336C6B Food Dairy Microbiology Summary

Course Units

Unit 1: To Impart Current Knowledge Of Basic And Applied

• Food as a substrate for microorganisms - Microorganisms important in Food Microbiology; Molds
• yeasts and bacteria -General Characteristics - Classification and importance. Principles of food preservation - Asepsis - Removal of microorganisms
• - High temperature - Low temperature - Drying - Food additives. Nanoscience in food preservation; microencapsulation.

Unit 2: Gives An Insight Into Various Types Of Food

• Contamination and spoilage of food products - Food borne infections (Bacillus cereus, Salmonella sp., Shigella sp., Listeria monocytogenes and Campylobacter jejuni) and intoxications – (Staphylococcus aureus, Clostridium botulinum ,Clostridium perfringens and mycotoxins) Food borne disease outbreaks - newly emerging pathogens. Conventional and Novel technology in control of food borne pathogens and preventive measures - Food sanitation - plant sanitation - Employees' health standards. Regulatory Agencies &criteria; for food safety.

Unit 3: Information About Microflora Of Milk

• Microflora of raw milk - sources of contamination. Spoilage and preservation of milk and milk products. -antimicrobial systems in raw milk. Importance of biofilms
• their role in transmission of pathogens in dairy products and preventive strategies.

Unit 4: About The Production Of Fermented Dairy Products

• Food fermentations: Indian pickles
• bread
• vinegar
• fermented vegetables (Sauerkraut)
• fermented dairy products (Yoghurt, Cheese, Acidophilus milk, Kefir, Koumiss). Oriental fermented foods-Miso – Tempeh
• Ontjom
• Natto and Idli. Spoilage and defects of fermented dairy products - Functional fermented foods and nutraceuticals
• Bioactive proteins and bioactive peptides
• Genetically modified foods.

Unit 5: To Impart Current Knowledge Of Probiotics, Prebiotics

• Probiotic microorganisms
• concept
• definition

• safety of probiotic microorganisms
• legal status of probiotics
• Characteristics of Probiotics for selection: stability maintenance of probiotic microorganisms. Role of probiotics in health and disease: Mechanism of probiotics. Application of bacteriocins in foods. Biopreservation. Prebiotics: concept
• definition
• criteria
• types and sources of prebiotics
• prebiotics and gut microflora - Prebiotics and health benefits: mineral absorption
• immune response
• cancer prevention
• elderly health and infant health
• prebiotics in foods.

Course Outcomes

CO1: Gain knowledge about food as a substrate for various microbes, Understand about the principles and application of different types of food spoilage and preservation technique,

CO2: Acquire a thorough understanding of food borne diseases, testing methods, and preventive technique

CO3: Gain information about spoilage of milk and its products and its antimicrobial properties

CO4: Learn about the various fermented product and its various stage spoilage

CO5: Impart current knowledge of probiotics, prebiotics and functional dairy foods for the health benefits

Text Books

1. Frazier WC and West off DC. (2017). Food microbiology. 5th Edition TATA McGraw Hill Publishing Company Ltd. New Delhi.

2. Adams, M.R., Moss, M.O.(2018). Food Microbiology 1stedition. New Age Publishers by New Age International (P) Ltd., Publishers.

3. R.C. Dubey. (2014). Advanced Biotechnology. S. Chand publishers.

4. Banwart GJ. (1989). Basic food microbiology, Chapman & Hall, New York.

5. Sugumar D. (1997). Outlines of dairy technology, Oxford University press. 1997.

Reference Books

1. Jay JM, Loessner MJ and Golden DA.(2005). Modern Food Microbiology. 7th Edition CBS Publishers and Distributors, Delhi, India.

2. Prescott, Harley and Klein Wim.(2008). Microbiology, 7th Edition McGraw Hill Publications.

3. Robinson, R. K.(2002). Dairy Microbiology Handbook - The Microbiology of Milk and Milk Products (Third Edition), A John Wiley & Sons, Inc., New York.

4. Yuankunlee,Sepposalminen. (2008). Handbook of probiotics and prebiotics Second Edition. A John Wiley & Sons publication Inc.

5. DharumauraiDhansekaran, AlwarappanSankaranarayanan. (2021). Advances in Probiotics Microorganisms in Food and Health 1st Edition. eBook ISBN:9780128230916.

6. https://www.researchgate.net/publication/15326559_A_Dynamic_Approach_to_Predicting_BacterialGrowth_in_Food/link/5a1d2e02aca2726120 b28eba/download

7. https://www.fda.gov/food/laboratory-methods-food/bam-foodsamplingpreparation-sample-homogenate

8. https://www.researchgate.net/publication/243462186_Foodborne_diseases_in_India_- _A_review

9. https://www.researchgate.net/publication/228662659_Fermented_Dairy_Products_Starter_Cultures_and_Potential_Nutritional_Benefits/link/000084160cf23f86393d5764/ download

10. https://www.fda.gov/food