

Recovering ability of freeze-stressed *Salmonella typhimurium* and *Staphylococcus aureus* cells in frozen shrimp

Viability of *Salmonella typhimurium* and *Staphylococcus aureus* in frozen shrimp sample was investigated. Shrimp slurry was sterilized and divided in to two parts. The slurry samples were artificially inoculated with the above organisms separately, frozen and stored at -24 0C. The increment of one log cycle of *S. aureus* was observed after frozen storage at -24 0C for 24 h, and more than one log cycle reduction at the end of 8 weeks storage. But, *S. typhimurium* count was reduced by 3 log cycles at the same storage temperature and storage period. The above microorganisms were also detectable to detectable in the shrimp slurry samples, inoculated with the same strength even after two months storage at -24 0C.

The construction of quality control charts for *S. aureus* and aerobic plate count by using reference samples helped to validate and to monitor the test procedure. A chart was drawn by analyzing 14 reference samples. The mean values (MV), upper and lower warning limits ($MV + 2 *SD$) and upper and lower control limits ($MV + 3 *SD$) were transferred into the control charts. Thereafter the reference sample was analyzed once a month and results were transferred into the control charts of *S. aureus* and Aerobic plate count. These control charts are ideal and useful to decide the quality of the results obtained from the analysis at the laboratory.