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Marcy Brings Industrial, Academic Experience to Center



John Marcy

John Marcy learned in his first academic job that "I'm not a state-paid consultant, I'm an educator for industry." He still adheres to that philosophy today as an Extension food scientist at the University of Arkansas System Division of Agriculture. His work on the Center of Excellence for Poultry Science faculty also includes a role as a member of the Center for Food Safety faculty.

Marcy came to the UA in 1993 from Virginia Tech University, where he had worked for a few years following several years in industry. While in Virginia, he occasionally worked with James Denton of Texas A&M University, who was soon hired as the first director of the UA Center of Excellence for Poultry Science. Denton then hired Marcy to join the UA staff.

"A lot of why I was hired was retail food safety," Marcy explained. "I had done a program in Virginia that partnered the Cooperative Extension county faculty with county health departments to do ServSafe training throughout the state."

His industry experience was extensive. He was a supervising food technologist at Stokely Van Camp's quality assurance department, a supervisor and quality assurance inspector at Swift and Co., a packaging superintendent at Jerome Foods and quality assurance director for Portion-Trol Foods (the manufacturing division of Denny's restaurants). Along the way he earned his master's and doctoral degrees in food technology from Iowa State University.

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Marcy Brings Industrial, Academic Experience to Center (Continued from page 1)

His biggest annual project is coordinating the two-day poultry processors educational workshop with the Arkansas Poultry Federation. It's in efforts such as this that he considers himself an educator for industry. "I get consulting-type questions but it's a very small part of my day," he said. "I really focus on education and how I can be of service. People always need to learn."

Marcy has conducted workshops that cover the details of Hazard Analysis Critical Control Points (HACCP), but attendance at those workshops has dropped to near zero levels. It's not from lack of interest but because industries are now offering the instruction to their employees rather than sending them elsewhere. Following HACCP procedures has been required of the meat and poultry industry since the mid-1990s under U.S. Department of Agriculture regulations. Now that the recently enacted Food Safety Modernization Act requires the same of industries regulated by the Food and Drug Administration, Marcy expects more activity with the HACCP course he teaches.

Marcy first became acquainted with HACCP as an undergraduate in 1972 as the FDA began basing canned food regulations in HACCP principles. "If we understand the hazards, if the raw materials are correct, if the process is in control, the end product has to be OK, there are no other options and you shouldn't have to test it," he explained. "That's a very simplistic way to put it but it was absolutely true 40 years ago and it's still true."

Marcy doesn't have a teaching appointment, but he guides the academic careers of graduate students. "I have 10 grad students, none of them on campus," he said. "Six of them are in the master's program online for food safety. I have four Ph.D. students, all in industry. They're holding down their obs. They can't quit their jobs to get their Ph.D. They're high up in their companies."

Crandall Honored as IFT Fellow

The Institute of Food Technologists has elected Philip Crandall, professor of food science in the University of Arkansas System Division of Agriculture, as one of this year's IFT Fellows. The IFT Fellow designation is an honor bestowed upon members by their peers, recognizing exemplary professionalism in the field of food science. IFT calls the award "a unique professional distinction conferred on individuals with outstanding and extraordinary qualifications and experience for their contributions to the food science and technology field."

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Professor Philip Crandall

Crandall is one of 15 IFT members chosen to receive the honor this year. In a given year, no more than 0.3 percent of the professional membership is eligible, and even fewer than that earn the honor. The IFT is an international association of professionals with more than 20,000 members.

“I am delighted to see Dr. Crandall being recognized by IFT for his contributions to the food science profession and our

professional organization,” said Jean-Francois Meullenet, head of the Department of Food Science. “This brings great distinction to the department and contributes very positively to our national reputation and visibility.”

Crandall has served since 1989 on the Department of Food Science faculty and also currently serves on the university's Center for Food Safety faculty. His research interests include thermal and non-thermal food processing, natural antimicrobials, benefit/risk assessment of poultry products and increasing the safety of ready-to-eat foods through employee education. He has also served as a faculty member at the University of Florida Citrus Research and Education Center. He holds a bachelor's degree from Kansas State University and master's and doctoral degrees from Purdue University.

Crandall and other 2012 IFT Fellows will be honored at the organization's annual meeting in June in Las Vegas.

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UA Personnel View NCTR, Discuss Strategic Collaboration and Future Partnerships



National Center for Toxicological Research in Jefferson, Ark.

Several faculty and students from the Center for Food Safety and the UA Department of Food Science spent the day at the Jefferson Laboratories of the Food and Drug Administration (FDA) in Jefferson, Ark., on April 11 to become better acquainted with FDA food safety research.

The National Center for Toxicological Research (NCTR), one of the seven federal FDA centers that are tasked to protect and promote the public health, and the Arkansas Regional Laboratory (ARL), an FDA Office of Regulatory Affairs' facility, reside at the Jefferson Labs campus.

About 30 scientists from Arkansas academic and public health institutions joined NCTR and NRL scientists for the event. The visit was the outgrowth of a food safety conference last fall sponsored by the Arkansas Research Alliance. NCTR scientists participated in that conference, and personnel from the UA and other agencies expressed interest in learning more about NCTR's food safety work.

"The visit was a great step taken forward among research entities in Arkansas that deal with food safety issues," said Jean-Francois Meullenet, UA Department of Food Science head. "I hope that these types of interactions lead to the formation of a food safety research alliance in our state. Such an alliance could have a great impact on both our competitiveness and effectiveness."

The visitors heard presentations by NCTR director William Slikker, ARL director Paul Norris and Thomas Flammang, NCTR senior advisor for science and policy, who discussed FDA's memorandum of understanding with the state. Steven Ricke, director of the UA

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Center for Food Safety, explained the university's resources and approaches that it takes to develop effective long term food safety research collaborations with the food industry as well as other institutions.

NCTR microbiologist Steven Foley reviewed NCTR's food safety research areas: food contaminants and byproducts, dietary supplements, rapid identification methodologies, microbial knowledge bases, microbial food safety/food defense, and antimicrobial resistance.

"NCTR is a vast treasure of research capability in Jefferson, Ark.," said Philip Crandall, UA professor of food science. "The level of scientists, equipment and laboratory facilities would rival any government or private facility anywhere. I look forward to expanded cooperation with this eminent team of scientists."

Brian Umberson, vice president of business development for Vivione Biosciences, LLC, which collaborates with the UA Center for Food Safety, also participated in the visit. He said the tour demonstrated NCTR's world class equipment, technology and researchers.

"We need to find a way to inventory resources from all the other research institutions in the state so that we can combine resources to drive more significant research, develop intellectual property, find complementary intellectual property and write more successful grant applications to drive more research funding," Umberson said.

The visit to NCTR included opportunities for participants to describe their research interests and identify potential opportunities for collaboration. A poster session followed along with guided tours of the laboratory campus.

Soybean Project Has Potential for Aiding Diabetics

People with diabetes might benefit from a three-year project involving UA food science personnel that will explore the properties of soybean seed coats and identify their potential new uses as marketable functional food ingredients. The Arkansas Soybean Promotion Board is funding the \$35,000-a-year project to be conducted by Sun-Ok Lee, assistant professor of food science; Pengyin Chen, professor of crop, soil and environmental sciences; Philip Crandall, professor of food science, and Steven Ricke, director of the UA Center for Food Safety.

The investigators noted that soybean seed coats are a good source of fiber and minerals that are used mostly in livestock and poultry feed but that the seed coat can be converted into value-added products with nutraceutical property.

"If consuming soy soluble fibers during a meal could be shown to decrease the amplitude of

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the blood glucose response following the meal, then this fiber could help diabetics control their blood sugar level," the investigators said in their proposal to the soybean board.

The project will begin with Chen screening, growing and selecting the best soybean breeding lines for recovering functional fibers from seed coats. Then Crandall will manufacture functional fiber from the seed coats for potential commercial scale production for human dietary use. Ricke will identify the beneficial *Lactobacillus* bacteria that grow well on soybean seed coat fiber. Lee will assess the soybean fibers' ability to control diabetes through blood glucose and insulin responses when consumed by test subjects.

Center, New Jersey Firm Probe Yeast as an Antibiotic Substitute



From left: Steven Ricke, director of the UA Center for Food Safety; Jim Borkan, president of Vernon Walden, Inc., and Kristen Gibson, a postdoctoral associate at the Center for Food Safety.

The overuse of antibiotics as a food animal growth promoter has prompted researchers to look for alternatives. The UA Center for Food Safety has joined with an ingredient firm in a project to determine the effectiveness of brewer's yeast as a different option.

Jim Borkan, president of the New Jersey-based firm Vernon Walden, Inc., visited Fayetteville in April

to meet with CFS director Steven Ricke about the research project's progress. Vernon Walden, Inc., and its German partner firm Leiber GmbH are funding the UA study that is assessing the effectiveness of two Leiber products as potential prebiotics and immune modulators in poultry.

Two Leiber yeast products, the Biolex MB40 and ExCel derived from brewer's yeast, are

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being included within chickens' diets, with a group receiving only the conventional feed being compared to other groups being fed one or the other prebiotics.

"We want to evaluate both their growth and their health, the pathogen loads and antibiotic resistance that we see in the pathogens that we see in these animals' food cycle," Borkan said. "This, potentially, I don't want to say is an exact replacement but certainly could be a very effective tool at helping lessen the use (of antibiotics) and improve the health of the birds during their life cycle."

The goal is to eliminate or at least lessen the use of antibiotics in animal feed and to find an acceptable substitute. Borkan noted that recent events could force the issue. In March, a U.S. District Court judge in Washington ordered the federal Food and Drug Administration to begin withdrawing approval of two antibiotics used in animals. The Associated Press reported that the FDA in 1977 issued an order banning the nonmedical use of antibiotics in farm animals unless drugmakers could show the drugs were safe, but the order has been unenforced for 35 years. The recent court ruling requires FDA to schedule a public hearing to allow drug companies a chance to show their drugs are safe.

Borkan explained that in the past 10 to 15 years scientists have learned more about why yeast appears to have "an extra boost that no one understood." It has been used as a feed additive for many years, although more in Europe than in the U.S.

The investigation of the products' applicability covers a broad range of issues, Borkan said. "It's also looking at the microbiological demographics of the gastrointestinal tract and really being able to delineate ultimately to our customers but also for industry and researchers exactly what's going on and what are the underlying mechanics of what we're seeing in these studies," he said.

Organic Food Safety Worthy of Closer Look, Authors Say

Consumers are willing to pay more for organic foods and they often believe that organic products are safer and healthier than conventionally grown foods. But a review of current research notes that organic production of food does not necessarily make it safer.

"There are no stricter food safety standards for organic foods; organic foods are required to meet the same food safety standards as nonorganic foods," said the authors of "Food Safety and Organic Meats," an article published in the 2012 edition of the *Annual Review of Food Science and Technology*. The authors are Ellen Van Loo, a former UA food science graduate student now studying at Ghent University in Belgium; Walid Alali, assistant professor at the

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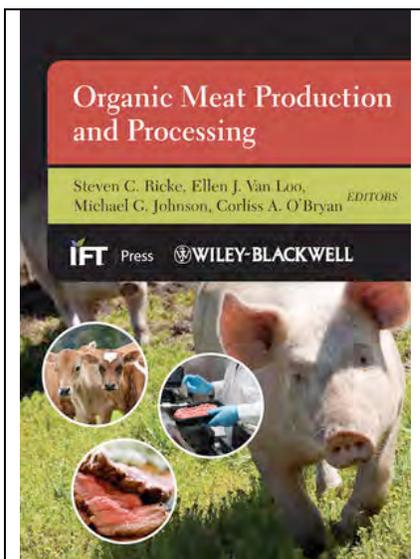
University of Georgia Center for Food Safety, and Steven Ricke, director of the UA Center for Food Safety.

"With increasing popularity in consumption of organic, free-range and natural meat, it is becoming more urgent to address the associated impacts on food safety and to further evaluate if the consumer perception of organic meat being safer than conventionally produced meat is warranted," the authors wrote. The article said despite the consumers' perception that organic products are safer, they may actually have a greater microbiological safety risk because of the animals' access to the outdoors, restrictions on therapeutic use of microbials and smaller processing facilities.

"In general, bacteria isolated from conventionally produced livestock or meats may have a higher likelihood of antimicrobial resistance compared with organically raised animals, and the use of antibiotics in food-producing animals may select for resistant bacteria," the authors said. They noted that the prevention of antimicrobial resistance in livestock and poultry production will likely be increasingly important in the future and that pathogens on organic meat are generally more sensitive to antimicrobial agents.

The authors also noted the need for more research comparing meat product safety in their respective production systems and the need to improve the production practices affecting organically raised animals.

Center for Food Safety Personnel Serve as Editors for Organic Meats Book Published by IFT/Wiley



Four researchers from the UA Center for Food Safety are the editors of *Organic Meat Production and Processing*, a 464-page hardcover book published by IFT Press. The editors are Steven Ricke, director of the Center for Food Safety; Ellen Van Loo, a former UA food science graduate student and now a doctoral researcher at Ghent University in Belgium; Michael Johnson, UA emeritus professor of food science, and Corliss O'Bryan, postdoctoral research associate at the Center for Food Safety.

"*Organic Meat Production and Processing* describes the challenges of production, processing and food safety of organic meat," according to a statement from IFT Press. "The editors and international collection of authors

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<i>Steven Ricke</i>	<i>Michael Johnson</i>	<i>Ellen Van Loo</i>	<i>Corliss O'Bryan</i>

explore the trends in organic meats and how the meat industry is impacted. Commencing with chapters on the economics, market and regulatory aspects of organic meats, coverage then extends to management issues for organically raised and processed meat animals. Processing, sensory and human health aspects are covered in detail, as are the incidences of foodborne pathogens in organic beef, swine, poultry and other organic meat species. The book concludes by describing pre-harvest control measures for assuring the safety of organic meats."

Organic food sales in the U.S. have increased each year in the past decade, rising from \$6.1 billion in 2000 to \$26.7 billion in 2010, according to the Organic Trade Association. In 2010, a survey by the American Meat Institute and the Food Marketing Institute showed that about 18 percent of all consumers purchased organic or natural meat in the previous three months. Conventional supermarkets, rather than natural and organic food stores are now the top outlets for organic meat sales.

The 24-chapter book is available to purchase for online viewing or for ordering a print copy at the Wiley Online Library at <http://bit.ly/L6dFj1>.

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Former UA CFS Postdoctorate Discusses Transition to Becoming New Faculty Member at Tennessee



Irene Hanning visits with Steven Ricke, director of the UA Center for Food Safety, during her recent return trip to Fayetteville.

A year after leaving the University of Arkansas to begin work as a University of Tennessee faculty member, Irene Hanning returned to Fayetteville for a few days in March and brought Food Science Department personnel up to date on her work as an assistant professor.

Hanning's career at Arkansas began as a graduate student in cell and molecular biology, in which she earned a doctorate. She then went to work in the Center for Food Safety as a postdoctoral associate in the laboratory of Center director Steven Ricke. She began her Tennessee job in January 2011 in the Department of Food

Science and Technology where she has a 100 percent research appointment.

"When I went to grad school, I figured out how to make the connection between the benchtop and the real world," Hanning said, referring to the five years that she was a quality microbiologist at Gerber Products Co. in Fort Smith before coming to the UA. At Tennessee, she works to make sure students working in her lab understand that connection.

Hanning supervises five students in her lab in Knoxville, where their research emphasizes foodborne illness and pathogenic bacteria, especially the virulence of *Campylobacter* and *Salmonella*. She also explores environmental effects on *Campylobacter*, next-generation sequencing applications, organic versus conventionally raised poultry, antimicrobials and packaging, fresh and organic produce and functional foods such as blackberry extracts.

Although she has a 100 percent research appointment, she has occasionally lectured on advanced food microbiology to animal science classes. Hanning said teaching presents good opportunities to recruit students for graduate school and laboratory jobs.

But as a full-time researcher, she finds herself responsible for an ongoing pursuit of grants to fund research efforts. "As long as you're creative, there are always opportunities for money," she said, noting that it is, however, a difficult market these days as many grant sources have cut their funding.

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In other respects, her first year on the faculty has been busy with duties besides her research and teaching. She has been interviewed on television to provide insight on food-related news, worked with farmers and industry, been a journal reviewer and editor, served on a faculty committee and worked as a consultant.

OFPA Explores Industry's Health Food Trend

The food industry is active in the current trend toward encouraging healthy eating, but "you can't tell people they need to cook healthier unless you give them the tools to do that," a Wal-Mart executive said at the Ozark Food Processors Association convention on April 4.

Joe Quinn, Wal-Mart senior director for issue management and strategic outreach, addressed the OFPA's 106th Annual Convention and Exposition that centered on the theme of "Healthy Food Trend: Keeping Your Products Competitive." He discussed the company's recent efforts to encourage better diets, such as the new "Great for You" icon that will begin appearing on some of Wal-Mart's in-house Great Value branded products this year. About 20 percent of its Great Value products that Wal-Mart determines to be eligible by meeting particular nutrition standards will carry the icon, which will be used in consumer education to encourage incremental changes in diet, Quinn said.

Quinn said Wal-Mart is also addressing nutrition issues by opening 275 to 300 stores in urban and rural "food deserts" – areas not served by grocery stores – between now and 2016. The company has also begun working with the "Sesame Street" television program to educate children about healthy food choices and has donated \$2.2 million to the Sesame Workshop for that purpose. Wal-Mart is also partnering with the American Heart Association to make heart-healthy recipes available to consumers.

Quinn offered a quote from Bill Simon, president and CEO of Wal-Mart U.S., who said, "No American family should have to choose between food that is good for them and food they can afford."

Food product developers seeking to make more nutritious offerings for children should consider what children like, how to improve snacks and how to produce balanced meals, said Jamie Baum, an assistant professor of food science at the University of Arkansas System Division of Agriculture. The industry can help by reducing sugars and sodium in products, removing trans fats, making decreased portion sizes and increasing the availability of plant-based proteins, she said. Baum also called on the industry to reduce advertisements of less healthy foods and increase access to healthy foods by making them more affordable.

"Parents want healthy foods that are nutritious and easy to prepare," she said. "Kids want foods that taste great."

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Baum cited statistics showing that 34 percent of American adults are obese, and 25 percent of that group was obese during childhood. Obesity prevalence in children has tripled since 1980. One-fifth of children eat six snacks a day. The chief sources of sugar in children's diets come from soda, energy and sports drinks, grain-based desserts and dairy desserts. Ninety percent of children older than 8 don't consume a recommended amount of vegetables, she said.

The images that children see play a role in their eating choices, Baum said, pointing to another statistic that 83 percent of food advertisements on children's television programs are for snack foods, fast foods and sweets.

Since 2000, Tyson Foods has launched initiatives to voluntarily label allergens in its products, reduce trans fats, update its nutrition guidelines and reduce products' sodium content. Molly Miller, a Tyson senior food technologist, said the sodium reduction effort demonstrated the issues that must be considered in addition to the nutritional aspect, such as the effects on a product's shelf life and the inhibition of pathogens.

Food product developers are faced with significant challenges, Miller continued, as they consider ingredients, costs, technology and regulatory issues. Among consumers, she said, "Taste always trumps nutrition."

Maureen Dolan, an assistant professor at Arkansas State University, explained current issues surrounding mislabeling of seafood products' nutritional contents. Following a flurry of national news coverage of the problem last year, Applied Food Technologies of Florida implemented a DNA barcoding technique to identify fish species. Proper labeling contributes to efforts to maintain high standards of the nation's food supply and consumer health, she said.

Mark Cochran, U of A System vice president for agriculture, welcomed the audience to the convention and noted the frequent occurrence of industry-backed research grants for food safety projects in the food science department led by its "internationally recognized faculty."

The OFPA convention opened April 3 with its annual golf tournament held at Shadow Valley Country Club in Rogers. A record 93 golfers played in the event with proceeds benefiting the OFPA scholarship fund. Scholarships sponsored by OFPA and its members were awarded to seven students. In addition, nine students competed in a scientific poster competition and four students participated in presentation sessions. The convention had 61 exhibitors and more than 300 attendees.

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Culture, Language Serve as Key Impacts in Food Safety Training



Nathan Jarvis (left) and Philip Crandall stand beside the research poster on food safety language and culture. Jarvis presented the poster during the April 11 visit by Center for Food Safety personnel to the National Center for Toxicological Research in Jefferson, Ark.

Many food service operations experience high rates of employee turnover. New employees are expected to learn all of the manufacturing skills in addition to proper food safety procedures. That's usually enough of a task in itself, but some employees have an additional hurdle of speaking another language as their native tongue plus a lifetime of cultural influences that run contrary to the new food safety procedures they are supposed to adopt.

"The primary challenge is that they bring to the workplace their cultural framework and they find it difficult to believe the science behind food safety education," said Nathan Jarvis, a doctoral student in the UA

Department of Food Science. His recent research into food safety culture and language has examined the most efficient way for managers to train their new employees.

"Their mom always prepared food a certain way and left it on the counter for so many hours and it was perfectly fine," he said. "Since they didn't perceive that they ever got sick on their mom's rules, now when they come to work at the restaurant they are less inclined to adhere to the food safety behaviors because they think it's always worked before."

Jarvis noted that language should be applied to food safety training in the contexts of whether the training materials are in the employees' native language and whether the concepts and behaviors are being addressed in culturally appropriate terms.

Food safety training must be relevant to their individual cultures so that their employees understand and accept the information, Jarvis said. Its principles must apply not only to food service but also to the home environment so that the students receive reinforcement. Repetition is the key because one-time training will not instill food safety fluency in these situations.

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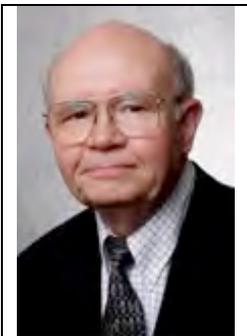
"Often, they'll get the initial training but when they actually get into the workplace, the workplace culture and atmosphere doesn't foster food safety," Jarvis said. "So what happens is that you compile their lack of understanding the language with the fact that the workplace doesn't reinforce safety with the fact that they are still enmeshed in their mother's teaching. So the behavior never happens."

Jarvis said industry is looking into how to teach food safety in native languages and translating materials into Spanish, Mandarin, Vietnamese and other languages. And, he said, the industry is learning the employees' native cultures to see if they need to be taught differently.

Jarvis said the UA is taking steps in that direction by using a USDA-funded project to train deli employees in proper food safety behavior at the pilot food processing plant.

Contribute to the Michael G. Johnson Endowed Fund in Food Science

The Arkansas Association for Food Protection has established the Michael G. Johnson Endowed Fund in Food Science at the University of Arkansas in honor of Dr. Michael G. Johnson, emeritus professor of food science. Johnson, who retired in 2009, joined the food science faculty in 1984. He served as research coordinator for the Arkansas component of the Food Safety Consortium.



Michael G. Johnson

When establishment of the scholarship was announced at an AAFP meeting, 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."

Donors may give to fund online by following these steps:

1. Go to the UA Office of Development online donor site at <https://onlinegiving.uark.edu>

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2. Complete the online donation form. At the drop-down menu for "About My Gift," select the line for "Other Department or Program."
3. In the box for "Other Department or Program," type in "Michael Johnson Endowed Fund in Food Science." Type your donation in the "Gift Amount" box.
4. After completing the information in the "About Me," "About My Spouse" and "About My Employer" categories, go to the "For Memorial/Honorary Gift" category. Under the choice of "This gift is being made:" select "In honor of" and type "Michael Johnson" on the box.
5. Leave blank the line for "Who should we notify of this gift?" The UA Office of Development will notify Dr. Johnson of donations to the fund.
6. Proceed with the credit card donation procedures.

To discuss major contributions, contact Blake Bard, director of development for the UA Dale Bumpers College of Agricultural, Food and Life Sciences, at bsbard@uark.edu or 479-575-2270.

Workshops at the UA Institute of Food Science and Engineering

Microbiological Laboratory Logistics and Fundamentals - This workshop will be held on several dates (May 22-24, June 12-14, July 10-12, August 14-16, September 11-13 and October 9-11, 2012). See http://www.uark.edu/ua/foodpro/Workshops/Micro_Lab.html

Better Process Control School -- There will be a regular Better Process Control School at Oklahoma State University May 21-24, 2012.

-- This 3.5-day workshop will be held the first week of November (Nov. 6-9, 2012) at the University of Arkansas. For more information and registration form, go to <http://www.uark.edu/depts/ifse/bpcsrev1.html>

Sensory Evaluation of Foods – This workshop will be held June 2012. For details and registration information, see http://www.uark.edu/ua/foodpro/Workshops/Sensory_Evaluation_Workshop.html

Food and Nutritional Labeling Workshop – This workshop will be held in August 2012 in Kansas City MO. Details will be available at a later date. For details, go to http://www.uark.edu/ua/foodpro/Workshops/Food_Labeling_Workshop.html

Food Protection Workshop - This workshop will be held in June 2013 in Fayetteville. It

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involves both Food Safety and Food Defense. For more details and registration, go to http://www.uark.edu/ua/foodpro/Workshops/Food_Safety_Defense_Workshop.html

The UA Center of Excellence for Poultry Science

CONTACT - Dr. John Marcy –Extension Food Scientist jmarcy@uark.edu

Culinary Arts for Food Technologists Series - The U of A CEPS offers a series of three 40-hour culinary arts classes in conjunction with the Research Chefs Association to fulfill the 120-hour requirement for Certified Culinary Scientist©. Each year we offer Culinary Arts Fundamentals, Advanced Culinary Arts and Baking Arts Fundamentals. Registration is through the U of A CEPS at <http://www.uark.edu/ua/culinary/>

GMPs, SOPs and HACCP - May 21-22, 2012 at the University of Arkansas. In association with Dr. Rich Linton, Ohio State University and Dr. James Denton, U of A Emeritus. Basic HACCP class meeting the regulatory requirements of FSIS.

Advanced HACCP - The U of A CEPS offers this program geared toward meat and poultry operations dealing with FSIS HACCP regulations in cooperation with Bob Galbraith of the HACCP Consulting Group. The Fall 2012 dates have not been set.

CFS Publications and Presentations

Publications

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