

A facile and sensitive method for detecting pathogenic bacteria using personal glucose meters

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We report a facile and sensitive method for the detection of Salmonella bacteria in milk using a personal glucose meter (PGM). Monoclonal antibody-functionalized magnetic nanoparticle clusters (MNCs) were used to capture Salmonella bacteria in milk, and MNC-Salmonella complexes were magnetically separated from the sample using a permanent magnet. The complexes were further conjugated to polyclonal antibody-functionalized invertase and dispersed in a 0.5 M sucrose solution. After the hydrolysis of sucrose to glucose and fructose, the concentration of glucose was measured using the PGM. The hydrolysis reaction was conducted at various temperatures, and the optimal temperature and activation energy were determined. The detection limit of Salmonella in milk was found to be 10 cfu/mL.