Survival, Elongation, and Elevated Tolerance of *Salmonella enterica* Serovar Enteritidis at Reduced Water Activity

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Abstract:

Growing microorganisms on dry surfaces, which results in exposure to low water activity (a_w), may change their normal morphology and physiological activity. In this study, the morphological changes and cell viability of *Salmonella enterica* serovar Enteritidis challenged to low a_w were analyzed. The results indicated that exposure to reduced a_w induced filamentation of the cells. The amount of filamentous cells at a_w 0.94 was up to 90% of the total number of cells. Surviving filamentous cells maintained their membrane integrity after exposure to low a_w for 21 days. Furthermore, cells prechallenged to low a_w, obtained with an ionic humectant, demonstrated higher resistance to sodium hypochlorite than control cells. These resistant cells are able to survive disinfection more efficiently and can therefore cause contamination of foods coming in contact with surfaces. This points to the need for increased attention to cleaning of surfaces in household environments and disinfection procedures in processing plants.

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