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Colloidal gold-based immunochromatographic strip assay for the rapid detection of three natural estrogens in milk

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Abstract: In this study, we developed highly sensitive and specific monoclonal antibodies (mAbs) against estrone (E₁), 17 β -estradiol (17 β -E₂), and estriol (E₃). The half-maximal inhibitory concentration values of anti-E₁, anti-17 β -E₂, and anti-E₃ mAbs were 0.46, 0.36, and 0.39 ng/mL, respectively, based on competitive enzyme-linked immunosorbent assay (ic-ELISA) results. A rapid colloidal gold-based immunoassay strip assay was developed for the determination of E₁, 17 β -E₂, and E₃ residues in milk samples. The assay had a visual cut-off value of 5 ng/mL, and required 10 min to assess with the naked eye. The results obtained from the immunochromatographic strip assay were consistent with those obtained from ic-ELISA and gas chromatography–mass spectrometry. The immunochromatographic strip assay is useful and rapid for the detection of E₁, 17 β -E₂, and E₃ in milk.

Keywords: estrone; 17 β -estradiol; estriol; monoclonal antibody;
immunochromatographic strip.

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