

T.Y.B.Sc. Biotechnology 2020 - 2021

Food Biotechnology



SEMESTER – VI

BIO-VI.E-15

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COURSE SCHEDULE

THEORY

Lecture	Lecture topics	References
L1	History of microorganisms in food	Singh B.D. (2004).
L2	Role and significance of microorganisms in foods	
L3	Intrinsic factors responsible for food spoilage	Jay J.M. (2005) & Singh B.D. (2004).
L4	Extrinsic factors responsible for food spoilage	
L5	Intrinsic factors responsible for food spoilage	
L6	Extrinsic factors responsible for food spoilage	
L7	Microorganisms involved in food spoilage: fruits & vegetables	
L8	Microorganisms involved in food spoilage: meat, eggs & bread	
L9	Food poisoning: bacterial toxin - Botulism	
L10	Food poisoning: Staphylococcal toxin	
L11	Fungal toxins: Aflatoxin	
L12	Food borne infections: Gastroenteritis	
L13	Food borne infections: Salmonellosis	
L14	Nutritive value and use of Mushroom	
L15	Nutritive value and use of SCP - Spirulina	
L16	Sources of contamination	Singh B.D. (2003) & Frazier W.C & Westhoff D.C. (2015).
L17	Different microorganisms implicated in spoilage	
L18	Milk borne diseases: Listeriosis	
L19	Milk borne diseases: Scarlet fever	
L20	Grading of milk by dye reduction test – MBRT	
L21	Grading of milk by dye reduction test – Resazurin	
L22	Methods of detection of food spoilage in Milk	Frazier W.C. (2015) Jay J.M. (2005)
L23	Traditional approaches in detection of spoilage	
L24	SCP & Breeds smear	
L25	Identification of specific organisms - selective & differential media	
L26	New approaches - Gene probes & Bioluminescence	
L27	CA-1 of 30 marks & Review of CA-1	
L28	Food safety	Singh B.D. (2003) Frazier W.C. (2015) Jay J.M. (2005) & Satyanarayan U. (2009)
L29	HACCP system to food protection	
L30	Preservation by drying: solar & mechanical drying, salting, smoking	
L31	Preservation at high temperature: concept of TDP and TDT	
L32	Pasteurization (LTHT, HTST, UHT processes)	
L33	Efficiency of pasteurization – phosphatase test, Canning	
L34	Hurdle technology, Preservation at freezing low temperature	
L35	Preservation by use of additives	
L36	Preservation by radiation	
L37	Hydrostatic pressure cooking, modified atmosphere	
L38	Fermented Food process	Singh B.D. (2003) Jay J.M. (2005) & Satyanarayan U. (2009)
L39	Microbiology involved and changes during fermentation	
L40	Fermented food: Sauerkraut & Milk product: Yogurt	
L41	Pros and cons of GM foods	
L43	Flavr Savr tomato	Singh B.D. (2003) Jay J.M. (2005) & Satyanarayan U. (2009)
L44	Bt Brinjal	
L45	CA-2 of 30marks	
L46	Review of CA-2	

*Text in Black – Dr. R. Kanchana; Text in Blue – Ms. Madhavi M. Motankar

REFERENCES

1. Das H.K. (2007). Textbook of Biotechnology, 3rd Edition, Wiley India (P) Ltd, New Delhi.
2. Frazier W.C & Westhoff D.C. (2015). Food Microbiology. 5th edition. McGraw Hill Education (India) Private Limited: New Delhi
3. Jay J.M., Loessner, M.J. & Golden D. A. (2005). Modern Food Microbiology, 7th edition. United States: Springer science business media
4. Jogdand S. N. (2004). Medical Biotechnology, Himalaya publishing house Pvt. Ltd, India.
5. Purohit S.S. (2004). Biotechnology: Fundamentals and applications Agrobios, Jodhpur.
6. Ray B. (2004). Fundamental food microbiology, 3rd edition. CRC press: Washington D.C.
7. Satyanarayan U. (2009). Biotechnology, Books and Allied Pvt Ltd, Calcutta.
8. Singh B.D. (2004). Biotechnology: Expanding horizons, Kalyani Publishers, New Delhi.
9. Tiwari R.P., Hoondal G.S. & Tewari R. (2009). Laboratory Techniques in Microbiology and Biotechnology, Abhishek Publications Chandigarh (India).

WEB REFERENCES

1. <https://www.britannica.com/topic/food-preservation> (Food Preservation)
2. <https://www.sciencedirect.com/topics/food-science/food-borne-disease>
3. <https://dairyprocessinghandbook.tetrapak.com/chapter/microbiology> (Milk Microbiology)

PRACTICAL SCHEDULE

Practical No.	Practical topics
P1	Grading of quality of milk using Resazurin dye Reduction Test (RRT)
P2	Grading of quality of milk using Methylene blue dye Reduction Test (MBRT)
P3	Determination of efficiency of pasteurisation in milk by phosphatase test
P4	Microbial examination of spoiled food on selective media
P5	MIC of common food preservatives – (sugar/ salt)
P6	MIC of chemical food preservatives – (sodium benzoate/ potassium metabisulphite) Milk Microbiology
P7	Grading of quality of milk by Standard Plate Count method (SPC)
P8	Determination of TDP and TDT

*** MANDATORY ITEMS TO BE CARRIED FOR PRACTICALS;**

Laboratory note book and Pen

- *Note: 1. Practical protocols have been uploaded on Google Classrooms for your reference.
2. You are required to go through the same and be well prepared for better understanding during the practical session.

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