

### Honeys Reduce Biofilm Formation and Virulence in Pathogenic *Escherichia coli*

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Honey at 0.5% (v/v) significantly reduced biofilm formation in enterohemorrhagic *Escherichia coli* O157:H7 without affecting the growth of planktonic cells, while it did not harm commensal *E. coli* K-12 biofilm. Transcriptome analyses show that honey significantly repressed curli genes (csgBAC), quorum sensing genes (AI-2 importer and indole biosynthesis), and virulence genes (LEE genes). Glucose and fructose in the honeys were found to be key components in reducing the biofilm formation of *E. coli* O157:H7 through the suppression of curli production and AI-2 importer. Furthermore, honey decreased the colonization of *E. coli* O157:H7 cells on human HT-29 epithelial cells. In contrast, glucose had a temperature-dependent effect on commensal *E. coli* K-12 biofilm formation. These results suggest that low concentrations of honey, such as in honeyed water, can be a practical means for reducing the colonization and virulence of pathogenic *E. coli* O157:H7 without harming commensal *E. coli* community.