The Food Safety Consortium Newsletter

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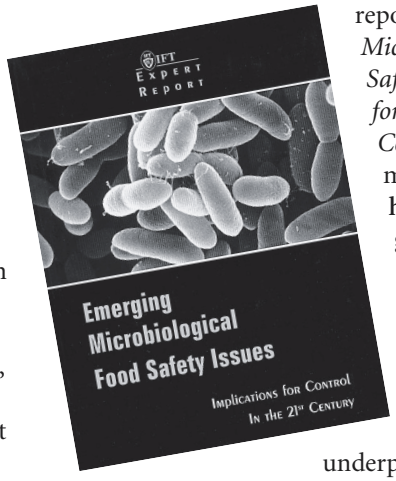
New Pathogens Will Keep Researchers Busy, IFT Says

Although scientists have made great strides in finding new ways to increase the safety of the nation's food supply, consumers should not expect the marketplace to become entirely free of dangerous organisms at all times. That is the conclusion announced by a team of scientists assembled by the Institute of Food Technologists (IFT). The panel released its report in February at the IFT's national convention in Atlanta.

Twenty-one scientists contributed to the report, headed by Morris Potter, the lead epidemiologist at the Food and Drug Administration's Center for Food Safety and Applied Nutrition. Jim Dickson, program director for the Food Safety Consortium at Iowa State University, was one of the panel members.



Copies of the 107-page report — titled *Emerging Microbiological Food Safety Issues: Implications for Control in the 21st Century* — and related materials are on line at **http://www.ift.org/govtrelations/microfs.**

"Scientific research has resulted in significant success in improving food safety, but the current science underpinning the safety of our food supply is not sufficient to protect us from all the emerging issues associated with the complexity of the food supply," the experts stated in the report's conclusion.

"The body of scientific knowledge must be further developed, with our research efforts carefully prioritized to yield the greatest benefit. Food safety and regulatory policies must be based on science and must be applied in a flexible manner to incorporate new information as it becomes available and to implement new technologies quickly. The food industry, regulatory agencies and allied professionals should develop partnerships to improve food safety management," according to the report.

The scientists further stated that the rates of certain foodborne diseases have

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Home Remedies for Food Safety Warrant a Second Look

The up side of the nation's emphasis on food safety is that more consumers are actively looking for ways to prevent foodborne contamination from making its way into their homes. The down side is that they can sometimes spend money on items that are not very effective.

For example, consumers can buy home ozonating units on the market to reduce contamination on the surfaces of raw food products. Food Safety Consortium researchers at Kansas State University advise that consumers could achieve equally effective results using tap water.

"You have to really know what you're doing to apply ozone in a manner that would be effective as a food antimicrobial," said Randall Phebus, a KSU food microbiology professor and Food Safety Consortium researcher. "You can't just assume that getting a little bit of ozone in the water with a home system is going to make remarkable changes in the safety of your product. Ozone has to be controlled and you have to know how you're maintaining the ozone in the water."

Randall Phebus

Ozone is defined as activated oxygen and can be a natural purifier to deter microorganisms that contaminate food. Water that has been ozonated has

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New Pathogens … *continued*

been driven down thanks to food manufacturers, consumers and regulatory programs. Regulatory policies should be based on science, the IFT team said, noting that such policies based on sampling and testing "may incorrectly imply an absence of pathogens, causing some individuals to assume that it is unnecessary to engage in proper food selection and handling practices."

Policies based on sampling and testing may incorrectly imply an absence of pathogens.

But the IFT said it was unlikely that the marketplace would be made always free of the presence of pathogenic microorganisms "given the characteristics of some foods, available technologies and our desire for year-round availability of a diverse array of foods."

While acknowledging that much progress has been made in minimizing contamination of animal carcasses during slaughter, the IFT scientists said the occasional presence of pathogens on meat and poultry carcasses is unavoidable. "Greater attention to preventing cross-contamination and undercooking may have more impact on the public's health than further reductions in the already small numbers of *E. coli* O157:H7 occasionally present in raw ground beef," the report's authors said.

The scientists also emphasized proper hygiene and sanitation in handling and preparing food, the use of appropriate methods of refrigeration and freezing and thorough cooking as effective ways to prevent foodborne illness. After the application of good management practices and Hazard Analysis and Critical Control Points provides safe foods, "the individuals preparing the food must use proper knowledge, attitudes, skills and practices to achieve food safety."

The food safety community must be prepared to respond to changes prompted by advances in science, which must be accomplished by "unfettered data sharing." Food safety systems must emphasize validation and verification of methods used to assure safety.

"A flexible, science-based approach that relies on all parties to fulfill their role is our best weapon against emerging microbiological food safety issues," the report concluded.

The report's separate sections address in depth the science of pathogenicity, humans as hosts of foodborne diseases, microbial ecology and foodborne disease, the application of science to food safety management and the next steps in food safety management. ■

Home Remedies … *continued*

been identified by scientists as a potential agent to prevent waterborne and foodborne illness. The food industry is looking at ozone as a means to reduce pathogenic bacteria and extend the shelf life of food.

Phebus' research team tested a home ozonating unit to determine its effectiveness in reducing the presence of three pathogens — *E. coli* O157:H7, *Salmonella typhimurium* and *Pseudomonas aeruginosa* — attached to meat and produce. The researchers examined chicken thighs, iceberg lettuce and apples that were inoculated with the pathogens and rinsed them with ozonated water and ordinary tap water.

"Both rinsing treatments significantly reduced each bacterial population when compared to the inoculated unwashed control," the researchers' report said. "However, the ability of ozonated water and tap water to inactivate *E. coli* O157:H7, *S. typhimurium* and *P. aeruginosa* was not different."

The results showed that ozone was more effective in inactivating pathogens on the surfaces of apples than it was with lettuce and chicken surfaces. But Phebus pointed out that the surface is not the main problem with apples.

"It's the stem and the organisms that actually get down inside the apple," he said. "So none of these wash systems will be effective. You can wash the surface but it doesn't make any difference."

The ability of ozonated water and tap water to inactivate bacteria was not different.

This does not necessarily mean that home ozonating units are useless, but several factors can determine whether one gets significantly better results than ordinary tap water provides. The bottom line is the particular ozone unit must be capable of producing enough ozonated water to get an effective ozone concentration to all food product surfaces for significant microbial decontamination to be achieved. Phebus noted that ozone can serve as a decontaminant for the food industry and that smaller meat rooms in retail stores may someday have portable units that will be effective in washing food surfaces.

"But I am also sure that we're going to have several fly-by-night companies trying to build these units and market them to your average Joe," he added.

KSU researchers are working with companies with considerable commercial experience in ozone application to develop food decontamination systems based on effective use of ozone.

"KSU and the Consortium are definitely going to be working with companies that make these systems to validate their effectiveness for food industry use," Phebus said. "I anticipate success in bringing effective technology to the market." ■

Food Safety Should Also Include Public Health, JIFSR Head Says

Protecting the public's health is the point of food safety efforts, and that concept is a key element of how Jerry Gillespie believes the food safety system should be viewed.

Food safety has traditionally been regarded as a "farm-to-table" project, but Gillespie wants to widen that continuum at each end.

"An integrated food safety 'environment-to-person' science-based approach is necessary to support the existing interdependent system," Gillespie said in the keynote address at the Institute of Food Technologists convention in February in Atlanta. Gillespie is director of the federal Joint Institute for Food Safety Research.

The environment portion at the front of the system includes air, water and soil, Gillespie said, and the endpoint should be the maintenance of humans' health and well being.

> *A food safety 'environment-to-person' science-based approach is necessary.*

"Too often we look at food safety as what's at the end of the table and not as what caregivers provide," Gillespie said. "We need to pay attention to public health systems and health delivery systems."

The changing world environment affects food safety because new priorities for the use of natural resources include non-agricultural uses and competition for use of water, he said.

Jerry Gillespie

Gillespie listed as current food safety successes achievements such as making the public aware of foodborne diseases, developing better foodborne disease and pathogen reporting, improving regulations, progress in international dialogue and improving the education of food handlers and consumers.

Gillespie explained that international travel and world trade have increased the chances of foreign diseases' introduction into the U.S. Globalization has also increased the danger of bioterrorist attacks on the food supply, animals and humans. Coordinated research efforts must be used to deal with the threat.

The Joint Institute for Food Safety Research was established in 1998 by the U.S. Department of Agriculture and the Department of Health and Human Services as an information nexus, Gillespie said. Its mandate is to assemble a food safety portfolio, coordinate planning and foster partnerships.

"There were gaps in sharing information available to the scientific community" prior to the institute's start, Gillespie said. The institute's work should improve food safety information so that decision making is improved, he added. ■

Kelly Johnston

OFPA Urged to Be Proactive

The U.S. food industry's top priority is maintaining the world's best food safety system, but it spends too much time "playing catch-up" on food safety questions, says a prominent industry official.

Kelly Johnston, executive vice president for government affairs of the National Food Processors Association, delivered his remarks to the Ozark Food Processors Association's 96th annual convention. The OFPA, in association with the University of Arkansas Institute of Food Science and Engineering, featured food safety as the theme of its convention and exposition March 26-27 in Springdale, Ark.

The NFPA has created a task force among its regional affiliates to improve food safety systems based on science and risk assessment, Johnston said.

He called on the industry to be more proactive in food safety issues because

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Report *from the* Coordinator

Gregory J. Weidemann

The Institute of Food Technologists recently released the product of 21 of its experts who investigated the current state of food safety in the U.S. An article elsewhere in this edition of *The Food Safety Consortium Newsletter* summarizes some of the findings and points readers to the web site where the full report can be downloaded (**http://www.ift.org/govtrelations/microfs**).

The report, *Emerging Microbiological Food Safety Issues: Implications for Control in the 21st Century*, serves many purposes in updating the food safety community as to the big picture around us and also as to the value of our research. It tells us that our best efforts won't totally eliminate food safety problems and that we have plenty of work ahead.

Take note of the report's opening statement: "The continued occurrence of foodborne illness is not evidence of the failure of our food safety system. In fact, many of our prevention and control efforts have been — and continue to be — highly effective. The U.S. food supply is arguably among the safest in the world, but significant foodborne illness continues to occur. Despite great strides in the area of microbiological food safety, much remains to be done."

The team of scientists that produced the report specifically pointed out that the overall matter of food safety is not a question of finding a solution but rather "a complex combination of factors that must be managed on a continual basis." That's a good definition of the focus of the food safety research performed in the FSC and elsewhere: finding ways to continually manage this continuing problem.

Food safety issues themselves change over the years. Today we are investigating pathogens that weren't known to us in previous decades. As we seek to bring under control today's pathogens, we do not know what microorganisms may face us in future years. That reality motivated the panel to get a handle on the long-term situation.

The panelists were charged with "identifying the factors that make a microorganism 'emerge' as an important foodborne pathogen and identifying mechanisms that use this knowledge to improve the safety of our food supply." The resulting report seeks to increase understanding of this scientific information that will influence public policy and research agendas.

The report elaborates on a couple of basic points.

- One is that a "trinity of factors" causes foodborne illness: the susceptibility of the human host, the pathogen and the environment in which they exist. Concentration on each of these factors' complex interactions with each other is a key to reducing foodborne illness.
- Current technologies and production methods cannot provide a food supply free of all pathogens, but small reductions in the impact of the factors can have substantial combined effect in reducing foodborne illness.

The report makes the case for the need for continued research: "A science-based food safety management framework should use food safety objectives to translate data about risk into achievable public policy goals."

That also happens to explain much of what the Food Safety Consortium is all about. ■

OFPA ... *continued*

consumer organizations "with a pseudo-science agenda are on the offensive."

While legislation in response to bioterrorism is being considered in Congress, Johnston noted, "we in the food industry are the front line in the battle against bioterrorism." There are, however, disagreements over how to fight the battle.

Johnston referred to the government's proposal presented to Congress last fall by Health and Human Services Secretary Tommy Thompson, which Johnston said would greatly increase the Food and Drug Administration's authority. The NFPA supports efforts to obtain more resources for FDA to fight bioterrorism, but it believes existing laws provide the necessary authority.

In October, Thompson proposed changing existing laws pertaining to imported foods. Thompson's letter to Congress said "new records maintenance and records inspection authorities would facilitate determination of the cause and scope of serious violations of food safety laws. FDA would have authority, during a public health emergency, to detain foods that presented a serious threat of serious illness or death."

Improve food safety systems based on science and risk assessment.

Johnston said such administrative detention authority would bring "unprecedented access to your company's records."

Johnston predicted that if another terrorist attack occurs, Congress would consider additional proposals such as authorizing the FDA and the U.S. Department of Agriculture to recall food products, federal licensing of food processing plants, mandating across the entire food chain the Hazard Analysis and Critical Control Point procedures now required of meat and poultry processors, closing of ports, labeling of foods containing allergens and the establishment of a single federal food safety agency. ■

FSIS Seeking Major Push on Bioterrorism

Protection of the food supply against intentional harm — essentially biosecurity — is one of the goals of the federal Food Safety and Inspection Service (FSIS).

"We're taking a multifaceted approach to biosecurity, which includes both short- and long-term strategies," said Paul Resweber, acting district manager of the FSIS field office in Springdale, Ark. Resweber, during a speech to the Ozark Food Processors Association convention in March in Springdale, explained the five goals that Elsa Murano, U.S. Department of Agriculture undersecretary for food safety, has set for FSIS.

Paul Resweber

Resweber said the Bush administration is proposing an allocation of $328 million in emergency funding to USDA to strengthen biosecurity-related programs, with FSIS receiving $15 million of that allocation for security upgrades and protection against bioterrorism.

The FSIS funds will be allocated to education, specialized training for inspection personnel, expanding the agency's capabilities to test meat and poultry products for suspected chemical agents and strengthening biosecurity and physical security at FSIS facilities.

Application of science to all FSIS policy decisions is another of Murano's goals, which Resweber described as essential in protecting public health.

"One way to accomplish this is to use risk assessment as a way to identify hazards and provide a basis for making risk management decisions," Resweber said. "We are gaining more experience in this area and are better able to use the data gathered by FSIS through its regulatory decisions to make policy decisions."

Resweber noted that FSIS has established a risk assessments section at its Washington headquarters. "Risk assessment studies must be designed not only to discover what the risk is but also how our behaviors, our practices and industry's behaviors and practices will affect that risk. And then we must be able to communicate that risk to consumers."

Murano also seeks to improve coordination of food safety activities inside and outside of USDA, Resweber said. "This has been going on for some time with active participation of FSIS and joint efforts with out sister agencies," he said. He cited the Food Net surveillance program that looks for signs of outbreaks of foodborne illness in certain population areas.

Another goal set by Murano — to enhance the agency's outreach and public education efforts — comprises efforts to make FSIS the entity that consumers consult for food safety education. Murano "is seeing an aggressive education and risk communication campaign to insure that our efforts reach consumers," Resweber said.

The full potential of the Hazard Analysis and Critical Control Point system has yet to be realized, Resweber said. Improvements can be made in regulating HACCP systems.

"Is industry identifying the correct critical control points and can their choices be justified scientifically?" he asked. "This is necessary for all hazards associated with these foods to be appropriately addressed and controlled." ■

Pierson, Crawford Appointed to Federal Posts

Two prominent figures in the food safety research community have been appointed to positions in the federal government. Merle D. Pierson was named deputy undersecretary for food safety in the U.S. Department of Agriculture and Lester M. Crawford Jr. was appointed deputy commissioner of the Food and Drug Administration. Both appointments were announced in February.

Pierson was professor of food microbiology and safety at Virginia Tech University prior to his appointment by Agriculture Secretary Ann Veneman. At Virginia Tech, Pierson had also been head of the food science and technology department and acting superintendent of the Center for Seafood Extension and Research. He has served as a consultant to government and industry on several food safety issues.

As deputy commissioner, Crawford began serving FDA as its senior official pending installation of a permanent commissioner. He was previously head of the Center for Food and Nutrition Policy in Washington when he was appointed to the FDA position by Health and Human Services Secretary Tommy Thompson. He has also served as director of the FDA Center for Veterinary Medicine, executive director of the Association of American Veterinary Medical Colleges, executive vice president of the National Food Processors Association and chair of the University of Georgia physiology-pharmacology department. ■

Murano Views Performance Standards as Food Safety Key

This is an excerpt of opening remarks prepared for delivery by Dr. Elsa Murano, USDA undersecretary for food safety, before the Committee on Review of the Use of Scientific Criteria and Performance Standards for Safe Food on Feb. 5 in Washington.

When I began my tenure as undersecretary for food safety, I emphasized that my number one priority was to ensure that food safety policies are science-based. My commitment to this goal has only become stronger over the past four months that I have been on board.

I believe that FSIS' food safety program has come a long way in recent years. Today's program is more science-based in many important areas.

For example, HACCP is now in place in all meat and poultry plants, a major achievement carried out by government and industry together. We have seen reductions in the prevalence of *Salmonella* on products and reductions in foodborne illness for certain pathogens. ...

Let me take a few minutes to talk specifically about the role of performance standards in improving food safety. Science tells us that they serve as a critical measure of process control. They are the markers that point to potential problems that must be addressed in order to maintain control of hazards.

However, it is not enough to set just any performance standard. The wrong standard can mislead us into believing that systems designed to control hazards are working when maybe they are not. Thus, we must be sure that performance standards, and microbial criteria in general, are reliable, and that they are accurate in terms of reflecting when control of hazards has been lost.

The recent public debate over FSIS' *Salmonella* performance standards illustrates some of the tough questions that remain. Our ability to answer these questions and design effective regulatory programs has a major impact not only on food safety, but also on consumers' confidence in the ability of the government to protect them.

For example, some believe that the recent circuit court decision on the Supreme Beef case has taken away the power of the USDA to shut down plants that fail to control hazards. This is simply wrong, and we must do a better job of communicating that FSIS is very much able to enforce its Pathogen Reduction/ HACCP regulation.

Elsa Murano

So, a lot is at stake here. If we are to use performance standards, as science dictates we should, then we need to determine how standards should be used to accomplish the goal of ensuring food safety, and which standards are the ones that will successfully take us there.

I know the National Academy of Sciences is in a unique position to explore these difficult issues. The role of the NAS as a special advisor to the federal government, and the expertise it is able to bring to the table are important qualifications.

I'd like to take a moment to speak to the people who will be doing the work for the NAS. Being selected to serve on a committee of the NAS is indeed an honor, and it is a testament to your expertise and to your standing in the scientific community. I know most of you personally, and am certainly familiar with the fine reputation that all of you have as scientists and scholars. You are all professionals and people of integrity, so I have no doubt that the product of your efforts on behalf of the National Academy of Sciences will be of the highest caliber. ...

Now, let me get to the charge to the committee, which is why I'm here today. As you know, a parent committee has been formed, which will address overlapping issues that affect both FSIS and FDA-regulated products. ...

Two subcommittees have also been formed, with the one of interest to FSIS being the Subcommittee on Meat and Poultry. This subcommittee will specifically address meat and poultry, which are regulated by FSIS. Specifically, we are asking the subcommittee to:

1. Review the extent to which microbiological performance standards are an appropriate means of ensuring the safety of meat and poultry products in a HACCP-based system. This is a very basic, but fundamental, question for FSIS, since the success or failure of performance standards to accomplish the goal of ensuring food safety can significantly impact our decision to implement them.

2. Evaluate the scientific basis for existing FSIS microbiological performance standards and recommend ways to improve them. We want to know what process should be used to establish these criteria so they are scientifically valid. There are questions regarding the use of specific pathogens vs. general classes of microorganisms which are at the heart of this issue. If we implement new standards, it must be because they are better than our current standards at predicting control over foodborne hazards.

3. Examine whether current FSIS criteria, including microbiological performance standards, accomplish what they purport to accomplish.

Do they ensure a reduction in public health hazards? Are they technically, economically, and administratively feasible? Standards that do not impact

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Papers & Presentations

Daniel Fung, Kansas State, received the 2001 Waksman Outstanding Educator Award from the Society for Industrial Microbiology. He was recognized for his accomplishments over his career. The citation called Fung "an educator, researcher and tireless worker in promoting food microbiology, food fermentation, applied microbiology and especially rapid methods and automation in microbiology throughout the world in the past 30 years. ... Fung is truly a dedicated educator in applied microbiology."

Beth Ann Crozier-Dodson

Kendra Kerr Nightingale

Beth Ann Crozier-Dodson and **Kendra Kerr Nightingale**, both of Kansas State, each received $10,000 V. Duane Rath Graduate Research Fellowships awarded by the International Association of Food Industry Suppliers. Crozier-Dodson is a Ph.D. student and research assistant studying under FSC researcher **Daniel Fung**. She is researching the koshering of meat, lactic acid intervention, prune extracts, "Pop-Up" tape, antimicrobial effects of cinnamon and resuscitation of injured organisms from air. Crozier Dodson also won the M.E. Franks Scholarship offered by the Dairy Recognition and Education Foundation and is the first student to win the Rath Fellowship and the Franks Scholarship in the same year. Nightingale, a Ph.D. student in the Cornell University food science department, received bachelor's and master's degrees in food science at KSU. She is researching the human and animal foodborne pathogen *Listeria monocytogenes*.

Kelly Getty, **Liz Boyle**, **Randall Phebus** and **Curtis Kastner**, all of Kansas State, received an $80,000 grant from the Kansas attorney general's office for interactive distance learning food safety modules.

John A. Fox, Kansas State, presented a paper on "Factors Affecting Purchase Decisions on Irradiated Foods at Retail and Food Service Settings" in March at the Food Irradiation 2002 conference in Dallas.

John A. Fox, Kansas State, **Dermot J. Hayes**, Iowa State, and **Jason F. Shogren**, Wyoming, co-authored "Consumer Preferences for Food Irradiation: How Favorable and Unfavorable Descriptions Affect Preferences for Irradiated Pork in Experimental Auctions" in *Journal of Risk and Uncertainty*, 24 (2002): 75-95.

Michael A. Boland, **Dana Hoffman** and **John A. Fox**, all of Kansas State, co-authored "Post-implementation Costs of HACCP and SSOPs in Great Plains Meat Plants" in *Journal of Food Safety*, 21 (2001): 195-204.

Christiane Schroeter, **Karen P. Penner** and **John A. Fox**, all of Kansas State, coauthored "Consumer Perceptions of Three Food Safety Interventions Related to Meat Processing" in *Dairy, Food and Environmental Sanitation*, 21 (2001): 570-581.

James Huss and **Dan Henroid**, both of Iowa State, have been cited by the National Science Teachers Association (NSTA) for their work on the irradiation page of the ISU food safety project web site. The NSTA's professional review committee reviewed the site "using a stringent set of criteria that ensure selected materials have accurate content and effective pedagogy." The web site's content is now eligible to be identified in science textbooks with a SciLinks icon that directs readers to the web page for more information. The web site was also recognized with the Fall 2001 Bronze Award as "one of the best health-based sites for consumers and professionals." The American Association for the Advancement of Science also recommended its use in classrooms. *Restaurants and Institutions' Food Safety Update* magazine recognized it as one of the top food safety web sites.

Henroid and Huss also published an article titled "Educating Consumers on Food Safety Via the World Wide Web" in the *Journal of Applied Communication,* 85 (3): 19-20. They also delivered presentations on "Feasibility of Web-Based Food Safety Training in Iowa Restaurant and Food Service Operations" in July at the International Council on Hotel, Restaurant and

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Murano Views ... *continued*

public health are useless, and so we must be sure that in our aim to seek a way to verify process control, we do not overlook this very important outcome.

4. Evaluate the way criteria are used under the HACCP rule and recommend specific changes for improvement, if any are needed.

5. Finally, we are asking the subcommittee to determine the extent to which the current process is adequate for establishing microbiological food safety criteria, or, if necessary, identify improved ways to establish criteria.

I also want to emphasize that FSIS needs this evaluation in the context of its regulatory setting. Our policies must be science-based and must be applicable in a regulatory setting. Thus, you must think not only as scientists, but you must also consider the correct way for the application of your science-based recommendations by FSIS.

Believe me when I say that I wish I had the answers to all these questions today. I read in a fortune cookie that "patience is virtue," so I will have to be patient and wait for the committee and subcommittee to do its work. ■

Food Safety Digest

by Dave Edmark

Almost two-thirds of the respondents to a national opinion survey last fall were concerned about the prospect of bioterrorists contaminating the U.S. food supply with anthrax or biological agents.

The Porter Novelli public relations firm of Washington questioned 1,008 adults by telephone. A breakdown of the results shows that only 23 percent were not concerned with bioterrorism while 64 percent were concerned.

When asked if they agreed that irradiation could be used to kill anthrax and other biological agents, 51 percent said they agreed. Twelve percent disagreed and 37 percent were either unsure or didn't know.

The respondents were then asked if the government should require irradiation to ensure a safe food supply in response to the bioterrorism threat. Fifty-two percent said the government should require irradiation, 22 percent said it should not and 26 percent were either unsure or didn't know.

■ ■ ■

In markets where irradiated frozen ground beef is offered, sales are going well if a marketing program exists. Christine Bruhn, director of the University of California-Davis Center for Consumer Research, said recently that the purchase of irradiated meat products "will increase with increased consumer education and public endorsements by health professionals."

Writing in *Poultry USA*'s e-Digest in December, Bruhn said she is working with colleagues in nine states on a brochure and video tape about irradiation "that is accurate, science-based and responsive to consumer needs." She said the brochure explains why consumers should consider irradiation, defines irradiation, responds to potential questions and notes what health groups endorse the process.

Bruhn listed several cases of successful marketing of irradiated food: irradiated fruit has been available in Midwest markets since 1992, irradiated fruits from Hawaii have been sold in the Midwest and California since 1995 and Kansas consumers have purchased irradiated poultry in market tests conducted by Kansas State University since 1996.

■ ■ ■

Irradiation is the poultry industry's biggest opportunity, according to Alan Sams, a Texas A&M University poultry science researcher. Food safety is the industry's top issue and such issues are likely to continue, he wrote in the February edition of *Poultry USA*.

"Food safety is certainly a justifiable issue and our poultry and plants are cleaner now than ever, but the industry is not using all of the tools at its disposal," Sams said. "Irradiation has tremendous potential to greatly ease this crisis. While it will not solve all the problems, and may even cause some new concerns, it is not being used effectively in the poultry industry.

"Irradiation is an extensively studied technology that eliminates the pathogens we all want out of the food supply. The reluctance to use irradiation boils down to one main issue, fear. Not fear of the product by the consumers, but fear by the industry that a small group of the population will be trouble for them. Some visionary and opportunistic company will see the chance and mainstream it."

Sams echoed points that Bruhn made, noting that irradiated foods are already being sold in certain markets and consumer surveys find favorable attitudes toward irradiation when they are informed of its effect on pathogens.

"The vast majority of consumers are more concerned with the pathogens than the irradiation procedure," Sams said. ■

Papers & Presentations *continued*

Institutional Education conference in Toronto and on "Educating Consumers on Food Safety Via the World Wide Web" in July at the Agricultural Communicators in Education/National Extension Technology Conference in Toronto. Henroid delivered a presentation on "Food Safety Project Update" in August at the International Association of Food Protection conference in Minneapolis. ■

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Your comments are welcome.

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