

## **Effect of Environmental Conditions on E. Coli o157:h7 Atcc 43888 and L. Monocytogenes Atcc 7644 Cell Surface Hydrophobicity, Motility and Cell Attachment on Food-Contact Surfaces**

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**Abstract :** Biofilm formation is a major source of materials and foodstuffs contamination, contributing to occurrence of pathogenic and spoilage microbes in food processing resulting in food spoilage, transmission of diseases and significant food hygiene and safety issues. This study elucidates biofilm formation of E. coli O157:H7 and L. monocytogenes ATCC 7644 grown under food related environmental stress conditions of varying pH (5.0;7.0; and 8.5) and temperature (15, 25 and 37 °C). Both strains showed confluent biofilm formation at 25 °C and 37 °C, at pH 8.5 after 5 days. E. coli showed curli fimbriae production at various temperatures, while L. monocytogenes did not show pronounced expression. Swarm, swimming and twitching plate assays were used to determine strain motilities. Characterization of cell hydrophobicity was done using the microbial adhesion to hydrocarbons (MATH) assay using n-hexadecane. Both strains showed hydrophilic characteristics as they fell within a < 20 % interval. FT-IR revealed COOH at 1622 cm<sup>-1</sup>, and a strong absorption band at 3650 cm<sup>-1</sup> - 3200 cm<sup>-1</sup> indicating the presence of both -OH and -NH groups. Both strains were hydrophilic and could form biofilm at different combinations of temperature and pH. EPS produced in both species proved to be an acidic hetero-polysaccharide.

**Keywords :** biofilm, pathogens, hydrophobicity, motility

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