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2010 Dietary Guidelines for Americans Maintains Meat and Poultry Recommendations

Calorie Balance and Obesity Epidemic Are Areas of Primary Focus

The *Dietary Guidelines for Americans* 2010, released in January, maintained the longstanding recommendation that consumers, on average, should eat five to seven ounces of meat and poultry per person per day.

The 2010 *Guidelines* focused on two main points for a healthy living: calorie balance and the role it plays in achieving and sustaining a healthy weight; and emphasizing nutrient dense foods and beverages as a way to maximize health benefits while minimizing energy intake. The overarching goal of the *Guidelines* is to mitigate

the obesity epidemic in Americans.

Within the two main points of the *Guidelines* are 23 key recommendations for all Americans and six recommendations for specific population subgroups. The recommendations fall into five categories: Balance Calories to Manage Weight; Foods and Food Components to Reduce; Foods and Nutrients to Increase; Nutrients of Concern; and Building Healthy Eating Patterns.

The calorie balance category recommendations include *(see page 2)*

AMI Foundation Board Approves New Research

The AMI Foundation (AMIF) Board of Directors approved in January five new research projects, recommended for funding by the AMIF Research Advisory Committee, that address a broad spectrum of food safety concerns.

Rodney Moxley, DVM, at the University of Nebraska-Lincoln will evaluate the effect of flagellin and intimin type expression on colonization of bovine intestine by non-O157 Shiga toxin-producing *Escherichia coli* (STEC). The overall goal of the research is to determine mechanisms of intestinal colonization of STEC O26, O45, O103, O111, O121 and O145 to provide a basis for the development of new and improved pre-harvest interventions for these organisms.

A collaborative effort between Haley Oliver, Ph.D., of Purdue University and Martin Wiedmann, DVM, Ph.D., of Cornell University will focus on *Listeria monocytogenes* in retail deli environments. The overall goal of the project is to develop and implement control strategies for *L. monocytogenes* *(see page 4)*

► AMIF Research

White Paper Calls for Continued Monitoring of MRSA

A recently completed AMI Foundation-funded white paper by Ellin Doyle, Ph.D., of the University of Wisconsin recommends the continued monitoring of methicillin-resistant *Staphylococcus aureus* (MRSA) and other methicillin-resistant Staphylococci in foods and the environment. The paper evaluated the sources of infections and their potential implications for the food supply.

S. aureus is commonly found in humans, with approximately 50 percent of the population colonized in the nasal passages or on the skin. A much smaller percentage of people -- about 1.5 percent -- are colonized with MRSA. While many people harboring *S. aureus* are asymptomatic, they may pass these bacteria to others directly or contaminate food, clothing, towels and other surfaces. Carriage of MRSA increases risk for serious infections that are difficult and more expensive to treat. Methicillin resistance *(see page 4)*

Dietary Guidelines Advisory Committee Issues Recommendations

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controlling total caloric intake to manage body weight, increasing physical activity, preventing or reducing weight gain and obesity through improved eating and physical behavior and maintaining appropriate calorie balance during each stage of life.

The *Guidelines* also recommended limiting certain foods and food components such as reducing daily sodium intake to 2,300 mg and further reducing to 1,500 mg among persons who are older than 51 years of age and those of any age who are African American or who have hypertension, diabetes or chronic kidney disease. In addition, the *Guidelines* recommended consuming less than 10 percent of calories from saturated fats and less than 300 mg of dietary cholesterol per day.

The new *Guidelines* also encourage increased consumption of vegetables and fruit, whole grains, fat-free or low-fat milk and milk products, and urged consumers to choose a variety of protein foods and foods that provide more potassium, dietary fiber, calcium and vitamin D, which are nutrients of concern.

Selecting a healthy eating pattern that meets nutrient needs over time, accounting for all foods and beverages and how they fit in a total eating pattern and observing food safety recommendations when preparing and eating foods were the key recommendations in selecting the best eating pattern for oneself.

The consumer education portion of the *Guidelines* is expected to be released in spring 2011. The *Guidelines* form the basis for federal food, nutrition education, and information policies and programs.

Additional information on the *Guidelines* as well as the full policy document is available at <http://www.cnpp.usda.gov/dietaryguidelines.htm>.

Dietary Guidelines Q&A with Fergus M. Clydesdale, Ph.D.

AMIF Foundation staff interviewed Fergus M. Clydesdale, Ph.D., about the *2010 Dietary Guidelines for Americans*. Clydesdale is Distinguished University Professor and director of the University of Massachusetts Food Science Policy Alliance. He was a member of the 2005 Dietary Guidelines Advisory Committee (DGAC).

AMIF: This was the first time the DGAC committee used the Nutrition Evidence Library (NEL) in forming the Technical Report. Do you think its use bolstered the credibility of the report, and made it more scientifically sound?

Clydesdale: The NEL recruits an expert workgroup that among its duties defined by USDA included: formulating evidence analysis questions, conducting a literature review for each question, analyzing the data for each study which is then synthesized and developing a conclusion statement that is graded for each question.

I think the use of the NEL in forming the Technical Report bolstered its credibility, but I also think that more time is required to adequately formulate the questions and keep the questions to a manageable number.

AMIF: What are two or three of the main differences between the 2010 Guidelines and those published in 2005?

Clydesdale: The 2010 Guidelines place emphasis on solid fat and added sugars, rather than calories and added some confusion on solid fats being in certain foods where they aren't. Also in 2010, whole grains are lessened in importance compared to 2005 and the Dietary Guidelines Advisory Committee drifted into sources of food and sustainability issues.

AMIF: In what respects does the 2010 policy document differ from what was recommended in the 2010 Technical Report? Was this similar to 2005?

Clydesdale: I think generalizations were made to simplify the recommendations for consumers. This was also done in 2005.

AMIF: Critics of the policy document argue that the 2010 Guidelines go out of the way to recommend specific foods we should be eating more of, but fail to mention specific "foods" to avoid. Do you agree with them?

Clydesdale: I think a positive approach is a good one.

AMIF: In your opinion, if the average American only took home two messages from the 2010 Guidelines, what should they be?

Clydesdale: Very simply, eat less calories/food and exercise on a regular basis.



Fergus M. Clydesdale, Ph.D.

AMI Joins USDA's 'Partnering with MyPyramid' Program

Prior to the release of the *2010 Dietary Guidelines for Americans*, AMI was accepted as a partner in the Partnering with MyPyramid program.

The MyPyramid Food Guidance System is a network of nutrition education tools that puts the *Dietary Guidelines for Americans* into practice by providing personalized information on foods and dietary patterns.

AMI has long supported the MyPyramid system and uses its nutritional education tools and the *Dietary Guidelines*' recommendation of consuming five to seven ounces of meat per day as part of a healthy, balanced diet as a focal point in many of the Institute's consumer education materials.

"We are proud to join with USDA in this partnership," said James H. Hodges, president of the AMI Foundation.

“We are proud to join with USDA in this partnership. The health of our customers is the driving force in the production of meat and poultry products. ...”



- AMIF President James H. Hodges ”

"The health of our customers is the driving force in the production of meat and poultry products, not only with respect to improving the safety of meat and poultry products, but also in offering diverse nutritional products to consumers so they can make an educated

decision in choosing the food that best fits their personal lifestyle and family needs."

Currently, AMI's MeatPoultryNutrition.org provides links to many of the MyPyramid tools as a step to encourage a healthy lifestyle, including sections about proper portion sizes, the benefits of protein in the diet and information about achieving a healthy body weight. The site also features a "MyPyramid for Kids" section that offers parents a guide to healthier foods and physical activity choices for kids.

Additionally, three of AMI's consumer education videos, part of its "Ask the Meat Scientist" YouTube series, focus on what it means to be a "lean" cut of meat, proper meat and poultry portion sizes and the role of sodium in meat products.

Nitrite Expert Refutes Review Linking Processed Meat to Health Issues

In a letter published in *Circulation*, University of Texas Health Science Center's Nathan S. Bryan, Ph.D., raised concerns that a 2010 epidemiological review, "Red and Processed Meat Consumption and Risk of Incident Coronary Heart Disease, Stroke and Diabetes Mellitus," by Micha *et al.* lacked the proper physiological perspective and context for accurate interpretation of the data.

Micha *et al.* reported a weak association between red meats and coronary heart disease (CHD) and diabetes mellitus. According to Bryan, the authors suggest that the increased risk may be due to nitrites and nitrates used as preservatives, but data presented in their review indicated minimal difference in the nitrite and nitrate content of red versus processed meats, which reflected the fact that endogenous nitrogen oxides in

meat or muscle exceed that added in meat processing.

In addition, Bryan pointed out that their conclusions contrast with the emerging cardiovascular benefits of nitrite and nitrate. Dietary nitrite and nitrate have been shown to reduce inflammation, restore endothelial function, reduce C-reactive protein, protect from heart attack, stroke and even improve exercise performance.

"Studies such as this and others leave scientists and consumers alike confused as to what we should or should not eat. We have been told for decades to eat our vegetables. However, the large European Prospective Investigation into Cancer and Nutrition (EPIC Oxford) study found vegetarians had increased colon cancer risk compared to non-vegetarians, raising the specter that some dietary component

in vegetarians increases risk or that meat-eating conferred decreased risk of this type of cancer. Does this mean that we should not eat our vegetables at the risk of getting colon cancer by the same argument as Micha *et al.* put forward?" Bryan asked.

"My point is not to discredit important epidemiological data but rather to put it in proper perspective," Bryan concluded. "Epidemiology is an important and critical discipline to public health protection and understanding disease associations, but it alone cannot establish causation. This extensive review by Micha *et al.* is an important area of research but we clearly need more research to clarify mechanisms and/or appropriate dietary recommendations."

To view Bryan's letter, go to <http://circ.ahajournals.org/cgi/content/extract/123/3/e16>.

White Paper Evaluates MRSA Relationship with Infections

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also occurs in other staphylococci, including *S. intermedius* and *S. pseudintermedius* that colonize and infect pets and other animals.

Because MRSA has been detected in retail foods and on animal carcasses at slaughter, food may also be a source of infection to food handlers or of foodborne intoxication to consumers.

Surveys to date indicate that the prevalence of MRSA in meat is low and the concentration of bacteria in food samples is also low. In some cases, MRSA contamination of foods appears to result from MRSA present in dairy cows or in animals before slaughter and in other cases, from human food handlers.

The objectives of this white paper were to summarize all historical data on MRSA and its relationship with animal and non-animal related infections; evaluate hospital acquired MRSA infections; evaluate worldwide understanding of MRSA infections and their sources; and identify the data gaps and discuss how these gaps influence the understanding of MRSA and propose tasks needed to close them. The paper identified the following data gaps and areas of needed research:

- Characteristics of different methicillin-resistant staphylococci should be compared to common methicillin-sensitive strains to determine any differences in growth in different foods and sensitivity to heat, sanitizers and other control methods and why/how certain strains are adapted for colonization of particular animal species.
- More data are needed on prevalence and concentration of MRSA in meats and the MRSA strains present to determine sources of contamination – human or livestock. Since the ecology of MRSA is changing, MRSA levels in foods should be monitored over time.
- Studies should determine whether food handlers can acquire MRSA from preparing meat and other foods containing MRSA.

- Risk factors associated with MRSA and methicillin-resistant *S. intermedius* (MRSIG) infections in animals need to be better characterized so that animal infections and potential transmission to humans can be better controlled.

- Animal husbandry practices and slaughtering methods vary in different countries. Research should determine whether some methods result in greater contamination of meat.

- Some studies in the U.S. and other countries reported that there is a relatively high prevalence of MRSA on some farms and a low prevalence or absence of MRSA on other farms. The reasons for this should be investigated.

- Important transmission pathways are not completely understood among people in the community and potential aerosolization and airborne spread.

- Genetic studies of staphylococcal cassette chromosome (SCC) and multilocus sequence typing (MLST) would provide more information on important virulence and resistance factors.

- Potential for horizontal transfer of SCC_{mec} among staphylococci is not well understood but may be an important factor in increasing prevalence of antibiotic resistance.

Summary and Perspective

“Although MRSA and MSRIG contamination of foods is not currently a significant problem, these bacteria continue to evolve and spread in the environment. MRSA was originally isolated in a UK hospital in 1961, community-associated MRSA strains appeared in the early 1990s as did methicillin-resistant *S. intermedius* (*pseudintermedius*) in companion animals, and livestock associated MRSA strains were first described in 2003,” the report concluded.

To view the white paper, go to <http://amif.org/ht/a/GetDocumentAction/i/67833>.

AMI Foundation Board Approves Five New Research Projects

(from page 1)

in retail delis and to the test the ability of these strategies to reduce and control *L. monocytogenes* contamination. AMIF is pleased to announce that the Food Marketing Institute is cosponsoring this research.

Researchers at Iowa State University, led by Joseph Sebranek, Ph.D., will examine the recovery of injured *L. monocytogenes* cells on natural and/or uncured ready-to-eat meat and poultry products. The project goal is to find the treatment with the greatest initial lethality

that also achieves sustained suppress of growth of injured and uninjured *L. monocytogenes* when combined with natural and/or organic antimicrobials.

Jeffrey Sindelar, Ph.D., and Kathy Glass of the University of Wisconsin will team up with Robert Hanson of HansonTech to develop thermal processing guidelines for ready-to-eat deli meat and poultry products. The project will validate the effect of thermal processing interventions on the survival of *L. monocytogenes*, *Salmonella* and shiga toxin-producing *E. coli* on a variety

of meat products and use this data to develop a series of time-temperature tables organized in product categories covering a wide array of meat products and thermal processes.

A collaborative team of epidemiologists, a toxicologist and an expert in nitrite physiology will conduct a technical review of the International Agency for Research on Cancer’s evaluation of nitrite (and nitrate).

Additional information is available on the AMIF website (www.amif.org).

AMIF Calls for Additional Funding for Agricultural Research

“To prevent foodborne illnesses, one must fully understand how microorganisms live and thrive in their animal host environment, how they may attach to raw agricultural products during processing, and how those microorganisms may infect a human host,” said AMI Foundation Director of Scientific Affairs Betsy Booren, Ph.D., in comments January 7 to the President’s Council of Advisors on Science and Technology (PCAST). Booren noted that in order to sustain the progress that has been made in enhancing food safety, increased funding for agricultural research is essential.

Funding research to better understand this process allows for the development of: animal production practices that minimize initial colonization; antimicrobial interventions for use on-farm and during processing; packaging materials that preserve the product safely and for greater periods of time; and education programs. Booren noted that education programs for ranchers, farmers, meat processors, workers, and even the consumer give the entire food chain the tools they need to produce and ultimately consume the safest food product possible.

Booren detailed data suggesting that the meat and poultry industry’s research and education efforts have contributed to the food safety progress reflected in

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

government data. Pathogenic bacteria on fresh and ready-to-eat products are down dramatically and so, too, are foodborne illnesses caused by pathogens associated with some meat and poultry products. The AMI Foundation has demonstrated this approach to research is a wise investment and believes it is a formula to create real change and real progress, Booren said.

Unfortunately, as Booren told PCAST, “This type of research rarely garners sexy media headlines. It is timely, expensive and easily cut by universities and legislators.”

Booren stated that since 1999, the AMI Foundation research program has directly

sponsored more than 85 food safety research projects at leading universities and research labs. It has seen firsthand, however, the funding for agriculture research drastically decline over the last two decades with departments removing critical agriculture disciplines. This is disappointing as the need for agricultural research has never been greater and it is absolutely critical to have science-based research that will help meet the challenges that lay ahead in the future for the health of Americans.

The critical need for more agricultural research and subsequent funding, particularly in the area of food safety research, has been reiterated by the Foundation staff to USDA’s National Institute of Food and Agriculture, Agricultural Research Service and Food Safety and Inspection Service.

“We will be unable to build on our progress and make our food supply even safer without additional funding for agricultural research,” concluded Booren.

PCAST, administered by the Office of Science and Technology Policy (OSTP), is an advisory group of the country’s leading scientists and engineers who directly advise the president and the Executive Office of the President on science and technology issues.

Booren’s comments can be viewed at <http://bit.ly/hB4gTv>.

AMIF Updates Secretary Woteki on its Food Safety Priorities

AMI Foundation President James H. Hodges and Director of Scientific Affairs Betsy Booren, Ph.D., in February briefed USDA Under Secretary for Research, Education and Economics (REE) Catherine Woteki, Ph.D., about the Foundation’s current food safety research priorities and issues.

Woteki also serves as chief scientist and oversees the four agencies that comprise REE: the Agricultural Research Service (ARS), National Institute for Food and Agriculture, Economic Research Service and National Agriculture Statistics Service.

Among the issues Hodges and Booren highlighted for Woteki was the need for additional scientific documents, frequently referred to as “safe harbors,” for the meat and poultry industry.

The Foundation 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 that these documents offer. AMIF believes this type of research is appropriate for collaboration among ARS and the Food Safety and Inspection Service (FSIS) as it fits under both the agencies missions and could greatly improve the safety of meat and poultry products.

Hodges and Booren shared other research and educational programs the Foundation conducts in an effort to reduce shiga toxin-producing *E. coli*, *Salmonella* and *Listeria monocytogenes* from the meat and poultry supply.

► SCIENCE SOUNDBITES

Guinea Pig Study Finds *L. monocytogenes* Reaches Fetus in As Early As 2 Days

L. monocytogenes may reach the fetoplacental barrier and invade the fetus as early as two days postinoculation, according to a recent study by the University of Georgia using pregnant guinea pigs.

The objective of this study was to orally challenge pregnant guinea pigs with *Listeria monocytogenes* to assess maternal and fetal tissue invasion at postinoculation days two, six, nine and 21. The time course of invasion was followed by fluorescence microscopy and a traditional culture method.

When comparing fecal shedding, all animals treated with 10^4 CFU were shedding *L. monocytogenes* by postinoculation day seven, and all animals treated with the higher doses (10^6 or 10^8 CFU) were shedding *L. monocytogenes* by postinoculation day five.

When comparing the sensitivities of microscopy and culture, neither method consistently detected *L. monocytogenes* at a higher rate. However, detection in individual tissues differed. Microscopy was significantly more sensitive with fetal liver and brain at the highest dose of 10^8 CFU, but at the lowest dose of 10^4 CFU culture was significantly more sensitive with maternal spleen.

Researchers noted that additional studies are needed to determine whether the pathogen invades fetal tissues earlier than two days postinoculation. *Journal of Food Protection*. 72 (2): 248-253.

Researchers Identify Possible Screening Method for Pathogenic STECs

Screening ground beef enrichments for some combination of *stx1*, *stx2*, *ehx*, *eae*, *subA*, *chuA*, *nleB* and *nleF* may be a good approach to identifying samples that might harbor pathogenic STEC (pSTEC), according to new research by the United States Department of Agriculture (USDA).

This study reports the prevalence and characterization of non-O157 STEC in commercial ground beef (n=4,133)

obtained from numerous manufacturers across the U.S. for a period of 24 months. All samples were screened by DNA amplification for the presence of Shiga toxin genes, which were present in 1,006 (24.3 percent) of the samples. Then culture isolation of a STEC from all samples that contained *stx1* and/or *stx2* was attempted. Of the 1006 *stx* screened positive ground beef samples, 300 (7.3 percent of the total 4,133) were confirmed to have at least one strain of STEC present by culture isolation.

In total 338 unique STEC isolates were recovered in the 300 samples that yielded a STEC. All unique STEC isolates were serotyped, and were characterized for the presence of known virulence factors. These included Shiga toxin subtypes, intimin subtypes, and accessory virulence factors related to adherence (*saa*, *iha*, *lifA*), toxicity (*cnf*, *subA*, *astA*), iron acquisition (*chuA*), the presence of the large 60MDa virulence plasmid (*espP*, *etpD*, *toxB*, *katP*, *toxB*) and a pathogenicity molecular risk assessment (MRA, based on presence of various O-Island *nle* genes). Results of this characterization identified 10 STEC (0.24 percent of total 4,133) that may be considered a significant food safety threat defined by the presence of *eae*, *subA*, and *nle* genes.

However, researchers noted, further work is needed to validate this approach. *Applied Environmental Microbiology*. 77: 2103 - 2112

Plant Interventions Effective at Decreasing MDR *Salmonella* Contamination

Multiple-hurdle processing interventions employed at plants are quite effective at decreasing multi-drug resistant *Salmonella enterica*, according to a study by the United States Department of Agriculture (USDA).

The prevalence and diversity of multi-drug resistant (MDR) *Salmonella enterica* associated with cattle at harvest in the United States was examined. Hides and carcasses of cattle were sampled at processing plants located in four geographically distant regions, from July 2005 to April 2006.

Mean prevalence of *Salmonella* on hides, pre-evisceration (immediately after hide removal) and post-intervention (in the chiller and after the full complement of interventions) carcasses was 89.6 percent, 50.2 percent and 0.8 percent, respectively. MDR *Salmonella enterica* (defined as those resistant to two or more antimicrobials) as a percent of *Salmonella* prevalence was 16.7 percent, 11.7 percent and 0.33 percent, respectively.

In this study, 16,218 *Salmonella* hide and carcass isolates were screened for antimicrobial resistance. Of these, 978 (6 percent) unique MDR *S. enterica* isolates were identified, serotyped and their XbaI PFGE profiles determined. The predominant MDR *S. enterica* serotypes observed were Newport (53.1 percent), Typhimurium (16.6 percent) and Uganda (10.9 percent).

Differences in MDR *S. enterica* prevalence were detected and PFGE analysis revealed both epidemic clusters (profiles found in plants in multiple regions/seasons) and endemic clusters (profiles observed in plants in limited regions/seasons), within several of the MDR serotypes examined. Despite these differences, interventions were found to be effective in decreasing MDR *S. enterica*. *Applied Environmental Microbiology*. 77: 1783 - 1796.

Alternative Cooking Times for Large, Intact Meat Products Meet Microbiological Standards

The industry may have increased flexibility associated with cooling large, whole-muscle cuts while still complying with the required stabilization microbiological performance standards, a new study by Texas A&M University has determined.

Achieving the U.S. Department of Agriculture, Food Safety and Inspection Service (USDA-FSIS) stabilization microbiological performance standards for cooling procedures has proven to be a challenge for processors of large, whole-muscle meat products.

This study was conducted to determine if slower cooling times than (see page 7)

► AMIF Research

Review Examines Challenges of Reducing Sodium Content in Foods

Food processors face a difficult challenge when attempting to reduce salt content in food, while still producing safe, palatable and economic products, but there are options available, according to a recent AMI Foundation-funded paper by University of Wisconsin researcher Ellin Doyle, Ph.D.

The objectives of the paper were to review the use of sodium as a food safety intervention; to evaluate the synergistic effects of sodium with other food safety hurdles; to identify risks associated with use of sodium alternatives; to assess human health risks resulting from changes in dietary sodium and potassium; and to evaluate the risk of reduced sodium and sodium replacements to targeted at-risk populations.

The sodium salt substitutes and additives that were examined include potassium, calcium, magnesium, organic acid, sodium diacetate, sodium and potassium lactates, propionates, sodium, benzoate and benzoic acid and sorbates. The paper also discussed the potential concerns with flavor enhancers and thickeners.

The report noted that other dietary and lifestyle changes, including increased exercise and intake of fruits and vegetables with high potassium levels and reduced intakes of saturated fats, are also important for good health.

Regarding salt substitutes, the report found that surveys have

demonstrated variation in sodium content in different brands of foods in the same category and in the same foods sold in different countries, indicating that reductions in sodium levels in many foods are possible.

Noting that the process is not a simple one, the report said that potassium salts can partially substitute for sodium salts in foods, but flavor issues arise if too much potassium is used. However, while populations in industrialized countries generally ingest too little potassium, high dietary potassium levels may pose a risk for people with kidney disease. High dietary phosphate is also a concern for those with reduced kidney function.

Other substances used in reformulated, low-sodium foods are primarily compounds or extracts that have already been approved for use in foods. They are considered safe at currently used levels but if their usage were to greatly increase, then safety might need to be reconsidered, according to the findings.

“Some new products, such as plant extracts and hydrolyzed proteins from new sources should be tested for allergenicity as well as toxicity,” the report concluded.

The review paper is available at <http://amif.org/ht/a/GetDocumentAction/i/67835>.

► AMIF Research

Method Identified to Determine Ammonia Contamination in Meat

A recent study by University of Nebraska researcher Randy Wehling, Ph.D., found that using an ion selective electrode method is a simple and rapid procedure to determine ammonia concentration in contaminated meat and poultry and that this method should be suitable for use as a quality control procedure in meat processing facilities.

Once developed, the method was used to investigate the uptake of ammonia by fresh meat exposed to air containing 200 ppm ammonia. Fresh meat rapidly absorbs and binds ammonia, achieving ammonia concentrations in the product that exceed the levels of ammonia in the surrounding air. The rate of ammonia uptake by frozen meat is much slower.

Potential simple methods for removing ammonia from exposed product were evaluated, including air flushing, vacuum treatment, and acid rinsing; however, none of these simple procedures were effective in providing substantial reduction in the ammonia levels.

This study is available at <http://www.amif.org/ht/a/GetDocumentAction/i/67970>.

► SCIENCE SOUNDBITES

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those provided by USDA-FSIS guidance will comply with the performance standard for *Clostridium perfringens*. Large (9 to 12 kg) cured bone-in hams and uncured beef inside rounds were used.

Stabilization treatments extended times to reduce internal product temperature from 54.4 to 26.7 degrees Celsius (hams and rounds) and from 26.7 to 7.2 degrees Celsius (for hams) and 26.7 to 4.4 degrees Celsius (for rounds). Control treatments, defined by current USDA-FSIS Appendix B guidelines, and a “worst-case scenario” treatment, in which products were cooled at room temperature (approximately 22.8 degrees Celsius) until internal product temperature equilibrated, were used.

For both hams and rounds, stabilization showed less than 1-log growth of *C. perfringens* for all treatments, with the exception of the worst-case scenario for rounds. As expected for products cooled at room temperature, there was .1-log growth of *C. perfringens* reported for rounds, and the addition of curing ingredients to hams had an inhibitory effect on the growth of *C. perfringens*.

Journal of Food Protection. 74 (1): 101-105.

► AMIF ONGOING RESEARCH

E. coli

<u>Investigator</u>	<u>Institution</u>	<u>Project Title</u>
Rodney Moxley	University of Nebraska	Effect of flagellin and intimin type expression on colonization of bovine intestine by non-O157 serotypes Shiga toxin-producing <i>E. coli</i> (Phase 2 only)
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

Salmonella

<u>Investigator</u>	<u>Institution</u>	<u>Project Title</u>
Jeffrey Sindelar, Kathleen Glass, Robert Hanson	University of Wisconsin, HansonTech	Developing Validated Time-Temperature Thermal Processing Guidelines for Ready-To-Eat Deli Meat and Poultry Products
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>
Andrew Milkowski, Jim Coughlin, Nathan Bryan, Dominik Alexander	Milkowski Consulting LLC, Coughlin & Associates, University of Texas Medical School – Houston, Exponent	Response to International Agency for Research on Cancer 2A Classification of Nitrite (and Nitrate)

Listeria monocytogenes

<u>Investigator</u>	<u>Institution</u>	<u>Project Title</u>
Haley Oliver, Martin Wiedmann	Purdue University, Cornell University	Development and Evaluation of Control Strategies for <i>Listeria monocytogenes</i> in Retail Deli Environments ¹
Joseph Sebranek, James Dickson, Byron Brehm-Stecher, Stephanie Jung, Aubrey Mendonca	Iowa State University	Reducing or Preventing Recovery of Injured <i>Listeria monocytogenes</i> on Ready-to-Eat Natural and Organic “Uncured” Processed Meats
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

¹Co-sponsored by Food Marketing Institute

► NUTRITION NEWS CORNER

Study: Replace Carbohydrate and Fat Intake with Protein to Combat Obesity

For those wishing to lose weight or avoid gaining weight, reducing overall caloric intake is key, perhaps by substituting protein intake in place of both carbohydrate and fat intake, according to a new study published in the *American Journal of Clinical Nutrition*.

Researchers examined trends in carbohydrate, fat and protein intakes in adults and their association with energy intake (calories) by tracking intake over time using data from the National Health and Nutrition Examination Survey (NHANES) — a program of studies designed to assess the health and nutritional status of adults and children in the United States.

According to the study, one of the most striking findings was the

consistently strong and negative association with increasing percentage calories from protein and daily energy intake across all three body mass index categories (normal weight, overweight and obese) in both NHANES I, 1971-75, and NHANES 2005–2006.

This finding may be surprising to many as it contradicts the belief that the rise in obesity has been caused by increased caloric intake due to the overconsumption of protein-based foods.

The research showed that in NHANES 2005–2006, a one percent increase in the percentage of energy from protein was associated with a decrease in energy intake (calories) of 32 kcal (substituted for carbohydrates) or 51 kcal (substituted for fat). Similar findings were seen across all body mass index categories, in men and women, and in NHANES I.

“This finding is all the more interesting given the exclusion of individuals following any type of special diet (such as low-carbohydrate or high

protein diets) and supports human experimental data in obese individuals that a high-protein diet can be more effective at increasing satiety, reducing hunger and energy intake, and achieving greater weight loss,” the researchers noted.

“The decrease in energy intake was greater if protein was substituted for fat, but the effect was still substantial when protein was substituted for carbohydrates.”

The researchers said a shift toward more carbohydrates during the years examined was associated with an overall increase in energy intake and an increase in obesity prevalence, and concluded, “Dietary interventions to combat the obesity epidemic should focus on reducing total energy intake, perhaps by substituting protein intake in place of both carbohydrate and fat intake.”

To view an abstract of the study, go to <http://bit.ly/eXvJIK>.

(see page 10)

► NUTRITION NEWS CORNER

(from page 9)

No Link Between Fresh or Processed Red Meat and Increased Risk of Bladder Cancer, Study Finds

There is no association between consumption of fresh or processed red meat and an increased risk of bladder cancer, according to a new analysis of data published in the journal *Cancer Epidemiology, Biomarkers & Prevention*.

The researchers, led by Paula Jakszyn from the Catalan Institute of Oncology in Spain, also noted that their analysis showed no link between nitrosamines and heme iron and bladder cancer risk.

“To our knowledge this is the first prospective study of heme iron intake and bladder cancer risk,” the researchers wrote. “The strengths of this study include its large size, prospective design and inclusion of potential confounding variables.”

In light of inconsistent results from previous epidemiological studies, Jakszyn and her team investigated the association between red meat consumption, dietary nitrosamines and heme iron and the risk of bladder cancer among participants of the European Prospective Investigation into Cancer and Nutrition (EPIC).

The result was no overall association between intake of red meat, nitrosamines or heme iron and bladder cancer risk. According to the analysis, the associations did not vary by sex, high versus low risk bladder cancers, smoking status or occupation. At the same time, when assessing red and processed meat separately, there were no differences observed.

EPIC is a study of 520,000 people from 10 European countries (Denmark, France, Germany, Greece, Italy, Netherlands, Norway, Spain, Sweden and the United Kingdom) that investigates the relationships between diet, nutritional status, lifestyle and environmental factors and the incidence of cancer and other chronic diseases.

To read the complete details and methods of the study, visit <http://cebp.aacrjournals.org/content/20/3/555>.

AMIF-Sponsored Decision Making for Dietary Recommendations Workshop Proceedings Published

Recently published in the Critical Reviews in Food Science and Nutrition were extended abstracts from the AMI Foundation and North American Branch of the International Life Sciences Institute (ILSI-NA) sponsored Workshop on Decision-Making for Dietary Recommendations and Communications Based on Totality of Food-Related Research held on December 15, 2008, in Washington, DC.

As outlined by Darinka Djordjevic, ILSI-NA, the purpose of the workshop was to “educate the nutrition and food safety communities about current practices in the field of epidemiology regarding the interpretation of weak associations and stimulate a dialogue around improving the transparency and approaches to the use of epidemiological data” for the development of public health recommendations. Experts discussed current epidemiological methods, examined case-studies, and reviewed appropriate interpretations of epidemiological data and decision making for policy recommendations.

The proceedings of the workshop can be viewed at <http://www.informaworld.com/smpp/title~db=all~content=g9307384.60>.

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Betsy Booren, Ph.D. Director of Scientific Affairs

“Meat Myths and Facts”
March 23, 2011
Certified Angus Beef
Workshop
Hamilton, Kansas

“Inside the Beltway/
National Meat Politics”
Feb 26, 2011
NCMPA/SCAMP Joint
Annual Meeting

“Meat Myths and Facts”
April 9, 2011
Beef 510
Ohio State University

“American Meat Institute:
Perspective on the Meat
and Poultry Industry”
March 5, 2011
University of Nebraska

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