3. FOOD PRESERVATION AND PROCESSING

1. INTRODUCTION

The main aim of food preservation is to minimize the growth of microorganisms during the storage period, thus promoting longer shelf life and reduced hazard from eating the food. Fruit and vegetables are an important supplement to the human diet ass they provide the essential minerals and vitamins and fibre required for maintaining health. For various reasons, this abundance of production is not fully utilized and about 25-30% of it is wasted due to spoilage.

Most of fruits and vegetables are seasonal crops and perishable in nature. In a good season there may be a local glut, particularly of fruit, but because of insufficient transport facilities, lack of good roads and poor availability of packing materials, the surplus cannot be taken quickly enough to the natural markets in urban areas. Moreover, the surplus often cannot be stored for sale in the off-season because of inadequate local cold storage facilities. Thus the cultivators do not get a good price for their produce because of the glut and some of it is spoiled resulting in complete loss.

Two approaches are possible for solving this problem. One is the creation/expansion of cold storage facilities in the fruit and vegetable producing regions themselves, as also in the major urban consumption centres, to ensure supply of fresh fruits and vegetables throughout the year. Another approach is to process the fruits and vegetables into various products that could be preserved for a long time, and add to the value of the product. With increasing urbanization, rise in middleclass purchasing power, change in food habits and the dying out of the practice of making preserve in individual homes, i.e. dehydrated foods, pickles etc. in the domestic market. Moreover, there is considerable demand for some of these products in foreign markets e.g. Mangoes both fresh and canned, fruit juices, salted cashew and good foreign exchanges.

2. OBJECTIVES

1. To impart thorough knowledge on the technical skills in various aspects of food processing and preservation.
2. To inculcate the students to work in a hygienic way.
3. To provide an employment potential in food processing and preservation /self-employment.

3. SKILLS TO BE PROVIDED

1. Handling of preservation equipment for large scale.
2. Working in hygienic manner.
3. Maintaining sanitation.
4. Preparation of preserved products

5. Identification of spoilage and apply remedial measure.

4. EMPLOYMENT OPPORTUNITIES

1. Wage Employment
   a. As A Technical Specialist In Food Industry
   b. Pickling Unit
   c. Bottling
2. Self Employment
   a. Establishing A Home Scale Unit Of Food Preservation
   b. Cottage Industry
   c. Small Scale Industry
   d. Large Scale Industry

5. Schemes Of Instruction Per Module

Module	Theory		On Job Training		Total	
	Hours	Weightage	Hours	Weightage	Hours	Weightage
I	72	30	216	70	288	100
Total	72	30	216	70	288	100

Schemes Of Instruction Per Week

Module	Theory	On the Job Training	Total
Modules I/II/III	6 Hours	18 Hours	24 Hours

VOCATIONAL SHORT TERM CERTIFICATE COURS1E (ONE YEAR)
IN
FOOD PRESERVATION AND PROCESSING

SYLLABUS
Module I

Food Processing

THEORY: **Time: 72Hrs**
Marks: 30

1. Food groups Time: 12Hrs

1.1. Classification of foods

1.2. Different food groups

1.3. Nutrient contribution of different food groups

2. Cooking Time: 12Hrs

2.1. Composition of different foods

2.2. Methods of cooking foods to conserve maximum nutrients.

2.3. Changes during cooking foods by different methods

3. Processing of cereals, pulses, oilseeds, milk, meat etc. Time: 24Hrs

3.1. Cereals – Types commonly used, its products, methods of cooking cereals, changes in composition during cooking, storage, antinutritional factors.

3.2. By products from cereals, Nutritive value, composition, utilisation and uses.

3.3. Pulses – Difference between legumes and pulses. General milling And its advantages, methods of cooking legumes, changes in Nutritive value, antinutritional factors.

3.4 By products from Pulses and Oil seeds, Nutritive values, composition, utilisation and uses.

3.5 Spoilage of by products and factors affecting quality.

3.6 Milk – Composition, Nutritive value, types, objectives of milk processing, changes during boiling.

3.7. Meat – Composition, structure, cooking changes in composition and nutritive value, tenderizing agents, factors affecting.

3.8. Vegetables – Classification, coloring and flavoring pigment changes that take place in cooking. Conservative methods of cooking vegetables, selection and storage.

3.9. Fruits – Classification, ripening changes, selection and storage.

4.0. Common Products from by products Vinegar, fermented wines.

4.1. Fermented Wines, types of wines, sources, raw material, steps in preparation, Aging, maturing, nutritive value and uses.

4.2. By products obtained during production, processing of fruits and vegetables and utilisation.

5. Food additives – Definition and classification. Time: 10Hrs

5.1. Citric Acid – Sources, preparation, uses.

5.2. Permitted colors, flavors, stabilizer, emulsifier, antioxidants etc. Safety and need for use.

5.3. Different additives used commonly in food, functions.

5.4. Stabilizers and emulsifiers and antioxidants need – types and uses, specific roles with reference to each type. Safety and its uses, BIS certification, Natural and artificial.

6. Food standards – FPO, MPO, Agmark, BIS – Specification for different foods, food labeling – importance, specifications. Time: 4Hrs

7. Effect of food preservation on nutritive value of Food with special reference to vitamins, factors Affecting losses at various stages, means of minimizing losses. Time: 10Hrs

7.1. Processing and preservation of foods – its effect on nutrients – Vitamins and minerals.

7.2. Preservation of losses, means of minimizing losses at various Stages and factors affecting losses.

Module – I

ON THE JOB TRAINING **Time: 216 Hrs**
Marks: 70

1. Use of food additives in various cooking method – leavening, flavor enhancing, emitters etc. Time: 33 Hrs
2. Preparation of wine.
3. Preparation of Vinegar.
4. Preparation of candied peel.
5. Preparation of products using oil seed cake.
6. Different fruit pectin and product preparation.
7. Preparation and labeling the products according to specification. Time: 20 Hrs
8. Visit to food industries to observe the application of food standards and food labeling Time: 150 Hrs
9. Visit to BIS Time: 13 Hrs

Module II

Food Preservation

THEORY **Time: 72Hrs**
Marks: 30

1. Principals of food preservation Time: 8Hrs

1.1 Definition of food spoiling and food preservation, importance of Food preservation.

1.2 History and scope of fruit and vegetables industry, its growth and Development.

1.3 Food production and food loss incurred due to poor food Utilization.

2. Methods of food preservation. Time: 8Hrs

2.1. Different methods used in the preservation of food i.e. high Concentration of sugar, pickling, dehydration etc. Objectives Principles involved, merits and demerits.

3. Preservation by low temperature. Time: 10Hrs

3.1. Methods involved in preservation of food by low temperature.

3.2. Principals underlying the above methods.

3.3. Quick and slow freezing – merits and demerits.

3.4. Thawing, refrigeration, cold storage, de-hydrofreezing, Cryogenic freezing etc.

4. Preservation by high temperature. Time: 10Hrs

4.1. Definition of processing, canning, autoclaving

4.2. Preservation of food by canning, steps involved in process of canning.

4.3. Spoiling of canned food.

5. Preservation by preservatives. Time: 10Hrs

5.1. Objectives, principles, types of preservatives.

5.2. Chemical preservative used in preservation of food, their Role and function, reaction.

5.3. Different types of chemical preservatives.

5.4. Safety in use and certification levels etc.

6. Preservation by high osmotic pressure. Time: 8Hrs

6.1. Pickling, salting, curing – principles.

6.2. Methods, raw material, quality.

6.3. Quality, processing.

6.4. General spoilage.

7. Preservation by dehydration Time: 8Hrs

7.1. Difference between sundrying and dehydration.

7.2. Objectives and principles of dehydration.

7.3. Steps in process of dehydration

7.4. Merits and demerits of dehydration.

7.5. Effects on Nutritive value in dehydrated foods.

8. Containers used for storage – Glass, tin, polythene Advantages and disadvantages. Time: 10Hrs

8.1. Different types of containers used in processing of foods.

8.2. Selection of containers with specific reference to food.

8.3. Types and advantages and disadvantages of using glass, tin, Polythene.

8.4. Special food packaging – modified atmosphere packing etc.

Module – II

ON THE JOB TRAINING **Time: 216 Hrs**
Marks: 70

1. Preparation of fruit squashes. Time: 28 Hrs
2. Pectin utilisation from different fruits.
3. Preparation of jams, jellies, marmalades. Time: 32 Hrs
4. Preparation of tomato ketchup/sauce Time: 42 Hrs
5. Preparation of pickles/chutneys Time: 42 Hrs
6. Preparation of mango slabs Time: 30 Hrs
7. Preparation of dehydrated products - Papads, vadiyas, dehydrated vegetables. Time: 42 Hrs

Module – III

Food Spoilage

THEORY **Time: 72Hrs**
Marks: 30

1. Role of micro organisms in food spoilage – Bacteria, yeast and moulds. Time: 12Hrs

1.1. Definition of spoilage, types of spoilage, factors affecting growth of microorganisms.

1.2. Growth and multiplication of microorganisms – Yeast, moulds,

Bacteria. Factors affecting growth – Different foods that are spoiled by yeast, mould and bacteria.

2. Types of spoilage in perishables and Nonperishable. Time: 12Hrs

2.1. Food classification based on spoilage and shelf life.
2.2. Spoilage of by products and factors affecting quality.

2.3. Storage changes that take place in the food spoiled.

2.4. Preservation of spoilage, storage conditions etc.

3. Types of spoilage in canned food. Time: 12Hrs

3.1. Definition of canning, steps in the process of canning from Field to the can.

3.2. Types of spoilage in canned food and prevention.

3.3. Causes of spoilage, remedial measures to be taken.

4. Factors affecting kinds of spoilage. Time: 6Hrs

4.1. General spoilage of foods.

4.2. Kinds of spoilage.

4.3. Factors affecting spoilage

5. Fermentation Time: 12Hrs

5.1. Fermentation, decomposition and purification

5.2. Desirable and undesirable fermentation.

5.3. Factors affecting decomposition, fermentation and purification.

6. Food deterioration. Time: 6Hrs

6.1. Definition, changes that take place in food on deterioration.

6.2. Prevention and minimizing deterioration.

7. Food adulteration. Time: 12Hrs

7.1. Definition of adulteration, types of adulterants.

7.2. Foods commonly adulterated.

7.3. Detection of food adulteration in common foods at domestic level.

7.4.

Module – III

ON THE JOB TRAINING **Time: 216 Hrs**
Marks: 70

1.	Identification of spoilage in fresh fruits and vegetables and application of remedial measures to prevent them.	Time: 32 Hrs
2.	Identification of spoilage in preserved fruit and Vegetables and application of remedial measures To prevent them.	Time: 30 Hrs
3.	Identification of spoilage in food – bacteria, Yeast and mould – remedial measures.	Time: 32 Hrs
4.	Identification of spoilage in milk and Milk products.	Time: 45 Hrs
5.	Identification of spoilage in food by insects – Identification of insects.	Time: 45 Hrs
6.	Identification of food adulteration and Adulterated food.	Time: 32 Hrs

1. Hyderabad bottling company, Hyderabad.
2. Jaya Food Industries, Hyderabad.
3. Priya Foods, Hyderabad.
4. Foods Industries in local area etc.

7. LIST OF TOOLS & EQUIPMENT

LIST OF NON COMSUMABLES

1. Suitable balance and weights for macro and micro weighing.
2. Cabinet driers, solar driers.
3. Stainless steel clutters, peelers and pitters.
4. Refractometers, jelmeters, brixhydrometer.
5. Stainless steel or plastic sieves.
6. Stainless steel cooking pans, cookers.
7. Standard measuring cups & spoons
8. Food processor, manual in electric / juice extractor, lime squezer.
9. Stainless steel basins, mugs, graters, vessels.
10. Preparation tables / with stainless steel or marble top, work benches.
11. Mortar and pestle, funnels [plastic, glass or steel] tongs.
12. Linen and equipment drying rack.
13. stainless steel spoons, teaspoons, table spoons, perforated ladles.

LIST OF COMSUMABLES

1. Heating equipment [gas, kerosene or electric].
2. Storage container like plastic, glass or ceramic bottles, jam, cans with suitable corks and lids, polythene sachets.
3. Wall paper, butter paper, aluminum foil.
4. Towels, dusters, aprons, gloves, muslin cloth.
5. Brushes and sponges.
6. Detergents, cleaning powders, bleach, disinfectants.
7. Dustbins, plastic tubs, plastic sheets.

8. QUALIFICATION FOR TEACHING FACULTY

1. M.Sc.Home Science in Nutrition
2. P.G.Diploma in Deities.

9. REFERENCE BOOKS

1. Fruit and Vegetable preservation by Srivastana R.P. and Sanjeev Kumar, International Book Distributing Company, Lucknow.

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