

Biosensors in food industry

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In modern food processing plants, the in-line monitoring of processed food has become very important part of factory operations. Sensor technology currently attracts increasing attention as a successor to conventional analytical techniques in the food industry. Food analysis is thus a very challenging field, especially when dealing with the detection of minor components, unwanted toxic heavy metals from soil, herbicides or pesticide residues etc. Detection of such chemicals is very difficult to analyze because these methods are most unfriendly with surroundings and time-consuming while sensor technology is a rapid method. A biosensor is usually a compact analytical device that detects and transmits information pertaining to biochemical reactions. Two primary components consist of a bioreceptor that recognizes a target analyte and a transducer that converts biochemical signals into a quantifiable electrical response. The bioreceptor is a biological or organic material such as an antigen, enzyme, microbe, or nucleic acid. The transducer may assume many forms (such as optical, amperometric etc.) depending on the parameter being measured. Clearly, the term biosensor is used in diverse ways, but generally, a biosensor should respond selectively, continuously, rapidly, specifically, and ideally without added reagent to biological events. A huge variety of biosensors have been invented for food analysis like immunosensor, microbial and DNA biosensors have been reported for analysis of different components in food. Biosensor technology can offer the food industry a new, rapid monitoring and measuring devices whose speed, sensitivity and ease of operation exceed the current methodologies. Potential use of biosensor technologies in coming years in food industries may include proximate analysis, nutritional labeling, pesticide residues, toxins and antinutrients, processing changes, microbial contamination and BOD of biowastes. There are some limitations such as life of bioreceptor that affect the market of biosensor. Therefore, further research is needed for improved performance of biosensors.

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