

# IMPACT

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*IMPACT is a series of publications highlighting how UC Davis' College of Agricultural and Environmental Sciences makes a difference in the lives of Californians. Through research, teaching, and outreach programs, UC Davis research touches almost all aspects of Californian life. Today, millions of people eat safer foods, breathe cleaner air, and drink healthier water with the help of our researchers. We're making discovery work -- for California and the world.*

## MAKING FRUITS AND VEGETABLES SAFER

### THE ISSUE

Most fruits and vegetables are free of disease-causing microorganisms when handled with care from farm fields or backyard gardens until mealtime. However, contamination can occur – often by end users during food preparation and storage. Safety precautions taken by growers and processors keep the risk of illness from a serving of produce low.

The increased foodborne illness outbreaks linked to fresh produce in recent years reflect a number of changes, including more sophisticated detection and reporting methods and increased consumption of fresh fruits and vegetables. *E. coli* is a common and usually harmless bacterium that lives in the intestinal tract of humans and animals. However, a particularly toxic strain – *E. coli* O157:H7 – has been implicated in several well-publicized outbreaks of foodborne illnesses. The outbreaks have drawn national attention to the growing and handling practices of the produce industry.

Microorganisms that cause foodborne illnesses survive surprisingly well in water and soil and can be transported to new areas by humans, insects, and domestic and wild animals. Once in contact with fresh fruits or vegetables, microbes can contaminate plant surfaces. Thus safe growing and handling practices to *prevent* contamination are crucial at every link in the food production chain.



### WHAT WE'RE DOING

The UC Davis College of Agricultural and Environmental Sciences has a long history of working with agricultural producers, handlers, and consumers to ensure the safety and wholesomeness of the food we eat. Extensive food safety information is online at the “UC Food Safety” Web site ([www.ucfoodsafety.ucdavis.edu/](http://www.ucfoodsafety.ucdavis.edu/)). This site contains links to presentations, publications, and other sites on food production, harvesting, and processing. For instance, commodity-specific guides explain the components of good microbial food safety programs for growers, packers, and handlers of melons, fresh-market tomatoes, and other horticultural crops. Other guides have a consumer focus – a guide for home gardeners, for instance.

Trevor Suslow is a Department of Plant Sciences Cooperative Extension specialist in the postharvest quality and safety of fruits and vegetables. He shows industry personnel how to control harmful microorganisms in perishable produce – from preharvest stages through harvest operations, postharvest handling, processing, transportation and distribution. His research analyzes the packing and processing techniques used to wash, brush, and clean whole and fresh-cut produce and has led to new diagnostic tools and procedures to prevent spoilage and loss of quality. Suslow has authored numerous publications on good agricultural practices for producers, handlers and processors, such as those for tomatoes and melons. When *E. coli* O157:H7 was identified as the source of spinach-related illnesses in 2006, Suslow became a primary UC Davis resource to explain food safety precautions. He is probing how spinach fields may have become contaminated.

Linda Harris is a Cooperative Extension specialist in the Department of Food Science and Technology whose work covers a broad range of microbial food safety research and education. In her analytical laboratory at UC Davis, she investigates microorganisms on fresh fruits, vegetables, and nutmeats, and has developed standardized testing methods that evaluate the behavior of pathogens under a variety of storage conditions and gauge the effectiveness of sanitizers against microorganisms on produce. Harris is also the associate director of research for the Western Institute for Food Safety and Security, a partnership between government and UC Davis to fund research and foster communication on issues related to foodborne pathogens.

Christine Bruhn is a Cooperative Extension food marketing specialist in the Department of Food Science and Technology who studies consumer perceptions of fresh fruit quality and food handling practices. She and Harris have conducted research on how consumers wash and prepare fruits and vegetables. Based on focus-group and laboratory findings, they developed a consumer-oriented publication – *Safe Handling of Fruits and Vegetables* – to reduce the risk of produce contamination in the home. Bruhn updates health professionals, educators, and the media with food safety information.

Other UC Davis scientists are conducting food safety research and building awareness to reduce the risk of foodborne illnesses from microbial contamination. For instance, a team of microbiologists led by Glenn Young, professor in the Department of Food Science and Technology, is studying the genes and proteins that influence the virulence of foodborne pathogens and how *E. coli* O157:H7 may infiltrate leafy plants.

## A SHARED VISION

Ensuring a safe food supply is a national effort involving university scientists, regulators, industry, and policymakers throughout the country. New methods and technologies are continually being developed to analyze risk, detect pathogens, prevent contamination, and sanitize work environments where food is grown and handled. Food safety education is a top priority at UC Davis.

That's impact – creating the diagnostic tools, scientific knowledge, and informed public and industry education to keep our food system safe.

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