

FSAT 5108 3(2-1)

INTRODUCTION TO FOOD SCIENCE AND TECHNOLOGY

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Lecture # 1

FOOD

Food is any substance that when ingested provides energy to our body. The energy in turn used to perform various functions like:

- Maintenance of body tissues
- Regulate body processes

Food provides nutrients such as carbohydrates, fats, proteins, vitamins, minerals and water.

FOOD SCIENCE

Food science is a subject that deals with the nature and composition of food under different conditions of processing, preservation and storage.

➤ Nature of food

Food may be acidic or basic

- Citrus is acidic in nature (pH low)
- Acidity of milk is less and pH is high (pH 6.5)
- Lemon (highly acidic, pH 3.7)

Composition of food / Components of food

6 components

1. Water is present in everything (fruits, vegetables, human)

2. Carbohydrates present in bread, custard, chappati etc.
3. Fats (fried food)
4. Proteins (meat, eggs, cereals)
5. Vitamins (fat soluble and water soluble)
6. Minerals

FOOD PROCESSING

Food processing involves any operation/step that alter the value of food. For example:

- Simple step like washing
- Complicated step like food preservation and new product development.

OBJECTIVES OF FOOD PROCESSING

- To increase shelf life
- Consumer acceptance
- Preservation of nutrients

FOOD PRESERVATION

Food preservation is a form of processing of food to prevent it from spoilage and making it possible to store in a fit condition for future use

It is carried out to maintain the quality of raw material and physico-chemical properties as well a

FOOD SCIENCE AND TECHNOLOGY

Application of physics, chemistry, microbiology, engineering and nutrition to the handling, processing and storage of food is called food science and technology.

So it's a multidisciplinary approach

Lecture # 2

RELATIONSHIP WITH OTHER DISCIPLINES:

PHYSICS:

Basic principles underlying heat exchange, cooling, heating, evaporation etc. were discovered by physicists. Discovery of semi-conductors, transistors and chips also use the principles of physics. Equipment used in analysis of food has their origin in physics. e.g. Determination of pH, relative humidity, moisture in packaging materials etc. Latest techniques used in food processing include irradiation, preservation and microwave heating have also been contributed by physicists.

CHEMISTRY:

The food molecules are complex, so are the changes occurring in them. Reactions occurring during spoilage and processing are of chemical or biochemical nature. Processes like ripening and spoilage of fruits and vegetables as a result of enzymatic activity. Polymer chemistry is another field that contributes the non-rigid, plastic packages that protect food from rancidity and loss of moisture vapors.

BIOLOGY:

Biotechnology contributes to genetically modified varieties of plants and animals that are high yielding and disease resistant. The sciences of pathology, entomology and parasitology are also important to grow healthy plants and animals and to keep commodities safe from attack of pest in the field and storage.

Microorganisms are the chief spoilage agents in foods. Therefore their control is important in food industry. Food processing techniques like pasteurization, sterilization, irradiation etc. are used to kill microbes present in food. Activities of some organisms are used usefully to produce some foods like leavened bread, alcoholic beverages, yogurt, cheese, sausages and pickles.

ENGINEERING:

Several branches of engineering like chemical, biochemical, electrical and mechanical engineering have their role in developing processes and equipments for commercial plants. Designing and maintenance of commercial food processing plants and equipments also involve services of engineers.

COMPUTER SCIENCES:

Modern instrumental techniques like microscopy, calorimeter and rheological analysis are impossible without computer assistance. Computers are also used for data storage, communication and data analysis.

Lecture # 3

DUTIES OF FOOD SCIENTIST

- New product development
- Research and development
- Quality control and quality assurance

CAREER OPPURTUNITIES

1. Food industries
2. Food service organization (Macdonald, pizza hut, hotels, KFC etc)
3. Teaching institutes
4. Research institutes
5. Other organizations (NGOs, own business, consultants)