Abstract

Comparison of real time PCR with the Culture method for detecting *Salmonella* spp in raw chicken at the Medical Research Institute (MRI) Colombo

Introduction:

Non Typhoidal *Salmonella* leads to gastroenteritis, bacteremia, endovascular infections, deep bone or visceral infections and has lead to significant morbidity and mortality. Chicken provides the main route of transmission of infection. Culture is labour intensive and time consuming when comparing with real time PCR (rt- PCR). Rapid results are helpful in outbreaks and to reduce storage time of perishable food. A validated rt- PCR kit was used in this study that can detect down to 10 copies of *Salmonella* DNA in a reaction.

Objectives:

General objective

Comparison of rt- PCR with the Culture method for detecting *Salmonella* spp in raw chicken

Specific objectives

Comparing the sensitivity, specificity, cost and rapidity of rt- PCR with the culture method in artificially contaminated samples

To find out the isolation rate of *Salmonella* in raw chicken samples

To determine the serotypes isolated from the chicken samples

Method:

For the comparison study all the artificially contaminated known positive and negative samples that included 35 samples of *Salmonella*, 12 samples of *Shigella*, 12 samples of *Escherichia coli* and 11 samples of Buffered peptone water were processed by culture as well as by rt- PCR. To detect isolation rate, 130 random samples of chicken were collected from 10 wet markets and six supermarkets in selected MOH areas. All these samples were also processed by culture as well as by rt- PCR.

Results:

The sensitivity and specificity of rt- PCR in the comparison study was 100%. The cost analysis showed an equal amount for both culture and rt- PCR for an individual test. The time taken to identify *Salmonella* was reduced by 4 days when PCR was performed instead of culture. The random sample positivity rate by culture was 26% and by real-time PCR was 35%. There was a higher rate of *Salmonella* in wet markets than in Supermarkets. Out of all the samples collected from wet markets *Salmonella* was isolated in 39% by culture and 49% by rt- PCR. Out of the samples collected from Supermarkets 0% was isolated by culture and 7% by rt- PCR. The serotypes isolated were *Salmonella* Agona (16/34), *Salmonella* Corvalis (10/34), *Salmonella* Kentucky (4/34) and *Salmonella* Newport (4/34).

Conclusion:

The rapidity and reduction in labor makes this highly sensitive and specific rt- PCR assay an excellent alternative to Culture in maintaining food safety. Getting negative results in a shorter period of time is also extremely helpful for industry and business operators.