Dear AMI Member and Others Concerned About Food Safety

AMI Foundation 2010 Year in Review

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AMI Foundation
Dear AMI Member and Others Concerned About Food Safety:

This year marked the beginning of the second decade of the AMI Foundation’s Food Safety Initiative, an effort designed to research strategies to target and destroy key pathogens and to educate consumers about the role they play in ensuring safe food. This document highlights the activities of the Foundation in 2010.

The Foundation staff has reiterated the need for food safety research to the U.S. Department of Agriculture’s National Institute of Food and Agriculture, Agricultural Research Service, and Food Safety and Inspection Service. During the last 12 months, the Foundation funded 12 research projects and held various food safety educational programs for the meat and poultry industry. The Foundation in 2010 also continued its work to reaffirm the safety of nitrite in meat and poultry products.

Our Foundation has developed a reputation for proactive leadership in food safety and in other areas as well, like animal welfare, worker safety and nutrition. We have demonstrated that research is a wise investment and have developed a formula to create real change and real progress. We will apply that formula to meet the challenges that lay ahead in the future. That is why in 2011, AMIF is continuing to address non-O157:H7 shiga toxin-producing Escherichia coli in the beef supply, working with our retail partners to address Listeria control in deli operations and assisting the industry in meeting the new Salmonella performance standards.

We encourage you to visit the AMI Foundation website (www.amif.org) to view final reports of the Foundation’s funded research, which are all made publicly available. The AMI Foundation believes it is essential to be transparent in communicating the results of food and agricultural research to improve food safety during the production of meat and poultry products.

Thank you for your support and your interest in the AMI Foundation and our efforts during this past year and we look forward for another successful year in 2011.

Sincerely,

President
About AMIF

The American Meat Institute Foundation (AMIF) is a non-profit research, education and information foundation established and funded by the American Meat Institute (AMI) to study ways the meat and poultry industry can operate more efficiently and produce the best and safest products possible.

Originally created in 1944, the Foundation provides research funding to universities, private institutions, non-profit organizations and other foundations to conduct research on behalf of the meat and poultry industry. AMIF publicly disseminates research findings, best practices and other educational materials on a broad range of food safety, worker safety, nutrition and consumer information projects.

The Foundation’s food safety program has set a clear goal to reduce and ultimately eliminate: *Escherichia coli* O157:H7 in fresh beef; *Listeria monocytogenes* in ready-to-eat meat and poultry products; and *Salmonella* in meat and poultry products. In addition to these three focused priority areas, the Foundation has “Other Food Safety” research priorities that are designed to identify emerging areas of concern as well as other safety issues not otherwise addressed.

Since 1999, the AMI Foundation research program has directly sponsored more than 85 food safety research projects at leading universities and research labs totaling nearly $7.5 million. Those projects have helped develop new technologies to reduce microbial hazards in raw and fully cooked food products, gain a better understanding of the taxonomy of microorganisms to select or create intervention antimicrobials, and maintain the highest level of employee training through continued education programs.

The Foundation’s research priorities are developed through a collaborative process of industry, academic and government experts who help solicit proposals for applied and fundamental research that will improve the microbial profile of meat and poultry products. The Foundation’s Research Advisory Committee identifies knowledge gaps and predicts future research needs for the meat and poultry industry.

During the last 18 months, much attention has focused on non-O157:H7 shiga toxin-producing *E. coli* (STEC). What you may not know is that AMIF has included non-O157:H7 STEC in its research priorities since 2006. In fact, in 2010, AMIF distributed a supplementary request for proposals in January focusing on beef safety with an emphasis on non-O157 STECs.

The Foundation is nearing the end of the 2010-2011 funding cycle. Research proposals were solicited on the 2010-2011 AMI Foundation Research Priorities which can be viewed here: [http://amif.org/ht/a/GetDocumentAction/i/60024](http://amif.org/ht/a/GetDocumentAction/i/60024). New research funding will be awarded in January 2011.
AMI Foundation Funded Research Projects - Ongoing

E. coli
Post-Harvest Research

Antimicrobial interventions/application methods for the reduction of *Escherichia coli O157:H7* and *Salmonella* in beef trimming and/or ground beef

Fred Pohlman, Steven Ricke, Palika Dias-Morse, Anand Mohan, Sara Millilo, Peggy Cook, Karen Beers

University of Arkansas, Safe Foods International

This research will provide a practical and cost-effective, novel decontamination technology for beef processors that can be immediately implemented for commercial application of antimicrobial interventions during the ground beef production chain. The main focus of this research is to utilize and validate antimicrobial properties of peroxyacetic acid, novel organic acids alone or in combination with a non-ionic surfactant on beef trimmings against *E. coli* O157:H7 O26, O103, O111, O121, O45, and O145 and *Salmonella Typhimurium* DT 104, Newport MDR-AmpC.

Evaluation of chemical decontamination treatments for beef trimmings against *Escherichia coli* O157:H7, non-O157 shiga toxin-producing *E. coli* and antibiotic resistant and susceptible *Salmonella Typhimurium* and *Salmonella Newport*

John Sofos, Hua Yang, Ifigenia Geornaras, Kendra Nightingale, Keith Belk, Dale Woerner, Gary Smith

Colorado State University

The objective of the proposed study is to determine whether interventions known for reducing *Escherichia coli* O157:H7 contamination on beef trimmings are also effective against *E. coli* O157:H7, non-O157 STEC (O26, O45, O103, O111, O121, and O145), and parent and derived *Salmonella Typhimurium* and *Salmonella Newport* strains.

Efficacy of commonly used antimicrobial compounds on decontamination of Shiga toxin-producing *Escherichia coli* serotypes O45, O121, and *Salmonella* inoculated fresh meat

Norasak Kalchayanand, Terrance Arthur, Joseph Bosilevac, Dayna Brichta-Hartay, John Schmidt, Steven Shackelford, Tommy Wheeler

USDA-ARS-U.S. Meat Animal Research Center

The overall objective is to validate effectiveness of antimicrobial compound treatments on inactivation of STEC and *Salmonella* (MDR versus non-MDR strains) inoculated fresh beef. The AMIF recently funded ARS to conduct a similar study on the following non-O157 STECs: O26, O103, O111, and O145. This study will complete this work by adding the other two non-O157 STECs from the CDCs top six and include MDR and non-MDR *Salmonella Typhimurium* and Newport.

Evaluating the Efficacy of Commonly used Antimicrobial Interventions on Shiga-toxin Producing *E. coli* Serotypes O26, O103, O111, O145 and O157

Norasak Kalchayanand, Terrance Arthur, Joseph Bosilevac, John Schmidt, Steve Shackelford, Tommy Wheeler

USDA-ARS-U.S. Meat Animal Research Center

This research intends to validate the effectiveness of hot water, lactic acid, peroxyacetic acid, and other commercial interventions on the inactivation of STEC inoculated fresh beef. Non-O157 STECs have come under increasing regulatory oversight.
Innovative Pathogen Intervention Technologies

Role of Protozoa in the Persistence of *Listeria monocytogenes* in a Ready-to-Eat Poultry Processing Plant

Richard Meinersmann, Mark Berrang, Tim Hollibaugh, Joseph Frank
Agricultural Research Service, USDA and University of Georgia

This research will determine if bacterivorous protozoa contribute to shaping bacterial communities in food processing plants and influence the survival of *Listeria monocytogenes* in floor drains. The proposed project is designed to identify *Listeria*-lytic protozoa and isolate them for further research in the use of naturally decontaminating floor drains.

Genetic Attributes Associated with the Ability of Different Serotypes of *Listeria monocytogenes* to Colonize the Meat Processing Plant Environment and to Contaminate Ready-To-Eat Meat Products (Chicken, Turkey, Pork, and Beef)

Sophia Kathariou, Dana Hanson
North Carolina State University

The study will characterize the genetic basis for the apparent differences in prevalence of different serotypes and strain types of *L. monocytogenes* in the processing plant environment and in foods, specifically if genes mediating adaptations are highly relevant to the ability of the pathogen to colonize the processing plant and contaminate RTE meats.

Validation of Quaternary Ammonia and Hydrogen Peroxide Powder for Control of *Listeria monocytogenes* in Ready-to-Eat Meat and Poultry Plants

Robin Kalinowski, Erdogen Ceylan
Silliker, Inc.

This research will assess the effectiveness of two chemical interventions, quaternary ammonia and hydrogen peroxide powder, to control *Lm* in RTE facilities. Results can be used to validate these interventions.

Post Production Research

Cost Effective Treatments to Minimize In-Store Deli Meat Slicer Cross Contamination of Ready-To-Eat Meats by *Listeria monocytogenes*, Phase II

Phil Crandall, John Marcy, Steve Ricke, Mike Johnson, Betty Martin, Corliss O’Bryan, Sara Rose Milillo
University of Arkansas

This study is the second phase of this research, and will further evaluate deli slicers to reduce the risk of listeriosis in commercial settings. Best practices will be validated, as well as, the comparison of cleaning and sanitizing compounds used on deli slicers.
Innovative Pathogen Intervention Technologies

Development of an Intervention to Reduce the Likelihood of *Salmonella* Contamination in Raw Poultry Intended for use in the Manufacture of Frozen, Not Ready-to-Eat Entrees

John Sofos, Ifigenia Geomaras, Jarret Stopforth, Dale Woerner, Keith Belk, Gary Smith
Colorado State University

The research will identify antimicrobial treatments for reducing levels of *Salmonella* contamination on raw ground chicken used in the preparation of frozen, NRTE breaded chicken strips. Data will indicate antimicrobial effectiveness, the effect on the subsequent thermal tolerance of *Salmonella* during partial cooking and the effect of freezing on *Salmonella* after partial cooking of raw, frozen, breaded chicken strips.

Reduction of *E. coli* O157:H7 and *Salmonella* in Ground Beef

Michael Doyle, Tong Zhao
University of Georgia

The use of levulinic acid and sodium dodecyl sulfate has been shown to be effective in reducing *E. coli* O157:H7 and *Salmonella* contamination in culture and non-meat food products. This study will examine their effectiveness when applied to ground beef as a surface treatment method to substantially reduce *E. coli* O157:H7 and *Salmonella* contamination.
Other Research

**Diet and Health**

**Understanding Sodium Replacements from a Food Safety and Health Risk Perspective**
Ellin Doyle
University of Wisconsin
This paper will review the use of sodium as a food safety intervention; evaluate the synergistic effects of sodium with approved food safety hurdles; identify food safety risks associated with sodium alternatives; assess human health risks that may result from changes in dietary sodium and potassium; and evaluate risks of reduced sodium and sodium replacements for targeted at-risk populations.

**Processed Meat Intake and Stomach Cancer**
Dominik Alexander
Exponent, Inc.
This research will conduct a systematic literature search and perform a comprehensive meta-analysis of processed meat intake and stomach cancer. The results will be submitted to a peer-reviewed scientific/medical journal.

**Analysis of Heterocyclic Amines (HCAs) Formation in Various Cooked Meat Products**
J. Scott Smith, Terry Houser, Melvin Hunt
Kansas State University
This research will examine the occurrence and levels of heterocyclic amines in various meat products, including meat products containing antioxidant containing marinades and enhancement with various ingredients. An extensive literature review and evaluation of potential exposure and risk will be undertaken during the course of this research.
Projected is co-funded with National Pork Board.

**Other Food Safety Activities**

**Causes of Human Methicillin-Resistant Staphylococcus aureus (MRSA) from All Food and Non-Food Vectors (White Paper)**
Ellin Doyle
University of Wisconsin
The white paper will summarize all historical data on MRSA and its relationship with animal and non-animal related infections; evaluate hospital acquired infections; evaluate worldwide understanding of MRSA infections and their sources. The white paper will also identify data gaps and discuss how these gaps influence the understanding of MRSA and propose tasks needed to close the gaps.

**Evaluation and Analysis of Meat Products Contaminated by Low Levels of Ammonia**
Randy Wehling, Michael Zeece, Harshavardhan Thippareddi
University of Nebraska
This project will develop a practical method for measuring ammonia contamination levels in meat products. The method will then be used to study the uptake of ammonia by meats, and the effectiveness of methods designed to decrease contamination levels.
AMI Foundation Education and Training Programs

Each year, the AMI Foundation conducts annual conferences and educational workshops to meet the needs of AMI members, others in the meat and poultry industry and their retail and foodservice customers. AMIF will continue to provide annual conventions and conferences for segments of the meat and poultry industry and to develop special workshops, seminars and other programs to meet needs as they arise. Below is a brief summary of the objectives of the programs and the results of the training offered in 2010:

Advanced Listeria monocytogenes Intervention and Control

Two separate Advanced Listeria monocytogenes Intervention and Control Workshops were held in Chicago, Ill. with more than 170 registrants. These sold-out workshops focused on the basics for process control and how to build a firm foundation for Listeria control through sanitary equipment, facility design techniques and sanitation best practices. The Canadian Meat Council and the North American Meat Processors Association co-sponsored these events.

Animal Care and Handling Conference

The Animal Care and Handling Conference was held March 25-26, 2010, in Kansas City, Mo. A total of 279 participants attended the conference – an increase of 16 percent from 2009. Notable presenters on animal handling research included Temple Grandin, Ph.D, professor, Colorado State University and John McGlone, Ph.D., professor, Texas Tech University. Other timely presentations included a review of the revised AMIF animal handling guidelines, an update on consumer behavior and a review of lessons learned in video auditing.

Annual Meat Conference

The Annual Meat Conference, co-sponsored by AMI and the Food Marketing Institute, was held in Orlando, Fla. on March 7-9, 2010. A total of 822 registrants attended educational sessions that provided practical, useful information on varied topics including regulatory compliance, consumer behavior, environmental sustainability and recall communication. This year’s attendance increased by 18 percent from 2009 and attracted a number of key retail chains. The annual Product Tasting Reception and Tech Fair
were showcasing innovations in food and food technologies premier events during the conference.

Conference on Worker Safety, Human Resources and the Environment

The Conference on Worker Safety, Human Resources and the Environment held on April 29-30, 2010, in Kansas City, Mo., continued to keep attendees ahead of the curve on issues specific to the meat and poultry industry. This year’s conference included not only traditional mainstays, such as ergonomics, but also some timely topics, such as engaging your supervisors in the safety process, updates on new legislation and regulations, and case studies in alternative energy. A total of 183 attended this year’s conference an increase of 19 percent from the previous year.

This year a pre-conference workshop was offered on Sanitation and Maintenance Safety in Food Processing. Thirty-five attendees participated in the train-the-trainer session on sanitation and maintenance operations specifically highlighting risks such as slips, trips, and falls and unguarded machinery, as well as improper lockout/tagout to control hazardous energy. The pre-conference workshop was co-sponsored by the Georgia Tech Research Institute.

Safety Recognition Award Program

The primary goals of the safety recognition program, administered by the National Safety Council, are to motivate employers to improve their safety performance through the establishment of sound safety and health programs at the plant level and to recognize those plants that have achieved a high level of safety performance as part of a continuing effort to reduce occupational injury and illness.

AMIF recognized the 157 safety awards winners in a joint awards ceremony with the Environmental Recognition Awards on April 30, 2010. AMI Chairman Jeffrey Ettinger, president and CEO, Hormel Foods Corporation, and AMIF Chairman J. Patrick Boyle were on hand to distribute and congratulate the award recipients.

Environmental Awards Program

The Environmental Recognition Awards are administered by the Education and Professional Development Department in conjunction with the AMI Environmental Affairs Committee. The 4-tier awards program was developed to provide recognition of a company’s dedication to continuous environmental improvement, as witnessed by the development and implementation of Environmental Management Systems.

AMI recognized 141 Tier awards winners on the final day of the Conference on Worker Safety, Human Resources and the Environment.
The AMI Foundation offers conferences, educational workshops and timely briefings throughout the year on topics including food safety, worker safety, human resources, animal welfare and the environment. Please note the new fall dates for the Animal Care and Handling Conference.

**Ground Beef Production For Safety Workshop**  
February 2-3, 2011  
Kansas City, Mo.  
This new workshop will be led by industry experts who will share their experiences and knowledge on the production of ground beef products within a preventative food safety system. During this workshop, participants will hear detailed case studies about ground beef production and food safety challenges and how companies have tackled them.  
The workshop agenda is structured to permit extensive discussion between attendees and instructors. The goal: to make sure that attendees are armed not just with theory, but with practical, new ideas and information that can be implemented to ensure the production of the safest possible ground beef products.

**Annual Meat Conference**  
February 20-22, 2011  
Dallas, Tex.

**Conference on Worker Safety, Human Resources and the Environment**  
March 9-11, 2011  
Kansas City, Mo.

**AMI International Meat, Poultry and Seafood Industry Convention and Exposition**  
April 13-16, 2011  
Chicago, Ill.

**Animal Care and Handling Conference**  
October 19-20, 2011  
Kansas City, Mo.

**Meat and Poultry Research Conference**  
November 1-2, 2011  
Kansas City, Mo.

The Meat and Poultry Research Conference, formerly named the Meat Industry Research Conference, will bring together research funding organizations for the purpose of sharing research results, research priorities and, to the extent possible, coordinating respective research activities. The conference will be open to all industry, government and academia personnel that wish to participate. The programming committee consists of representatives from the AMI Foundation, National Cattlemen's Beef Association, National Pork Board, U.S. Poultry and Egg Association, American Meat Science Association, Poultry Science Association, and the USDA's Agricultural Research Service and National Institute of Food and Agriculture.

**Advanced Listeria monocytogenes Intervention and Control Workshop**  
Summer 2011
“Ask the Meat Scientist” Video Series Unveiled

AMI and the AMI Foundation developed eight new 2-minute educational videos for AMI’s YouTube channel, The Meat News Network, featuring meat scientist Betsy Booren, Ph.D., director of scientific affairs of the AMI Foundation.

These eight new videos complemented AMI’s existing series, “Ask the Meat Science Guy,” and provided answers to many of the questions consumers pose about meat and poultry.

The video series was released during April through mid-June, and addressed commonly held questions about meat and poultry safety, preparation and nutrition, including:

- Are meat products high in salt?
- Should I prepare hot dogs in a special way for toddlers and small children?
- What do the beef cuts mean and where do they come from?
- Why is the ground beef I buy in the grocery store red on the outside but sometimes brown on the inside?
- What do the pork cuts mean and where do they come from?
- How much meat should I eat and how do I know the proper portion sizes?
- I’m trying to save money at the supermarket? How can I stretch my meat dollar?
- What does it mean to be a lean meat?

The videos have been an outstanding tool, utilizing social media to educate consumers. The videos have been viewed almost 9,000 times since April.

To watch the two-minute videos, visit the Meat News Network on YouTube at http://www.youtube.com/MeatNewsNetwork.
The AMI Foundation’s 2010 Animal Care & Handling Guidelines and Audit Guide: A Systematic Approach to Animal Welfare was released. The 120-page document is available for download on AMI’s dedicated animal welfare site http://www.animalhandling.org/.

Authored by Temple Grandin, Ph.D., professor of animal science Colorado State University, and the AMI’s Animal Welfare Committee, the 2010 edition included an important new transportation audit that measures key animal welfare factors on trucks when they arrive at meat plants and as drivers and plant personnel unload livestock.

The latest edition also was reviewed and certified by the Professional Animal Auditor Certification Organization (PAACO) and was only the second guidelines to have received PAACO certification.

AMI’s guidelines were first developed in 1991 by Grandin and, in 1997, AMI asked Grandin to create an audit program as a companion to the guidelines. Over time, the two documents were merged. Today they have become a widely recognized standard for ensuring animal welfare in U.S. meat packing plants and in many countries around the world.

The guidelines were based upon the principle that “You manage what you measure.” By objectively scoring factors like livestock vocalization, how often livestock fall, how often electric prods are used and other factors, the industry has been able to make measurable progress in the decade since the audit program was released. Today, third party audit firms provide the AMI audit and plants score themselves on a regular basis to monitor welfare indicators.

Every two years, AMI’s Animal Welfare Committee reviews the guidelines and makes changes and enhancements to the document based upon new research and data collected. In addition to the new transportation audit in the 2010 edition, the new guidelines include a helpful grid that details how to evaluate the effectiveness of various stunning methods.
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