

# AMI Foundation News

A quarterly update on research, education and information

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## AMIF Says Updated Food Safety Metric Data From CDC, FDA and FSIS Needed

Credible food attribution data is critical to improving public health, AMI told federal officials during a recent meeting held by the Centers for Disease Control and Prevention (CDC), Food and Drug Administration (FDA) and Food Safety and Inspection Service (FSIS). The purpose of the meeting, "Measuring Progress on Food Safety: Current Status and Future Directions," was to obtain stakeholder input on appropriate metrics to be used to assess performance in food safety.

In AMI's comments, the Institute noted that the meat and poultry industry already has a variety of metrics in place to assess food

safety, whether it involves supplier purchase specifications or the diverse set of metrics used to assess the food safety of the finished products they produce. Also, depending on the pathogen of concern, the meat and poultry industry uses various operational metrics to evaluate the effectiveness of food safety systems. For instance, one of the most useful meat and poultry industry metrics credited with spurring the decline of *Listeria* has been the "seek, find, and destroy" responses to environmental positives. This mentality has driven the prevalence of *Listeria* down by 85 percent since 1998. This, combined with interventions to (see page 4)

## USDA Releases Report on Dietary Guidelines

The Department of Agriculture (USDA) has released for comment the *Report of the Dietary Guidelines Advisory Committee on the Dietary Guidelines for Americans, 2010*.

The recommendations detailed in the *Report* are factored into the the development of the *Dietary Guidelines for Americans, 2010 (Guidelines)*. The *Guidelines* are developed jointly by the Department of Health and Human Services (HHS) and USDA and provide recommendations about how physical activity, combined with a healthy diet, may reduce the risk of major chronic diseases. The *Guidelines* form the basis for federal food, nutrition education and information policies and programs for the next five years. USDA and HHS expect to publish the *Guidelines* later this year.

The *Report* focused on the obesity epidemic and its impact on health outcomes in the U.S. The *Report* contained scientific chapters on energy balance and weight management; nutrient adequacy; fatty acids and cholesterol; protein; carbohydrates; sodium, potassium, and water; alcohol; and food (see page 3)

### ► AMIF Research

## Study: Natural Antimicrobials Can Improve Safety

Certain natural growth inhibitors can improve the safety of natural and organic ready-to-eat (RTE) meat and poultry products, according to results from AMI Foundation-funded research at the University of Wisconsin.

The objectives of the study, conducted by Kathy Glass, Ph.D. and Jeff Sindelar, Ph.D., were to screen a variety of natural flavorings, plant extracts and microbial fermentation byproducts for antilisterial activity in model uncured and "naturally" cured meat systems (turkey slurries); to determine the effect of natural antimicrobial systems on flavor for meat/poultry products; and to compare the antilisterial activity of "natural antimicrobial" systems in naturally cured ham, uncured beef, and uncured deli-style turkey with that for traditional cured ham prepared with lactate-diacetate.

This study identified several commercial ingredients (1.5% lemon/ (see page 2)

# Non-*E. coli* O157:H7 STECS: What You Need to Know

The subset of *Escherichia coli* microorganisms, non-O157:H7 shiga-toxin producing *E. coli* (nSTEC) has been the focus of regulators and researchers as a group of organisms that need to be better understood.

The National Institute of Food and Agriculture (NIFA) identified all shiga-toxin producing *E. coli* (STEC) as the major food safety concern within their Agriculture and Food Research Initiative program in this year's call for research proposals. The Food Safety and Inspection Service (FSIS) has held two public meeting since 2007 on this issue, and received a citizen's petition to declare all enterohemorrhagic *E. coli* STECs adulterants.

While FSIS has not approved or rejected the petition, it has stated that such microorganisms may be a public health concern. Using Centers for Disease Control and Prevention data, FSIS has specifically identified the "Top Six" nSTECs as potential adulterants in ground beef products and the components that make up ground beef products: O26, O111, O103, O45, O145, and O121.

Last year, the AMI Foundation (AMIF), on the advice of its Research Advisory Committee, expanded the *E. coli* section of its research priorities to include the CDC "Top Six." This expansion was a means of gathering additional information on how these microorganisms survive under typical food safety process control systems employed by the meat and poultry industry. AMIF currently is funding four such studies: one at the University of Arkansas, one at Colorado State University and two at USDA-ARS U.S. Meat Animal Research Center. AMIF is optimistic that the information gained from these studies will assist the meat and poultry industry in better understanding how the current food safety interventions with

commercial processing practices are effective against nSTECs.

On August 18, AMI sent a letter to Agriculture Secretary Vilsack outlining a path FSIS should take to address nSTECs prior to making a regulatory decision. The letter recommended eight specific and comprehensive actions the agency should take. Specifically, FSIS should have a transparent public policy decision-making process, which is based on sound science resulting in quantifiable improvements to public health outcomes. Prior to any regulatory actions, FSIS should commission a baseline study of the nSTECs to determine the prevalence of nSTECs in the production of ground beef and the beef components that may be used to manufacture of ground beef, which is necessary for a systematic evaluation for the public health risk of nSTECs.

AMI also recommended that a risk assessment should be performed to determine if current preventative food safety processes for *E. coli* O157:H7 are adequate for nSTECs, identify knowledge gaps that need further research, identify areas of potential food safety vulnerability to nSTECs and ultimately determine the public health risk of nSTECs in the production of ground beef and the beef components that may be used to manufacture ground beef. A baseline study and a risk assessment for nSTECs are necessary as critical first steps in developing a systematic preventative process control program for nSTECs in raw beef production.

AMI recommended that if FSIS decides to regulate nSTECs in beef products further, it should only be done through a scientifically-based and transparent regulatory process and only if such regulatory action will quantifiably improve public health.

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## Natural Antimicrobials Can Improve Safety of RTE Meat and Poultry

(from page 1)

cherry/vinegar blend, 2.0% buffered vinegar and 3.0% cultured cane sugar/vinegar blend), which can be used to inhibit growth of *L. monocytogenes* in natural ham, turkey, and roast beef without significant adverse effect on sensory attributes. The addition of "natural nitrite" through the use of pre-converted vegetable powder enhanced the effect of the antimicrobials tested in ham compared with uncured turkey. Since the antilisterial effect of nitrite is dose-dependent, and nitrite levels contributed by preconverted vegetable powder are typically lower than those found in traditionally cured products, naturally cured products logically have reduced microbial inhibition compared with traditional products.

Overall, inhibition of *L. monocytogenes* in naturally cured ham supplemented with certain adjunct natural antimicrobials was similar to that of lower salt (1.6-1.8% NaCl) traditionally cured ham with lactate-diacetate blend.

However, even the most effective turkey and ham treatments supported a 2-log increase of *L. monocytogenes* within 6 weeks of storage at 4°C.

Researchers said it should be noted that listerial growth in beef was significantly delayed compared to the ham and turkey samples. The additional delay in beef may be attributed to either the relatively small differences in product moisture and pH compared to the other two product types or to other unidentified factors. These data suggested that certain natural growth inhibitors can improve the safety of natural and organic RTE meat and poultry products, but their efficacy is enhanced in the presence of nitrite, in products with lower moisture and pH, and when stored at strict refrigeration temperatures.

The full report is available at <http://amif.org/ht/a/GetDocumentAction62610>.

## CDC: Annual Foodborne Illness Averages Down 15 Percent

Foodborne illness outbreaks numbered 1,097 and caused 21,244 illnesses and 18 deaths in 2007, according to a recent Centers for Disease Control and Prevention (CDC) report summarizing the epidemiological data for reported foodborne outbreaks in 2007, the most recent year available. The CDC defines a foodborne outbreak as the two or more similar illnesses resulting from ingestion of a common food.

The total number of foodborne outbreaks decreased in 2007 by 8 percent when compared to the annual averages from 2002-2006. The total number of illnesses also decreased 15 percent when compared with the annual averages for the same period of time.

Of the 497 outbreaks attributed to a single etiologic agent, bacteria caused 259 (52%), viruses caused 199 (40%), chemical agents 34 (7%) and parasites caused five (1%) of the outbreaks. Norovirus was the single most common cause attributed to an outbreak followed by *Salmonella*.

There were 18 multistate foodborne illness outbreaks. Among

these outbreaks, 10 were associated with *Salmonella*, six with *Escherichia coli*, one with *Clostridium botulinum* and one with norovirus.

A single food commodity was linked to 235 outbreaks with 4,119 illnesses. Outbreaks were most commonly associated with finfish (41), poultry (40) and beef (33). Illnesses were most frequently associated with poultry (691), beef (661) and leafy vegetables (590).

Eleven of the 18 deaths were attributed to norovirus, five deaths were attributed to *Salmonella*, three to *Listeria monocytogenes*, two to *E. coli* and one to *C. botulinum*. The etiologies of four were unknown.

Public health officials from 48 states, Puerto Rico and the District of Columbia reported the outbreaks with an additional two states reporting illnesses indirectly. The data was collected for the year 2007 and was reported to CDC by May 3, 2010.

## Dietary Guidelines Advisory Committee Releases Report for Comment

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safety and technology. In addition to the scientific chapters, the *Report* included two new introductory chapters, “The Total Diet: Combining Nutrients, Consuming Food” and “Translating and Integrating the Evidence: A Call to Action.”

The Total Diet chapter “synthesizes the evidence on dietary components that contribute to excess energy and inadequate nutrient intakes in the U.S. and the foods that are needed to provide essential nutrients and other health benefits.” The chapter noted that the “Advisory Committee supports a total diet approach to achieve dietary goals.” Different dietary patterns from a DASH-style diet to a vegetarian diet were outlined. This chapter also encouraged consumers to moderate energy intake; reduce solid fats and added sugars; consume nutrient dense foods and to reduce sodium intake.

Also of note in this chapter, the *Report* stated, “Recommended intake amounts in the USDA Food Patterns remain unchanged from 2005 with the exception of the vegetable groups.” The Food Patterns referenced recommend 5.5 oz. daily consumption from the meat and beans group for a 2,000 calorie diet.

The Translating and Integrating the Evidence chapter described four major findings to enhance the health and well being of the population and noted several important steps:

- Reduce the incidence and prevalence of overweight and obesity of the U.S. population by reducing overall calorie intake and increasing physical activity.
- Shift food intake patterns to a more plant-based diet that emphasizes vegetables, cooked dry beans and peas, fruits, whole grains, nuts, and seeds. In addition, increase the intake of seafood and fat-free and low-fat milk and milk products and consume only moderate amounts of lean meats, poultry and eggs.
- Significantly reduce intake of foods containing added

sugars and solid fats because these dietary components contribute excess calories and few, if any, nutrients. In addition, reduce sodium intake and lower intake of refined grains, especially refined grains that are coupled with added sugar, solid fat, and sodium.

- Meet the 2008 *Physical Activity Guidelines for Americans*.

The *Report* recommended a gradual reduction in sodium intake from 2,300 mg to 1,500 mg per day and pointed to the recent Institute of Medicine report as a guideline to implement such a reduction. Processed foods, including meats, were referenced for their contribution of sodium to the diet. The *Report* also recommended a reduction from 10 percent to 7 percent of daily energy intake from saturated fat.

The AMI Foundation staff, which follows the latest diet and health research in respect to meat and poultry products, assisted in developing AMI’s comments response to the *Report*. AMI’s written comments supported the premise that a well-balanced diet, proper portion sizes and exercise are keys to reducing obesity and emphasized the important role of meat and poultry in a well-balanced diet. AMI also noted the potential unintended, adverse consequences that could result from the recommended sodium reductions in foods; the need to clearly define terms in the *Guidelines* (e.g. plant-based diet, processed food, minimally processed food) to ensure consumer understanding; and the fact that consuming animal-based proteins as part of a healthy diet is not a health risk. Comments also stressed that the Advisory Committee should provide recommendations based upon sound science and that it should not develop social policy and recommendations for the 2015 Committee.

Additionally, AMI filed comments with other animal agriculture groups stressing the importance of effectively communicating the *Guidelines*’ messages about the importance of meat and poultry in healthy, well-balanced diet.

## AMIF Continues Dialogue With NIFA Director on Research Needs

AMI Foundation (AMIF) Director of Scientific Affairs Betsy Booren, Ph.D., said that food safety is the meat and poultry industry's number one priority when she spoke at a recent Department of Agriculture Research, Extension and Economics stakeholder meeting and she said that the National Institute of Food and Agriculture (NIFA) research funding should reflect that priority. The discussion was led by NIFA Director Roger Beachy and focused on future areas for research funding and developing strategies to ensure increased and long-term funding of NIFA.

Booren said AMIF strongly supports the funding of extension education

programs to solve food safety problems throughout the entire food chain, but the removal of food science and other agricultural disciplines from the Agriculture and Food Research Initiative program compromises food safety challenges facing the industry.

Booren encouraged NIFA to reexamine their mechanism to determine funding priorities to target future food safety research that will improve public health and have the greatest societal impact. She pointed out that this research should also include food processing technologies, food ingredients, animal production and other critical multi-disciplinary areas in the

food sciences which are needed to solve the problems facing today's agricultural community as all are integral to food safety research.

AMIF continues to support increased funding for basic fundamental agriculture research and NIFA is the ideal agency to fund such studies. Booren further encouraged NIFA to fund more investigator-initiated research ideas as they may lead to the innovation of new food safety solutions.

The National Coalition for Food and Agricultural Research organized the meeting.

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## AMIF: Updated, Accurate and Timely Food Safety Data Necessary

(from page 1)

inhibit growth or post-package pasteurization, have delivered meaningful food safety enhancements on pre-packaged ready-to-eat meat and poultry products.

According to AMI, finished product testing of raw uncooked finished product has not been helpful in pathogen control due to inherent sampling statistical limitations. Finished product testing can be useful as a verification that control systems are working if the inherent statistical uncertainty is considered.

During the meeting, the importance of credible food attribution data and necessity of updating the Mead *et al.* (1999) "Food-Related Illness and Death in the Untied States" report was highlighted by most presenters. This need was also the basis of a recent letter the AMI Foundation Director of Scientific Affairs Betsy Booren, Ph.D., sent Chris Braden, M.D., acting director of the CDC's Division of Foodborne, Waterborne, and Environmental Diseases.

The Mead *et al.* "Food-Related Illness and Death in the Untied States" report is widely referenced by public health agencies, regulatory agencies and congressional staff when discussing foodborne illnesses.

"In order to improve food safety and further reduce the risk of foodborne illness, it is absolutely critical to have the most accurate estimation of foodborne disease as the cause of illness, hospitalizations and deaths," said Booren.

Booren noted that the meat and poultry industry has been successful in making a tremendous reduction in the pathogen risk profile of their products and that updated foodborne illness estimates could show tangible results to these efforts. She said that AMI and the Foundation have eagerly awaited the update to the Mead *et al.* report, which has been in preparation since before 2007.

According to Booren, large discrepancies between the 1999

illness estimates and current CDC data exist and may be caused by the fact that the estimates were derived using adjustments for underreporting of foodborne illnesses, which are likely no longer valid given the changes in public health reporting over the past two decades. These 11-year old estimates also virtually ignore the newer, more accurate and specific methods of detecting microorganisms and the vast improvements made by the food industry in improving the safety of their products over the last decade, she noted.

Booren also reinforced how accurate and timelier foodborne illness attribution data is critically needed to improve the safety of the U.S. food supply.

"This objective data allows food safety stakeholders to allocate food safety resources and scientifically justify the decisions made in their food safety system," Booren wrote. "By having timely, credible food attribution data, the food industry can accurately identify and improve any food safety gaps that may exist. It also may help to identify emerging foodborne risks, especially when such risks have not been previously associated with specific foods. This rapid adjustment to improve food safety can only occur if accurate data is made available as soon as possible to all food safety stakeholders."

"AMI Foundation recognizes the challenges of accurately estimating the burden of foodborne disease and accurately attributing these burdens to food types, but these metrics are essential. The last decade has shown the important role cooperation and communication between public health officials, regulators, the food industry and other allied stakeholders has had on improving food safety. This collaborative story of success could be affirmed through the update of the Mead *et al.* estimation of the burden of foodborne disease," Booren concluded.

## AMI: Performance Standards Should Be Based on Science

The American Meat Institute (AMI) urged the Food Safety and Inspection Service (FSIS) to conduct a comprehensive scientific and technical review of the new performance standards for *Salmonella* and *Campylobacter* in young chickens and turkey to determine the impact of the revised standards on public health before they are implemented in federal establishments. AMI made its statement in comments submitted July 13, 2010.

The Institute said that such an examination could deliver a practical means to convert food safety objectives into targets that can be used by FSIS and the meat and poultry industry to improve public health. Having specific targets, instead of meeting a prevalence percentage that seemingly appears to have no link to improved public health, would enable the industry to design quantifiable control processes.

As part of its public health mission, FSIS established a new regulatory program

“AMI supports achievable performance standards based on sound science that significantly improve public health ...

- AMI Director of Scientific Affairs  
Betsy Booren, Ph.D.

in 1996 by promulgating *Salmonella* performance standards for raw meat and poultry products. The agency's stated goal was to improve public health by reducing the prevalence of *Salmonella* on raw meat and poultry products. In its comments, AMI suggested that the agency had not achieved its public health goal through these performance standards.

Publicly available data show the



prevalence of *Salmonella* on raw meat and poultry products has been significantly reduced since the standards were implemented, but the incidence of salmonellosis in the human population shows no quantifiable improvement during the same time period. AMI stated that the lack of improvement in human illness since the performance standards were fully implemented in 2000 does not support the agency's perspective.

“AMI supports achievable performance standards based on sound science that significantly improve public health through quantifiable metrics. Standards that do not meet these criteria could place unnecessary hardships on businesses and may not be the best focus and application of food safety resources,” said AMI Director of Scientific Affairs Betsy Booren, Ph.D. “The agency should understand the possible improvement and impact on food safety as measured by the HHS's Healthy People goals before proposing changes to the *Salmonella* performance standards and in the development of the *Campylobacter* performance standards.”

### ► AMIF Research

## Study: Premi-Test System Has Great Potential for Expansion

The Premi-test® *Salmonella* System (PTS) System has great potential for growth and expansion, researchers for the Texas A&M University, University of Nebraska-Lincoln (UNL) and the Inter-American Institute for the Cooperation in Agriculture have found.

The researchers recently completed their AMI Foundation (AMIF)-funded study, which specifically sought to understand if the PTS system can be used as a serotyping tool to identify pork and poultry isolates obtained from vertically integrated operations and then compare to the performance of the PTS system to the traditional Kauffman-White (KW) serotyping methods.

The PTS system is a DNA-based method which targets genetic information of different serovars to identify the serotype and the genus *Salmonella*. *Salmonella* strains (n=100) were obtained

from USDA-ARS-SPARC in College Station, Texas, and UNL stock culture collection and were serotyped according to traditional KW methods. Additional *Salmonella* strains from poultry (n=50) and pork (n=50) were collected and serotyped by KW method. All PTS samples were analyzed by UNL.

“Identification of serotypes from the USDA culture collection using the PTS system was reproducible independently of the source (pork or chicken) or replication. Serotypes (69 percent) present in the PTS database were successfully identified as *Salmonella* and matched traditional serotyping,” the researchers reported. Interestingly, 31 percent of the isolates were identified as *Salmonella*, but did not match the traditional serotyping results. Further investigation indicated that these discrepancies may be due to mistyping of the original isolates by the traditional method or overlaps with known serotypes.

Researchers found that isolates not present in the PTS database were recognized as *Salmonella* genovars, although the profile was unknown.

Researchers stated that the PTS system was easy to use and it “has tremendous potential for additional growth, expansion, and research even though the results of this study indicate that it does not yet possess the discriminatory power necessary to replace traditional serotyping.” But the researchers concluded, “As the system and method evolves, it should continue to undergo rigorous testing. ... If perfected, this new technology could provide a means of rapid surveillance of *Salmonella* serotypes in the food chain and in epidemiological investigations.”

The full report is available at <http://amif.org/ht/a/GetDocumentAction/i/61384>.

# AMIF Affirms Safety of Nitrites Used in Meat and Poultry

The AMI Foundation (AMIF) responded to a study published in early August in the journal *Cancer* that links nitrite and nitrate intake from processed meats to a potential increased risk of bladder cancer, calling it the latest example of “nutrition whiplash” facing consumers. AMIF President James H. Hodges said the study creates needless confusion rather than providing clarity to the complex issue of diet and its effect on health.

Hodges pointed out that the study was an epidemiological study, which by itself is not sufficient to establish cause and effect. Rather, it allows researchers to identify associations that may merit further study.

Even the authors of the study state that the findings of their research are “tentative,” the relationship between dietary nitrite and nitrate was of “borderline statistical significance,” and “not enough data was available to draw conclusive findings,” he told media.

“The study erroneously perpetuates the myth that cured meats are the main source of ingested nitrite,” he said. “The fact is that less than five percent of ingested nitrite comes from cured meats. Ninety-three percent comes from vegetables

“*The study erroneously perpetuates the myth that cured meats are the main source of ingested nitrite. The fact is that less than 5 percent of ingested nitrite comes from cured meats.*



- AMIF President James H. Hodges ”

like lettuce, spinach, celery, cabbage and beets and from our own saliva. In fact, research conducted in the last 20 years has concluded that the body makes nitrite as part of its healthy, normal nitrogen cycle.”

AMIF pointed out that the U.S. National Toxicology Program (NTP), which is considered the “gold standard” in determining whether substances cause cancer, completed a multi-year study in which rats and mice were fed high levels

of sodium nitrite. The study found that nitrite was not associated with cancer. NTP maintains a list of chemicals found to be carcinogenic, and sodium nitrite is not on that list.

These facts about nitrite levels and the nitrite biochemical mechanisms in humans and food were also shared with the leadership of the Food and Drug Administration’s Office of Food Additive Safety and the Department of Agriculture’s Agricultural Research Service and Food Safety and Inspection Service in a series of briefing held in June 2010.

AMIF staff reaffirmed nitrite safety when used in meat and poultry products in anticipation of the release of the World Health Organization’s International Agency for Research on Cancer Monograph on nitrite, which published in July 2010.

The overall evaluation and conclusion in *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans*, Volume 94 (2010), Ingested Nitrate and Nitrite and Cyanobacterial Peptide Toxins remained unchanged since the publication of the meeting summary in 2006.

## AMIF, ARS Discuss Common Research Priorities, Goals

AMI Foundation (AMIF) staff met this summer with Department of Agriculture’s Agricultural Research Service (ARS) leadership to give an update on AMIF current food safety research priorities and issues. Among the issues identified with ARS was the need for additional scientific documents, frequently referred to as “safe harbors,” for the meat and poultry industry.

AMIF stated these documents are essential to the meat and poultry industry, especially the small processors who may not have the resources, facilities or the expertise to perform the type of food safety validation these documents give. This need for additional scientific documents was made more apparent when the Food Safety and Inspection Service (FSIS) shared their updated thoughts on validation within the current definition of a Hazard Analysis and Critical Control Points (HACCP) system this past Spring.

The Foundation encouraged ARS to collaborate with FSIS to develop scientific documents similar to the FSIS’s 1999 Appendix A-Compliance Guidelines for Meeting Lethality Performance Standards for Certain Meat and Poultry Products and Appendix B-Compliance Guidelines for Cooling Heat-Treated Meat and Poultry Products (Stabilization). These new documents should be developed for a variety of meat products and take into consideration differences in product composition like fat and protein, which may affect time-temperature lethality relationships. AMIF believes this type of research is appropriate for collaboration among ARS and FSIS as it fits under both of these agencies’ missions and could greatly improve the food safety profile of meat and poultry products.

AMIF is hopeful that ARS will consider their recommendation to work with FSIS to develop more scientific food safety documents for the meat and poultry industry.

## Science Soundbites

### Review: More Research on Non-O157 STECs Needed

More research on non-O157:H7 shiga-toxin producing *E. coli* (STEC) is needed to uncover unique characteristics and resistances, according to a new literature review on STECs conducted by the Grocery Manufacturers Association (GMA).

The review noted that the industry has programs in place to control *E. coli* O157:H7, and, based on current research, these should be effective in controlling non-O157 STEC as well.

The report also notes that while it is apparent that some strains of non-O157 STEC may cause human illness, many questions about their pathogenicity remain. For example, non-O157 STEC isolates identical to strains associated with illness have been recovered from asymptomatic patients.

In addition, a scientific definition of a pathogenic STEC has not yet been accepted. Several laboratories have attempted to develop detection and identification methods, and although substantial progress has been made, a practical method of STEC detection has yet to be validated.

“Careful consideration of the relative scope and magnitude of the public health risk from pathogenic non-O157 STEC in beef and other products should also be quantified in a risk assessment to help determine effective risk reduction strategies and to support risk-based regulation,” the review concludes.

*Journal of Food Protection*.73 (9):1721-1736.

### Study Demonstrates High Value of Poultry Carcass Mapping

Poultry carcass mapping as a research tool has potential for identification of critical control points where greater process control can be exercised to reduce the level of pathogens on the chicken carcass, according to a new study by the United States Department of Agriculture and the University of Maryland.

This study, which examined patterns of *Salmonella* contamination on Cornish game hens obtained at retail during a three-year period, demonstrates for the first time, the high value carcass mapping offers for improving poultry inspection and food safety.

The results indicate that carrying out whole-carcass incubation with parts and then subtyping multiple isolates per carcass, is needed to properly assess and manage this risk to public health.

However, the researchers acknowledged that this approach is more labor-intensive than the current approach used in the Food Safety and Inspection Service monitoring program, and thus, it might be impractical in the field.

According to the authors, future research needs in poultry carcass mapping with *Salmonella* and other pathogens include development of quantitative maps for risk assessment; development of maps for carcass parts; development of maps for multiple commercial plants; development of maps for other classes of poultry; and development of maps at different steps in poultry processing.

*Journal of Food Protection*.73 (9): 1596-1603.

### Surface Shear May Enhance Food Safety

Surface shear can kill foodborne pathogens and reduce cross-contamination, a study by United States Department of Agriculture has found.

The objective of this research was to investigate the impact of mechanical shear on the survival of *Listeria monocytogenes* on surfaces. Mechanical shear is created by slicing a model food was explored to investigate the viability of *L. monocytogenes*.

Cell injury and death were readily demonstrated in fluorescence images by confocal microscopy in which the live and dead cells were fluorescently stained green and red, respectively, with a viability dye kit. Images showed that a large percentage of dead cells appeared after slicing, and they were readily transferred from the slicer blade onto the surfaces of sliced agar, indicating that surface shear may cause the lethal effect on *L. monocytogenes*.

Surface transfer results also showed that viable cell counts on agar slices (in a slicing series) followed a consistently decreasing pattern. The cell counts initially at 5 to 6.5 log CFU/slice (slices 1 to 6), decreased to 3 to 4 log CFU/slice (slices 8 to 30), then to 2 to 3 log CFU/slice (slices 31 to 40), and counts would be expected to further decrease if slicing continued. The overall cell recovery (survival) ratio was about 2 percent to 3 percent compared to the initial 8.4 log CFU/blade on a 10 cm<sup>2</sup> edge area.

The impact of shear on microbial viability during slicing may contribute 99 percent of viable cell count reduction, the study found.

*Journal of Food Science*. 75 (6):E387-E393.

## Nutrition News Corner

### No Association Between Red Meat and Colorectal Cancer, Analysis Finds

Currently available epidemiologic evidence does not support an independent positive association between red meat consumption and colorectal cancer, according to a new review by researchers D.D. Alexander and C.A. Cushing.

In this comprehensive review, the prospective

epidemiologic studies of red meat intake and colorectal cancer were summarized to provide a greater understanding of any potential relationships. Specifically, salient demographic, methodological and analytical information was examined across 35 prospective studies.

Collectively, researchers found that associations between red meat consumption and colorectal cancer are generally weak in magnitude, with most relative risks below 1.50 and not statistically significant. (see page 9)

## Ongoing Research

### *E. coli*

| <u>Investigator</u>   | <u>Institution</u>                               | <u>Project Title</u>   |
|---|--|--|
| Norasak Kalchayanand, Terrance Arthur, Joseph Bosilevac, John Schmidt, Steve Shackelford, Tommy Wheeler                       | USDA-ARS-U.S. Meat Animal Research Center        | Evaluation the Efficacy of Commonly used Antimicrobial Interventions on Shiga toxin Producing <i>E. coli</i> Serotypes O26, O103, O111, O145 and O157  |
| Fred Pohlman, Steven Ricke, Palika Dias-Morse, Anand Mohan, Sara Milillo, Peggy Cook, Karen Beers                             | University of Arkansas, Safe Foods International | Antimicrobial interventions/application methods for the reduction of <i>Escherichia coli</i> O157:H7 and <i>Salmonella</i> in beef trimming and/or ground beef   |
| John Sofos, Hua Yang, Ifigenia Geornaras, Kendra Nightingale, Keith Belk, Dale Woerner, Gary Smith                            | Colorado State University                        | Evaluation of chemical decontamination treatments for beef trimmings against <i>Escherichia coli</i> O157:H7, non-O157 shiga toxin-producing <i>E. coli</i> and antibiotic resistant and susceptible <i>Salmonella</i> Typhimurium and <i>Salmonella</i> Newport |
| Norask Kalchayanand, Terrance Arthur, Joseph Bosilevac, Dayna Brichta-Harhay, John Schmidt, Steven Shackelford, Tommy Wheeler | USDA-ARS-U.S. Meat Animal Research Center        | Efficacy of commonly used antimicrobial compounds on decontamination of Shiga toxin-producing <i>Escherichia coli</i> serotypes O45, O121, and <i>Salmonella</i> inoculated fresh meat   |

### *Listeria monocytogenes*

| <u>Investigator</u>  | <u>Institution</u>   | <u>Project Title</u>   |
|--|--|--|
| 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  |
| Phil Crandall, John Marcy, Steve Ricke, Mike Johnson, Betty Martin, Corliss O'Bryan, Sara Rose Milillo | University of Arkansas                                     | Cost Effective Treatments to Minimize In-Store Deli Meat Slicer Cross Contamination of Ready-To-Eat Meats by <i>Listeria monocytogenes</i> , Phase II  |
| Sophia Kathariou, Dana Hanson  | North Carolina State University                            | Genetic Attributes Associated with the Ability of Different Serotypes of <i>Listeria monocytogenes</i> to Colonize the Meat Processing Plant Environment and to Contaminate Read-to-Eat Meat Products (Chicken, Turkey, Pork and Beef) |
| Richard Meinersmann, Mark Berrang, Tim Hollibaugh, Joseph Frank  | Agricultural Research Service, USDA, University of Georgia | Role of Protozoa in the Persistence of <i>Listeria monocytogenes</i> in a Ready-to-Eat Poultry Processing Plant  |
| Amy Wong, Charles Kaspar, Charles Czuprynski   | University of Wisconsin                                    | Formation, Survival, and Virulence of Stress-induced Filamentous <i>Listeria monocytogenes</i>   |
| Robin Kalinowski, Erdogan Ceylan   | Silliker Inc., Food Science Center                         | Validation of Quaternary Ammonia for Control of <i>Listeria monocytogenes</i> in Ready-to-eat Meat and Poultry Plants  |



Salmonella

| <u>Investigator</u>  | <u>Institution</u>        | <u>Project Title</u>  |
|--|---------------------------|---|
| Michael Doyle, Tong Zhao   | University of Georgia     | Reduction of <i>E. coli</i> O157:H7 and <i>Salmonella</i> in Ground Beef  |
| John Sofos, Ifigenia Geornaras, Jarret Stopforth, Dale Woerner, Keith Belk, Gary Smith | Colorado State University | Development of an Intervention to Reduce the Likelihood of <i>Salmonella</i> Contamination in Raw Poultry Intended for use in the Manufacture of Frozen, Not Ready-to-Eat Entrees |

Diet and Health

| <u>Investigator</u>                       | <u>Institution</u>      | <u>Project Title</u>  |
|---|-------------------------|---|
| J. Scott Smith, Terry Houser, Melvin Hunt | Kansas State University | Analysis of Heterocyclic Amines (HCAs) Formation in Various Cooked Meat Products <sup>1</sup> |
| Ellin Doyle                               | University of Wisconsin | Understanding Sodium Replacements from a Food Safety and Health Risk Perspective              |
| Susan Brewer, Terry Hatch                 | University of Illinois  | Nutritional Benefits of Meat. A White Paper   |
| Dominik Alexander                         | Exponent, Inc.          | Processed Meat Intake and Stomach Cancer  |

<sup>1</sup> Co-funded with the National Pork Board

Other Food Safety

| <u>Investigator</u>                                     | <u>Institution</u>      | <u>Project Title</u>   |
|---|-------------------------|--|
| Randy Wehling, Michael Zeece, Harshavardhan Thippareddi | University of Nebraska  | Evaluation and Analysis of Meat Products Contaminated by Low Levels of Ammonia   |
| Ellin Doyle, Amy Wong, Faye Hartmann                    | University of Wisconsin | Causes of Human Methicillin-Resistant <i>Staphylococcus aureus</i> (MRSA) from All Food and Non-Food Vectors (White Paper) |

## Nutrition News Corner

(from page 7)

Researchers also noted that a lack of a clear dose–response trend.

Results varied by tumor site and by gender. Data were not indicative of a positive association among women. Findings in men were slighting stronger, although the potential reasons for this observed disparity between genders was unclear.

“Colinearity between red meat intake and other dietary factors (*e.g.* Western lifestyle, high intake of refined sugars and alcohol, low intake of fruits, vegetables and fiber) and behavioral factors (*e.g.* low physical activity, high smoking prevalence, high body mass index) limit the ability to analytically isolate the independent effects of red meat consumption,” researchers concluded.

*Obesity Reviews*.2010:1-22.

## Organic Food Not More Healthy Than Conventional Food, Analysis Finds

Consumers who buy organic food because they believe that it contains more healthful nutrients than conventional food are wasting their money, says a new analysis by Joseph Rosen of Rutgers University.

According to the report, which examines the nutrition claims made by proponents of organic food such as Soil Association of the United Kingdom and the Organic Center in the United States, these organizations often stretch the truth in an attempt to fulfill their missions.

“Much of the proof advanced by both the Soil Association and the Organic Center are based on research articles that have not been reviewed by independent scientists and data that are not statistically significant,” Rosen said. “Nonexistent or incomplete data are nevertheless ‘published’ in the media.”

Rosen found that in some cases, organic proponents omit data that do not support their views, the most egregious example being the dismissal of conventional vegetables because some contain higher levels of nitrate than organic vegetables.

*Comprehensive Reviews in Food Science and Safety*. (2010)

► **AMIF Education Calendar**

**Ground Beef Production and Safety Workshop**

February 2-3, 2011  
 Marriott Country Club Plaza  
 Kansas City, Missouri

**Annual Meat Conference**

February 20-22, 2011  
 Hyatt Regency Dallas  
 Dallas, Texas

**Conference on Worker Safety, Human Resources and the Environment**

March 9-10, 2011  
 Hyatt Regency Crown Center  
 Kansas City, Missouri

**AMI International Meat, Poultry & Seafood Industry Convention and Exposition**

April 13-16, 2011  
 McCormick Place  
 Chicago, Illinois

**Animal Care and Handling Conference**

October 19-20, 2011  
 Westin Crown Center  
 Kansas City, Missouri

**AMI Foundation to Host Listeria Intervention and Control Workshop**

Registration is now open for the AMI Foundation's popular Advanced *Listeria monocytogenes* Intervention and Control Workshop in November.

The workshop is scheduled for November 9-10, 2010, at the Chicago Marriott O'Hare in Chicago, Illinois.

This updated educational opportunity is designed to help manufacturers of ready-to-eat (RTE) meat and meat products examine the issues surrounding control methods and to provide experience in developing appropriate sanitation protocols and testing plans for processing RTE products. In addition to assuring optimal product safety and implementing best practices for RTE process, the workshop offers a key benefit: helping to assure compliance.

Attendees will benefit from interaction with leading experts who have decades of experience in RTE production and sanitation, gain hands-on experience developing sanitation protocols and testing plans and learn how to successfully complete a routine risk-based *Listeria monocytogenes* sampling (RLm) and food safety assessment.

Registration is limited to 60 participants to ensure a quality learning experience.

To register for the November workshop, visit [www.meatami.com/education](http://www.meatami.com/education).

**AMIF Presents New Ground Beef Production and Safety Workshop**

The AMI Foundation (AMIF) is sponsoring a ground beef production and safety workshop February 2-3, 2011, at the Marriott Country Club Plaza in Kansas City, Missouri.

This new workshop will be lead 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. The goal is make sure that attendees return to their companies 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.

To register, visit [www.meatami.com/education](http://www.meatami.com/education).

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