

ADIKAVI NANNAYA UNIVERSITY

RAJAMAHENDRAVARAM

CBCS / Semester System

(From 2015-16 Admitted Batch)

B.Sc. Food Technology

III Semester Syllabus

FOOD SAFETY AND MICROBIAL STANDARDS – 1

Unit-I:

History of Food spoilage, Food poisoning, Food legislation and Food preservation. Dietary Toxins: Naturally occurring in food – Endogenous toxin, Exogenous toxin: Toxic phenolic substances, Flavonoids, Tannins, Coumarin - Toxicity and symptoms - Chemical properties(structure and stability) - Type of foods involved – Prevention.

Unit-II:

Microbial toxins: i) Bacterial: *Clostridium botulinum*, *Clostridium perfringens*, *Staphylococcus*, *Salmonella*, *Vibrio*, *Escherichia coli*, five groups of *E.coli*, *Bacillus cereus*- Types of food involved - toxicity and symptoms - Chemical properties ii) Mold. Types of mycotoxins - Aflatoxins, Patulin, Penicillic acid, Ochratoxin, citrinin, Alternaria toxin -Types of food involved - toxicity and symptoms - Chemical properties, Mushroom toxins, Intrinsic toxin produced during processing and storage.

Unit-III:

Food Borne infections: Protozoans - Giardiasis, Amebiasis, Flat worms, Taeniasis, Round worms Food borne viruses - Polio, Hepatitis A & E, Noroviruses, rota viruses Types of food involved - toxicity and symptoms - Chemical properties. Metals as toxin –Heavy metals - Occurrence - detection in foods – Toxicological effects – limits, contamination, and Elimination

Unit-IV:

Lead,Tin, Zinc, Aluminium, Chromium, Cobalt, Antimony - Occurrence - detection in foods - Toxicological effects – limits. Pesticidal residues as toxin; i) Chlorinated ii) Non-chlorinated. Mechanisms of Toxicity-Residues in Food, Acceptable daily intakes, Maximum residue limits.

Unit-V:

Anti microbial agents - common anti microbial food agents - Benzoic acid - Benzoates - Sorbic acid - Sorbates - Short chain organic acids - acetic acid - lactic acid - propionic acid- citric acid - parabens - sulfite – nitrite
Anti microbial agents - Natural antimicrobial substances present in foods (Indirect antimicrobials) - Antioxidants, Flavoring agents, spices and essential Oils, phosphates, Medium chain fatty acids and esters, acetic and lactic acid
Anti microbial agents - Antibiotics(Monensin, natamycin, tetracyclins, Subtilin, Tylosin, Nisin, Endolysins), Antifungal agents for fruits, Ethylene and propylene Oxides

Practicals:

- 1-4. Estimation of bacterial toxins from food samples. (Different types of foods).
- 5-8. Estimation of fungal toxins from food samples. (Different types of foods).
- 9-10. Heavy metal detection (lead).

Books for Reference:

1. M.P.Doyale, L.R.L Benchat, T.J.Montville, *Food Microbiology*, ASN Press, Washington USA.
2. Carlvan Derzant and Splittoessev, *Methods for Microbial Examination of Foods*, APHA Publishers, Washington DC, USA.
3. Frazer, Math and Deibel, *Laboratory Manual for Food Microbiology*, Burgers Publishers –Minnesota, USA
4. J.M.Jay, *Modern Food Microbiology*, CBS Publishers and Distributors, New Delhi, 1987.
5. N.G.Marriott, *Principles of Food Sanitation*, AVI Pub.Co.USA, 1985.