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Impact of Persistent and Non-persistent Generic *Escherichia coli* and *Salmonella sp.* Recovered from a Beef Packing Plant on Biofilm Formation by *E. coli* O157

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Abstract

AIMS:

To examine the influence of meat plant *Escherichia coli* and *Salmonella sp.* isolates on *E. coli* O157 biofilm formation.

METHODS AND RESULTS:

Biofilm formation was quantified by crystal violet staining ($A_{570\text{ nm}}$) and viable cell numbers for up to 6 days at 15°C. All five persistent *E. coli* genotypes formed strong biofilms when cultured alone or co-cultured with *E. coli* O157, with $A_{570\text{ nm}}$ values reaching ≥ 4.8 at day 4, while only two of five non-persistent genotypes formed such biofilms. For *E. coli* O157:H7 co-culture biofilms with *E. coli* genotypes 136 and 533, its numbers were ≥ 1.5 and ≥ 1 log CFU per peg lower than those observed for its mono-culture biofilm at days 2 and 4, respectively. The number of *E. coli* O157:NM in similar co-culture biofilms was 1 log CFU per peg lower than in its mono-culture biofilm at day 4 and 6, respectively. *Salmonella sp.* lowered the number of *E. coli* O157:NM by 0.5 log unit, once, at day 6.

CONCLUSION:

Generic *E. coli* may outcompete *E. coli* O157 strains while establishing biofilms.

SIGNIFICANCE AND IMPACT OF THE STUDY:

Findings advance knowledge regarding inter-strain competition for a similar ecological niche and may aid development of biocontrol strategies for *E. coli* O157 in food processing environments.

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