Survival of *Salmonella* on Tomatoes and Plastic Mulch under Varying Relative Humidities and Sanitation Practices of New Jersey Packinghouses

Tomatoes have been linked to *Salmonella* outbreaks in the United States, some of which were due to contamination on the farm (CDC 2006). Current research suggests that many factors, such as temperature and relative humidity, can contribute to *Salmonella* death or survival on tomatoes (Shi et al. 2007). Better understanding of *Salmonella* survival as well as sanitary practices in packinghouses could lead to a decrease in outbreaks.

The survival of *Salmonella* on fresh, whole tomatoes and plastic mulch was studied under different relative humidities (15, 50, and 100%). Three *Salmonella* strains were selected for the study based on RDAR morphotype and biofilm production. The relative humidity was controlled by salt slurries in desiccators. It was found that *Salmonella* consistently survives at higher concentrations on tomatoes and plastic mulch at 100% humidity. A positive RDAR morphotype may contribute more to *Salmonella* survival on tomatoes and plastic mulch than biofilm production.

The sanitation practices of 5 New Jersey packinghouses were surveyed and tomatoes were tested for total bacterial, coliform, and generic *E. coli* counts before and after processing. Packinghouse total bacterial reductions ranged from -0.1±0.50 to 1.67±0.91 log CFU/tomato and coliform reductions ranged from -0.14±0.83 to 1.56±1.24 log CFU/tomato. Statistically significant reductions occurred only 2-3 out of 5 times per packinghouse. Most packinghouses showed a decrease in samples positive for *E. coli* after treatment, however, Packinghouse A had consistently higher number of samples positive after treatment (5-85% post vs. 0-20% pre).

Since *Salmonella* can persist on tomatoes, packinghouse sanitation is critical. Each of 5 NJ packinghouses used different sanitary procedures, which resulted in a wide range of bacterial reductions. Standardization of sanitary practices could assist in more consistent bacterial reductions and may prevent further outbreaks.

**Selected References**
