilus niger* (bread, fruit and vegetables)	Viruses
Saccharolytic group (*Leoconostic*)	*Saccharomyces cerevisiae* (fruit and vegetables)	*Aspergilus flavus* (honey)	Helminths
Halophilic group (*Micrococcus rosens*)		*Alternaria solani* (tomato)	
Proteolytic group (*Clostredium, Bacillus, Proteus*)		*Fusarium* (potato)	
		Rhizopus nigricans	