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# A rapid low-cost and easy method based on time resolved fluorescence lateral flow immunoassay for BaP in rapeseed oil

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**Background:**

Rapeseed oil is a favourite cooking oil for its low saturated fat content and a neutral flavour. However, during the production of canola oil, rapeseed is susceptible to the formation of the hazard factor benzo(a)pyrene (B[a]P) under high-temperature processing conditions. B[a]P is classified as a class 1 toxicant (i.e., carcinogenic to humans) by the IARC of the World Health Organization.

**Objective:**

Due to the genotoxic and carcinogenic nature of B[a]P, maximum residue limits have been set by several countries. efforts should be focused on developing a rapid, simple, and sensitive on-site immunoassay to detect it as early as possible to reduce the associated health risks.

**Methods:**

In this work, a lateral flow immunoassay (LFIA) was developed based on time resolved fluorescence. Microspheres enclosing fluorescent europium (III) [Eu (III)] nanoparticles were used as a label for B[a]P monoclonal antibody conjugation. The marker probe and the gradient dilution of B[a]P standard solution were added to the microtiter wells simultaneously and mixed. Then the prepared test strips were inserted into the assay and the fluorescence signal was detected under 365 nm UV lamp irradiation to draw the standard curve.

**Results:**

The established method allows quantitative determination of B[a]P with limit of detection as low as 0.6 ng/mL. The spiked recoveries were 85.4%-119% with relative standard deviations (RSDs) below 5%. Compared to high-performance liquid chromatography (HPLC), the established method indicated reliability that could be used for further detection of B[a]P, providing a technique to support rapeseed oil quality and safety

**References:**

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