FOOD MICROBIOLOGY

39 Hr (13× 3 units)

Course Outcome

At the end of this course students will be able to-

CO 1. Identify microorganisms associated with food.

CO 2. Describe different type of microbes present and their beneficial as well as deleterious effect on food.

CO 3. Understand food borne pathogens, food spoilage and toxins produced by them and its health effect.

CO 4. Assess the importance of microbes in food industry for baking, fermentation and various traditional foods.

Unit I: History and scope of food microbiology. Types of micro-organisms associated with food- mold, yeast, and bacteria, Microbial growth pattern, physical and chemical factors influencing destruction of microorganisms. Growth curve, bacterial group based on morphology- gram positive, gram negative, motile, non-motile, sporulating and non sporulating. Microorganisms in natural food products and their control.

Unit II: Food spoilage and food borne diseases: Food spoilage - definition, biochemical changes caused by microorganisms, deterioration and spoilage of various types of food products – Physical, chemical and microbiological spoilages (Enzymatic or fermentative spoilage – rancidity, hydrolytic spoilage, putrefaction, souring, off flavour etc.; Texture deformations – slime, ropiness, curdling, discoloration etc.; Contamination of fruits vegetables, cereals, pulses, oilseeds, milk and meat during handling and processing. Microbial spoilage of foods and food items – milk, cereals, fruits and vegetables, meat, egg, fish, poultry. Toxin production
–endotoxins and exotoxins). Food borne diseases and infections, mycotoxins, typhoid, diarrhea, botulism, salmonellosis, staphylococcal intoxication. Food borne pathogens, food poisoning, food infection and intoxication - *E. coli* O157:H7, *Campylobacter jejuni*, *Bacillus cereus*, Shigella sp.,Hepatitis A. Assessing the microbiological quality of food – indicator organisms, microbiological standards, principals of GMP and HACCP in food processing.

Unit III: Fermentation: Importance of microorganisms in food industry and food preparations (milk industry, meat, fish, baking). Food fermentation -Traditional fermented foods of India and other Asian countries; Probiotics and prebiotics: effect on gut microflora. Fermented foods based on milk, meat and vegetables; Fermented and alcoholic beverages.

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