



# Food Safety

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## Plant Pathology's Role in the Safety of the American Food Supply

**Background:** Since 1996, there have been approximately 76 reported foodborne illness outbreaks associated with fresh vegetables or produce due to contamination with human pathogens (i.e. *Salmonella*, *E. coli*). In the fall of 2006, a significant outbreak of *E. coli* O157-H7 on fresh bagged spinach resulted in the death of 3 people and sickened ~200 (hospitalizing more than 100). Recall of the contaminated spinach resulted in ~\$74million in economic losses by the California leafy vegetable industry alone. Concerns of future contamination continue to haunt the U.S. food and agricultural production system. After the most recent outbreak, there have been increased calls for the government, agriculture producers, and food retailers to improve the food supply chain by ensuring early incidence detections, rapid identification of the possible sources of contamination, and increased and more responsive communication with the public when an outbreak occurs.

**The Problem:** Optimizing the safety of our food supply requires cooperative and coordinated interactions among representatives of each component of the food system. Research is needed to identify best management practices (BMPs) for ensuring food safety strategies at the farm and maintaining them through shipping, processing, storing, and marketing. Many questions on the nature of contamination and the capacity of human pathogens to interact with plants remain to be addressed. With so little knowledge available regarding the true nature of food borne pathogens and their relationships with plants, it is very difficult to determine the actual risk of contamination and the need for changes to safeguard the food production supply chain. Any new regulations or guidelines should be implemented only after specific, relevant research indicating the risks of contamination. The APS Public Policy Board supports and encourages the use of sound science and high quality data to ensure the safety of food for public consumption. Regulatory decisions about minimizing the contamination of fresh vegetables and produce must be science-based. Education of the public at large also remains an important factor in ensuring that the food we eat is safe and that everything is being done to minimize risks to the public.

**Solution:** The 5,000-member American Phytopathological Society (APS), with 100 years of expertise on the complex and intimate relationships between microbes and plants and a professional infrastructure known for its strength in communication and knowledge dissemination, represents a valuable scientific resource for governmental agencies (USDA, FDA, CDC, NSF) to address and design solutions for issues of microbial contamination of food plants and to establish priorities for research programs.

Plant pathologists can apply existing strategies for understanding host-pathogen interactions to needed research on the relationships between food borne pathogens and plant hosts. These same research tools will allow us to address the true nature of the associations between human pathogens and contaminated food plants. Currently, we are not well prepared to react quickly to possible contamination and rapidly trace such microbes back to their source.

The training and experience that plant pathologists apply routinely to understand the mechanisms pathogens use for colonizing and translocating within their hosts, plant strategies to defend themselves, and possible management strategies will be critical elements of a *balanced* program to safeguard food plants from human pathogen contamination. Recognizing that plant pathologists must work closely with food safety specialists, medical personnel, producers, policy-makers and others to achieve our food safety goals, **we propose a national workshop** to bring these scientific and agricultural communities together to (1) identify the state of the art of plant-microbe interactions as it relates to food borne diseases; (2) delineate concrete scientific research priorities to address gaps in our knowledge of the interaction between food borne disease and plant-microbial relationships; (3) identify scientific resources needed to accelerate our understanding of biological underpinnings of the relationships between human pathogens and plants; and (4) identify strategies to accomplish these research needs.

**The Result:** These actions will ensure that appropriate scientific input on the relationship between food borne diseases and plant pathogen interactions is provided to regulatory agencies to facilitate efforts to ensure the safety of our nation's food supply.

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