

Introduction to Food Science

Food is defined as anything solid or liquid which when swallowed, digested and assimilated nourishes the body.

1. Food Science is the systematic study of the nature of food materials and the scientific principles underlying their modification, preservation and spoilage.
2. It is the study of characteristics of foods including chemical, biochemical, physical, physiochemical and biological properties and effect of these on the quality of the product. It also covers application of this information in development of new products and efficient processing techniques (Dictionary of Food Science).
3. It is a discipline in which the biological and physical sciences and engineering are used to study the nature of foods, the causes of their deterioration and the principles underlying food processing. It deals with acquisition of new knowledge to elucidate course of reactions or changes occurring in foods whether natural or induced by handling procedures.
4. Food is a mixture of many different chemical components. Study of food science involves an understanding of changes that occur in these components during its preparation whether natural or induced by handling procedures. Many physical and chemical reactions occur during food preparation these reactions may be a result of the interaction between components with the medium of cooking, and the environmental conditions like heat, cold, light and air to which they are subjected during cooking.
5. Study of food science also includes understanding the nutritive value of different foods and methods of preserving them during cooking; this information provides a foundation of theory and method on which to build the study of food preparation.

Relationship with other Sciences

All foods are chemical compounds which undergo various chemical reactions at all stages from production to consumption. These reactions are based on the laws of chemistry. Many processes used while preparing food involve physical changes too. The three states of matter- solid, liquid and gaseous can be observed during food preparation. As temperature is increased or decreased solids gets converted to liquid which further converts to gas with change in chemical compounds. Decomposition of organic compounds also takes place with various chemical reactions instead of change in nature of state.

FOOD CHEMISTRY

It is the science that deals with the composition, structure and properties of food along with the chemical reactions. It forms a major part of food science and is closely related to food microbiology. The chemical composition of food tells which micro-organism can grow on it and the changes that take place in food because of their growth. Changes can be desirable and undesirable which can lead to contamination of the food and further leads to food poisoning, food infection or just spoiling and thus rendering it unfit for consumption.

FOOD MICROBIOLOGY

Microbiology is the study of micro-organisms. They are very small, usually single celled organisms which are not individually visible to the naked eye. If they are present in large number in food, can lead to food poisoning. They also serve useful role in making of bread and yogurt etc. A knowledge of the factors that favours or inhibits the growth of micro-organisms is essential to understand the principle of food spoilage and preservation.

Food chemistry and Food microbiology are intimately related to food processing as the processes to which food needs to be subjected to improve its texture, flavour and aroma depends on its composition and ingredients. The time and temperature for food processing depends not only on the

chemical composition of food but also on its microbial load and the type of packaging to be used.

FOOD PROCESSING

The growing public demand for meals away from home has made the problem for serving safe, wholesome food more critical and challenging. This makes it imperative for food handlers to understand and implement the basic principles of food science to enable them to prepare and serve high quality products over extended hours.

Rapid urbanization has led to an increase in demand of convenience foods. To these food additives are added to restore the properties and then to bring certain changes for storage. The special requirements for them are they need to be handled properly, not to be stored in open and maintenance of hygienic condition.

Thus food science covers all the aspects related to food and serves as beneficial component for all food professionals.

