

# IMPACT

RESEARCH AT THE UNIVERSITY OF MARYLAND

Vol. 2 No. 2 | October 2007



## *Protecting the nation's food supply*

is a multi-pronged effort that involves the federal government, private industry, and the research and expertise of faculty at major research universities. For a closer look at the University of Maryland's role in food safety and food defense, **take a look inside ...**



### researchTRENDS

In addition to comprehensive scientific investigation in the laboratory, university faculty and extension specialists provide expertise to policymakers, and also offer outreach and educational programs on food safety. Here are some examples:

#### **ADVANCING RATIONAL, SCIENCE-BASED**

food, nutrition and agriculture policy is the mission of the Center for Food, Nutrition, and Agriculture Policy. Through its research and educational programs, CFNAP examines complex issues facing government policymakers, regulators, agribusinesses, food manufacturers, the media and consumers.

#### **FOOD SAFETY RISK ANALYSIS**

is offered by the university in an online format to local and federal officials involved in inspecting the nation's food supply. A worldwide commitment to the use of risk analysis in food safety has created a need to educate food safety and other public health professionals on this important topic.

#### **MARYLAND COOPERATIVE EXTENSION**

offers numerous programs in food safety to food industry and food service personnel as well as consumers. Extension specialists cover topics like pesticide residues, irradiation and food additives, and constantly respond to questions or concerns from the public on food safety issues.

## research **PROFILES**

For a closer look at Maryland faculty involved in key areas of food safety and food defense, go to [www.umresearch.umd.edu](http://www.umresearch.umd.edu).



**JIANGHONG MENG**

This professor of nutrition and food science is addressing the problem of food-borne pathogens from multiple angles.



**DANIEL PEREZ**

This associate professor of veterinary medicine is studying the deadly H5N1 strain of avian influenza.



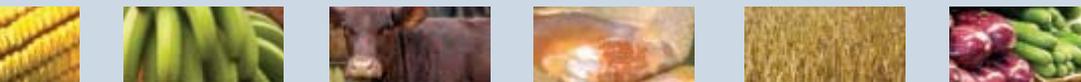
**WILLIAM SPRINKLE, M.D.**

This physician and associate professor of public policy is examining issues related to food safety and public policy.



# Protecting What We Eat

## New Research in Food Safety and Food Defense



According to the U.S. Department of Agriculture, more than 85 percent of seafood consumed in the United States is now imported, as is 40 percent of the fresh fruit we eat. This globalization of America's food supply brings new challenges to those responsible for the safety and security of our food resources. To better meet these challenges, federal agencies are looking toward major research universities for help in developing new scientific safeguards.



“We believe the University of Maryland is uniquely positioned to take a leadership role in assessing and minimizing significant threats to our food systems,” says Cheng-i Wei, professor and dean of the College of Agriculture and Natural Resources. “In addition to the university’s already established centers—which benefit from our strengths in basic science related to food safety—we are launching new research activities and global-scale outreach programs that will have an impact.”

Wei, internationally known for his research in food microbiology and food toxicology, points to the longstanding relationships the University of Maryland has with federal research labs that focus on the nation’s food supply. The Beltsville Agricultural Research Center, or BARC—overseen by the USDA—is located a few miles from the university and is recognized as the largest agricultural experiment station in the world. University researchers regularly collaborate with government scientists at BARC on topics of food safety and food defense, Wei says.

University faculty from several departments and centers also interact with government scientists in the U.S. Food and Drug Administration’s Center for Food Safety and Applied Nutrition, located at the 124-acre M Square research park adjacent to Maryland’s campus. For example, the university’s Joint Institute for Food Safety and Applied Nutrition, or JIFSAN, is a multidisciplinary initiative that joins FDA researchers located in M Square (and elsewhere, including the FDA’s

Center for Veterinary Medicine) with Maryland faculty. JIFSAN provides scientific expertise and mechanisms for the exchange of technical information and scientific concepts in areas of food safety, human nutrition and animal health as it relates to food production. *(See research profile on Jianghong Meng for more detail on JIFSAN research.)*

### Microbiology and Chemistry

Norma Allewell, professor and dean of the College of Chemical and Life Sciences, says that faculty in the college she oversees often collaborate with federal labs involved with food safety and food defense, mainly in areas of microbiology and chemistry. There is also research from across the university that involves the development of nanoscale sensing devices able to detect dangerous food-borne pathogens, Allewell says.

Maryland faculty in the life sciences and government scientists are also hard at work developing new methodologies in systematics, which is the study of the relationship among living things. This can help in immediately identifying tainted foods, Allewell says, such as imported grain products from China containing harmful chemicals like melamine, and it can also be used as a means to discern potential sources of bioterrorism.

The college’s new Bioscience Research Building brings cutting-edge research capabilities to bear on food safety. Senior faculty researchers have been recruited by the university to fulfill the bioscience facility’s three main research thrusts:

*(Continued on back.)*

genomics, host pathogen interaction, and bioinformatics and computational biology. The Maryland Pathogen Research Institute—a key component of the new bioscience facility—will enhance efforts in food safety research.

### Threats of Bioterrorism

Since the terrorist attacks of Sept. 11, 2001, the FDA and other government agencies have greatly expanded their efforts to counteract potential acts of bioterrorism against the nation's food supply. "The federal government is aware of the significant risks of a terrorist attack against the nation's food supply from microbial, chemical and even radiological food contaminants," says Mickey Parish, professor and chair of the university's Department of Nutrition and Food Science.

A new research center at Maryland, the Center for Food Systems Security and Safety, will address the security of food supplies and the food system from the field to the dinner table, with an emphasis at the food manufacturing level. Established with a \$1.2 million endowment from Robert Facchina, a 1977 alumnus of the college and now CEO of Johanna Foods, the center's main research thrusts, according to Parish, are to "look at threats to the nation's food supply ... everything from bioterrorism, to the intentional contamination of foods that would cause health problems, death or economic

disruption to our country's food supply."

Parish expects faculty in the Center for Food Systems Security and Safety to work closely with the Department of Homeland Security, the FDA's Center for Food Safety and Applied Nutrition, and the USDA.

### Production-Scale Field-Testing

What gives the University of Maryland an edge in food safety research, says Reggie Harrell, acting associate dean for research in the university's College of Agriculture and Natural Resources, is that the scientific investigation done in the laboratories can be carried over to the college's Agricultural Experiment Station, where production-scale field-testing is done to look at proof of concept. "We look at the entire gamut of food safety—from identification of pathogens, to rapid response best practices if an abnormality is found, to genetically designing better (safer) foods," Harrell says.

"We have one of the safest, most secure food systems in the world—and this is not by accident," Harrell concludes. A lot of this is due to the diligence of federal agencies tasked with protecting our food sources, he says, but part of it is also because of the ongoing scientific investigation at major research universities like the University of Maryland. — *Tom Ventsias*

*Impact* is published by the Office of the Vice President for Research and is mailed to members of the mid-Atlantic research community and others who have an interest in the latest research at the University of Maryland.

Your comments and feedback are welcome; please email your comments to [impact@umd.edu](mailto:impact@umd.edu) or fax them to Anne Geronimo, executive editor, at 301.314.9569.

If for any reason you would **not** like to receive this publication, contact us using the same information above.

**PUBLISHER**  
Mel Bernstein  
Vice President for Research

**EXECUTIVE EDITOR**  
Anne Geronimo  
Director for Research Development

**MANAGING EDITOR**  
Tom Ventsias

**CREATIVE DIRECTOR AND PHOTOGRAPHER**  
John T. Consoli

**ART DIRECTOR**  
Jeanette J. Nelson

**RESEARCH PROFILE WRITER**  
Karin Jegalian



## researchSPOTLIGHT



The Maryland Institute for Applied Environmental Health—part of the university's just-launched School of Public Health—is involved with the detection and prevention of environmentally related diseases, including the study of pathogens that can affect food and water safety. Research by **Amy Sapkota**, assistant professor of environmental health and core member of the new institute, examines how antibiotics used in animal food production may impact antimicrobial resistance among human populations. The use of non-therapeutic levels of antibiotics for the purposes of promoting growth and increasing feed efficiency is a common practice in the United States, but Sapkota says that "it is increasingly being examined as a practice that needs to be reduced,

because we are finding increased levels of antibiotic-resistant bacterial pathogens on farms and retail meats." Sapkota and her colleagues are also assessing possible environmental hazards to communities that are adjacent to large-scale animal feeding operations like swine or cattle farms. The Maryland researchers want to know whether these agricultural facilities expose nearby residents or people who work at the farms to higher levels of microbes and chemicals through aerial contamination, or runoff into groundwater from the farm's manure pits. For more information on the Maryland Institute for Applied Environmental Health, go to [www.hhp.umd.edu/miaeh](http://www.hhp.umd.edu/miaeh)



UNIVERSITY OF  
MARYLAND

Office of the Vice President for Research  
2133 Lee Building  
University of Maryland  
College Park MD 20742-5121

NON-PROFIT ORG  
US POSTAGE PAID  
PERMIT No. 10  
COLLEGE PARK MD