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Use of bacteriophages to prevent and control *Salmonella* Enteritidis biofilm formation on poultry skins at refrigerated and room temperatures

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Salmonella is one of the leading worldwide foodborne pathogens responsible for illnesses and hospitalizations. *Salmonella*'s capacity to form biofilms contributes to its resistance and persistence in both host and non-host environments, and is especially important in food processing settings. Because cross-contamination still happens during food processing and preparation, other down-stream safety measures must be applied, like the use of control agents of foodborne pathogens in food products. Phages are the natural killers of bacteria, innocuous to human and animals, and good candidates to be used in the control of bacterial pathogens. In this work we aimed to characterize a *S.* Enteritidis phage, phi38, which was shown to have 4.3 kbp in size, dsDNA genome and to contain 60ORFs. We also evaluated whether the addition of phi38 on poultry skin samples could decrease the levels of *S.* Enteritidis. For this, two approaches were used: a preventive approach focusing on decreasing *Salmonella* colonization ability of phage-pretreated skins*;* and a control one, aiming to kill *Salmonella* biofilms already present in the poultry skins. The effect of these two approaches was investigated at refrigerated temperatures (-18 and 4ºC) and also during 1 h at RT (22ºC). While poor effectiveness was observed using phi38 to control and reduce *Salmonella* biofilms following *in vitro* contamination of skins (< 1 log reduction of CFU) at all tested conditions, the preventive approach showed promising results (> 2 log reduction of *Salmonella* colonization). In this way, this study endorses that phages can be used to prevent foodborne pathogen colonization and consequently to promote food safety.