

The Food Safety Consortium Newsletter



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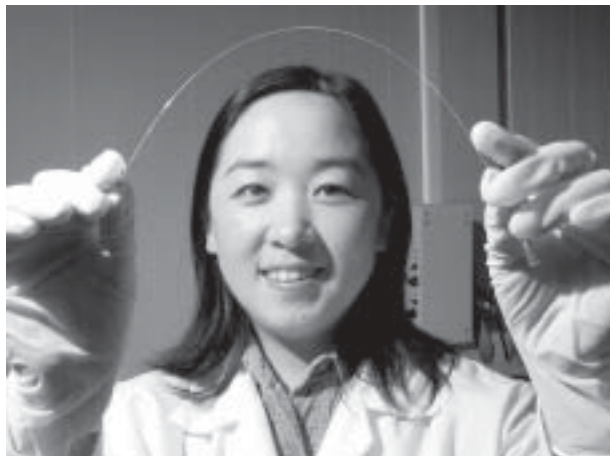
Biosensors Promise Rapid Detection of Food Pathogens

Biosensors being developed at the University of Arkansas can detect harmful bacteria during food processing in a matter of hours, much faster than conventional methods that take days to detect pathogens.

Yanbin Li, a Food Safety Consortium researcher and biological engineer for the Arkansas Agricultural Experiment Station, is leading an interdisciplinary research team to develop fast, reliable methods for detecting *E. coli*, *Salmonella typhmuri* and other illness-causing bacteria during poultry processing.

“The food industry would like to detect a host of pathogens in a matter of minutes, to keep up with the pace of food processing, and we’re working toward this,” Li said.

The methods developed in Li’s lab employ sensors with names like immuno-electrochemical biosensor, capillary column bioseparator/bioreactor, chemiluminescent optical fiber biosensor and impedance immunosensor.



University of Arkansas research specialist Zhenyu Zhang examines a capillary column used as an electrochemical sensor to detect harmful bacteria in food products. Such sensors promise to speed up detection of harmful bacteria in food processing industries.

“These are prototypes for tools that will help industries ensure safe foods for consumers,” Li said. “Our ultimate goal is to develop working models that can

detect the smallest possible presence of several types of pathogens, as rapidly as possible. We’d also like to have it in a portable unit.”

The first step in measuring the presence of pathogens is to separate the target bacteria from the food sample, Li said. Then the sensor must produce a signal that can be converted to readable data that measures the presence of pathogens.

Most of the sensors he’s developed use antibodies to trap

specific bacteria. Li said an immuno-optical capillary column-based biosensor, for example, pumps the

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Qualified Personnel Is HACCP’s Vital Link, FDA Official Says

Education is turning out to be more of a critical component of the Hazard Analysis and Critical Control Points (HACCP) system than anyone originally expected. Both regulators and industries that implement HACCP need personnel on the line that have the appropriate level of scientific expertise.

Donald Kraemer of the federal Center for Food Safety and Applied Nutrition (CFSAN) explained his concerns during a session of the Institute of Food Technologists national convention

earlier this year. CFSAN, a branch of the Food and Drug Administration (FDA), is responsible for enforcing food safety regulations that industries must meet within the HACCP framework.

Food processors develop HACCP plans that are then evaluated by FDA or state inspectors. “We know that there is going to be a component of the application of science both by the regulator and by the industry to develop and review HACCP plans,” Kraemer said.

To bring the FDA regulators to the necessary level of expertise, the agency

developed a training course for them. The personnel who visited processing plants were instructed in the mechanics of HACCP inspections, how to perform hazard analyses, how to review a processor’s HACCP plan and how to evaluate the implementation of that plan.

“So we did all that training but I still think we have some problems with both the industry and some regulators on the understanding of some scientific principles,” Kraemer said.

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Biosensors Promise ... continued

sample solution through capillary columns — tiny tubes — lined with antibodies that can capture bacteria. The sensor then uses secondary antibodies labeled with an enzyme, such as alkaline phosphatase, to produce a signal that can be measured optically or electrochemically.

“A cluster of capillary columns, each one using a different antibody, could be used to test for multiple pathogens in the same sample,” he said.

At this point, Li is focusing on methodology, working with UA

scientists in poultry science, food science, biochemistry and electrical engineering. They are exploring new technologies that can make sensors smaller, more accurate or faster.

The prototype sensors he’s developed can detect several pathogens, including *Salmonella* and *Listeria*, but so far he’s had the most reliable results with *E. coli* O157:H7, one of the most prevalent illness-causing bacteria found in foods. “We have to evaluate

antibodies and enzymes to find the ones that are most suitable for each pathogen and are stable enough for use on sensors,” he said.

The next step will be to automate detection. “We want to be able to simply drop the sample in a unit and wait for the results.”

Li said the University of Arkansas is working with a Fayetteville firm to create a company through which this technology will be transferred to the poultry industry.

“Speeding up the detection of pathogens in processed chicken could save the food industry millions of dollars by avoiding product recalls,” he said. “And consumers can have more confidence that they are buying safe foods.” ■

“These are prototypes for tools that will help industries ensure safe foods for consumers.”

— Yanbin Li

Qualified Personnel ... continued

Confusion and frustration can result if key people in a processing plant don’t understand the instructions or the recommendations they receive from the regulators, Kraemer said. The regulators are in a similar spot if they don’t understand what they need to do to evaluate an industry’s HACCP plans.

Kraemer noted that before HACCP was implemented, “regulators have been well rewarded in their culture by a command-and-control system.” But HACCP systems allow for flexibility and the application of scientific principles. When regulators don’t understand the science, they revert to the command-and-control system.

“That creates problems because it is counter to what HACCP is all about,” Kraemer said. “HACCP needs to be a system where the processors develop their own plans that are properly tailored to their facility.”

To maintain and improve HACCP as a functioning system, “we need a better scientific base for both industry and regulators,” he said. CFSAN is discussing how to get its own personnel to that level. “I think there needs to be national discussion as to how we get industry as

well as regulators to a higher level of scientific expertise so that they can better implement HACCP.”

With HACCP regulations now a fact of life in food processing industry for the past few years, Kraemer suggested that regulators and industry begin asking what is the best way to evaluate the effectiveness of a HACCP program.

Checking to determine whether the number of illnesses has fallen is a starting point, but “there is still far too much under-reporting for a supportive evaluation system to be based on number of illnesses.”

Determining the reduction in the number of pathogens is another method of evaluation. That system works well for many commodities, but Kraemer noted that it is not as reliable for seafood because there is not a single hazard that affects seafood as is the case with many other commodities.

Seafood regulators have settled on monitoring increases in the adoption of preventive controls in the industry. “For

example, what is the percent of the industry that has properly identified their hazards?” Kraemer said. “Set their critical limits appropriately? What is the percent of the industry that is consistently monitoring their critical control points? That approach makes good sense to FDA.”

Not everyone outside the FDA

sees it that way. Kraemer said there is still skepticism as to what levels of compliance tell about the likelihood that illnesses are being reduced. A General Accounting Office audit of the seafood HACCP program argued that “as long as FDA was not measuring reductions in pathogens or contaminants, we were really not evaluating the effectiveness of the program at all. This is forcing us to rethink this issue and how we publicly look at the effectiveness of our program.” ■

Regulators and industry should begin asking what is the best way to evaluate the effectiveness of a HACCP program.

A Dash of Dried Plum Keeps Burgers Safer

Here's a new solution to protect hamburger meat from bacterial contamination: prunes. And as a bonus, they keep the burgers juicy.

It's not yet time for consumers to look for ways to cook prunes into their ground beef. The procedure requires dried plum extract that commercial food processors use. But Food Safety Consortium research at Kansas State University is pointing the way to improving the safety of ground beef for large-scale preparers.

"The addition of dried plum mixtures can control foodborne pathogens in uncooked meat products," said Daniel Fung, a KSU food scientist who conducted the research with graduate student Leslie Thompson with support from the California Dried Plum Board. The research experiments showed that using the extract significantly reduced levels of *Salmonella typhimurium*, *Yersinia enterocolitica*, *Staphylococcus aureus*, *Listeria monocytogenes* and *E. coli* O157:H7 in uncooked ground beef and uncooked pork sausages that had been

deliberately inoculated with the pathogens for testing.

Prunes' benefits for the meat don't stop with the suppression of pathogens. Fung said earlier research by Jim Keeton, a meat scientist at Texas A&M University, showed that the extracts keep the ground beef moist even after reheating. Reheated ground beef tends to be dry and tough.

"A dried plum has a compound called sorbitol, which retains

moisture," Fung said. "So they found that if you heat and reheat the hamburger with the dried plum extract, it will still be moist and juicy."

"That's very important because there are a lot of school lunch programs that cook hamburgers in large batches and then send it to the schools to reheat it. Students say it's too hard to eat."

The work by Fung's team has

attracted interest around the world. The California Dried Plum Board sent him to discuss the findings in Japan, the largest importer of California prunes. He also met with U.S. Army officials at their Natick food research center in Massachusetts to discuss the practical

application of dried plum extract in rations that must be reheated.

Other benefits accompany the process. There is no distinctive taste from the extract, so the meat's flavor isn't

altered. Its use would not result in special labeling on products because it is a natural compound, Fung said. Also, the researchers have determined that the extract extends the ground beef's shelf life for more than a week at 7 degrees Celsius storage temperature. ■

The research experiments showed that using the prune extract significantly reduced levels of several pathogens.

FSC Work at Arkansas Recognized by *National Geographic*

Food safety research at the University of Arkansas was profiled in photographs in the May edition of *National Geographic* magazine. The magazine presented a 24-page article on food safety concerns around the world and ways that scientists, industries, government officials and consumers are dealing with them.

Two photographs depict research efforts by scientists at the UA, the only

university whose work in food safety was included in the article.

One full-page photo, taken in the food science department laboratory supervised by Professor Michael Johnson, shows petri dishes containing colonies of *Campylobacter*, a bacterium found on retail chickens. UA researchers are examining ways to reduce the incidence of *Campylobacter* on raw chicken.

Another photo on a facing page

features Lisa Bielke, a graduate student in the poultry science department, spraying chicks with "healthful" bacteria in an experiment to determine if those bacteria can overcome the harmful *Salmonella* bacteria on chickens. Bielke works in the Poultry Health Research Laboratory supervised by Professor Billy Hargis.

The *National Geographic* article was more than a year in the making. Jim

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Report from the Coordinator



Gregory J. Weidemann

We at the Food Safety Consortium (FSC) are researchers first and foremost. This statement may seem obvious to readers of this newsletter, but not everyone else has received the message. Some people incorrectly believe that we sell products. Others mistakenly presume we are lobbyists. We have even received inquiries from people asking for recipes. Sorry, but we're just researchers who rely on science to seek ways to assure the safety of the animal meat supply from the producer to the processor to the consumer.

As researchers, we're sympathetic when we hear from one of our own who has gone on to what could be called a bigger laboratory. Dr. Merle Pierson spent 30 years in the academic world engaged in research and other activities before he recently left Virginia Tech University to become deputy undersecretary for food safety at the U.S. Department of Agriculture. He said in a recent speech that government work is a substantial change from his work at the university, even though he dealt extensively with government and industry in his former position.

When he spoke in May to the

International HACCP Alliance in Chicago, Pierson discussed the USDA's list of food safety goals. These goals include biosecurity, improved management of agency programs and improved coordination with sister agencies. Those are important, but there are two other goals Pierson listed that should catch the eye of food safety researchers.

One goal is to base policy decisions on science. The use of risk assessments is one way of achieving this goal. "Our risk assessments must pass the rigor of the peer review process in order to be a credible source for risk management decisions," Pierson said. "We're also engaging the scientific community to help us work through complex issues, such as the proper application of performance standards."

Pierson also said that USDA is engaging the scientific community through a series of symposia. These symposia cover such topics as pathogen reduction and implementation of performance standards for ensuring meat and poultry safety, topics that Food Safety Consortium researchers also explore in their work.

Pierson also listed as a goal the

engagement of USDA in aggressive food safety education programs. Consumer education on safe food handling procedures continues to be vital and must be widened. USDA, he said, "will continue working with industry and other government agencies at the state and local levels to educate producers, retailers and others." The emphasis on education at the federal level coincides with the FSC's thrust to include research focusing on better ways to achieve consumer education and involvement.

It is gratifying to know that the FSC's research is on the same page as the USDA's food safety goals and priorities. It is also no accident. Researchers, government officials, industrial executives and consumers work to keep an efficient flow of ideas and results coming from the science that is our best hope for conquering the threats to the safety of our food supply. ■

FSC Work ... continued

Richardson, the magazine's photographer who visited Northwest Arkansas in July 2001 on the assignment, spent five days shooting photos of food safety-related activities on campus and off campus. Richardson predicted that he would take close to 1,000 photos in the course of the assignment that took him to several countries overseas. The food

safety article contained 21 photos from around the world, including the two UA photos.

The UA was also included in a web-only audio-visual presentation that was available on the *National Geographic* web site during the spring. The web feature, which is no longer on line, was a seven-minute photo montage narrated by

Richardson and consists of photos that weren't published in the magazine. Among them was a photo of UA food science researcher Marlene Janes showing a chicken patty that has been coated with an invisible film to protect against bacteria. ■

Research Shows Vitamin E Helps Turkeys Resist Pathogens

One way of keeping turkeys healthy on their way to market is to guard them against infection by pathogenic *Listeria monocytogenes* bacteria. Food Safety Consortium (FSC) scientists have found that Vitamin E helps the turkeys resist the infection because it increases their white blood cell counts.

Vitamin E is a dietary supplement that boosts turkeys' immune response, explained Irene Wesley, a microbiologist at the National Animal Disease Center in Ames, Iowa, where she is leading the FSC study with Iowa State University faculty researchers Aubrey Mendonca and Dong Ahn. Previous studies by Ahn showed that Vitamin E fed to turkeys prolonged the shelf life of the turkey meat.

"Vitamin E in the bird increased a type of immune cells known as T lymphocytes," Wesley said. "The lymphocytes that are increased in the presence of Vitamin E are lymphocytes that have a certain marker on them known as CD-4. These are helper lymphocytes that are needed to boost the immune response. Those are the good guys."

Birds treated by Vitamin E also have lymphocytes labeled CD-8 that kill infected cells and help eliminate foodborne pathogens.

Vitamin E also provides a bonus of preventing the off odors that occur after oxidation, the combination of oxygen with the turkey meat. "Vitamin E tends to inhibit the deterioration of the meat and the off odor so the quality of the meat is protected," Wesley said. That

much was known because of Ahn's earlier work on Vitamin E, which prompted the researchers to look into its qualities of pathogen protection.

Industry is interested in future findings on Vitamin E's impact on pathogens in turkeys, but it's too soon to determine if the vitamin should be a significant dietary supplement for turkeys.

"We know from our contacts in the turkey industry that the use of antimicrobial drugs in turkey production is going to be phased out," Wesley said. "Vitamin E, since it boosts the immune response, will lead to a healthier bird and therefore diminish the use of antimicrobials."

Wesley's research team is testing both natural Vitamin E and synthetic Vitamin E to find out if either is more effective in boosting turkeys' immune responses.

After researching the effects on *Listeria monocytogenes*, the scientists will begin investigating Vitamin E's effects on *Salmonella* in turkeys. "One of our studies has us trying Vitamin E with *Salmonella* to see if we get the same kind of lowering of the *Salmonella* levels that we saw with *Listeria*," Wesley said. "We're expecting to see a boost in the immune response and associate this with a diminution of carriage of foodborne pathogens."

Meijun Zhu conducted experiments elucidating the immune response of Vitamin E-primed turkeys experimentally infected with *Listeria monocytogenes*. Wasin Charerntantanakul is measuring immune parameters in Vitamin E-treated turkeys experimentally infected with *Salmonella*.

Vitamin E is just one vehicle for potentially reducing foodborne pathogens in animals. Another one is conjugated linoleic acid, commonly known as CLA. The researchers' preliminary studies indicated that CLA in the diet changed the meat's fatty acid content and influenced the meat's storage stability.

The use of Vitamin E or CLA, separately or in combination, may improve the birds' immune response and reduce the colonization of potential foodborne pathogens in their intestines, Wesley said. Either dietary supplement can also lessen the changes in turkey meat caused by oxidation and enable the turkeys to keep the original color that consumers want to see on display in the market. ■

Vitamin E also provides a bonus of preventing the off odors that occur after oxidation.



Turkeys fed with Vitamin E stand a better chance of resisting infection.

C. Dayton Steelman, Arkansas, delivered a presentation on “Spatial Relationship of *Alphitobius diaperinus* and *Salmonella typhimurium* During Broiler Flock Growouts” at the Entomological Society of America annual meeting in December. **Keith O. Strother**, Arkansas, presented a paper on “Incidence of *Campylobacter* in Broilers and the Lessermealworm, *Alphitobius diaperinus* (Panzer), During Broiler Flock Growouts.” Steelman also has received approval for a two-year \$128,814 grant from the U.S. Department of Agriculture for research on “Evaluation of Monitoring Systems, Pathogen Detection and Alternative Tactics for Filth Fly Integrated Pest Management in Broiler-Breeder Egg and Turkey Facilities.”

Mike Johnson, Arkansas, served on a USDA Cooperative State Research, Education and Extension Service panel in April to review the research, teaching, extension and center activities of the Food Science Department of Purdue University. He also served on a USDA National Research Institute panel in May in Washington to evaluate food safety research proposals in Washington.

Two photos taken from the laboratories of **Mike Johnson** and **Billy Hargis**, Arkansas, were selected for use in a major food safety article appearing in the May 2002 issue of *National Geographic* magazine. **James Denton**, then the director of the Center of Excellence for Poultry Science at Arkansas, and **David Edmark**, Food Safety Consortium communications director, helped coordinate the photographer’s visit a year ago.

Marlene Janes, Arkansas, presented two invited papers on bacterial pathogen detection and control in a short course, “Rapid Techniques for Food Pathogens Detection on Fresh Fruits and Vegetables and in Irrigation Water” in May at the Universidad Autonoma de Coahuila, Saltillo, Coahuila, Mexico, and

sponsored by a joint grant from the United States of America-Mexico Foundation for Science. Janes also presented a research paper with co-authors **B. Lungu**, graduate student, and **Johnson** at the annual research meeting of the Institute for Food Technologists in June in Anaheim, Calif.

Rama Nannapaneni, with co-authors **Robert Story**, **K. Wiggins** and **Johnson**, Arkansas, presented a food safety paper at the general meeting of the American Society for Microbiology in May in Salt Lake City.

James Denton, Arkansas, participated in the following activities in recent months: Conference for Food Protection, Pre-Conference Symposium on Alternative Pasteurization Methods: National Alliance for Food Safety, in April in Nashville, Tenn.; Food Net Services Food Safety Symposium-Microbial Testing Panel: “The Good and the Bad,” in April in San Antonio; Ozark Chapter of the Federal Veterinarians: “The Role of Academia, Industry, Government in an Evolving Food Safety System,” in May in Springdale, Ark.; Global HACCP Conference, panel moderator: “Prerequisite Programs in Food Safety,” in May in Chicago; host of senior executives of Ecuador (Luis and John Bakker, Pronaca, Inc.) for a tour of the University of Arkansas Center of Excellence for Poultry Science and facilities and discussion of future relationships with the Center in June in Fayetteville, Ark.; attended the National Advisory Committee for Meat and Poultry Inspection in June in Washington; attended the Poultry Federation Board of Directors meeting in June in Hot Springs, Ark.; attended the Institute of Food Technologists meeting in June in Anaheim, Calif., representing the National Alliance for Food Safety and the Food Safety Consortium and serving on the Planning Committee for future direction of the IFT Food Safety and Quality Conference.

Phil Crandall, Arkansas, has received grants for the following projects: Systematic Microbial Risk Assessment, \$32,100 annually for three years from USDA; Food Safety and Food Irradiation, \$18,700 annually for three years from USDA; Enhancement of the Safety of Poultry Products, \$21,000 from the Food Safety Consortium; Elimination of Off Odors and Flavors, \$15,500 from the Food Safety Consortium, and Effects on Shelf Life of Irradiated Poultry, \$5,500 from the Arkansas Science and Technology Authority.

In December 2001, Crandall organized a symposium on microbial risk analysis for fruits and vegetables at the meeting of the Society for Risk Analysis in Seattle. Crandall presented a paper on hazard identification and exposure assessment for consumers of fruits and vegetables with **Corliss O’Bryan**, **Yanbin Li** and **Ira Zakariadze**; a paper on product liability related to the sale of fruits and vegetables with **Joe H. Hobson** and **O’Bryan**, and a paper on a quantitative microbial risk assessment model for a broiler hatchery within a poultry production and processing system with **Zakariadze**, **Li** and **S. Wang**.

Crandall, **O’Bryan**, **Navam Hettiarachchy** and **Jubal Hausam**, Arkansas, and **Dong Ahn**, Iowa State, presented a paper on ascorbic acid and sodium chloride effects on microbial stability and quality characteristics of irradiated poultry breast meat at the 2002 annual meeting of the Institute of Food Technologists.

Dong Ahn, Iowa State, presented a paper on “Causes and Remedies of Off-Odor Production and Color Changes in Irradiated Meat” at Intertech’s fourth annual International Food Safety Conference: Food Irradiation 2002 in March in Dallas. Ahn also received a \$23,494 grant from the National Aeronautics and Space Administration for the purchase of SolarTek 72 Multi-matrix vial Autosampler and System Software and a \$22,032 grant from the National Pork Board for research on “Prevention of Pinking and Prevention Investigator of Pinking and Off-Odor in Irradiated Pork Loin.” **Ahn**, **Aubrey Mendonca** and **Eunjoon Lee**, Iowa State,

received a \$35,482 grant from the Midwest Poultry Consortium for research on "Impact of Electron-beam Irradiation on Survival of *Listeria monocytogenes* and Quality of Ready-to-Eat Turkey Products During Refrigerated Storage."

Irene Wesley, National Animal Disease Center, was an invited speaker for the 50th anniversary celebration of the Department of Biology at the University of Nuevo Leon in Monterrey, Mexico, in March. She spoke on "Microbes of Public Health Significance to Food Safety."

Dong Ahn, Aubrey Mendonca, Irene Wesley and **Joseph Cordray**, Iowa State, received a \$550,000 grant for three years under USDA-CSREES Program 406 National Food Safety Initiative to study effect of dietary and irradiation interventions on the pathogen reduction and quality of turkey meat.

Curtis Kastner, Kansas State, delivered presentations on "Food Safety Research at a Time of National Emergency" at the Merrill Advanced Studies Center annual meeting in June and on "Food Safety Initiatives at Kansas State University" in March at the Leadership Lecture Series for KSU's master's of agribusiness program. ■

FSC to Host Symposium at Annual Meeting

The Food Safety Consortium will present a symposium and panel discussion on risk assessment at 8 a.m. Oct. 15 at the Holiday Inn in Manhattan, Kan., featuring five prominent food safety experts. Researchers from the Consortium's three member institutions — the University of Arkansas, Iowa State University and Kansas State University — are hosting the event as part of their annual meeting being held at Kansas State.

The speakers and their topics are:

- Dr. Catherine Woteki, Iowa State University — Introduction to Risk Assessment
- Dr. Anna Lammerding, Health Canada — The Science of Risk Assessment
- Ms. Jenny Scott, National Food Processors Association — An Industry Perspective on Risk Assessment

- Ms. Lisa Lefferts, Consumers Union — Consumer Perspectives on Risk Assessment

- Dr. Doug Powell, University of Guelph — Communicating Risk Through the Media

Questions from the audience will be taken during the session. Lunch will be provided following the symposium to provide additional opportunities to meet the speakers.

Registration is \$50 for individuals not employed by the three FSC universities. Employees of the FSC universities will be admitted at no charge. To register, clip or copy and mail the form below with payment. For additional information, call the FSC offices at the University of Arkansas at 479-575-5647.

To arrange for accommodations, call the Holiday Inn at 785-539-5311. ■



Registration Form

Food Safety Consortium Symposium

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_____ I am employed by Kansas State University, Iowa State University or the University of Arkansas. No fee applies.

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▼ Send this form and remittance by **Oct. 1, 2002**, to:

Food Safety Consortium, 110 Agriculture Building, University of Arkansas, Fayetteville, Ark. 72701

Food Safety Digest

by Dave Edmark

There is less *Salmonella* in the raw meat and poultry moving through the nation's processing plants. The U.S. Department of Agriculture released figures this spring and said the results are due to the new inspection procedures mandated by the government a few years ago.

Agriculture Secretary Ann Veneman said in April that the new data showed *Salmonella* levels well below the baselines that were set before plants were required to implement HACCP programs. Under HACCP — the science-based Hazard Analysis Critical Control Points inspection system that was required of plants beginning in 1998 — plant personnel identify key points in processing where contamination would be likely to occur and develop measures to prevent or reduce them.

The statistics show that for 1998 to 2001, an average of 10.7 percent of broilers were found to have *Salmonella* compared to 20 percent before HACCP; ground chicken was down to 15.7 percent from the pre-HACCP 44.6 percent, and ground turkey was down to 29.2 percent from the pre-HACCP 49.9 percent.

"HACCP has played a vital role in reducing pathogens," said Elsa Murano, USDA undersecretary for food safety. "While the prevalence of *Salmonella* in meat and poultry products has declined, USDA is continuously working to reduce the prevalence of pathogens in meat and poultry and to improve food safety at each step of food production, from farm to table."

■ ■ ■

Another effort to measure the effectiveness of HACCP has been under way for five years and is showing positive results. USDA has been conducting the HACCP-based Inspection Models Project (HIMP) by collecting data from 16 of the participating plants.

HIMP tests whether new government slaughter inspection procedures and HACCP controls can improve food safety. The program participants are meat and poultry plants that slaughter only young, healthy uniform animals — market hogs, fed cattle or young poultry.

Data from the program — which was collected by the research organization RTI International — showed that improvements have been made in detecting and controlling quality concerns such as bruises and ingesta as well as food safety measures such as infectious disease and fecal contamination, USDA reported.

The agribusiness publication *Feedstuffs* reported that the personnel employed by HIMP participants take

more responsibility for eliminating carcass defects by determining at the beginning of the slaughter line whether a carcass should be taken out, rather than waiting for USDA inspectors to make a determination.

Murano said in June that USDA will continue soliciting input on the process. "Decisions on whether to expand HIMP must be based on sound science and meet our goals for enhancing food safety," she said.

■ ■ ■

Rutgers University is starting a Food and Agriculture Biosecurity Initiative as a way of guarding against threats to the food supply. The New Jersey Agricultural Experiment Station at Rutgers announced that the initiative would assess the vulnerability of early warning surveillance points in the food system.

Rutgers also said the initiative would concentrate on plant and animal disease agents, potential foodborne pathogens, recombinant infectious agents and vaccines. The initiative would work with government and industry on prevention of threats to the system and rapid communication systems for identifying those threats. ■

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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