

AMI Foundation News

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International Panel Recommends Controlled Risk BSE Classification for United States

The World Organization for Animal Health's (OIE) Scientific Commission has endorsed the recommendation from an OIE expert panel that the United States should be classified as "controlled risk" country for Bovine Spongiform Encephalopathy (BSE), according to a statement from the U.S. Department of Agriculture.

"This recommendation provides strong support that U.S. regulatory controls are effective and that U.S. cattle and products from cattle of all ages can be safely traded in accordance with international guidelines, due to our interlocking safeguards," said Animal and Plant Health Inspection Service (APHIS) Administrator Dr. Ron DeHaven.

USDA submitted an application and supporting documents to the OIE to formally request country classification for BSE risk in October 2006. Prior to recommending a risk classification, the OIE undertakes a thorough review process and then provides an opportunity for all delegate countries to review the

recommendations and present comments prior to final adoption of a country's classification in May.

The classification could have major significance with the ongoing negotiations to restore lost trade in beef, which plummeted after the U.S. diagnosed its first case of BSE in December 2003 in a Canadian born cow. The United States has since reported two cases of BSE after testing nearly 800,000 high risk animals over the course of several years. To date, USDA has only been able to regain roughly fifty percent of the value of the lost markets.

AMI Foundation President James H. Hodges noted that the panel's recommendation underscores the effectiveness of the U.S.'s multiple firewall strategy that has been in place to combat and eventually eradicate BSE from the U.S. "We are gratified that the OIE's Scientific Commission recognizes the proactive efforts the U.S. undertook long before our first case of BSE was diagnosed," Hodges said. ■

AMIF Board Approves Funding for 2007 Projects

The AMIF Board of Directors approved the following projects for funding. These approvals are based on recommendations from the Research Advisory Committee and represent nearly half a million dollars in research funding. Projects awarded with funding demonstrate a potential for commercial applicability to the processing plant and ability to improve food safety in the meat and poultry industry.

Impact of Ground Beef Packaging Systems and Temperature Abuse on the Safety and Quality of Ground Beef

Chance Brooks, Mindy Brashears, Mark Miller and Adam Tittor, Texas Tech University

The objectives of this study are to both determine the impact of packaging methods and temperature abuse on the pathogen loads in ground beef inoculated with *E. coli* O157 and *Salmonella* and determine the effect of

packaging methods and temperature abuse on the spoilage characteristics and shelf life of ground beef. Researchers will be testing five packaging treatments – control (foam tray with film overwrap), high oxygen (80 percent O₂, 20 percent CO₂) modified atmosphere packaging (MAP), low-oxygen MAP without carbon monoxide, low-oxygen carbon monoxide (0.4 percent CO, 30 percent CO₂, 69.6 percent N₂) MAP, and vacuum (clear pouch/bag) of ground beef patties. (Note: This project is co-funded by the National Cattlemen's Beef Association)

Validation of Levulinic Acid for Topical Decontamination of Meat Surfaces

Charles Carpenter and Jeffrey Broadbent, Utah State University

The overall goal is to validate the extent to which topical application of levulinic acid – a possible alternative intervention (see page 5)

Science Soundbites: A Review of Recent Research

Current Evaluation of Imported Beef Trim Methods Adequate

The current pathogen monitoring procedures in the United States are adequate for evaluation of imported beef trim, a U.S. Department of Agriculture study found. Researchers compared the hygienic status of imported and domestic beef trim by enumeration of aerobic bacteria, *Enterobacteriaceae*, coliforms, *Escherichia coli* and *Staphylococcus aureus*. They also compared the prevalence of pathogens between imported and domestic samples by screening for the presence of *Salmonella*, *Campylobacter* spp., *Listeria* spp., and non-O157 Shiga toxin-producing *E. coli* (STEC).

Results of enumeration revealed significant differences between samples from all countries, with the lowest pathogen numbers from Australian samples and the highest in samples from Uruguay. Non-O157 STEC prevalence was 10 percent in New Zealand samples and about 30 percent in all of the other samples. Researchers isolated 99 STEC strains. Serotypes of these isolates revealed that serotypes associated with hemolytic uremic syndrome were not different in prevalence among imported and domestic trim.

Researchers stressed that these data cannot be used to compare the microbiological quality of beef trim between the countries examined.

Journal of Food Protection, Vol. 70, No. 2, 2007, Pages 440-449.

Tests of Octanoic Acid on RTE Products Effective

Results of an Ecolab Research Center study on the efficacy and sensory impact of an octanoic acid (OA)-based treatment for ready-to-eat (RTE) meat and poultry products were deemed effective as a post-lethality treatment, which also met Food Safety and Inspection Service (FSIS) regulatory guidelines and had minimal impact on sensory quality.

OA treatments were applied to the surface of whole-muscle and comminuted RTE products, sealed into vacuum packaging and immersed in water heated to 93.3 degrees C for 2 seconds to effect adequate film shrinkage. Once treated, RTE products were examined for survivor populations after 24 hours of storage at 5 degrees C.

The OA treatment of RTE products reduced *L. monocytogenes* numbers to between 0.85 log CFU per sample (oil-browned turkey) and 2.89 log CFU per sample (cured ham) when compared with controls. The antilisterial activity of OA improved by increasing the duration of the heat shrink exposure – specifically reductions of *L. monocytogenes* ranged from 1.46 log CFU per sample (oil-browned turkey) to 3.34 log CFU per sample (cured ham). Results from the sensory evaluation demonstrated that 10 of 11 treated products were not perceived as different from the untreated controls. Panelists detected reduced smoke flavor intensity with treated mesquite turkey, although the treated product was viewed as acceptable.

Journal of Food Protection, Vol. 70, No. 2, 2007, Pages 392-398

Transportation and Lairage Increased *E. coli* O157:H7 Prevalence

Transport to and lairage at processing plants can lead to increases in the prevalence and degree of *E. coli* O157:H7 contamination on hides and the number of different strains associated with the animals, a U.S. Department of Agriculture study found. Researchers, on three separate occasions, obtained samples from cattle at the feedlot and again after cattle were stunned and exsanguinated at the processing plant. The prevalence of *E. coli* O157:H7 on hides increased from 50.3 percent to 94.4 percent between the time cattle were loaded for transport at the feedlot and the time hides were removed at the processing plant.

Researchers also observed that only

29 percent of the *E. coli* O157:H7 isolates collected post harvest matched isolates collected before transport. Those performing the study believe that additional work must be completed to confirm the mechanism by which additional strains of *E. coli* O157:H7 contaminate cattle hides during transport and lairage and to design interventions to prevent this contamination.

Journal of Food Protection, Vol. 70, No. 2, 2007, Pages 280-286

Study Confirms Bacteria is Effective in Reducing *E. coli* O157:H7

A two-year study completed by researchers at the University of Nebraska – Lincoln confirmed that feeding *Lactobacillus acidophilus* strain NP51 is effective in reducing *E. coli* O157:H7 fecal shedding in feedlot cattle.

The study was conducted during the summer months (May to September). Steers were assigned randomly to pens, and pens of cattle were assigned randomly to NP51 supplementation or no supplementation. NP51 products were mixed with water and applied as the feed was mixed daily. Fecal samples were collected from each animal every three weeks and *E. coli* O157:H7 was isolated by standard procedures.

Results from the study demonstrated no significant differences for gain, intakes or feed efficiency of control for NP51-fed steers. The probability for NP51-treated steers to shed *E. coli* O157:H7 over the test periods was 13 percent in 2001 and 21 percent in 2002 – compared with 21 percent and 28 percent among the control group. Over the course of two years, NP51-treated steers were 35 percent less likely to shed *E. coli* O157:H7 than were steers in untreated pens.

Journal of Food Protection, Vol. 70, No. 2, 2007, Pages 287-291

Additional Science Soundbites can be found in the online edition of AMI Foundation News at www.amif.org. ■

Sanitary Design Principles Used Throughout Industry to Improve Food Safety Profile of Meat and Poultry Products

Plant layout and equipment design are key factors to ensure the safety of meat and poultry products. As part of its ongoing commitment to improving food safety, the AMI Foundation developed 10 Principles of Sanitary Design in 2003. Robert A. (Skip) Seward, Ph.D., AMI's vice president of regulatory affairs, facilitated the development of these principles and has served as a key contact to the industry on instituting these principles in packing and processing plants across the country. AMIF interviewed Dr. Seward in an effort to further understand these principles.

Q: Briefly explain the Principles of Sanitary Design and how they improve the overall food safety profile for meat and poultry products.

Sanitary design principles for equipment and facilities were developed by members of AMI to enable processors, equipment manufacturers, architects and engineers to have a foundation for discussing and evaluating sanitary design elements of equipment and facilities. Use of the principles in design, manufacturing and construction enables greater control over the risk of contamination of food products during food processing, construction of new facilities and renovation of existing facilities. Optimizing the design and performance criteria for facilities and equipment will reduce the likelihood that microbial hazards will have the opportunity to create harborage and growth niches that could lead to product contamination.

Underlying each sanitary design principle is a set of criteria that further define the principles. These criteria comprise checklist tools that facilitate internal and external evaluation of equipment design, facility design, and ultimately, the finished products (i.e., equipment or a renovated or new facility) against the sanitary design principles.

Q: What inspired the development of these design principles?

Based on the AMI 2001 *Listeria* Task Force, an agreement by the AMI Board of Directors that food safety is not a competitive issue, and the need to reduce the incidence of *Listeria monocytogenes* in ready-to-eat (RTE) meat and poultry products, sanitary design task forces were chartered to develop sanitary design principles for RTE processing equipment and facilities

used for food storage and production. The equipment and facility design task forces were charged with developing standard equipment sanitary design criteria that meet the expectations of the meat and poultry industries for sanitary design, and to develop facility sanitary design criteria to be used by those involved in redesigning existing facilities or in the construction of new facilities.

Q: How widely adopted are the principles?

The EDTF and FDTF Principles are used by AMI members, who produce over 90 percent of meat and poultry products in the United States, to evaluate equipment and facilities for sanitary

design. The principles also are being used by equipment manufacturers and architecture-engineering firms in their designs of equipment and facilities, respectively. The sanitary design principles are communicated through public meetings and trade journal publications to stress the commitment of the industry to these principles and continuous improvement of equipment and facility designs. Sanitary design and operation of equipment and facilities are critical elements of industry Best Practices to control *Listeria* and other microbial pathogen contamination.

Q: What are the practical applications of the principles? Have they changed the actual design of equipment and facilities?

The AMI task forces determined that it was not in their objective to write standards; however, the sanitary design principles have been integrated into decision criteria for purchasing of new equipment or in the selection process for facility design firms. All major

equipment and facility design companies are using the sanitary design principles in their development work, and the application of the sanitary principles has become part of the communications used by these companies in discussing their products and processes.

Improvements in design should reduce long term costs based on reductions in maintenance costs, sanitation costs (labor and supplies), down time, start-up delays, microbiological troubleshooting, manufacturing costs (one versus multiple models), and recalls. Greater productivity because of reduced down time also should improve the benefit to cost ratio. Equipment and facility design companies help themselves by inviting customers to be part of their design teams. ■

The 10 Sanitary Design Principles:

1. Cleanable to a Microbiological Level
2. Accessible for Inspection, Maintenance & Cleaning/ Sanitation
3. Made of Compatible Materials
4. No Liquid Collection
5. Hollow Areas Hermetically-sealed
6. Sanitary Operational Performance
7. Validated Cleaning & Sanitizing Protocols
8. No Niches
9. Hygienic Compatibility with Other Systems
10. Hygienic Design of Maintenance Enclosures

The 11 Facility Design Principles:

1. Distinct Hygienic Zones Established in the Facility.
2. Personnel & Material Flows Controlled to Reduce Hazards.
3. Water Accumulation Controlled Inside Facility.
4. Room Temperature & Humidity Controlled.
5. Room Air Flow & Room Air Quality Controlled.
6. Site Elements Facilitate Sanitary Conditions.
7. Building Envelope Facilitates Sanitary Conditions.
8. Interior Spatial Design Promotes Sanitation.
9. Building Components & Construction Facilitate Sanitary Conditions.
10. Utility Systems Designed to Prevent Contamination.
11. Sanitation Integrated into Facility Design.

Long-Standing Partnership with Animal Welfare Expert Has Yielded Dramatic Change in Meat Industry, AMI Tells Congress

A sixteen-year partnership with leading animal welfare expert Dr. Temple Grandin has helped revolutionize animal handling in the meat packing industry, according to AMI Senior Vice President of Public Affairs and Professional Development Janet Riley, who recently submitted testimony to a House Agriculture Subcommittee on Livestock, Dairy and Poultry hearing on animal welfare.

Riley told the Subcommittee that the U.S. meat packing industry is unique because it must comply with the Humane Slaughter Act, which is enforced by federal inspectors who are in our packing plants continuously. “No other sector of animal agriculture has this level of regulatory oversight,” Riley said. “But it is important to note that our industry seeks not just to meet federal humane slaughter requirements – we seek to exceed them.”

Riley said the meat industry took four key steps that have changed the way it handles animals and improved animal welfare in measurable ways: 1) formation of a partnership with leading animal welfare expert Dr. Temple Grandin in 1991; 2) launch of the first industry specific animal welfare audit in 1997; 3) development of AMI Foundation-sponsored training initiatives beginning in 1999 to encourage continuous improvement; and 4) 2002 declaration of animal welfare as a non-competitive issue in the meat industry.

Dr. Grandin, now the subject of books and television programs, was relatively new to animal welfare. As a result of her lifelong battle to emerge from autism, she developed a special appreciation for the way animals think visually and for the things that can be overwhelming to animals from a sensory perspective. According to Riley, Grandin offered practical, applied ideas about how to enhance welfare by working with – and not against – an animal’s natural tendencies. These practices were detailed in AMI’s 1991 *Recommended Animal Handling Guidelines for Meat Packers*, which Dr. Grandin authored.

Riley cited as an example her recommendation to use serpentine chutes that leverage an animal’s natural curiosity to see what is around a corner to encourage them to move forward. This reduced the need for aggressive driving and electric prod use.

“By trying to look at our plants as an animal would, we now understand how to use lighting, air flow and even certain color paints to help livestock remain calm and to reduce livestock stress. This is not only more humane, it also enhances meat quality,” Riley said. “Treating animals in an optimal way is not just the right approach from an ethical perspective, it is the right approach economically.”

In 1996, after Dr. Grandin audited U.S. meat packing plants, she concluded that animal welfare in meat packing plants

could be evaluated objectively. She argued that by developing measurable criteria and auditing regularly, we could monitor welfare in our plants and strive for continuous improvement. AMI’s Animal Welfare Committee endorsed this idea and in 1997, released the first animal welfare audit document called *Good Management Practices for Animal Handling and Stunning*. The industry began counting:

- Slips and falls by livestock,
- How often they vocalize,
- How frequently electric prods are used,
- How accurately animals are stunned, and
- How effectively livestock are made insensible during the slaughter process.

“Dr. Grandin argued that you manage what you measure. The act of counting and measuring with regularity ensures that when a deviation occurs, a plant can explore and rectify the cause,” Riley said. By 1999, major restaurant customers were requiring the use of this audit as requirements for doing business. The “AMI audit” also is used around the world and by certification groups like Certified Humane and Free Farmed.

In 1999, AMI launched an AMI Foundation conference to train members in the principles of this audit. In March 2007, 300 members of the industry attended two days of training in Kansas City, Mo. The conference was the first of its kind and today remains the largest.

“*Treating animals in an optimal way is not just the right approach from an ethical perspective, it is the right approach economically.*”

“During these two days, our plant employees learn from Dr. Grandin’s colorful style of training and they are encouraged to ask questions of her and of their peers and other academics, who co-present with her,” Riley said. “Through this conference, we have sought to professionalize the role

of the animal handler and to emphasize the significance of the jobs these employees do.”

In 2002, AMI’s Board affirmed a motion by the Animal Welfare Committee to make animal welfare a non-competitive issue. As a result of this non-competitive philosophy, if a member has an animal handling challenge, he or she can contact AMI and the Institute will facilitate dialogue with other members with similar operations.

“My years in this area have shown me that people are a critical factor in animal welfare. Often, we read in the newspaper that groups are arguing for one system over another. The animal welfare debate is cast in black and white terms with one system being good and another being bad. But I have

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AMI Foundation Board Approves Funding for 2007 Projects

(from page 1)

against pathogenic bacteria – results in surface decontamination of pathogenic bacteria and imparts residual protection against pathogen growth. To support the overall objective, the researchers will do the following:

1. Validate the extent of decontamination that results from topical application of levulinic acid to meat surfaces as compared to lactic and acetic acids.
2. Validate the extent of surface decontamination that results from topical application of levulinic acid at various concentrations and at temperatures greater than currently in use for lactic and acetic acid.
3. Validate the residual protection against growth of pathogenic bacteria imparted by topical application of levulinic acid to meat surfaces as compared to lactic and acetic acids.
4. Evaluate the organoleptic implications from topical application of levulinic acid as compared to lactic and acetic acids.

A Systematic Review of Literature on Pork Chain

Epidemiology

Annette O'Connor, Iowa State University

This project will synthesize, translate and combine the vast scientific knowledge describing the epidemiology of *Salmonella* in the pork chain using a systematic review. The review team will be overseen by a review advisory team and will follow the steps of a systematic review 1) question design, 2) literature search, 3) relevance screening, 4) quality assessment, 5) data extraction and 6) report synthesis. Current and future *Salmonella* public health risk assessment will benefit from the proposed systematic review, which will describe what literature is available about the epidemiology of *Salmonella* in the pork chain. The review will also identify areas where research is repetitive or lacking and can be used as a resource allocation tool to fill in gaps in risk assessment models. (Note: This project is co-funded by the National Pork Board)

White Paper on Destruction of H5N1 Avian Influenza in Meat and Poultry Products

M. Ellin Doyle, Ronald Weiss, Stacey Schultz-Cherry, University of Wisconsin; Hon Ip, United States Geological Survey National Wildlife Health Center; Michael Robach, Cargill, Inc.

The specific goals of this project are to:

1. Determine, from scientific literature, the generally accepted time and temperature requirements for inactivation of the H5N1 virus in meat and poultry products;
2. Review non-thermal methods for inactivation of the H5N1 virus and their effectiveness and practicality in meat and poultry matrices; and,
3. Determine current data gaps regarding inactivation of these viruses.

Included in the search will be scientific literature databases (PubMed and Food Science and Technology Abstracts), U.S. government publications from the Centers for Disease Control

and Prevention and U.S. Department of Agriculture, relevant international government publications and the World Health Organization and industry publications. The search will target information on the distribution of the virus in different tissues and organs of infected animals, thermal and non-thermal methods for destruction of the virus in meat and poultry, other foods and *in vitro*.

Evaluation of Alternative Cooking and Cooling Procedures for Large, Intact Meat Products to Achieve Lethality and Stabilization Microbiological Performance Standards

Jeffrey Savell, Kerri Harris and Alejandro Castillo, Texas A&M University

This project will aim to validate the safety of slower cooking and cooling times for large whole-muscle meat products to meet Food Safety and Inspection Service (FSIS) lethality and stabilization microbiological performance standards. Specifically, the project will try to achieve lethality microbiological standards for slower heating times than those defined by Appendix A using alternative heating times and temperatures and to achieve stabilization microbiological performance standards for slower cooling times than those defined by Appendix B using alternative cooling times and temperatures. Researchers will be inoculating with a mixture of various serotypes of *Salmonella* and coliforms before each cooking treatment and *Clostridium perfringens* spores before each cooling treatment. If successful, these analyses will help identify slower cooking and cooling procedures to meet FSIS lethality and stabilization microbiological performance standards.

Beyond Intent: Assessment and Validation of On-package Handling and Cooking Instructions for Uncooked, Breaded Meat and Poultry Products to Promote Consumer Practices that Reduce Foodborne Illness Risks

Randall Phebus and Douglas Powell, Kansas State University; Harshavardhan Thippareddi, University of Nebraska

The primary goal of this project is to determine whether current labeling guidelines are effective in producing a safe end product if followed correctly under different preparation conditions using *Salmonella*-inoculated controlled cooking experiments. To do this, researchers will first create a representative inventory of consumer handling and cooking recommendations on packages of heat treated, not fully cooked, not shelf stable poultry products available at retail and for food service in the United States – specifically, uncooked, breaded, boneless poultry products that also may be stuffed or filled, charmarked or artificially colored. Researchers will also undertake qualitative and quantitative research with consumers and food service employees to determine how various safe food-handling statements are understood, or misunderstood, and the intention to act upon such understanding. Observation of product preparation by consumers and food service employees and in-depth interviews will be used as part of the project to identify gaps between intention and actual behavior. ■

AMIF Releases 2007 Animal Handling Guidelines and Audit Guide By Leading Animal Welfare Expert Dr. Temple Grandin

The American Meat Institute (AMI) in May released the 2007 Animal Handling Guidelines and Audit Guide. These internationally recognized guidelines are an updated version of the 2005 guidelines and have been revised based upon feedback from the field.

Audit points in the guidelines include measurement of: frequency of slips and falls by livestock; frequency of vocalizations; frequency of electric prod use; stunner accuracy; and how effectively livestock are made insensible during processing. The audit also calls for the monitoring of any willful acts of abuse (which is an immediate audit failure) and the provision of water at all times. Major changes include the addition of a new audit point for monitoring slips and falls at unloading and a new approach to vocalization scoring of pigs.

The audit guide was first created in 1996, after Dr. Temple Grandin audited U.S. meat packing plants. At that time, she concluded that animal welfare in meat packing plants could be evaluated objectively. She argued that by developing measurable criteria and auditing regularly, the industry could monitor welfare in our plants and strive for continuous improvement. AMI's Animal Welfare Committee endorsed this idea, and in 1997, released the first animal welfare audit document. Since that

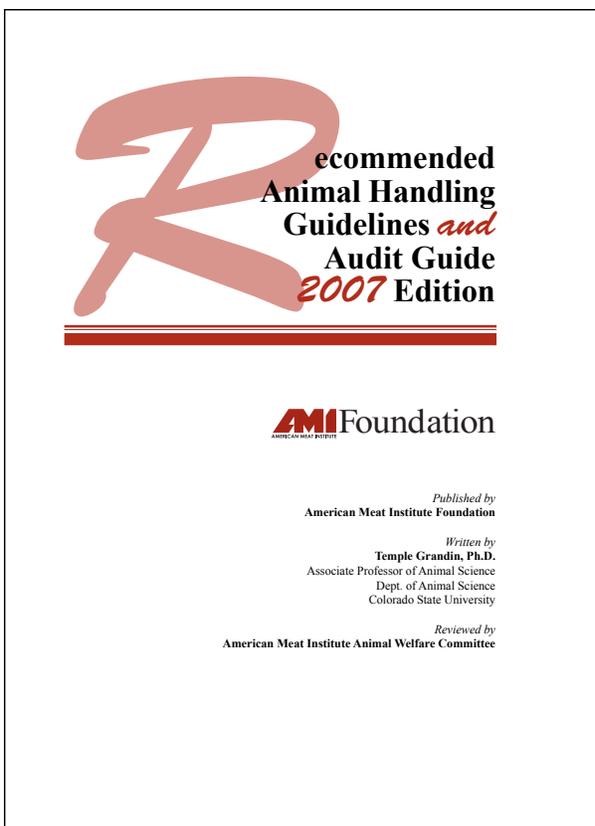
time, the guidelines have been updated twice.

By 1999, major quick service restaurant customers were requiring the use of this audit as a requirement for doing business. The "AMI audit" also is used around the world and by certification groups like Certified Humane and Free Farmed.

"Dr. Grandin argued that you manage what you measure. The act of counting and measuring with regularity ensures that when a deviation occurs, a plant can explore and rectify the cause," AMI President J. Patrick Boyle said. "We have seen dramatic improvements in our animal handling as a result of this innovative initiative a decade ago." Dr. Grandin's data documenting improvements are found at www.grandin.com.

In 2002, AMI's Board of Directors voted to make animal welfare a non-competitive issue, which has inspired further cooperation among members to help each other continuously improve.

"No other sector of animal agriculture is as heavily regulated and inspected for animal welfare practices as the meat packing industry. Federal inspectors oversee our packing operations continuously and can take actions – including closing a plant – for failure to comply with federal rules," Boyle said. "However, our goal has been to not just meet, but to exceed federal rules. We have a documented history of doing just that and we are very proud of our proactive record."



All of AMI's materials and guidelines may be found at www.animalhandling.org. The site is public and the guidelines are free. ■

Animal Welfare Testimony: AMI Foundation Training Efforts Contributed Substantially to Enhancements

(from page 4) learned that systems can be managed well and they can be managed poorly. A small, low-tech plant with well-trained people can achieve the same kind of outcomes as a larger, high-tech plant," Riley said.

"It takes management commitment and continuous monitoring. What matters most is the outcome and that is why we focus so heavily on achieving measurable outcomes," she added.

"Our industry's comprehensive animal welfare efforts come as a surprise to many. But I'm pleased to say that they are second

nature to us. Ten years ago, the thought of counting moos in a meat packing plant raised some eyebrows. But now, we don't let a week go by without it," Riley said. "Dr. Grandin has provided inspiration and motivation. And our members have provided the commitment to make what were once her theories a reality."

All of AMI's efforts, materials and guidelines are available at www.animalhandling.org. The site is public and the guidelines are free. To read Riley's testimony in its entirety, visit www.MeatAMI.com. ■

White Paper Identifies Areas of Study for Natural and Organic Cured Meat Products

Improvements in areas of safety, quality, marketing, manufacturing and regulatory guidance must be made to natural and organic cured meat products to provide consumers with wholesome and safe products was the conclusion of a White Paper recently released by the American Meat Science Association (AMSA).

The paper, “Natural and Organic Cured Meat Products: Regulatory, Manufacturing, Marketing, Quality and Safety Issues,” authored by Joseph Sebranek, Ph.D. of Iowa State University, and James Bacus, Ph.D. of Technical Ingredient Solutions, LLC, looked at the current state of and necessary improvements to the natural and organic cured meat product market.

Typically, formulations for conventional cured meat products include the use of nitrate or nitrite, or both. Nitrite is an antioxidant that serves a vital public health function to block the growth of botulism-causing bacteria and prevent spoilage. The use of nitrite in cured meats also gives products their color and flavor. Research sponsored by the USDA also indicates that nitrite can help prevent the growth of *Listeria monocytogenes*.

While nitrate and nitrite are safe for use in meat processing, some consumers hold negative perceptions of nitrite cured meats and have caused rapid growth in the market for “uncured” natural and organic versions of typical cured meats. Many natural and organic processed meats look and taste similar to typically cured products, but also have significant concentrations of residual nitrite and nitrate – demonstrating that nitrite and nitrate are being introduced to many of these products from other ingredients.

In a review of product labels of natural and organic processed meats, the authors found that natural flavorings, spices and celery juice or celery juice concentrate are frequently listed as ingredients. Given that these ingredients are derivatives of plant products, they are a potentially significant source of nitrate in natural meat products. Celery juice, and celery powder, has

become an increasingly popular option for use with processed meat products given its lack of impact on both flavor and color of the product. In addition, processors may also list it as a natural flavoring on product labels.

The paper lists five main areas to be studied and improved. They are:

1. Resolving the issue of “natural” versus “chemical” preservatives, which is currently retarding innovative product development and has the potential to compromise food safety;
2. Consideration of the use of natural ingredients in regards to the inherent variability of “natural” and “organic” meat products and the reduction of shelf-life;
3. Improved label terminology, including the replacement of “uncured” and “no nitrates or nitrites added” to “naturally cured,” with the addition of footnotes, such as “naturally occurring nitrites may be present” to adequately inform consumers of the potential existence of nitrite in the “naturally cured” products;
4. Determination of the long-term stability of color, flavor and flavor stability because of the processing techniques, especially in the presence of additional nitrite created because of natural nitrite sources;
5. Controlling ingoing and residual nitrite concentrations to assure product safety both because nitrite in conventionally processed products is a very effective antimicrobial agent and no microbiological challenge studies have been completed on “naturally” cured products and because residual nitrite concentration is a well-known risk factor in the potential formation of carcinogenic nitrosamines.

AMSA is a non-profit organization of individuals that discovers, develops and disseminates its collective meat science knowledge to provide leadership, education and professional development. This paper is available in full from the AMSA Web site, <http://www.meatscience.org>. ■

Calendar of Events

For additional information on any of these upcoming events, or to register, please visit our website at MeatAMI.com and navigate to Events/Education or contact Anne Nuttall at 202/587-4241 or anuttall@meatami.com.

Meat Industry Research Conference, McCormick Place, Chicago, Ill.

When: Oct. 23-24, 2007

What: Featuring specific sessions on meat safety, fresh meat and packaged meat research, the Meat Industry Research Conference (MIRC) provides attendees with new research results and the opportunity to discuss future topics.

Worldwide Food Expo, McCormick Place, Chicago, Ill.

When: Oct. 24-27, 2007

What: Worldwide Food Expo is the year’s largest food and beverage processing and packaging event in the world, covering more than a million square feet of exhibits and featuring 1,000 of the world’s leading suppliers. More than 25,000 attendees from 100 countries will visit the show to learn about new technologies, trends and ideas.

First Meat Industry Specific Standards Seminar Draws Record Crowds to Worker Safety Conference

The first of its kind, intensive, General Industry Standards Seminar targeted to the meat and poultry drew a record number of participants to the 2007 Conference on Worker Safety, Health & Human Resources.

The 10-hour course, which was presented by John Wallace, safety consultant, Workplace Group, was developed through a unique partnership of industry experts and academics and followed key guidelines developed by the Occupational Safety and Health Administration (OSHA). The Conference was held April 2-4, 2007, at the Hyatt Regency Denver at Colorado Convention Center and was sponsored by the AMI Foundation and the Canadian Meat Council.

“In Your Face Safety, That’s Fun” is what Bill Robbins calls his motivational, behavior-based “Hooked on Safety” presentation. Robbins kicked off the opening session and captured the attention of the conference attendees with his unique blend of humor and storytelling, which he used to discuss the story of his own workplace accident that cost him his hands. Participants connected immediately with Robbins, and through audience participation he was able to drive home his messages about the challenges faced by the disabled in the workplace and make the topic more relevant to the audience.

Participants agreed that the expanded session on immigration and employee verification was both timely, and helpful. The nuts and bolts of the BASIC Pilot Employee Verification Program - including the most recent optional photo verification program currently being tested by employers - was presented by Katherine Lotspeich, chief, outreach and education with the Verification Division of U.S. Citizenship and Immigration Services in the Department of Homeland Security. The session provided participants with a systematic approach to scrutinizing new job applicants for verification purposes.

The IMAGE, another important immigration-related initiative that is currently being rolled out to employers who applied

to be part of the effort, was detailed by John Shofi. Shofi is a section chief with Immigrations and Customs Enforcement in the Department of Homeland Security.

Another popular session, the two-part Workplace Violence Workshop analyzed root causes and provide tools that individual plants can implement to prevent possible incidents. The session was conducted by Bill Mulherin, Vice President of Court Services and OSHA, National Safety Council, Greater Omaha Chapter. Mulherin discussed violence in the workplace, particularly the liability of employers. He reviewed current statistics on workplace violence, and detailed key steps that need to be in place to protect employees.

Other sessions included advanced safety, public relations as it applies to the meat industry, succession planning and retirement, ergonomics, compliance with OSHA’s new hexavalent chromium rule, containing costs for benefit and wellness programs and internal audits. The final presentation was conducted by Neil Wasser, Attorney and Chairman, Constagny, Brooks and Smith, LLC. Wasser reviewed the 2006 OSHA guidelines and offered a glimpse into what to expect for 2007.

The two day event ended with Worker Safety Recognition Awards Ceremony. The awards recognized the efforts of meat packing and processing plants across the country to improve their safety performance through the establishment of sound safety and health programs and achieve a high level of safety performance as part of the continuing effort to reduce occupational injury and illness throughout the industry.

As part of this year’s award program, a total of 125 packing and processing facilities were honored. Thirty-four plants were recognized with the highest award – the Award of Honor – an increase of 31 percent over the 2006 awards. Fifty plants received the Award of Merit, an increase of six percent over 2006. In addition, 22 plants received the Award of Commendation and 19 received a Certificate of Recognition. ■

CDC FoodNet Data Shows Foodborne Illness Declines Overall, But Slight Increases in *E. coli* O157:H7 Cases Observed

Foodborne illnesses overall continued their downward trend in 2006, according to data released from the Foodborne Diseases Active Surveillance Network (FoodNet) at the Centers for Disease Control and Prevention (CDC). However, incidence of *E. coli* O157:H7 infections increased in 2006 due to several large, multi-state outbreaks linked to produce.

Individual cases of *Yersinia* decreased 50 percent in 2006 over 2005; *Listeria* cases decreased 35 percent; and *Campylobacter* cases decreased 30 percent. The estimated incidence of *Salmonella* and *E. coli* O157:H7 did not change significantly when compared to the baseline.

Outbreak-associated cases of infection accounted for at least 88 (15 percent) of 590 *E. coli* O157:H7 cases in 2006, compared with 36 (9.0 percent) of 402 cases in 2004 and 107 (23 percent) of 473 cases in 2005. “Three large, high-profile multi-state outbreaks of STEC [Shiga-toxin *Escherichia coli*] O157 infections associated with produce affected FoodNet sites in 2006,” CDC reported. “Of the 88 outbreak-associated STEC O157 cases ascertained in FoodNet in 2006, one outbreak associated with bagged fresh spinach accounted for 32 (36 percent), and two outbreaks associated with lettuce in two fast-food chains accounted for 14 (16 percent).”

(see page 10)

Ongoing AMI Foundation Research

Ongoing AMIF Research – *E. coli* O157:H7

Investigator	Institution	Project Title
Chance Brooks, Mindy Brashears, Mark Miller, Adam Tittor	Texas Tech University	Impact of Ground Beef Packaging Systems and Temperature Abuse on the Safety and Quality of Ground Beef ¹

¹ Co-funded with the National Cattlemen's Beef Association

Ongoing AMIF Research – *Listeria monocytogenes*

Investigator	Institution	Project Title
Charles Carpenter, Jeffrey Broadbent	Utah State University	Anti- <i>Listeria</i> Action of Levulinate
Mary Alice Smith, Joseph Frank	University of Georgia	Refinement of <i>Listeria monocytogenes</i> (<i>L. monocytogenes</i>) Low Dose Data from Pregnant Guinea Pigs for Human Risk Assessment
Kathy Glass, James Claus	University of Wisconsin	Minimum Nitrite Levels Required to Control <i>Listeria monocytogenes</i> on Ready-to-Eat Meat and Poultry Products
Charles Carpenter, Jeffrey Broadbent	Utah State University	Validation of Levulinic Acid for Topical Decontamination of Meat Surfaces

Ongoing AMIF Research – *Salmonella*

Investigator	Institution	Project Title
Annette O'Connor	Iowa State University	A Systematic Review of Literature on Pork Chain Epidemiology ²

² Co-funded with the National Pork Board

Ongoing AMIF Research – Targeted Research

Investigator	Institution	Project Title
Mindy Brashears, Mark Miller, Chance Brooks, John Blanton, Christine Alvarado, Guy Loneragan	Texas Tech University, West Texas A&M University	Risk Factors and Consequences Associated With Condensation in Fresh and Ready-to-Eat Processing Facilities
Bradley Marks, Alicia Orta-Ramirez, Alden Booren, Elliot Ryser	Michigan State University	Determine the Likelihood that <i>Salmonella</i> Develops Heat Resistance during Thermal Processing of Commercial, Whole-Muscle, Ready-to-Eat Meat Products
Catherine Cutter, Ed Mills	Pennsylvania State University	Determination of the Efficacy of Chlorine Dioxide as an anti-Listerial Agent in RTE Brine Chilling Solutions
Jeffrey Savell, Kerri Harris, Alejandro Castillo, Wesley Osburn	Texas A&M University	Evaluation of Alternative Cooking and Cooling Procedures for Large, Intact Meat Products to Achieve Lethality and Stabilization Microbiological Performance Standards
M. Ellin Doyle, Ronald Weiss, Stacey Schultz-Cherry, Hon Ip, Michael Robach	University of Wisconsin, USGS National Wildlife Health Center, Cargill, Inc.	White Paper on Destruction of H5N1 Avian Influenza in Meat and Poultry Products
Randall Phebus, Douglas Powell, Harshavardhan Thippareddi	Kansas State University, University of Nebraska	Beyond Intent: Assessment and Validation of On-package Handling and Cooking Instructions for Uncooked, Breaded Meat and Poultry Products to Promote Consumer Practices that Reduce Foodborne Illness Risks

Staff On The Move

The following is a list of recent industry meetings where AMI staff attended or participated as invited speakers.

Randy Huffman, Vice President Scientific Affairs

Canadian Meat Council Technical Symposium, Vancouver, British Columbia
 “Customer and Consumer Expectation of Meat Products: A U.S. Perspective”

AMI - FMI Annual Meat Conference, Orlando Fla.
 “Livestock Cloning: Meat Industry Perspective”

Beef Industry Food Safety Council, Dallas, Texas
 Moderator, “Meat Packaging Technologies and Impacts on Safety and Quality”

Ohio State University Thermal Processing of Ready-to-Eat Meat Products Short Course, Columbus, Ohio
 “Thermal Processing of Ready to Eat Meat Products: Importance to the Industry”

16th International Symposium on Problems of Listeriosis, Savannah, Ga.
 “Listeria Control in Processed Foods - How Far We Have Come and Where Do We Go From Here?”

National Restaurant Association Produce Safety and the Foodservice Industry Conference, Monterey, Calif.
 “Controlling Pathogens: Lessons Learned from the Meat Industry”

Skip Seward, Vice President Regulatory Affairs
 International Symposium on Meat Safety, Valencia, Spain
 “U.S. Regulations in the Meat Industry”

University of Georgia Annual Food Safety & Quality Symposium, Atlanta, Ga.

Kraft Annual Sanitary Design Symposium, Northfield, Ill.

Facilitator, Cooked Sausage Link Strategic Partnership Program on Agroterrorism, Johnsonville, Wisc.

FSIS Risk-Based Inspection Algorithm & Timetable Summit, Arlington, Va.

USDA-HHS RBI Attribution Summit, Arlington, Va.

Janet Riley, Senior Vice President Public Affairs and Professional Development
 AMIF Animal Care & Handling Conference, Kansas City, Mo.
 “Consumer Attitudes About Cloning”

International Meat Secretariat Animal Welfare Workshop, Paris
 “Animal Welfare Regulation in the U.S.” and “Animal Welfare in the U.S. Meat Packing Industry: A Case Study” ■

CDC FoodNet Data

(from page 10) In its preliminary report, CDC officials highlighted the need for more effective contamination prevention measures for fresh produce. The report also said that enhanced measures are needed to control pathogens in animal and plants; to reduce or prevent contamination during growing, harvesting and processing; and to educate consumers more effectively about risks and prevention measures.

According to the CDC, consumers can reduce their risk for foodborne illness by following safe food-handling recommendations and by avoiding consumption of unpasteurized milk, raw or undercooked oysters, eggs, ground beef and poultry. For additional information, visit <http://www.cdc.gov/foodnet/>. ■

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