Название публикации:
Development of ultrasensitive direct chemiluminescent enzyme immunoassay for determination of aflatoxin B1 in food products

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Аннотация:
A direct competitive chemiluminescent enzyme-linked immunosorbent assay (CL-ELISA) for determination of aflatoxin B1 (AFB1) was developed. To improve the assay sensitivity, a mixture of 3-(10'-phenothiazinyl)-propane-1-sulfonate and 4-morpholinopyridine previously optimized by a factorial design was used as enhancer of horseradish peroxidase-induced chemiluminescence. Varying the concentrations of the coating anti-AFB1 antibody and conjugate of AFB1 and horseradish peroxidase the conditions of the chemiluminescent assay were optimized. The values of the detection limit value and dynamic working range of CL-ELISA of AFB1 were 0.0015 ng mL(-1) and 0.003-0.03 ng mL(-1), respectively. It was shown that a dilution of rice and mung beans extracts in 5 and 10 times, respectively, prevented a matrix effect of the food products in CL-ELISA. The recovery values from the spiked samples of rice and mung beans were in the range of 90-104% and 102-117%, respectively. Studying 8 rice and 8 mung beans samples purchased in commercial stores the developed CL-ELISA allowed to find 3 samples (1 rice and 2 mung beans) containing AFB1, the content of AFB1 in one sample being higher than the maximum acceptable level established in the European Community.

Ключевые слова:
Aflatoxin B1; Enzyme immunoassay; Chemiluminescence; Rice; Mung beans; Peroxidase, luminol signal enhancer; peroxidase; kinetics; b-1; bioluminescence; optimization; intensity; samples; assay