MMB - C203
FOOD AND DAIRY MICROBIOLOGY

L T Credit
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Learning objectives:

- To know the spoiling microorganism responsible for food spoilage.
- To learn the preservative technique for the preservation of food commodities.
- To get the knowledge of factor that affect microbial growth in food.
- To understand fermentation technologies in the food processing industry.
- To understand the different food regulatory bodies and their functioning

Learning outcomes:

At the end of course student will be able to

- Use the principles of preservation techniques to preserve the food.
- Detect or isolate food borne pathogen from food contaminated with microorganism.
- Explain the different method of disinfection used in industry and also how to maintain quality of product.
- Prepare and develop dairy products in laboratory.
- Describe the rationale for the use of standard methods and procedures for the microbiological analysis of food

UNIT – I

Food substrates, its spoilage and preservation– Microorganisms and their importance in food microbiology - food-borne molds, yeast, bacteria, general features, principles of food preservation; asepsis- removal of microorganisms (anaerobic conditions, high temperature(D-value, Z-value and F-value), low temperature, drying), Mechanism of chemical preservation, chemicals used as preservative, canning,food additives, concept of modified atmosphere packaging (MAP).

(13 Lectures)

UNIT – II

Contamination and Spoilage –Factors influencing microbial growth in food– extrinsic and intrinsic factors; Cereals, sugar products, vegetables, fruits, meat and meat products; milk and milk products, fish and sea food, poultry; spoilage of canned food; detection of spoilage and characterization.Contamination and spoilage of cereals, sugar products, fruits, meat products, milk and milk products, fish and sea food; detection of spoilage and characterization.

(13 Lectures)

UNIT – III

Food-borne infections and intoxications – Bacterial and non- bacterial intoxication (with examples of infective and toxic types)– *Brucella, Bacillus, Clostridium, Escherichia, Shigella, Staphylococcus, Vibrio, Yersinia;* Protozoa, algae, fungi (aflatoxin) and viruses; food borne outbreaks– laboratory testing procedures, preventive measures, food sanitation in manufacturer and retail trade; Food control agencies and its regulations.

.(11 Lectures)

UNIT – IV

Indicators of microbial food quality – brief account of microbes (coliform group, enterobacteriaceae group, enterococcus group) and microbial products that correlate with food quality, control of microbiological quality of foods – training, facilities and operation, equipments, cleaning and disinfection, HACCP concept, hazard analysis, identification of CCPs and establishment of CCP limits .

(10 Lectures)

UNIT – V

Dairy microbiology: Dairy starter cultures, fermented dairy products: yogurt, acidophilus milk, kumis, kefir, dahi and cheese, Probiotics:concept of probiotics, prebiotics, and synbiotics, health benefits, types of microorganisms used, probiotic foods available in market.

(10 Lectures)

Suggested Reading

1. Doyle et al., Food Microbiology: Fundamentals and Frontier, American Society of Microbiology
2. William C Frazier, Food Microbiology, MacGraw Hills Education.
3. Adam and Moss, Food Microbiology, Royal Society of Chemistry

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