**Unit 7: Advanced Food Microbiology**

**Biosensor in food**

Safety of food and environment has been a major concern of food technologists and health scientists in recent years. There exists a strong need for rapid and sensitive detection of different components of foods and beverages along with the food borne and water borne pathogens, toxins and pesticide residues with high specificity. Biosensors present attractive, efficient alternative techniques by providing quick and reliable performances. There is a very good potential for application of biosensors for monitoring food quality and safety in food and bioprocessing industries in India.

Biosensors have extensive applications in the food and agriculture industries. The devices contain a transducer and a biological element, which may be an enzyme, antibody, microbe, or organelle. The biological element (bioelement) interacts with the analyte being tested and the biological response is converted into an electrical signal by the transducer.

A biosensor can be defined as a quantitative or semi-quantitative analytical instrumental technique containing a sensing element of biological origin, which is either integrated within or is in intimate contact with a physico-chemical transducer.

 A chemical sensor is a device that transforms chemical information, ranging from the concentration of a specific sample component to total composition analysis, into an analytically useful signal. Chemical sensors usually contain two basic components connected in series: a chemical (molecular) recognition system (receptor) and a physicochemical transducer. Similarly, biosensors are chemical sensors in which the recognition system utilizes a biochemical mechanism interfacing the optoelectronic system.

A device that uses specific biochemical reactions mediated by isolated enzymes, immunosystems, tissues, organelles or whole cells to detect chemical compounds usually by electrical, thermal or optical signals

**Application of biosensor in food industry**

1. Detection of heavy metal
2. Detection of residual agrochemical
3. Detection of toxic metabolites
4. Food borne pathogen detection
5. Assure food safety
6. As indicators of product acceptability
7. Detection of unpremitted chemicals

**Biosensor in Dairy Industry**

1. DNA testing of cow
2. Pathogen testing in milk
3. Microorganisms identification in milk
4. Test for preservation and pasteurization