

OBJECTIVES: To impart basic knowledge of:

1. Cold Preservation and freezers
2. Dehydration
3. Irradiation
4. Food Packaging
5. Thermal Processing

FOOD PROCESSING OPERATIONS:

UNIT – I: A. Cold preservation (4 Lectures)

1. Freezing: requirements of refrigerated storage - controlled low temperature, air circulation and humidity, changes in food during refrigerated storage, progressive freezing, changes during freezing –concentration effect and ice crystal damage, freezer burn. Refrigeration load, factors determining freezing rate-food composition and non compositional influences

B. Freezing- Mechanism and freezers (6 Lectures)

2. Freezing methods -direct and indirect, still air sharp freezer, blast freezer, fluidized freezer, plate freezer, spiral freezer and cryogenic freezing. **(Ch 9, Potter)**

UNIT – II: Dehydration (10 Lectures)

1. Normal drying curve , effect of food properties on dehydration , change in food during drying ,drying methods and equipments air convection dryer, tray dryer, tunnel dryer ,continuous belt dryer , fluidized bed dryer, dryer, drum dryer, vacuum dryer ,freeze drying ,foam mat drying.

UNIT – III: Food Irradiation and Microwave Heating (7 Lectures)

1. Ionizing radiation and sources, unit of radiations, direct and indirect radiation effects, safety and wholesomeness of irradiated food. Microwave heating and application.

UNIT – IV: Packaging of foods and Material handling (11 Lectures)

1. Packaging: Properties of packaging material, factors determining the packaging requirements of various foods and brief description of packaging of frozen products, dried products, fats and oils and thermally processed foods contaminants formed during processing – nitrosamines, acrylamide etc natural food contaminants and contaminants from packaging material.

2. Elementary concept of material handling in food industry, equipment and functioning of belt conveyor, screw conveyor, bucket elevator and pneumatic conveyor.

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UNIT – V: Thermal processing and Separation processes (10 Lectures)

1. Introduction, classification of Thermal Processes, Principles of thermal processing, Thermal resistance of microorganisms, Thermal Death Time, Lethality concept, characterization of heat penetration data, Thermal process Calculations
2. Principles and methods of: distillation, extraction, washing, filtration, sedimentation, sieving and centrifugation (**Ch 13, 14 Toledo**)

RECOMMENDED READINGS :

1. Desrosier NW and Desrosier JN, The Technology of Food Preservation, CBS Publication, New Delhi, 1998
2. Paine FA and Paine HY, Handbook of Food Packaging, Thomson Press India Pvt Ltd, New Delhi- 1992
3. Potter NH, Food Science, CBS Publication, New Delhi, 1998
4. Ramaswamy H and Marcott M, Food Processing Principles and Applications CRC Press, 2006
5. Rao PG, Fundamentals of Food Engineering, PHI Learning Pvt Ltd, New Delhi, 2010
6. Toledo Romeo T, Fundamentals of Food Process Engineering, AspenPublishers, 1999

ST. JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS) VISAKHAPATNAM

VI SEMESTER

BIOCHEMISTRY

TIME: 2 Hrs/Week

BCH A2 6852 (2)

FOOD PROCESSING AND ENGINEERING

Max.Marks:50

w.e.f. 2015-2018('15AC' batch)

PRACTICALS SYLLABUS – IV A2

1. Comparison of conventional and microwave processing of food
2. Preservation of food by the process of freezing
3. Drying of food using Tray dryer/other dryers
4. Preservation of food by canning(Fruit/Vegetable/meat)
5. Cut-out analysis of canned food
6. Osmotic dehydration
7. Minimal Processing
8. Testing of Packaging material

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