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MINI REVIEW

A review of culture-dependent and molecular methods for detection of *Salmonella* in food safety

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Abstract

Salmonella is the well-recognized foodborne pathogen leading the most research and surveillance attention especially from government agencies as well as in food industry. In Malaysia, *Salmonella* is one of the main bacteria which monitored by the National Laboratory Surveillance System. Previously, standard culture methods have always been employed by many laboratories for *Salmonella* detection in Food Surveillance Programs. However, more advanced detection methods will be needed to improve the sensitivity and specificity of *Salmonella* identification. In this review, *Salmonella* detection methods including conventional and recent advances in molecular-based methods will be discussed.

1. Introduction

Foodborne infectious disease caused by bacterial pathogens is a major health problem worldwide. Among the foodborne pathogens, *Salmonella* is the most common bacteria associated with outbreaks known as salmonellosis, and is contracted through consumption of contaminated animal products, which always results either from infected animals used in food production or from contamination of the carcasses (Cheung and Kam, 2012; Park *et al.,* 2014). Based on surveillance studies, the main vehicles of *Salmonella* infection include raw meat, eggs and poultry products (de Freitas *et al.,* 2010; Sallam *et al.,* 2014). Of greater consequence is that fruits and vegetables have gained notoriety in recent years as vehicles of human salmonellosis (Mritunjay and Kumar, 2015). The prevailing hygienic conditions especially in tropical and subtropical countries during the production, harvesting and distribution of fresh and dehydrated fruits and vegetables do not always meet minimum standards and may facilitate product contamination. For example, *Salmonella* spp. and *Salmonella enterica* serotype Typhimurium were detected in sliced fruits, like papaya, mango, jackfruit, watermelon, sapodilla, honeydew and dragon fruit (Pui *et al.,* 2011), and local salad known as *ulam* (e.g., *selom, pegaga nyonya, kacang panjang* and *kacang botol*) (Najwa *et al.,* 2015).

Rapid and reliable detection methods such as standard culture methods coupled with molecular techniques are necessary to control the safety of food. Typically, rapid methods have become increasingly popular among food testing laboratories and some of them have been accepted by international authorities as

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