

## Simulation of decontamination and transmission of *Escherichia coli* O157:H7, *Salmonella* Enteritidis, and *Listeria monocytogenes* during handling of raw vegetables in domestic kitchens

### ABSTRACT

Epidemiological data indicates that a large number of foodborne illnesses are attributed to cross-contamination during food preparation in the domestic kitchen. The objectives of this study were to evaluate the efficiency of household washing practices in removing *Escherichia coli* O157:H7, *Listeria monocytogenes*, and *Salmonella* Enteritidis on artificially contaminated lettuce and to determine the transfer rate of these three foodborne pathogens from contaminated lettuce to wash water, tomato, cabbage, and cutting boards during washing and cutting processes. Washing under the running tap water with scrubbing for 60 s was the most effective method in reducing pathogen populations by 1.86 to 2.60 log<sub>10</sub> CFU/g. Also, final rinsing and scrubbing practices were found to enhance the efficiency of washing treatment. In this study, the transfer rates of *S. Enteritidis*, *E. coli* O157:H7, and *L. monocytogenes* from cutting board to cabbage and tomato via cutting process (17.5 to 31.7%) were higher ( $P < 0.05$ ) than from wash water to cabbage and tomato (0.8 to 23.0%) during washing treatment. Overall, our findings suggest that wash water and cutting board can be potential vehicles in the dissemination of foodborne pathogens. Therefore, there is a need to promote consumer awareness for proper handling practices in the kitchen to minimise the risk of foodborne infection.

**Keyword:** Foodborne pathogens; Cross-contamination; Raw vegetable; Vegetable washing practices; Cutting board