

## **Low-cost, Portable, Rapid and Robust Analytical Methods for Food Safety**

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Safe food is the indispensable necessity of modern society. Due to the extensive public concerns and legal restrictions, it is essential to continuously track the food manufacture and processing, and to get fast and reliable results in order to protect both the consumer and the manufacturer. For these reasons; innovative analytical tools meeting the ASSURED criteria of World Health Organization (WHO) should be considered as a requirement. The ASSURED (affordable, sensitive, specific, user-friendly, rapid and robust, equipment-free and deliverable to end users) criteria was coined for the ideal characteristics of a test that can be used at all levels of the healthcare system. The ASSURED criteria is also very promising for food safety. For continuous tracking of the food manufacture and processing, in-situ tests and immediate decision-making is a crucial point.

In this review, analytical tools meeting the ASSURED criteria will be discussed and compared with the conventional (chromatographic and spectroscopic) methods. Moreover, detailed information will be given about bioassay methods, biosensors, paper-based microfluidics and potential applications of the smartphones. Finally, advantages, disadvantages and current status of these innovative analytical tools and their usage for food safety will be discussed.

**Keywords:** Food Safety, Bioassay, Biosensors, Paper-based assays, Low-cost