

Applications of High-Resolution Melt (HRM) Curve Analysis in Food Safety

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The incidence of food-borne diseases has been increased over the last decade and has become a major public health worldwide. Among 31 identified food-borne pathogens, non-typhoidal *Salmonella* and *Campylobacter*spp. are the most common detected bacteria in food-borne incidents. Poultry meat, eggs and products contaminated with *Salmonella* and/or *Campylobacter* are the major source of food-borne diseases in humans. The aim of this study was to develop reliable and rapid diagnostic tests that can detect and differentiate *Salmonella* serotypes and *Campylobacter jejuni* from *Campylobacter coli* without requiring DNA sequencing. Specific primers were used to amplify targeted genes of different *Salmonella* and *Campylobacter* reference strains and clinical isolates from commercial poultry farms. PCR products were subjected to high-resolution melt curve analysis and *Salmonella* or *Campylobacter* isolates were differentiated based on their HRM curves. Analysis of the nucleotide sequences of the amplicons from selected isolates confirmed that each melting curve profile was related to a unique DNA sequence. The relationship between *Salmonella* or *Campylobacter* reference strains and tested specimens was also evaluated using a mathematical model without requiring visual interpretation of HRM curves. In addition, the potential of the PCR-HRM curve analysis was evaluated for genotyping of additional *Salmonella* isolates from different avian species or human *Campylobacter* isolates. The findings indicate that PCR followed by HRM curve analysis provides a rapid and robust technique for genotyping of *Salmonella* and *Campylobacter* isolates in about 6 hours. Applications of PCR-HRM in identification of other pathogens, important in food safety will be discussed.

Key words: *Salmonella*, *Campylobacter*, PCR, high resolution melting curve analysis, genotyping

Biography:

Dr. Ali Ghorashi is a senior lecturer in Animal production and Health at the Charles Sturt University, Australia. He received his DVM degree from Tehran University and a Ph.D. from James Cook University in Australia. He worked at National Institute of Genetic Engineering and Biotechnology and moved to Melbourne University as a research fellow before joining Charles Sturt University. Dr. Ghorashi is a member of editorial board of five international scientific journals as well as professional organisations. His research interests are molecular diagnosis and genotyping of veterinary pathogens and molecular epidemiology of infectious diseases.