biosensors

MDPI

Supplementary

Electrochemical Sensor Platform for Rapid Detection of Food-borne Toxins

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Table S1. Maximum limit of zearalenone by food product as per EU standards [1,2.]

Food Product	Maximum Limit (μg/kg)
Unprocessed cereals (not including maize)	100
Cereal Flour (not including maize flour)	75
Bread Pastries and Biscuits	50
Other Cereal Snacks and Breakfast Cereal (not including maize)	50
Processed Cereal Based Foods for Infants and Young Children	20

Table S2. Comparison of the developed immunosensor with other studied label-free detection of AB1 and ZEA.

Device Type/ Detection Method	Mycotoxin Detected	Sample Type	LoD	Assay Time	Reference
Amperometric	Zearalenone	Maize	0.011 μg/L	Not Given	[3]
Square Wave Voltammetry	Zearalenone	Human biofluids	0.005 ng/mL	112 minutes for sample and sensor preparation 20 minutes for reading	[4]
Cyclic Voltammetry	Zearalenone	Amaranthus cruentus seeds	0.57 ng/mL	54 hours for sample and sensor preparation 5 minutes per reading	[5]
Fluorosensor	Zearalenone	Acetonitrile	2.5 × 10−5 M	20.5 hours for sample and sensor preparation Time for reading not given	[6]
Bioluminescence assay	Zearalenone	Milk	1 nM for α-zearalenol	3 hours assay time	[7]
Fluorosensor	Zearalenone	Wheat	0.018 mg/L	17.5 hours for sensor and sample preparation Time for reading not given	[8]

Aptameric with Fluorescence	Zearalenone	Corn Juice	0.085 fg/mL	46+ hours for sensor and sample preparation Time for reading not given	[9]
ELISA with Fluorescence	Zearalenone	Corn	4.1 pg/mL	96.75+ hours for sample preparation Time for reading not given	[10]
Electrochemical Impedance Spectroscopy	Zearalenone	Corn	0.05 ng/mL	Sample Running time 5 Min.	This paper

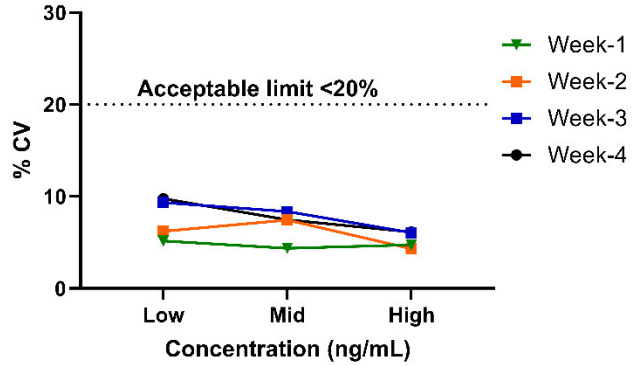


Figure S1. Stability assessment of the Zearalenone sensor over four weeks of storage at 4 °C. The impedance response was measured weekly (Week 1 to Week 4) at low (0.1 ng/mL), mid (1.6 ng/mL), and high (25.6 ng/mL) Zearalenone concentration, showing consistent signal levels with minimal variation, indicating stable sensor performance over time.

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