



Plant Pathology's Role in the Safety of the American Fresh Produce Supply

► **Background:** Since 2008, fresh produce has become the most likely contaminated food leading to human disease, negating the paradigm that foodborne human pathogens are associated primarily with animal products. Recalls and litigation cost the produce industry millions and impact every industry sector. Uncertainties about our ability to prevent future contamination throughout the supply chain haunt U.S. producers, processors, retailers, and regulators. As a result, increasing pressure is being placed on the government, produce associations, food retailers, and growers to institute improved science-based food safety standards and audit compliance programs. Passage of the Food Modernization Act is a first step toward reducing contaminated produce in the U.S. food supply; however, fundamental and practical research is still needed to base these new regulations in science. Unanswered questions remain as to best management practices, routes of contamination, environmental survival, and interactions between human pathogens and plants.

The American Phytopathological Society (APS), whose 5,000 members have extensive knowledge of the complex relationships between microbes and plants, is a valuable scientific resource that can drive discovery and design of effective solutions to microbial contamination of food plants. Plant pathologists study how microbes colonize plants and are dispersed in the environment as well as how plants respond to defend themselves. These are crucial elements for the development of intervention strategies and a balanced program to minimize foodborne illnesses. Utilizing modern plant pathology strategies, plant pathologists:

- Discovered that *Salmonella* can navigate to plant natural openings (stomata) and **enter lettuce leaves**, thus identifying a target site for control of future outbreaks
- Identified **active mechanisms**, fimbriae, cellulose, and capsule, used by *Salmonella* to colonize alfalfa seedlings, thereby offering targets for novel interventions to remove attached human pathogen cells
- Identified genes expressed by *E. coli* O157:H7 specifically on lettuce, thus providing the scientific community with a road map to important avenues of research.

The effectiveness of potential risk reduction and prevention strategies remains unclear and largely empirical as our knowledge about the interactions of foodborne pathogens with one another, with plants, and with nonpathogenic microflora is inadequate. More effective solutions will require the application of emerging research tools and strategies, as well as creative cross-disciplinary research efforts.

► **Solution:** We request increases in research funding for fundamental and practical knowledge of human pathogen-plant interactions. Specifically, we request the following:

- Including fundamental and applied **research** as a priority of the White House Food Safety Working Group and establishing research as an Administration food safety priority
- Establishing a **coordinated interagency funding initiative** for fundamental and applied research on the association of human pathogens with plants.

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