

SEMESTER-V

COURSE 13: FOOD & NUTRITIONAL BIOTECHNOLOGY

Theory

Credits: 3

3 hrs/week

I. LEARNING OUTCOMES

On successful completion of the course, the students will be able to

1. Learn about food Preservation and microorganisms associated with it
2. Learn about packaging of different foods
3. Learn types of Foods and their nutritional values
4. Learn about components of foods and their deficiency disorders
5. Learn about Essential minerals , BMR and RDA

II. Syllabus

Unit I

1. Principles of food preservation. Microorganisms associated with foods.
2. Infection, food intoxication, definition of self-life, perishable foods .Food preservation by freezing, refrigeration.
3. Storage at high temperature: sterilization, pasteurization, blanching, drying, dehydration, evaporation and irradiation.

Unit II

1. Food packing, methods of cooking – dry, moist, frying and microwave cooking.
2. Advantages, disadvantages and effects of various cooking methods of food.
3. Canning, fermentations, pasteurization and adulteration. Food additives..

Unit III

1. Animal and sea foods - their importance, nutritional values, and preservation methods
2. Microbiology of milk, milk products – cheese, yoghurt, butter, ice – cream, milk powder and their preparation.
3. Food preservation by salting, smoking, curing and crystallization

Unit-IV

1. Components of food: Carbohydrates, Fats, Proteins and their importance in daily diet.
2. Deficiency disorders: Protein deficiency disorders, Calorie maintenance diet, Malnutrition, Kwashiarkar, Maranus, Starvation.
3. Vitamins: types of vitamins, sources of various vitamins. Essential vitamins and their biological role in metabolisms. Vitamin deficiency disorders

Unit V

1. Basal Metabolic Rate (BMR) and its determination. Calorific values of foods, Atherosclerosis and obesity. Body Mass Index (BMI).
2. Recommended dietary allowances, Food allergy and its importance in health, Controlling measures
3. Essential minerals: Ca, Mg, Fe, I, Co, Mo, Zn, Se & F. Their role and deficiency disorders. Nutrition for pregnant, lactating women and for infants

III . Skills Outcome

On Successful Completion of this Course, Student shall be able to

1. Learn about Qualitative analysis of food
2. Learn about preservation methods
3. Learn about isolation on food spoiling Microorganisms

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Practical

Credits: 1

2 hrs/week

1. Quantitative analysis of food for a) Moisture b) ash c) Iron d) Calcium
2. Isolation of Glycogen from sheep liver
3. Preparation of chloroplast from green leaves / carotenes from carrots.
4. Determination of pH of different foods using pH meter.
5. Study of food preservation methods
6. Nutritional labeling of food
7. Preparation of yoghurt
8. Isolation and identification food spoiling microorganisms.

V. REFERENCES

1. "Food Biotechnology" by Elsayed Abdel-Aal and Andy Khatwa (2019)
2. "Introduction to Food Biotechnology" by Perry Johnson-Green (2016)
3. "Food Biotechnology" by Kalidas Shetty and Gopinadhan Paliyath (2005)
4. "Food Biotechnology, Second Edition" by Klaus Buchholz and Volker Kasche (2013)
5. "Nutritional Biochemistry and Metabolism: With Clinical Applications" by Maria Luz Fernandez and Jose M. Ordovas (2014)
6. "Biotechnology in Functional Foods and Nutraceuticals" edited by Debasis Bagchi and Francis C. Lau (2010)

VI. CO-Curricular Activities

a) Suggested CO-Curricular Activities

1. Assignments
2. Seminars, Group Discussions on related topics
3. Charts on deficiency disorders