CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE, MYSORE

BIOSENSORS
(GLUCOSE, SUCROSE & L-LACTATE)

Introduction

Biosensor is a modern analytical tool with several advantages over conventional instrument. It consists of a biological recognition element and a physical transducer.

Advantages of biosensor

- ✓ Specific in response to analyte
- ✓ Rapid response
- ✓ Simple to operate
- ✓ Require no pretreatment of sample – A major advantage
- ✓ Ease of miniaturization
- ✓ Economical
- ✓ Amenability for continuous operation
- ✓ Can be easily interfaced with microprocessor or computer for data processing and control

Applications

- Food, dairy and fermentation industries
- Sugar manufacture
- Confectionery and beverages
- Glucose saline water manufacturing
- Pesticides monitoring in food and water
- Clinical, medical and pharmaceutical
- Environmental analysis
- Agriculture
- On-line monitoring of biotechnological processes.

Work at CFTRI and Achievements:

- ❖ Useful biosensor devices for glucose, sucrose and L-lactate have been developed using immobilized enzymes and amperometric principle based detector system interfaced with a microprocessor.
- ❖ A flow injection analysis system for on-line monitoring of glucose and sucrose. Supported by DST.
- ❖ Biosensor development for oragnophosphorous pesticide detection supported by DBT
- ❖ Enzyme and affinity based biosensors for the detection of pesticides: insecticides and herbicides in food, water and environment. Under Indo-Swiss collaborative programme-initiated.

Salient feature of CFTRI biosensor

- Microprocessor based, user friendly
- Auto calibration feature
- Two point calibration
- Digital display of concentration
- Response time 3-4 minutes
- Accuracy ± 3%

The Project Economics

Project cost estimate

No. of Biosensors: 100 numbers/year

No. of working days in a year : 300 days

Materials required

1. Enzyme
2. Immobilization
3. Memberanes
4. Electrode having electrolyte
5. Sample cell having buffer
6. Signal conditioning: Electronic printed circuit board
7. Product: Biosensor instrument

Total project cost: 12,39,500 / year

Profitablility

Each Biosensor unit cost	:	Rs.	15,000/- is maximum profit
With profit selling cost is	:	Rs.	25,000/- unit
Each year selling Biosensor unit	:		50 – 100