MedicalXpress

Under lab conditions, Salmonella can reach tomato fruits through leaves, study shows

November 10 2011, by Mickie Anderson

Food-safety experts have long believed that Salmonella bacteria could only enter tomatoes through wounds in the stem or fruit — but a new University of Florida laboratory study shows it can also happen another way.

Plant pathologist Ariena van Bruggen, a professor in UF's Institute of Food and Agricultural Sciences, published a paper today in the online journal *PLoS One*, with research findings that show — for the first time — that Salmonella can enter tomato plants through intact leaves, travel through the plant and end up in the fruit itself.

But she says she can't stress enough that it isn't at all easy for it to happen, even in the lab, and would be unlikely under field conditions.

"The message is that yes, (Salmonella) can be internalized in tomato, but it's rare — the chance is so low," she said. "I would tell consumers not to worry too much."

Although van Bruggen, a member of UF's Emerging Pathogens Institute, described her experiment as a "worst-case scenario," she said the findings suggest tomato growers and packers should continue to review their already-stringent safety standards, taking a look at factors such as irrigation water sources, the possibility of wild animals getting too close to plants and the use of surfactants.

Keith Schneider, a food safety expert and IFAS faculty member, called

the study's findings intriguing, but said hand-washing by consumers and food handlers is still likely to have the single biggest impact on whether people become ill from anything they eat.

"There is probably a far bigger risk of people becoming sick from not washing their hands, or their kids not washing their hands, than the possibility of this route of infection occurring in nature," he said.

Tomatoes are a $619 million annual industry in Florida and food-safety scares do tremendous damage to growers. In 2008, the industry lost an estimated $100 million when federal health officials erroneously blamed a Salmonella outbreak on domestically grown tomatoes, only to announce later that contaminated jalapeño and Serrano peppers from Mexico were responsible.

Salmonella is among the most common foodborne illnesses, often spread by raw or undercooked meat, poultry or eggs, but sometimes through contaminated produce. It can cause abdominal pain, fever, nausea and vomiting.

Results from the 2 1/2 -year study were published today in the online, open-access journal *Public Library of Sciences (PLoS) One*. To test the hypothesis that Salmonella might be able to enter tomato leaves, van Bruggen and two postdoctoral researchers briefly dipped one leaf from each of 84 tomato plants into a potent solution that contained high concentrations of Salmonella, plus a surfactant commonly used by tomato growers to ensure that pesticides or fungicides stay on the plants. Another 42 plants were left as a control group.

Later, they tested adjacent, non-inoculated leaves and the tomatoes themselves.

The study was conducted over a 10-month period and then replicated.

In the study's first phase, nine tomatoes from one inoculated plant tested positive for Salmonella. In the second, Salmonella was found in adjacent, non-inoculated leaves from eight tomato plants; as well as 12 tomatoes from two plants that were leaf-inoculated with a different strain of Salmonella.

Reggie Brown, manager of the Florida Tomato Committee, which has regulatory authority over most of the state's tomato production, said the industry has some of the most stringent safety standards in agriculture, anywhere. In Florida, safe tomato production practices are required by law.

"Food safety is never an absolute, but we are doing everything that good science and good practices tell us to do to produce the safest product possible," he said. "Ninety-nine point nine nine nine nine percent of produce is safe."

Provided by University of Florida

Citation: Under lab conditions, Salmonella can reach tomato fruits through leaves, study shows (2011, November 10) retrieved 26 April 2024 from https://medicalxpress.com/news/2011-11-lab-conditions-salmonella-tomato-fruits.html