Cornell CALS

College of Agriculture and Life Sciences

Department of Food Science
Dairy Foods Extension

MQIP
MILK QUALITY IMPROVEMENT PROGRAM

BIOSENSORS

WHAT IS THIS USED FOR?

For detection or quantification of specific substance or organisms directly in food samples.

APPLICATION

Biosensors are most commonly designed as probes and are used by bringing the biological part of the probe into direct physical contact with the analyzed food. By design biosensors are a rapid and nondestructive analytical method, which means they don't need special sample preparation. Biosensors can be used to detect specific nutrients (e.g., glucose, lactic acid), antinutrients, toxins, pathogens, GMOs, and similar.

REGULATORY IMPLICATIONS

Biosensors are not official approved method for determining presence or absence of biological, physical or chemicals hazards in food and cannot replace the standard methods that need to be performed as part of the current regulation or part of confirmation process.

HOW DOES IT WORK?

Biosensor consists of several components; the biological part (e.g., enzyme, antibody, nucleic acid, or similar), is able to react to a specific component of interest and its concentration in food. A transductor generates a weak signal based on this reaction (e.g. electric, light, or similar). This weak signal is amplified and digitally processed to determine concentration or presence of the component of interest in food.

ASSESSMENT OF EFFECTIVENESS

Although still not widely used by food industry and far from replacing conventional methods, biosensor seem to be attractive rapid, specific, low-cost analytical tools food industry could routinely use in the future. Because biosensors are a rapid and nondestructive method, they are ideal for on-site, on-line, and/or continuous testing and monitoring of foods. Biosensors are also usually designed to be simple and portable which offers a lot of flexibility in the final application. The negative side of biosensors is that the biological component of the sensors is usually inherently unstable, the use of biosensors must be accompanied by well-established program of verification and validation.