

Title Incidence and Distribution of *Salmonella* Serotypes Isolated from Tomato and Related Environmental Materials from Hydroponic Greenhouses

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Abstract

In the last decade, at least three outbreaks of salmonellosis have been associated with the consumption of raw tomatoes. Sources and mechanisms of *Salmonella* contamination have been widely studied for produce grown in open fields. The prevalence of *Salmonella* during three years averaged 3.0% on tomatoes grown in hydroponic greenhouses. During 2003-2004, modern hydroponic greenhouses were affected by flooding and later, by the presence of wild animals. The objective of this work was to evaluate the influence of such events on the incidence and distribution of *Salmonella* on hydroponic tomatoes. *Salmonella* serotypes were investigated in 910 samples of tomato and 382 of different environmental materials. *Salmonella* was present in 7.9% of tomatoes collected in the greenhouses. Also, it was recovered from personnel shoes (10.6%), puddles (11.7%), vehicle wheels (14.0%), working-shoes(16.3%), soil (22.6%), and feces of both wild and farm animals (57.9%). The identified serovars were Montevideo (58.0%), Newport (4.2%), Abaetetuba (2.8%), Oranienburg (2.8%), Midway (1.4%), and Muenchen (1.4%). Strains from serogroup F were 29.6%. *S. Montevideo* was identified in 55.0% of positive tomato samples and 48.8% of positive environmental samples, whereas serogroup F strains were present in 20.0% and 25.8%, respectively. Apparently, *S. Montevideo* showed an association among tomatoes, wild animals and puddles. Meanwhile, serogroup F was associated with contamination of tomatoes, shoes and farm animals. This work shows the importance of flooding and the presence of wild animals as sources of contamination to the greenhouses, thus affecting the microbial safety of tomatoes even before harvest.