

**Association of *Escherichia coli* O157:H7 in Floccs:
Role of Extracellular Polymeric Substances and Fate of Pathogenic Organisms**

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ABSTRACT

Escherichia coli (*E. coli*) O157:H7 has been frequently associated with outbreaks of food- and water-borne infection. The association of *E. coli* O157:H7 with floccs is hypothesized to be a potential mechanism of transport and survival in natural environments. This study examines this hypothesis with a focus on the role of extracellular polymeric substances (EPS) in the floccs and on *E. coli* O157:H7 survival/pathogenicity in an aquatic environment. In the flocc characterization experiment, floccs with a dense EPS area showed a greater resistance to EDTA and enzymatic dissociation, indicating the significance of EPS in flocc stability. The EPS distribution experiment revealed abundant hydrophobic protein throughout the flocc suggesting possible hydrophobic interaction sites for flocc stability and microbial adhesion. The association of *E. coli* O157:H7 with floccs showed a higher concentration of survival than the free-living form in a low nutrient water sample for 10-day incubation. Migration of the flocc-adherent *E. coli* O157:H7 from the flocc surface toward a dense EPS area may indicate that EPS aided their survival by providing protection, nutrients and stable adhesion sites. Surviving *E. coli* O157:H7 exhibited both decreased host adhesion ability and α -actinin accumulation, however, their infection ability (efficiency of α -actinin accumulation) was not affected. This suggests that the low nutrient levels did not affect pathogenicity over 10 days in this study.