Practical Food Microbiology

Lab. 1

Introduction to Food Microbiology

2022/2023

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:

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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:

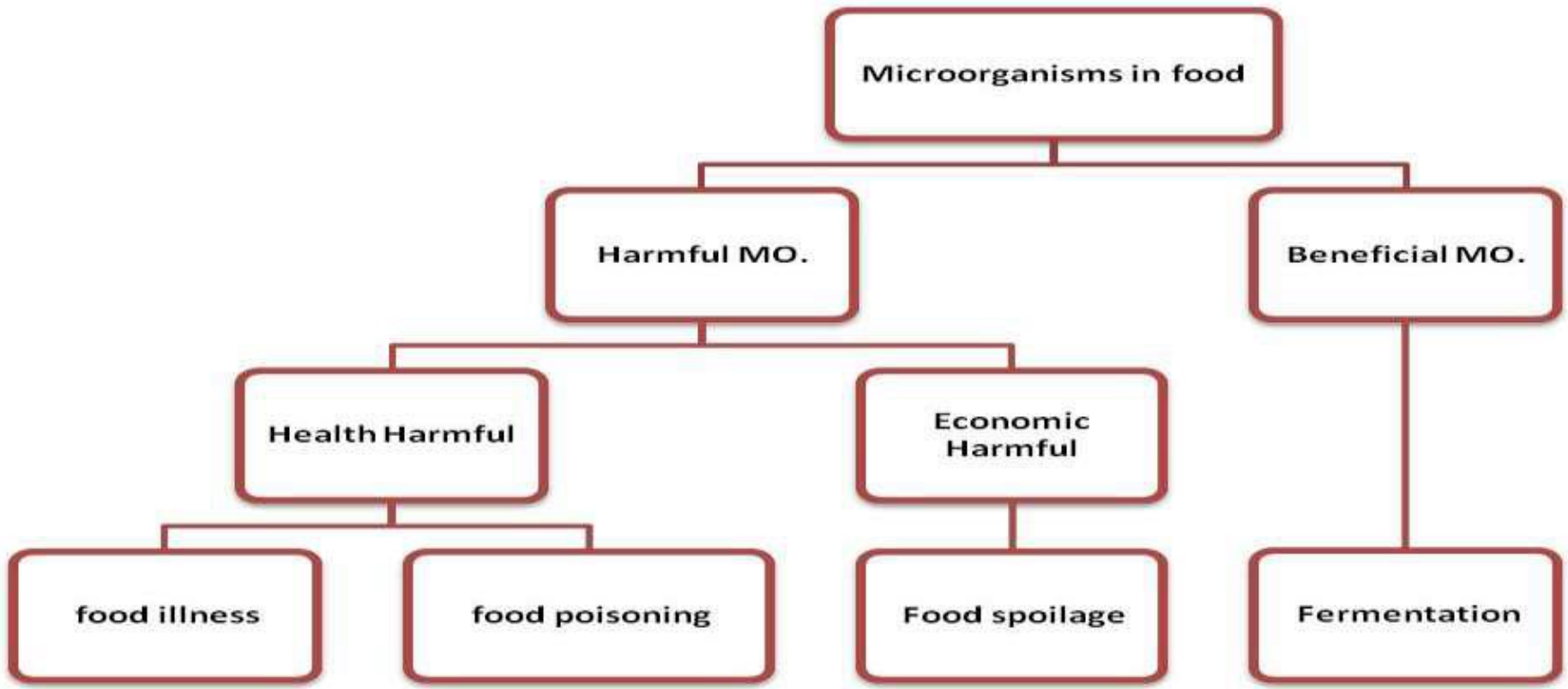
In general, there are two types:

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***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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)	*Aspergillus oryzae* (meat)	Protozoa
Lipolytic group (*Psedomonas fluorescence, Alcaligens faecalis)*	*Saccharomyces rouxii* (dry food)	*Aspergillus niger* (bread, fruit and vegetables)	Viruses
Saccharolytic group (*Leoconostic*)	*Saccharomyces cerevisiae* (fruit and vegetables)	*Aspergillus flavus* (honey)	Helminths
Halophilic group (*Micrococcus rosens*)		*Alternaria solani* (tomato)	
Proteolytic group (*Clostredium, Bacillus, Proteus*)		*Fusarium* (potato)	
		Rhizopus nigricans	