

Title Pathogenic potential of *Salmonella* Typhimurium DT104 following sequential passage through soil, packaged fresh-cut lettuce and a model gastrointestinal tract

Author Marcia Oliveira, Lucas Wijnands, Maribel Abadias, Henk Aarts and Eelco Franz

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Abstract

From a quantitative microbial risk assessment perspective it is important to know whether certain food environments influence the pathogenic potential of pathogens and to what extent. The purpose of the present study was to examine the pathogenic potential of *S. Typhimurium* DT104, measured as the capability to survive a simulated gastrointestinal tract system and the capability of adhering to and invading differentiated Caco-2 cells, after sequential incubation (without intermediate culturing) into soil, lettuce and cut lettuce stored under modified atmosphere (MAP) conditions. Two *S. Typhimurium* DT104 strains were used, one isolated from a pig carcass and one isolated from lettuce. The most important result of the present study is that the sequential incubation of *S. Typhimurium* in soil and lettuce slightly increased the capability of surviving the simulated gastric fluid, increased the capability to grow in the simulated intestinal fluid but decreased the capability of epithelial attachment and invasion and decreased the overall survival probability of the gastrointestinal tract system. Some variation in responses between the strains was observed, with the lettuce strain maintaining higher epithelial attachment capability and the carcass strains maintaining higher epithelial invasion capability. This study provided quantitative data on the effect of environmental and food matrices on the pathogenic potential of *S. Typhimurium* DT104 using a realistic system of sequential incubations in environmental and food matrices, followed by simulated gastrointestinal tract passage without intermediate culturing. These results could aid the development of more realistic quantitative microbial risk assessments.