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Evaluation of Crush Method for *Salmonella* Recovery from the Inoculated Egg Shell Sanitized with Sodium Hypochlorite

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Abstract

Salmonella infections of egg contents can be related to external contamination of the shell. In this study, the efficiency of recovery methods using swab-wipe (SW) and crush (CR) was evaluated for bactericidal activity of *Salmonella* inoculated onto the eggshell surface (10^7 CFU/egg). When 200 ppm of sodium hypochlorite was used to sanitize the eggshell, the SW method could not detect bacteria after treatment for 2 min. However, the CR method could still detect *Salmonella* from the sample. There were 10^5 CFU/swab-area reductions when the egg surface was sanitized with 200 ppm of sodium hypochlorite for 10 min.

However, when the egg contents (organic matter) were mixed with hypochlorite solutions, the reduction rate was decreased significantly. When the liquid egg was mixed above 0.5% in 200 ppm of sodium hypochlorite, the available chlorine concentration decreased immediately. There were 10^3 CFU/swab-area reductions when hypoclorite solutions were mixed with 0.1% liquid egg and recovered by the CR method. However, the SW method yielded higher estimates of bactericidal activity against *Salmonella* than CR method. We tested 4,000 of commercial eggs to estimate bacterial contamination levels by both methods. The CR method with 37°C of PBS showed the best recovery condition, and showed 10-times higher recovery than the SW method. Therefore, the CR method could be

a better alternative than the conventional SW method for detecting bacteria from eggshells.

Key words:
Egg shell, Crush method, Sodium hypochlorite, Bactericidal activity, Recovery rate

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