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The Food Safety Consortium Newsletter is a production of the three members of the consortium: University of Arkansas Division of Agriculture, Iowa State University and Kansas State University. Your comments are welcome.

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Implementation of New Food Safety Law Will Take Time

A new food safety law went on the books in January, but much more remains to be done before its full effect is felt. Specific regulations authorized by the law are still to be written over the coming months and years. Memoranda of understanding with other government agencies will be drafted. Perhaps most importantly, funding of the law's provisions will need to be determined by Congress each budget cycle.

The Food Safety Modernization Act applies to food regulated by the Food and Drug Administration — everything except meat, poultry and eggs, which are covered under U.S. Department of Agriculture rules. One significant aspect of the new law is that it approaches preventive measures similar to USDA's regulation of products.

"There's a clear parallel," said Harrison Pittman, director of the National Agricultural Law Center, a unit housed at the University of



Harrison Pittman

Arkansas School of Law that operates under the statewide U of A Division of Agriculture. Since the mid-1990s, USDA has required processors under its jurisdiction to develop Hazard Analysis and Critical Control Point (HACCP) plans that outline what in-house steps are being taken to prevent and control contamination before a product leaves the plant. The new FDA law has a similar requirement.

All facilities governed by the law must be registered on a two-year basis.

"The law gives FDA the authority to suspend or revoke the registration, which in effect would put it out of business," Pittman said. "You couple that with a new provision that has changed from voluntary recall authority on FDA's part to mandatory recall authority."

The new FDA law is targeted at situations in which foodborne illness has been discovered after a food product has left the processor. Previ-

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The Waiting Game Sometimes Beats the Pathogens

Of all the ways to control and reduce foodborne pathogens such as *Listeria monocytogenes*, sometimes it's effective to just wait them out.

That's what Food Safety Consortium researchers found at Kansas State University with regard to certain storage situations for whole muscle beef jerky, smoked sausage sticks and shelf-stable meat snacks such as kippered beef steak and turkey tenders.

For example, they learned that the growth of *L. monocytogenes* is inhibited in beef jerky by either holding it for 24 hours in a heat-sealed oxygen scavenger packaging system or



Kelly Getty

by holding it for 48 hours in heat-sealed scavenger packaging systems or nitrogen-flushed-with-oxygen scavenger packaging systems. Variations of these packing and storage combinations may work as well as antimicrobial tactics.

"This project has come about from a very good working relationship with Oberto Sausage," said Kelly Getty, an assistant professor in the K-State Food Science Institute

who led the project. "The research had shown that *Listeria* basically died off after a week or more. We wanted to know what we can do in a short time.

We know that for 24 to 48 hours we can still hold [\(Continued on page 2\)](#)

Implementation of New Food Safety Law... (Continued from page 1)

ously, Pittman said, there was no provision allowing for mandatory recalls. Instead, FDA would coordinate with and encourage the company to voluntarily recall the product. FDA's leverage was that it could also inform the company that it would publicize the discovery of contamination if the company didn't recall the product. Pittman explained that "FDA has made clear it wants to continue to use the voluntary recall approach, but reserves the right to use mandatory recall if the situation arises."

"It gives consumer groups and watchdog groups the ability to put pressure on FDA," Pittman said of the authority to order recalls. "If there's an outbreak they can say, 'You have this authority. You should use it.' It's definitely an added tool in terms of foodborne outbreak."

The new FDA law is targeted at situations in which foodborne illness has been discovered after a food product has left the processor.

One major change in the law is its requirement that high-risk plants must be inspected within five years of the law's enactment and every three years after the first inspection. These inspections will give FDA access to the facilities' records in cases

where it believes a product could cause serious health problems.

Pittman said this provision places the FDA in a more proactive position than previously and more power to perform inspections. "This is supposed to be proactive and science-driven

and as part of that they're supposed to allocate time and resources toward facilities and food products that are known scientifically to have a higher risk or have a history of particular problems," Pittman said.

The law exempts smaller operations from certain requirements, such as farmers who sell less than \$500,000 worth of food annually and who sell to farmers markets or restaurants. Pittman said congressional supporters of the exemption argued that foodborne illness outbreaks from such plants are likely to be localized events. He said the issue might be revisited if a future foodborne illness outbreak is traced back to an exempted small food processor that engages in direct marketing.

FDA authority over imported food now extends to the right to inspect foreign facilities that are making products bound for the United States. "The new import requirements are some of the most important provisions in the new law," Pittman said. He added, "Like other aspects of this law, though, much remains to be seen in terms of funding and, therefore, regulatory implementation." ■

The Waiting Game... (Continued from page 1)

it before we ship it out."

Tests on smoked sausage sticks showed results similar to the beef jerky. The researchers tested four packing systems and temperature storage times and found that all were effective at reducing *L. monocytogenes* when stored for 24 to 72 hours.

For kippered beef steak and turkey tenders, the greatest reduction

of pathogens would occur after 72 hours of storage. Getty's recommendation to processors is to wait the full three days before shipping out the product.

"It's more to create a very good margin of safety," Getty said. "So if you really want to enhance your margin of safety, you hold it longer. Small companies could probably do that. It's not really a hard technology to implement." ■

If you really want to enhance your margin of safety, you hold it longer.

UA Announces Collaboration to Protect Consumers From Food Contamination

The University of Arkansas Division of Agriculture's Center for Food Safety (CFS) has entered into a public-private collaboration with Litmus Rapid-B, LLC (LRB), a Little Rock-based biotechnology company, to develop research that will lead the fight against consumer sickness and death attributed to food contamination.

Each year roughly 3,000 Americans die from foodborne illnesses. Forty-eight million get sick. More than 100,000 are hospitalized. The Centers for Disease Control estimates that one out of six people is affected by this growing issue.

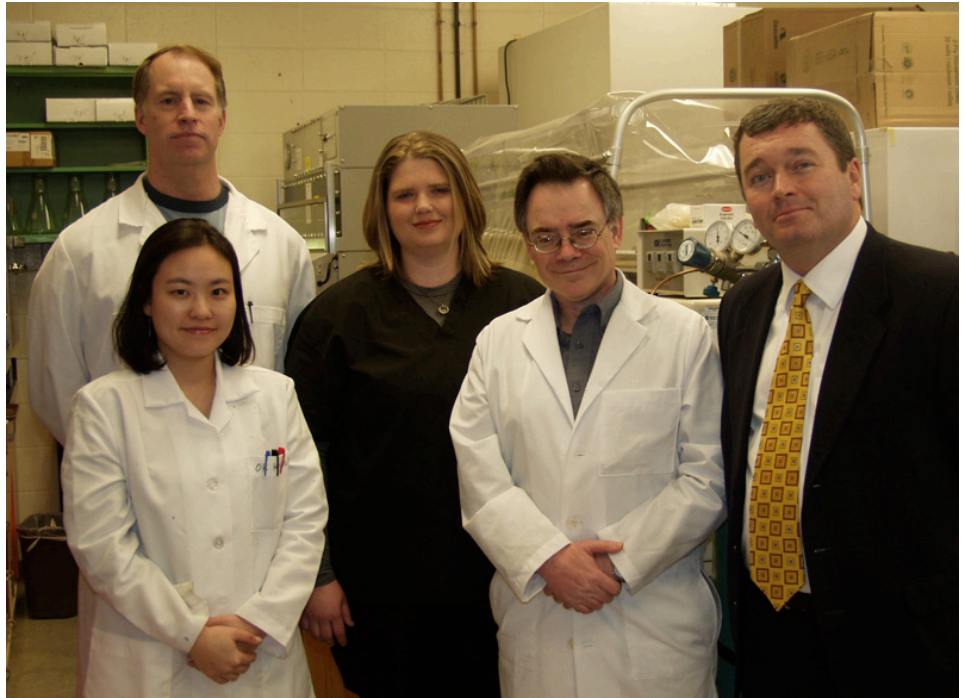
The collaborative research is intended to improve identification of foodborne bacteria such as *E. coli* and *Salmonella* throughout processing and distribution points to create value for the food processing industry and consumers. LRB recently placed its system at the Center for Food Safety, which is the first LRB system deployed to any university in the United States.

"The LRB system allows us to pinpoint specific bacteria faster than any other current methods," said Litmus Rapid-B president Ted Moskal. "Ultimately, this allows for earlier detection and management of food contamination inside the processing plant."

Moskal added that this is a win/win for the food processors and the public — less risk of exposure to the public, less product loss for the processors.

Steven C. Ricke, Center for Food Safety director, said, "Developing collaborative relationships with commercial partners such as Litmus Rapid-B really enhances the Center's ability to more closely interface with the food industry to solve not only current food safety issues

This allows for earlier detection and management of food contamination inside the processing plant.



Personnel from the UA Center for Food Safety (CFS) and Litmus Rapid-B met recently in a food science laboratory at the Fayetteville campus. From left are Robert Story, CFS program specialist; Ok Kyung Koo, CFS postdoctoral associate; Melinda Miller, Litmus Rapid-B staff scientist; Steven C. Ricke, CFS director; and Brian Umberson, Litmus Rapid-B sales and marketing manager.

but develop solutions for potential issues before they become a major problem."

LRB developed the system in conjunction with scientists at the National Center for Toxicological Research, an agency of the Food and Drug Administration in Jefferson, Ark.

"Our partnership with Litmus Rapid-B could advance research and development efforts for the CFS and our industry partners as well as create new protocols for maintaining clean processing environments," Ricke said.

The goal of the collaborative research effort is to provide the quickest and most accurate data to develop bacterial controls that protect consumers from sickness and death. ■

K-State to Host USDA Child Nutrition Food Safety Research Center

Agriculture Secretary Tom Vilsack has announced that Kansas State University was selected to establish the Center of Excellence for Food Safety Research in Child Nutrition Programs. The center will provide science-based support to improve the safety of foods provided through the USDA Food and Nutrition Service (FNS) nutrition assistance programs, particularly those served in schools and child care settings.

“Nothing is more important than the health and well-being of our nation’s children, and we must do everything we can to ensure that kids are being served safe, high quality meals,” said Vilsack. “The Center of Excellence will provide research on important topics such as produce safety and evaluation of school food safety programs.”

The Center of Excellence will provide a new and holistic research approach to determine how new initiatives, such as farm-to-school purchasing and school gardens, and emerging science affect food safety in FNS school and child-care programs. A multidisciplinary approach, including both basic and applied research, will draw expertise from fields such as foodservice management, food safety, food microbiology, agricultural production, education and the social sciences. The center will be funded with a two-year, \$1.6 million grant and will open as soon as the grant is awarded.

“We are excited about this new opportunity to support research focused on the unique food safety aspects of our programs,” said Kevin Concannon, USDA undersecretary for food, nutrition and consumer services. “Research conducted by the center will provide important information that we can use to improve programs and to develop education and training opportunities for school nutrition and child care employees. Kansas State University has a long history of research and education related to food service management and will provide excellent

leadership for school and child care food safety research.”

Many of the individuals served in FNS nutrition assistance programs are children, who are vulnerable to foodborne illness. To address this, USDA has put a number of initiatives in place to promote food safety for our children. In partnership with the Agriculture Marketing Service, FNS also conducts Produce Safety University, a series of week-long workshops focusing on

safe handling of fresh produce by school nutrition directors.

The National School Lunch Program is provided in more than 101,000 public and non-profit private schools and residential child care institutions, serving more than 31 million children each day. About 3.2 million children and 112,000 adults are served daily through the Child and Adult Care Food Program. ■

Rapid Methods Workshop Set for July at K-State

Kansas State University will present the 31st annual Rapid Methods in Automation and Microbiology workshop and symposium July 15-21. Sessions will be held at the Clarion Hotel, 530 Richards Drive, in Manhattan, Kan., and on the K-State campus.

This workshop will focus on the practical application of conventional and new commercial systems of rapid identification of microorganisms from medical specimens, foods, water and the environment. Workshop participants will receive eight days of intensive theoretical and hands-on training in microbiological automation under the direction of Daniel Y.C. Fung, a K-State food science professor, internationally respected expert in the field and a longtime principal investigator for Food Safety Consortium projects.

Two mini-symposia are included as an integral part of the workshop. The Rapid Methods mini-symposium is conducted the first two days of the workshop and features lectures, industry exhibits and a scientific poster competition. The National Alliance for Food Safety and Security mini-symposium held later in the week highlights original research work as well as summaries of key developments in nanotechnology, biosensors, infrared sensors, bioluminescence, immunomagnetic capture, immuno chemical methods, phage displacement and protein-based microarray.

Previous participants, numbering about 4,000 scientists since the first workshop in 1981, have come from 46 states and 60 countries. Since 1990, 35 internationally known scientists have been designated as Distinguished Fellows. Since 1987, more than 50 outstanding graduate students and scholars have been named Fellows.

Registration information is available at <http://www.dce.k-state.edu/conf/rapidmethods/>. ■

Johns Hopkins Researcher Explains Collaboration With UA on MTB, PTB

Just like it's been said for a long time, traveling to national conferences actually does bring back tangible results. An encounter a few years ago over a poster session led to a collaboration that has proven effective against two tuberculosis strains that have been deadly to ruminants.

It began at the 2007 annual meeting of the American Society for Microbiology, where Vesela Chelova, who was then a post-doctoral associate at the Center for Food Safety in the University of Arkansas Division of Agriculture, met Nicole Parrish, associate director of clinical mycobacteriology at the Johns Hopkins Hospital and University. Prompted by the poster before them, they began discussing tuberculosis strains. Chelova's interest was from the standpoint of animals, and Parrish's interest was oriented toward humans, but they soon began to see there could be common solutions.

During a visit to the Center for



Nicole Parrish

Food Safety in February, Parrish explained the research progress that has resulted since that meeting at ASM.

After learning about the Arkansas food science research on citrus, Parrish contacted Phil Crandall, professor of food science at the U of A. She then collaborated in experiments on the effects of Valencia orange oil against aerobically-

grown *Mycobacterium tuberculosis* (MTB). The Valencia treatments proved to be effective.

The research team also studied *M. paratuberculosis* (PTB), a related species of *Mycobacterium*.

MTB is one of the causative agents for the 2 billion cases of tuberculosis infections that were estimated to have arisen in 2009, Parrish said. Among those cases, MTB's

infections also causes Johne's disease, a fatal gastrointestinal disease in cattle that causes chronic wasting of cattle and other ruminants which can lead to the need to kill a herd. Johne's disease costs the United States about \$1.5 billion a year.

Parrish explained that the antimicrobial effects of essential citrus oils have been found to be effective against MTB. Her collaboration with the Arkansas scientists went on to find that all strains of MTB and PTB were

susceptible to the high concentrations of orange oil that were tested, with the Valencia orange oil providing the decisive results.

Additional studies are planned to further characterize the mechanism of action of these oils against the *Mycobacteria* in an

effort to find new drugs and drug targets for these diseases in humans and animals, Parrish said. ■

MTB is one of the causative agents for the 2 billion cases of tuberculosis infections that were estimated to have arisen in 2009.

OFPA Hears of Progress and Problems in Food Safety

Standards for food safety plans, the nation's new food safety law, product fraud and agriterrorism highlighted the educational presentations in April at the annual Ozark Food Processors Association Convention and Exposition in Springdale, Ark.

The Global Food Safety Initiative reviews food safety schemes and encourages retailers, food service and manufacturers to choose from those plans, said Rena Pierami, vice president of auditing at Silliker, Inc. By benchmarking these standards, GFSI promotes a vision of "once certified, accepted everywhere."

GFSI seeks to reduce food safety risks and manage risks through certification of industrial food safety schemes.

At companies using food safety plans built from commonly recognized benchmarks, "when something does break, it enables us to go in and find what caused it," Pierami explained. Auditors from the GFSI examine the approved schemes, which are then adopted by certified suppliers.

In the United States, the Food Safety Modernization Act went into effect early this year but its full effects won't be known for years to come as the

regulatory process begins implementing its provisions, said Harrison Pittman, director of the National Agricultural Law Center at the University of Arkansas.

The new law, which Pittman described as shifting policy from reacting to food safety problems to preventing them, amends the 1930s law that has governed the federal Food and Drug Administration. It does not affect areas of meat and poultry that are regulated by the U.S. Department of Agriculture.

In addition to implementing the law through the development of agency

[\(Continued on page 6\)](#)

OFPA Hears of Progress... (Continued from page 4)

rules and regulations, which Pittman said “is intended to be a long-term process,” the law must also be funded before its provisions can be effective. Meanwhile, the law mandates the FDA to establish comprehensive risk-based and prevention-based controls across the food supply chain. Food processing facilities must write plans that show areas for preventing pathogenic contamination, Pittman said.

Other provisions of the law include requirements that high-risk facilities must be inspected within five years of the law’s enactment. It also allows FDA to mandate a processor to recall contaminated food, a contrast from earlier law that permitted companies to voluntarily recall products but that didn’t give the government the authority to require recalls.

Pittman added that food importers must now verify that their foreign suppliers have implemented adequate preventive controls to keep food safe. Foreign facilities that export food to the United States must register with the FDA every two years.

The Grocery Manufacturers Association recently led a study of “economic adulteration” of food products, which could become a serious health and economic issue, said Stefan Ehling, an analytic chemist for GMA. Economic adulteration includes the fraudulent addition of unapproved enhancements to products, mislabeling, dilution of products and counterfeit labeling. Ehling said such adulteration can be done by anyone with access to the process starting with the producer. The solution is for processors to verify all the sources within their supply chains. Ehling said the FDA has implemented a program called PREDICT (Predictive Risk-based Evaluation for Dynamic Import Compliance Targeting) to score the level of risk associated with imported products that could have been economically adulterated.

Agriterrorism — intentional criminal acts on the food system and agricultural industry — would be easier to cause in the United States than people might think, said Dustan Clark, a U of A Extension poultry health veterinarian. American agriculture is vulnerable through points

of animal movement, animal production methods and crop destruction.

Diseases from foreign animals would be efficient agents for agriterrorism. The transfer of those diseases to American livestock could be accomplished through low-cost and low-technology means that would be difficult to trace, Clark said. Results could be devastating, Clark noted as he cited the deaths of 10 million animals from foot-and-mouth disease in the United Kingdom. An FMD outbreak in the United States would take five days to be detected, would spread to 40 states within 30 days and could result in the loss of 23 million animals, Clark said.

Avian influenza can have similar impact on poultry. Clark said the accidental release of the H7N1 virus in the Netherlands in 2003 led to the deaths of 28 million birds.

Mark Cochran, U of A vice president for agriculture, welcomed the audience to the convention and commended OFPA for its partnership with the university in research efforts and support for scholarships.

The OFPA convention opened April 5 with its annual golf tournament held at Shadow Valley Country Club in Rogers. Eighty-two golfers played in the event with proceeds benefiting the OFPA scholarship fund. The day’s activities included U of A food science students’ research poster competition. Scholarship recipients and poster competition winners were recognized at that evening’s banquet. Scholarships sponsored by OFPA and its members were awarded to 15 students.

The OFPA Exposition this year attracted 64 exhibitors with more than 300 people attending. ■

Papers & Presentations

Irene Wesley, Iowa State, retired in April after 25 years with the National Animal Disease Center, a unit of the U. S. Department of Agriculture Agricultural Research Service in Ames. As an early member of the Food Safety Consortium, she advised FSC-supported graduate students and post-docs, and was the ARS representative to the FSC Steering Committee. She has published more than 100 scientific reports, has authored book chapters and presented her research to national and international audiences. She is a member of the American Academy of Microbiology and former member of the International Taxonomy Committee for *Campylobacter*, *Helicobacter* and Related Organisms. She is on the editorial boards for *Applied and Environmental Microbiology* and the *Journal of Food Protection* and has reviewed grants submitted to the USDA, NIH and private industry. In May 2005, she was appointed by the secretary of agriculture to the National Advisory Committee on Microbiological Criteria for Foods.

Catherine Strohbehn, Iowa State, recently delivered presentations on “Reported Food Defense Measures Practices in Schools in the United States” and “Organizational Climate for Promotion of Safe Food Handling Practices: Development and Validation of Measures in Food Service Organization” at the Graduate Student Research Conference in Hospitality and Tourism in Houston, “Food Safety Assignments to Facilitate Learning: How Future Managers Can Motivate Employees to Follow SafeFood Practices” at the Food Service Management Education Council meeting in Oxford, Miss., and “Motivate Your Staff to Follow SafeFood Practices” at the Regional National Association College and University Food Services meeting in Ames, Iowa. She also delivered seven workshops around Iowa on “Implementing Food Safety Practices on the Farm.”

Curtis Kastner, Kansas State, delivered a presentation on “Foodborne Zoonotic Diseases” in February at the International Conference on Emerging Zoonoses at Cancun, Mexico. ■

Food Safety Digest

by Dave Edmark

Irradiation has once again been proclaimed safe, this time by the European Food Safety Authority. *Quality Assurance and Food Safety* magazine reported online in April that two EFSA panels examined the efficacy and microbiological safety of irradiation and the risks that could arise from the formation of several chemical substances through food irradiation. They found no irradiation-linked microbiological risks to the consumer.

“The panels recommend that the practice of irradiation, although effective, should be considered only as one of several processes which can reduce the presence of pathogens in food,” the magazine said. “They say irradiation should be a part of an integrated food safety management program to protect consumers, which includes good agricultural, manufacturing and hygienic practices.”



Back in North America, the *Canadian Medical Association Journal* criticized the nation’s food safety system in April for “major failings” in tracking foodborne illnesses. *The Globe and Mail* of Toronto reported that the CMA cited “inadequate surveillance systems” and the lack of a national farm-to-fork traceability system. The newspaper quoted Rick Holley, a University of Manitoba food microbiology professor, as saying Canada’s system for tracing outbreaks is insufficient.

“I hate to say that food safety in Canada is an accident, but the more I look at the system the more I think it’s likely to be the case more often than not,” said Holley, who is a former member of the Canadian Food Inspection Agency’s academic advisory board. “We’re strapped in terms of our ability to know what it is that causes us to become ill.”

Ron Doering, a former CFIA director, told the newspaper that the system could be improved but that it’s better off than Holley described. “I’m not aware of any system anywhere in the world that’s better than ours on public health reporting for foodborne illness,” Doering said. “It doesn’t mean it’s perfect. There’s no zero risk. But I’m not aware of any study that demonstrates in any persuasive way that any country has a better food inspection system than Canada.”



The U.S. Department of Agriculture has ordered beef, poultry and pork producers to wait for the government to test their products for pathogens before putting those products on sale in the stores. ABC News reported in April that the major food processors generally support the move but smaller processors are more skeptical.

ABC said producers have previously been able to ship raw cuts of potentially contaminated meat and chicken to market before test results were in. In some cases, foodborne disease outbreaks occurred.

Major producers such as Tyson Foods and Cargill support the new USDA rule. “We’ve had test-and-hold procedures in place at our plants for about 10 years,” said Tyson spokesman Gary Mickelson. “While we don’t typically favor more government regulation, we believe it makes sense in this case to mandate ‘test and hold’ for the whole industry.”

The American Meat Institute also supported the new policy, but a spokeswoman for the group noted that some smaller companies are opposed. “It’s challenging for some companies that are small or very small producers because they might not have the capacity to hold the product, said Janet Riley of AMI.



A recent wave of more food contamination outbreaks in China has prompted *The Wall Street Journal’s* China Real Time Report blog to ask why is China having such trouble making its food safe? The blog quotes Lester Ross, an attorney at an American law firm in Beijing, as saying the drive to make money at any cost is influencing Chinese food processors. Ross explained that some companies use additives to cut overhead costs or boost profits without considering the effects those additives have on consumers. He proposed an advertising blitz to let people know the dangers of chemical additives in food. Meanwhile, the Ministry of Health is preparing to publicize its list of legal and illegal food additives. ■