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

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Food Safety a Statewide Endeavor in University of Arkansas System

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On any given day, an Arkansas county extension agent may get a phone call from someone wondering how long it's safe to keep food that's been in a refrigerator after the power has gone out. Elsewhere, a group of restaurant managers in the state may be receiving food safety training from extension personnel who provide the means for hospitality personnel to receive national certification.

Meanwhile, academic researchers are putting down the building blocks that ultimately lead to the food safety information those consumers and industry personnel need. The pursuit of food safety in the University of Arkansas System's Division of Agriculture is a diverse enterprise that includes microbiological laboratory research, teaching and dispensing of everyday practical advice.

The foundation of food safety efforts in Arkansas arguably is the Food Safety Consortium, a federally-funded research alliance in which the U of A System collaborates with Iowa State University and Kansas State University.

Michael Johnson, an emeritus professor of food science at the Fayetteville campus, has been with the FSC since funding for its work began in 1988 and from 1997 to 2005 coordinated and directed the Arkansas research

component of its work. The support for the FSC's work from a congressional special grant to the U.S. Department of Agriculture has allowed researchers to look at important questions surrounding food contamination, Johnson said.

"The question we've been allowed to ask is how do we make a better tool to detect where a

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'How do we make a better tool to detect where a pathogen is?'

ISU Takes Protection of Organic Products to Next Level

Ready-to-eat, organic processed pork products look similar to conventionally cured meats. The organic versions have become popular among consumers as processors work to meet the demand. Although the natural and organic processed meat products are manufactured to simulate traditionally cured meat products as closely as possible, they're not exactly alike.

One key difference is that the traditionally cured pork products contain nitrate and nitrite. Nitrite is a chemical preservative that's effective in inhibiting the growth of certain foodborne pathogens. Under government regulations, the organic products are not permitted to contain preservatives such

as nitrate or nitrite. Instead, the organics may contain vegetable products that are considered natural ingredients and that contain high concentrations of nitrate, which is acceptable because it is from a natural source. The vegetable-based nitrate makes the organic pork product look and taste like it was traditionally cured.

The problem is that the organic products, lacking the directly-added nitrite, don't have the same level of built-in protection against pathogens such as Clostridium perfringens, Clostridium botulinum and Listeria monocytogenes.

"Consumers can't tell the difference, except that they're labeled natural and organic," said

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Joseph Sebranek

Food Safety a Statewide Endeavor...

(Continued from page 1)

pathogen is,” Johnson explained. “To the consumer, application is what it is about. But the basic research drives the applied research. The philosophy of this program is to keep an emphasis on developing new research tools that are needed and can be used to further enhance the safety of food.”

In Arkansas, the focus is on poultry products. Beef and pork issues are the focus in Kansas and Iowa, respectively. The poultry industry in Arkansas and elsewhere conducts food safety research to address short-term problems needing immediate solutions, while the university-based research has the luxury of doing more high-risk research to address long-term problems and basic questions facing the industry.

Control of the pathogen *Listeria* has been a focus of several FSC-funded research projects in Arkansas, particularly those of Johnson’s team. Two projects have focused on thermal processing to kill and use bacteriocins to prevent the growth of any survivors. Johnson collaborated with biological engineering professor Yanbin Li on ways to apply heat and thermal penetration to irregularly-shaped poultry pieces to assure the killing of *Listeria* and *Salmonella*.

“It’s all part of the same story,” Johnson said. “The questions we’ve been allowed to ask are how do we make a better tool to detect where a pathogen is and how to develop better methods to kill or limit growth of a pathogen to non-harmful levels.”

Industry understands the distinction between its work and academic research.

“University research is an important part of our quest to continually improve food safety,” said Richard Roop, senior vice president for science and regulatory affairs at Tyson Foods. “Third-party, independent researchers at the University of Arkansas provide valuable insight and creativity to the process. These qualities, combined with the practical experience and market knowledge industry provides, help ensure continued progress and leadership in the area of food safety.”

Some food safety research questions may not have an immediate payoff, noted Steven Ricke, director of the Division



of Agriculture’s Center for Food Safety, a research unit based at the Fayetteville campus. Ricke, who holds the university’s Donald “Buddy” Wray Chair in Food Safety, said emphasizing strong peer-reviewed science is the center’s key role.

“We want to understand the biology of the organisms so we can predict what they’re going to do,” Ricke said. “Then we can say we should be on alert for the appearance of a certain foodborne pathogen and not be surprised because we know what the organisms can do and what they can morph into.”

The answers to specific food safety problems in the processing plants may be rooted in larger questions that research centers explore, Ricke said. “The answers are often found by digging deep into the biology of the organisms and understanding them using every tool in the box and developing some new tools for understanding biological systems such as pathogens.”

The executives at the processing companies who deal with food safety for a living often find they need more education in this discipline. Many of them pursue the master of science degree in food safety through an online curriculum taught by Steven Seideman, a Division of Agriculture food processing specialist in the food science department.

“They are working for companies, they have mortgages, they have kids, and they will never go back to college — but they will go online,” said Seideman, who also supervises short-term workshops covering food safety procedures for industry personnel.

The master’s students may already work in quality control at their food processing companies, some having been on the job for 10 years. They may be middle management people or new personnel looking for an opportunity to advance, or they may simply want more background about what they’ve learned on the job.

“A lot of them have been doing these things, but they didn’t know why,” Seideman said. “We’re adding the why.”

Seideman pointed to the food law course taught as part of the master’s program. Some students’ professional responsibilities might not have required much knowledge of that field until recently, and they found that although they know some regulations, they didn’t know the law’s fundamentals. A semester’s study puts it into a different perspective.

“We’re grooming them for positions so someday they may be vice presidents for food safety, so they’d better know quite a bit about food safety law or epidemiology,” he said.

At the restaurant level, many managers learn how to serve food safely in their establishments using ServSafe, a certification program prepared by the National Restaurant Association Educational Foundation and delivered through extension training programs.

“It covers the basics from safe food handling, how to purchase food, how to transport it, how it should be received, how it should be inspected, how to store it and how to cook it to proper temperatures,” said Denise Brochetti, assistant professor of nutrition.

Brochetti said extension personnel also work with child care centers and senior centers, which is especially important because children and the elderly are more susceptible to developing foodborne illness than other age groups when exposed to contaminated food.

Working with consumers at the local level is an ongoing process, Brochetti said. “You teach them something about how to handle food safely, but all of a sudden it comes holiday time, and they need to know how to prepare a turkey safely. I think that’s one reason it’s good to have the agents with the knowledge and skills needed to address consumer concerns like these.” ■

ISU Takes Protection...*(Continued from page 1)*

There is a way to use natural ingredients to fight the potential of pathogenic contamination in organic products to make up for what nitrite isn't present to do.

Joseph Sebranek, an Iowa State University food science professor who is researching the case for the Food Safety Consortium. "From the standpoint of consumers, if they have a natural organic hot dog, it looks the same. The issue is if consumers expect that product to be identical in terms of handling requirements and refrigeration, and if they happen to do some temperature abuse, there is going to be more potential for problems to develop."

Sebranek said his research team's analysis has determined that naturally occurring nitrate is not present in the organic products at as high a concentration as the nitrite preservative is in traditionally cured products. But the level of concentration isn't the only factor that affects the product's ability to fight off pathogens. The researchers are reviewing what other formulations in the products could have an effect.

The research has found that there is a way to use natural ingredients to fight the potential of pathogenic contamination in organic products to make up for what nitrite isn't present to do. Natural vinegar, lactate and lemon powder have recently become commercially available for use as natural preservatives in foods. Sebranek's group tested their effectiveness against the pathogens and found them to be effective against *L. monocytogenes* and *C. perfringens*, although not to the extent that nitrite is effective in traditionally cured products.

More remains to be explored. Sebranek's research group is studying other natural antimicrobial ingredients to determine their effectiveness against pathogens in organic processed meat products. ■

Fresh Out of School, He's the Plant Food Safety Manager

Erik Friedly completed a master of science degree in food science in 2007 at the University of Arkansas. By February 2008 he had begun work as food safety manager for the Land O' Frost plant in Searcy, Ark., where ready-to-eat lunch meats are processed. He found there was plenty to do.

Friedly told current students at a UA Food Science Department seminar in September what it's like to take on that kind of major responsibility right after finishing school.

As a food safety manager for the plant, Friedly said he's responsible "to ensure the food is free of all chemical, biological and physical hazards. I lead teams in construction process control and facility design. I manage shelf life evaluation, a non-pathogen microbiology lab that interprets microbiological data for Land O' Frost's Arkansas and Kentucky plants."



Erik Friedly

There's more. He also identifies and implements procedures to control high-risk situations. A drain backup can happen, or packaging equipment may need to be moved carefully. In a plant where the raw product and the cooked product must be maintained in separate areas, it's necessary to closely regulate what moves between those areas and how items are transferred between them.

During the course of a year, Friedly and other staffers used a large portion of their workdays preparing for a Safe Quality Foods (SQF) Audit to attain a Level 3 certification. Wal-Mart requires that its food product suppliers, such as Land O' Frost, pass the audit to be allowed to continue to selling in its stores.

Friedly advised that in addition to having a solid food science background, students going into the industry should take courses in management, leadership and communication skills. A solid understanding of process control statistics would benefit any prospective job seeker. All are important in accomplishing his tasks as a food safety manager, he said.

Friedly finished his talk to the students late that afternoon at the university, but he couldn't linger on campus. He had a three-hour drive back to Searcy that evening where he needed to be present to check on things at the plant's third shift. ■

AAFP Holds First Educational Conference, Honors Johnson

The newly chartered Arkansas Association for Food Protection (AAFP) started its future in October by offering a tribute to the past decades of work by Michael Johnson, a University of Arkansas emeritus professor of food science who retired this summer. The AAFP, an affiliate of the International Association for Food Protection, recognized Johnson at a dinner during its first educational conference and announced the establishment of a scholarship in Johnson's name to be awarded to graduate students in food safety and food microbiology.

Johnson, who joined the UA faculty in 1984, also served as research coordinator for the UA component of the Food Safety Consortium.

The AAFP conference, hosted at Tyson Foods headquarters in Springdale, Ark., attracted nearly 100 participants from academia, industry and government. The event featured a full day of presentations by several speakers from around the nation on the theme of "Retail Food Safety — A Catalyst for Change." A half day was devoted to presentations by UA researchers for the Food Safety Consortium who discussed their current projects, plus presentations from the FSC research coordinators at Iowa State University and Kansas State University who summarized the work on their campuses.

Johnson was honored by testimonials from colleagues and former graduate students. In his remarks to the audience, Johnson said mentors should direct their time to people who are working their way up. This "spirit of investing" prepares the next generation of researchers to pass their skills along to future students, he said. He advised researchers to be proactive in food protection issues and to "take what works for you and pass it on." ■



The Arkansas Association for Food Protection received its charter during the annual conference of the International Association for Food Protection. The new affiliate held a major educational conference Oct. 8-9 at Tyson Foods in Springdale. From left are Mike Sostrin of Walmart, AAFP president; Hillary Hagan of Tyson Foods, AAFP vice president; Michael Johnson, UA emeritus professor of food science; Steven Ricke, director of the UA Center for Food Safety and AAFP president-elect; Scott Stillwell of Tyson Foods and AAFP treasurer; and John Marcy, UA Extension food scientist.



AAFP president Mike Sostrin (left) presents plaque to UA emeritus professor Michael Johnson.

Using Food Safety Resources, Lawyer Probes Cases for Clients

William Marler gets plenty of calls from people who've had a foodborne illness and want him to represent them in a lawsuit. But it's not necessarily easy to become his client.

"We need to quickly and reliably recognize unsupportable claims," Marler said during a lecture to a class in September at the University of Arkansas School of Law. Marler, an attorney with the Marler Clark firm in Seattle, is a renowned food safety lawyer who has secured more than \$300 million for his clients in cases stemming from foodborne illness. In the early 1990s he won a \$15.6 million settlement for a child seriously injured in an *E. coli* outbreak at Jack in the Box restaurants in the Pacific Northwest.



William Marler

Marler's firm does the scientific research first by doing due diligence to see if a potential client's symptoms match the symptoms known to be associated with particular pathogens. His team checks the suspected pathogen's incubation period before an illness develops. The investigators perform epidemiological assessments by reviewing the time and place of a possible incident of contaminated food and whether it could be part of a larger outbreak. They examine information about a victim's medical attention by reviewing available records from health care providers.

Marler also checks with the local health department "for the most persuasive evidence" to determine if his firm should take a case. If a restaurant is suspected as the source of contamination, Marler seeks records of its previous inspections to look for any history of improper cooking or sanitation procedures.

Health department records can provide important clues in some cases. Marler told of an incident in which school children who ate gelatin had become ill from *E. coli*. A health department report revealed that the gelatin had been in a cafeteria refrigerator and had apparently become contaminated by juices dripping from raw meat on the shelf above.

Marler noted that in civil litigation, strict liability rests on who is actually a food manufacturer with the legal standard focusing on the product rather than its retail seller.

"If they manufacture a product that causes someone to be sick, they are going to pay if they get caught," Marler said. "Public policy is to bend in favor of the victim and not the manufacturer."

Strict liability, Marler explained, puts pressure on manufacturers who can correct the problem at hand. It puts the cost of verdicts and settlements on those who profit from the product and creates the incentive not to let a problem happen again, he said.

Retailers and non-manufacturers are excluded from strict liability because the law distinguishes between those with actual control over a product and those who serve as a conduit, Marler said.

Marler's visit to the UA included meetings with students in its master of laws degree program in agricultural and food law. He also met with the staff of the *Journal of Food Law and Policy*, which is published at the law school, and with the staff of the National Agricultural Law Center that is based at the school. ■

KSU Frontier Students Visit U.S.-Mexico Border

Kansas State University students had an opportunity to learn about cross-border issues while on a field trip in May to the U.S.-Mexico border. A combination of 12 K-State undergraduate and graduate students went to destinations related to food safety, food defense and food security in Las Cruces, N.M., and El Paso, Texas. The trip was accommodated through the Frontier program, which is supported by both K-State and New Mexico State University, and which covers the historical studies of border security, food security and trade policy.

The trip began on the New Mexico State campus where the Frontier faculty and students from both universities delivered research presentations and a student panel. The K-State students also toured laboratories at NMSU. The trip continued with a briefing by a special agent at the El Paso Intelligence Center, Fort Bliss, Texas, and a visit to the Santa Teresa Port of Entry and cattle crossing site, where live animals are inspected prior to importation into the U.S.

Steve Toburen, program coordinator for Frontier Interdisciplinary eXperiences, said the experience is important for the students' future careers. "This enhances their education when it's time to find a job," he said. "They may be located in an area bordering Canada or Mexico. Or, if something food safety related comes across the border, regardless of their geographic location, they will need knowledge and training to deal with that."

The Frontier program is funded by the National Center for Food Protection and Defense and the National Center for Border Security and Immigration. ■

After Outbreak, U.K. Firm Advises Top-Level Food Safety Commitment

Executives at Cadbury Schweppes, the British confectionary maker, believe food safety requires a top-level company commitment with outside perspective and expert advice. They learned the hard way a few years ago.

“Complacency hurts,” said Jeff Banks, Cadbury Schweppes global director of food safety, during a panel discussion on food safety risks at the Institute of Food Technologists annual meeting in June in Anaheim, Calif. Banks told of his company’s experience in 2006 when British government regulators pinpointed the company as the source of a *Salmonella* montevideo outbreak that sickened 37 people.

Banks explained that the pathogen got into a dry chocolate crumb in its plant. The pathogen’s journey started through a dime-size hole in a leaky pipe at a poultry processing plant 50 miles away, got into the water and flowed down the river to the Cadbury factory that extracted water from the river.

The government fined Cadbury \$2 million. Other costs to the company added up to \$50 million following withdrawal of many of its products from the market, Banks said. He blamed mistakes in maintenance of Cadbury’s assets and in its cleaning and sanitation regimes.

The solution was to acknowledge that the company had a problem, Banks said. His advice was to not assume that good manufacturing practices are embedded but rather to verify them.

Challenge and validate the Hazard Analysis and Critical Control Point plans within a plant, he advised. “Food safety is the bond of trust between us and our customers.”

Recalls in recent years have caused a lower public confidence in the food supply, said Sid Jhaveri, director of global quality assurance for Starbucks Coffee Co. Jhaveri told the IFT panel that industry must take responsibility for self-governance in food safety matters and create awareness of food safety issues around the world. He called for food companies to require transparency from their suppliers by outlining expectations.

Food products should be safe and legal in all markets where a company does business, said Kurt Deibel, Pepsico Beverages and Foods vice president for quality and food safety. But he cautioned that being legal doesn’t necessarily mean being safe. Deibel noted that there is no need to operate at the lowest common denominator except when science validates that as an appropriate way. Full safety risk assessments are also necessary for items that aren’t regulated, he added. ■



Frank Yiannas

‘Culture of Food Safety’ Is Essential, Walmart Executive Says

It’s up to the leadership in the food industry to create a culture of food safety as well as to keep up with the science, says Frank Yiannas, Walmart’s vice president of food safety.

A food safety culture means maintaining “a continuous improvement model,” Yiannas said Oct. 26 during a talk at the University of Arkansas Division of Agriculture Center for Food Safety. “HACCP is a step in the right direction, but it’s not the final destination.”

The improvement model for a food safety culture sets high expectations for a company, Yiannas said. Employees are not simply “trained” in food safety — which tells them what to do — but they receive food safety “education” in which they learn why they are doing certain practices.

Reinforcement of appropriate food safety behavior in the industry is accomplished by emphasizing ways “to catch people doing things right” and telling them so instead of only waiting to catch them doing something wrong. Yiannas explained that this model of food safety leadership is distinct from mere food safety management.

The stakes are greater today than in recent years. “Food safety awareness is higher than it’s ever been,” Yiannas said. Meanwhile, public trust has declined in government, business and the perceived safety of the food supply.

Milestone outbreaks would happen only once a decade in earlier times; now such events might happen once a year. This has led to a race between the food safety community’s ability to prevent foodborne illness and its ability to detect foodborne pathogens. The beneficial aspect, Yiannas said, is that the pathogens that cause some outbreaks now are detectable but would not have been a decade ago. ■

Food Science Distance Education at KSU Assists With Careers

With about 75 students seeking bachelor's degrees and another 50 pursuing undergraduate certificates, Kansas State University's distance education program in food science is making its curriculum available to food industry employees and others who may not find it convenient to be a conventional on-campus student. With goals that are consistent with those of the Food Safety Consortium, KSU's program attracts a variety of students.

"They're usually looking for some way they can stay currently employed but keep working on their education," said Deanna Retzlaff, an assistant professor in the KSU Food Science Institute who coordinates the bachelor degree completion program. "Those students usually are working in the food industry but never finished a bachelor's degree, or have a degree in an unrelated field."

Online courses are offered in food processing fundamentals, microbiology, principles of HACCP (Hazard Analysis Critical Control Points), food defense, food safety and security, food safety risk analysis, quality assurance, and trade and agricultural health.

Distance education also applies to KSU's collaborative efforts with other universities. KSU is working with Purdue University and Indiana University to develop a national outreach program in food safety and food defense. KSU's role is to develop modules in a distance education format for graduate students and working professionals.

"We brought together stakeholders in food safety and defense and they developed key learning objectives and defined what knowledge and skill sets they thought would be needed for someone to be a food defense professional," said Kelly Getty, an assistant professor in the KSU Food Science Institute. "We're

looking at how to take that information and create courses and modules."

In September, KSU, Purdue University and Indiana University offered a two-day workshop for the food industry professionals and graduate students at Purdue. The workshop concluded with a simulation of a hypothetical food defense scenario where participants worked as teams to address an incident of internal plant contamination.

KSU also participates with three other universities to offer food safety and defense courses through distance education. KSU, Iowa State University, the University of Missouri and the University of Nebraska have formed an Education Alliance (AGIDEA, www.agidea.org) to offer graduate-level instruction. Of the nine courses offered through the alliance, five are based at KSU: multidisciplinary overview of food safety and security, food microbiology, principles of HACCP, principles of food defense for the food industry and rapid methods and automation in microbiology.

KSU is also working to develop a Graduate Certificate of Completion Program in Food Protection and Defense. The certificate would be offered jointly by several institutions and would demonstrate that

students attain core competencies in food defense. The National Center for Food Protection and Defense asked KSU to participate in the project. Abbey Nutsch, assistant professor in food safety and security at KSU, is serving as the lead principal investigator for this program.

"We have received funding to develop this program," Getty said. "We're trying to leverage some of the work with Purdue and then bring in other courses with the collaborators at the National Center." ■

'They're usually looking for some way they can stay currently employed but keep working on their education.'

FSIS, FDA Set Joint Meeting on Food Tracing System

A public meeting focused on improving the system for tracing of food products and ingredients that are causing illness outbreaks or presenting other risks to the health of consumers is set for Dec. 9-10 in Washington. The meeting will be presented jointly by the Food and Drug Administration and the U.S. Department of Agriculture Food Safety and Inspection Service.

The meeting will be held in the South Building in the Jefferson Auditorium, 1400 Independence Ave. SW in Washington. Those interested in attending the public meeting can pre-register online at http://www.fsis.usda.gov/News_&_Events/Meetings_&_Events/index.asp. Online pre-registration is preferred, but it is possible to pre-register by faxing registration information (including name, title, firm name, address, telephone number, e-mail address and fax number) to 1-877-366-3322 by Dec. 2.

Pre-registration is strongly encouraged for all persons who wish to attend the meeting, regardless of whether they also wish

to request an opportunity to make oral comments at the meeting on issues and questions described in the *Federal Register* notice.

Recognizing the need to increase the speed and accuracy of traceback investigations and trace-forward operations, both agencies are building on existing efforts by seeking public input that would help identify elements of effective food product tracing systems, identify current gaps in food product tracing, and suggest specific mechanisms for improvements.

The meeting is also intended to improve the ability of FDA and FSIS to use the information in such systems to respond to outbreaks more quickly by rapidly identifying the source of contamination during outbreaks of foodborne illness. Another goal is to improve the ability of all persons in the supply chain to more quickly identify food that is or could be contaminated and to remove it from the market during trace-forward operations. ■

Food Safety Digest

by Dave Edmark

Following a meeting with government officials in China, the U.S. Department of Agriculture has agreed to begin reviewing China's food safety laws and poultry plants. The Reuters news service reported in October that during the meetings China agreed to lift its ban on U.S. pork.

Congress recently lifted a U.S. ban on imports of Chinese poultry products. However, U.S. Agriculture Secretary Tom Vilsack said that Chinese Agriculture Minister Sun Zhengcai told him China's decision to lift its pork import ban was not connected to the U.S. decision to lift its poultry import ban.

U.S. pork exports to nations other than China accounted for \$560 million in trade in 2008. China has been a top buyer of chickens grown in the U.S., Reuters said.

The International Food Protection Training Institute (IFPTI) will receive \$1 million from the federal government to train state and local food safety inspectors. The funds are included in an appropriation passed recently by Congress. The institute opened earlier this year in Battle Creek, Mich., as a nonprofit organization to provide training that meets federal food safety standards.

Employees of state governments perform about half of inspections at food processing plants regulated by the federal Food and Drug Administration, IFPTI said, but the state food inspectors have not been required to receive federal training. IFPTI has trained more than 200 people

since July in collaboration with FDA and the Association of Food and Drug officials and plans to train more than 1,000 in 2010. It also plans to create university-based centers of excellence as part of a nationwide food safety system.

■ ■ ■

About 2.2 million people die each year in Africa from foodborne illnesses, a health official from Ghana said in October. Benjamin Kumbour, the Ghanaian deputy health minister, made his remarks at a food safety forum in the capital city of Accra. *The Ghanaian Times* reported that Kumbour said foodborne diseases and food security were his government's major concerns. Ghana is working with the World Health Organization to develop new food safety initiatives, he said.

■ ■ ■

The government of India plans to introduce new food safety regulations in 2010 to replace a 2006 food safety law, according to a report in November from the Press Trust of India.

"Under the existing provisions, small operators like street vendors are licensed," said P.I. Suvarathan, chair of the Food Safety and Standards Authority of India. "The new regulations will require them to undergo a simple registration process at the base level."

The new rules are designed to integrate the nation's licensing system. Food processing will be classified as high-risk products — such as meat, milk and edible oil — and low-risk products such as rice. ■

Papers & Presentations

Curtis Kastner, Kansas State, received the Distinguished Achievement in Agriculture national award from Gamma Sigma Delta, the honor society for agriculture.

Billy Hargis, Arkansas, received the Frank Perdue Live Poultry Food Safety Award from the Poultry Science Association. The award, which consists of \$2,500 and an engraved plaque, is given in recognition of devoted service and lasting contribution to the poultry industry and the PSA.

Billy Hargis and **Guillermo Tellez**, Arkansas, delivered presentations on "Bacillus Spores as Probiotics" in February at the Asociacion de Especialistas en Ciencias Avicolas de Mexico in Juriquilla, Mexico, and on "Advances in Probiotic Research" at the Asian VIV meeting in the spring in Bangkok, Thailand.

Catherine Strohbehn, Iowa State, delivered presentations on "What Food Safety Inspectors Need to Know" to the Food Service Inspectors of Yucatan, Mexico; on "Food Safety: Chefs' Responsibility" to the Culinaria Institute in Merida, Mexico; on "USDA Cooperative Extension Service and Community Healthy" to the University of Maya business and nutrition students in Merida, Mexico; and on "Chef's Role With Health and Safety" at Eastern University in Valladolid City, Mexico. ■