A REVIEW

Application of biosensors in dairy-food industry

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ABSTRACT...... The principle of detection of a biosensor is based on the specific interaction between the analyte of interest and the biological components. As a result of this specific interaction, different properties are changed, which can be detected and measured by transducers. The most important characteristics of biosensors are their specificity, high sensitivity, short response time; act as an integrated system, facility to automate them, versatility and low production cost. Biosensors are an important alternative in the food industry to ensure the quality and safety of products and process controls with effective, fast and economical methods. The use of enzymatic biosensor technology in food processing, quality control and on-line processes is promising compared to conventional analytical techniques. Recently the biosensor market in the food industry has increased by fifteen fold amounting to $150 million. The use of biosensor in the food industry may include nutrient analysis, detection of natural toxins and antinutrients, food process monitoring by measuring enzyme activity and microbial contamination, and rapid detection of genetically modified organisms (GMOs), proteins, vitamin B complex, essential amino and fatty acids, and hazardous residual materials comprising pesticides and antibiotics. Biosensors are classified according to the transduction mechanisms and biological reception mechanism. The biosensor may be divided into basic four main groups based on the transduction mechanisms which include optical, mass, electrochemical and thermal biosensor. In addition, the biological component used in biosensors include enzymes, microbial, immune, and nucleic acids, biochips (protein, DNA, and cell chips), and biomimetic sensors, which utilize artificial bio recognition elements (electronic nose and electronic tongue).

KEY WORDS...... Biosensors, Dairy, Food industry

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