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Virulence of *Salmonella enterica* Enteritidis biofilms after exposure to different disinfectants

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Salmonella Enteritidis is a pathogen responsible for numerous outbreaks worldwide. Although many disinfectants are available, bacteria can survive disinfection and then express resistance to antibiotics and changes in gene expression. However, little is known about these phenomena regarding biofilm cells. Hence, this study focused the effect of chemical disinfection in the resistance and virulence of *S. Enteritidis* biofilm cells. The minimum biofilm eradication concentration of three disinfectants commonly used was determined, and biofilms were periodically exposed to sub-lethal concentrations of the disinfectants. *S. Enteritidis* biofilm cells were then characterized in terms of biofilm formation ability, resistance to antibiotics, and expression of virulence genes. Results showed that benzalkonium chloride was the most effective against *S. Enteritidis* biofilm cells and, regarding antibiotic susceptibility, these cells were less susceptible than the planktonic ones. Moreover, exposure to disinfectants has slightly altered the susceptibility to antibiotics but no resistance was observed, except for ciprofloxacin (to which planktonic and biofilm cells, before and after exposure, were resistant). Exposure to sodium hypochlorite and peroxide hydrogen enhanced biofilm formation, and benzalkonium chloride was the disinfectant that most influenced the overexpression of *S. Enteritidis* virulence genes. This study shows that biofilm cells that survive disinfection may represent an increased public health risk, since they can have lower susceptibility to antibiotics, enhanced biofilm formation ability, and overexpression of virulence genes.