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Isolation and Identification of Salmonella spp and Salmonella enteritidis, from Distributed Chicken Samples in the Tehran Province using Culture and PCR Techniques

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Abstract : Salmonella is one of the most important common pathogens between humans and animals worldwide. Globally, the prevalence of the disease in humans is due to the consumption of food contaminated with animal-derived Salmonella. These foods include eggs, red meat, chicken, and milk. Contamination of chicken and its products with Salmonella may occur at any stage of the chicken processing chain. Salmonella infection is usually not fatal. However, its occurrence is considered dangerous in some individuals, such as infants, children, the elderly, pregnant women, or individuals with weakened immune systems. If Salmonella infection enters the bloodstream, the possibility of contamination of tissues throughout the body will arise. Therefore, determining the potential risk of Salmonella at various stages is essential from the perspective of consumers and public health. The aim of this study is to isolate and identify Salmonella from chicken samples distributed in the Tehran market using the Gold standard culture method and PCR techniques based on specific genes, invA and ent. During the years 2022-2023, sampling was performed using swabs from the liver and intestinal contents of distributed chickens in the Tehran province, with a total of 120 samples taken under aseptic conditions. The samples were initially enriched in buffered peptone water (BPW) for pre-enrichment overnight. Then, the samples were incubated in selective enrichment media, including TT broth and RVS medium, at temperatures of 37°C and 42°C, respectively, for 18 to 24 hours. Organisms that grew in the liquid medium and produced turbidity were transferred to selective media (XLD and BGA) and incubated overnight at 37°C for isolation. Suspicious Salmonella colonies were selected for DNA extraction, and PCR technique was performed using specific primers that targeted the invA and ent genes in Salmonella. The results indicated that 94 samples were Salmonella using the PCR technique. Of these, 71 samples were positive based on the invA gene, and 23 samples were positive based on the ent gene. Although the culture technique is the Gold standard, PCR is a faster and more accurate method. Rapid detection through PCR can enable the identification of Salmonella contamination in food items and the implementation of necessary measures for disease control and prevention.

Keywords : culture, PCR, salmonella spp, salmonella enteritidis
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