

# **[ID: 414] Interspecies interactions of Salmonella Enteritidis and Escherichia coli dual-species biofilms and their control by bacteriophages**

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Salmonella Enteritidis and Escherichia coli are foodborne pathogens forming challenging biofilms that contribute to their virulence, antimicrobial resistance and survival on food contact surfaces (1,2). Interspecies interactions occur in dual-species biofilms promoting different outcomes to each species (3,4). Here we describe bacteriophage control of biofilms focusing also in the interactions between two strong or weak biofilm producers of each species. Mono and dual-species 24 h-old biofilms, in all possible combinations, were formed in vitro and infected with S. Enteritidis and E. coli bacteriophages PVP-SE2 and vB\_EcoM\_CEB1. Treatment outcome was determined by viable cells counts and visualized by fluorescence microscopy. Biofilms presented higher pathogen loads in mono-species biofilms and weaker biofilm producers increased in number in the presence of strong biofilm producers. Fluorescence microscopy visualization showed different 3D biofilm from microcolonies and uniform layers to more complex and heterogeneously organized arrangements, and differences in carbohydrates in the biofilm matrix assessed by Fourier-transform infrared spectroscopy. Bacteriophage cocktail was efficient until 8 h resulting in greater reductions of S. Enteritidis cells highly due to bacteriophage PVP-SE2 growth characteristics. Furthermore, differences in bacteriophage effectiveness can also be a result of the biofilm 3D structure and matrix strength and compositions.

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