AMI Foundation News
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Nutrient Dense Lean Meats Key to a Healthy Diet Says USDA Nutrition Policy Expert

Balancing Choices and Caloric Needs Essential To Fixing Nation's Diet

"Lean meats" fit well into U.S. Department of Agriculture's (USDA) recommendation to consume nutrient dense foods, said Eric Hentges, Ph.D., executive director of USDA's Center for Nutrition Policy and Promotion.

Hentges, who has over 20 years of nutrition research and education experience, explains that lean meats are considered nutritionally dense – and thus key in dealing with issues of overweight and obesity. In answering questions posed by the AMI Foundation, Dr. Hentges talks about the USDA/Department of Health and Human Services Dietary Guidelines, the nutritional guidance tool "MyPyramid," and the importance of including meat in one's diet.

Q: Can you describe the role that USDA plays in ensuring that U.S. consumers get sound nutritional guidance?

A: The USDA has been in the nutrition guidance business for over 100 years beginning in 1894 with food composition and dietary standards for the U.S. population. The current process of federal nutrition guidance started with the 1980 *Dietary Guidelines for Americans* and the latest revision was issued January 2005. This current process is jointly administered by USDA and the Department of Health and Human Services with review and revision occurring every five years.

The process by which the *Guidelines* are developed is designed not only to ensure scientific accuracy, but also to give the public confidence and reassurance in the nutrition messages that are developed. The current scientific literature is reviewed by an independent advisory committee of academics from leading universities and research institutions across the country. Members of the Dietary Guidelines Advisory Committee are not paid by the government, but contribute their time and talent free of charge. All committee meetings, usually four or

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Advanced *Listeria* Intervention and Control Conference Slated for Fall

New breakout session topics, discussions on advanced intervention techniques, analyzing a case study and a talk on successfully completing a Food Safety and Inspection Service (FSIS) food safety assessment are all scheduled for the revised Advanced *Listeria* Intervention and Control Conference, scheduled for Nov. 14-15, 2006, at the Hyatt Regency Denver at Colorado Convention Center in Denver, Colo.

Conferees will be benefit from a plenary session led by Joe Meyer of Kraft Foods, Inc. on the public health and regulatory implications of *Listeria* control while producing safe ready-to-eat meat and poultry products

Attendees can then choose between two concurrent educational sessions. The first track will focus on the basics for process control and will include talks by Joe Stout, director of sanitation at Kraft Foods North America, Kraft Foods, Inc. and John Butts, Ph.D., vice president, research and development for Land O' Frost Inc., who will discuss building a firm foundation for *Listeria* control through sanitary equipment and facility design techniques. The "Back to the Basics" track will conclude with talks on sanitation best practices by Rory Redemann, food safety sanitarian at Kraft Foods North America, and Dale Fredell, manager for education services at Ecolab, Inc.

The second track on advanced intervention techniques is new to the 2006 conference. Several universities have been invited to speak on recent research in the areas of DNA tracking techniques, new ingredient technologies for preventing growth and alternative intervention techniques.

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Science Soundbites: A Review of Recent Research

Hot Water Proves Better Than Lactic Acid Wash

The application of hot water to reduce the levels of aerobic bacteria and Enterobacteriaceae and the prevalence of *Escherichia coli* O157:H7 on preevisceration beef carcasses proved to be more successful than the use of, or in addition to, lactic acid. Researchers with the U.S. Department of Agriculture's Roman L. Hruska U.S. Meat Animal Research Center found that a commercial hot water carcass wash cabinet applying 74 C water for 5.5 seconds reduced both aerobic plate counts and Enterobacteriaceae over one and a half times the reduction of a commercial lactic acid spray cabinet that applied 2 percent lactic acid at approximately 42 C. Additionally, the hot water treatments reduced *E. coli* O157:H7 prevalence by 81 percent, while the lactic acid treatment only reduced *E. coli* O157:H7 prevalence by 35 percent. A combination of the two treatments produced only a 79 percent reduction. The results suggest that hot water would be more beneficial than lactic acid for decontamination of preevisceration beef carcasses. *Journal of Food Protection*, Vol. 69, No. 8, Pages 1808-1813.

Organic Acids, Acidified Sodium Chlorite Control Bacteria On Beef Trim, Ground Beef

Acidified sodium chlorite and acetic and lactic acids were effective in reducing foodborne pathogens in beef trim prior to grinding in a simulated processing environment, a recent study showed. Researchers at Texas Tech University treated beef trim and ground beef with a high and low inoculation and found that all treatments reduced the pathogens *Salmonella* Typhimurium and *Escherichia coli* O157:H7 to non-detectable numbers. Materials treated with the high inoculation showed significant reductions. Organic acids prove to be more effective in ground beef immediately after grinding, but after one day of storage, there were no differences between the treatments. A consumer panel found few sensory differences between the control samples and the treated samples suggesting that the antimicrobial treatments did not cause serious adverse sensory changes. Researchers believe these antimicrobial treatments can be a promising intervention available to ground beef processors who currently have few interventions in their process. *Journal of Food Protection*, Vol. 69, No. 8, Pages 1802-1807.

CNS Tissue Detection on Production Tools Successful in Study

The detection of central nervous system (CNS) tissue on meat and carcass-splitting band saw blade surfaces was successful with a glial fibrillary acidic protein fluorescent enzyme-linked immunosorbent assay (GFAP F-ELISA) in a study performed by researchers at Colorado State University. GFAP is restricted to CNS tissue and has been used as a marker for CNS tissue presence in meat products. The sample preparation, extraction procedure and extraction temperature of the GFAP F-ELISA were modified to detect CNS tissue on meat surfaces and on carcass-splitting band saw blades. The process developed consistently provided detection of GFAP on meat surfaces and on carcass-splitting band saw blades and recovery was not affected by storing samples overnight. The study demonstrates the effectiveness of modified sampling procedures and preparations, sample extraction buffer pH and extraction temperatures. Additionally, the modifications introduced to the original F-ELISA sampling protocol resulted in a sensitive and repeatable assay for detection of CNS tissue. Journal of Food Protection, Vol. 69, No. 8, Pages 1966-1970.

Placenta May Be Culprit in Listeriosis Illnesses

Scientists at the University of California, Berkeley, have challenged some long-held assumptions regarding listeriosis illness in pregnant women with a recent study. The research, conducted in guinea pigs, showed that *Listeria monocytogenes* can invade the placenta, where – protected from the body's immune system – the bacteria is free to replicate before spreading to infect other organs such as the liver and spleen. The study claims to be the first to trace the pathway of listeriosis infection. The Centers for Disease Control and Prevention estimates that 2,500 people fall seriously ill because of listeriosis in the United States. Of those, about one in three occurs in pregnant women. The study was published online in the journal *PLoS Pathogens* in June. Researchers are now looking at how *Listeria* moves from the digestive tract to the placenta in order to understand the mechanisms of growth and create potential prevention and treatment methods for pregnant women.

Study Shows *Lm* Count at Deli Counter Declining

Less than one percent of all retail ready-to-eat meat and poultry luncheon meats tested positive for *Listeria monocytogenes* in a study recently presented at the Annual Meeting of the International Association for Food Protection in Calgary, Alberta. Researchers from four universities tested 8000 samples in four states (Georgia, California, Minnesota and Tennessee) and found that, overall, 0.69 percent of products tested had a positive result for *Listeria monocytogenes*. Deli products that were pre-sliced had a prevalence rate of 0.15 percent, while those deli items that were sliced in the retail store were slightly higher at 1.23 percent. This was reported to be very encouraging news when compared to a similar study conducted in 2003. When these data from 2006 were compared with the previous study, the prevalence rates were reduced by more than 50 percent for these two deli product categories.

'Super-Shedders' Responsible for Increasing *E. coli* Prevalence

Cattle with high levels of *E. coli* O157:H7 play a key role in increasing the prevalence of the bacteria throughout the feedlot, according to a recently released study, jointly funded by the AMI Foundation and the National Cattlemen's Beef Association.

The study, "The Role of Super-Shedders in Determining Feedlot Pen Prevalence of *E. coli* O157:H7," analyzed the removal and addition of "super-shedders" and the transmission of *E. coli* O157:H7 between cattle. It also looked at the association between the presence of a super-shedder in a pen and the prevalence of *E. coli* O157:H7 in the pen environment. "Super-shedders" are cattle within feedlots that are colonized by *E. coli* O157:H7 more frequently, persistently and in greater numbers than other cattle.

The project, completed by Washington State University, confirmed the role of the recto-anal junction in the general cattle population and in super-shedders as the main colonization point for *E. coli* O157:H7.

In addition, data derived from this study suggests a casual link between the presence of a super-shedder and the prevalence of *E. coli* O157:H7 in a cattle pen and among cattle that reside near by.

Removal of super-shedders from hot pens – pens where super-shedders reside – resulted in reductions in *E. coli* O157:H7 parameters for cattle colonization and environmental contamination; however, these reductions were no greater than those seen in control pens, where general reductions in *E. coli* O157:H7 prevalence, count and persistence also occurred over the course of sampling.

Researchers believe that interventions to identify super-shedders and prevent their entry into pens or dissemination among other cattle are necessary; however, they did not identify where this is best to occur, i.e. on entry into the feedlot, at saleyards, during transport, during lairage, or at some combination of these points.

> *"data derived from this study suggests a casual link between the presence of a super-shedder and the prevalence of* E. coli *O157:H7 in a cattle pen"*

Moreover, the study indicates that mixing cattle from different pens or herds has the potential to allow cohabitation of super-shedders and low-shedding cattle, which could result in the latter becoming more likely to carry and shed *E. coli* O157:H7 and thus making them a greater potential as a source of the bacteria.

An improved knowledge of how *E. coli* O157:H7 reside at the recto-anal junction and become excreted in feces will allow development of interventions designed to reduce *E. coli* O157:H7 carriage and transmission to other cattle and the food chain.

Rowland Cobbold, Ph.D., the principle investigator, now with the University of Queensland, will present these findings at the 6th International Symposium on Shiga-Toxin Producing *Escherchia coli* Infections in Melbourne, Australia. To read the entire report online, visit AMIF.org and navigate to "Research."

Listeria Intervention Research Shows Promise

The combination of pre- and post-package pasteurization demonstrated reduced levels of *Listeria monocytogenes* (*Lm*) on ready-to-eat (RTE) meat and poultry products in a recent study by Oklahoma State University researchers.

Lead investigators Peter Muriana and J. Roy Escoubas tested pre- and post-package pasteurization methods of RTE meats together with anti-listerial ingredients to validate the utility of surface pasteurization as a tool for reducing *Lm* on hot dogs and deli turkey.

Results demonstrated that liquid smoke-treated samples had a slight reduction of *Lm* during outgrowth. Liquid smoke or lactic acid treatments, when combined with heat, suppressed outgrowth for up to four weeks on hot dogs. The combination of pre- and post-package processing proved to be very efficient; however, none of the treatments were shown to be effective on uncured turkey products.

The two-part project focused first on pre-package pasteurization of hot dogs and later on pre- and post-package pasteurization of large RTE processed meats.

The hot dog pasteurization efforts included three components: first, to determine the effectiveness of a hot water deluge system; and second, organic acid sprays and pre- and post-package for reduction of *Lm* to determine if equivalent reductions can be obtained with less processing time or temperatures. Finally, researches aimed to determine the impact of antimicrobials and organic acids on outgrowth of *Lm* during the product's shelf life.

The large RTE processed meats pre- and post-package pasteurization efforts included two components - the first to examine the effectiveness of the combination of pre- and post-package pasteurization of RTE deli turkey and the second to examine the combination of pre- or post-package pasteurization of RTE deli meats in combination with antimicrobials and impact on outgrowth of *Lm*.

To read the entire report online, visit AMIF.org and click on "Research."

White Paper Traces *E. coli* O157:H7 Roots

A wide variety of government and scientific documents were reviewed as part of the recently released "White Paper on Human Illness Caused by *E. coli* O157:H7 from Food and Non-Food Sources."

Researchers at the Food Research Institute at the University of Wisconsin-Madison teamed up with the Wisconsin Division of Public Health's Bureau of Communicable Diseases and Preparedness, Communicable Disease Epidemiological Section to examine scientific literature databases, industry publications and government publications and regulations from the United States, Canada, Europe and Japan from the date that *E. coli* O157:H7 was first recognized as a possible human pathogen in 1975 up until July 2006.

Included in the search was information on the emergence of the organism as a human pathogen, surveillance and outbreak reports, epidemiological studies, important government regulations and industry initiatives to control *E. coli* O157:H7. From this, the authors of the paper generated an historical timeline summarizing major events occurring from the first recognized cases of illness cause by *E. coli* O157:H7 through July 2006.

Based on the information collected, researchers made the following two recommendations:

- Greater uniformity is needed in statewide investigations and reporting of foodborne illness. Public health systems in some states are well organized – with all samples sent to state labs for analysis. Other states, with different priorities, are less aggressive and rigorous in testing samples and conducting investigations. They should be encouraged to improve funding for public health and to adopt and incorporate better epidemiological procedures and improved laboratory methods.
- Federal grants could be targeted to improving laboratory facilities and training for state epidemiologists, as needed. Greater participation by all states will aid in the rapid identification of multi-state outbreaks.

The report also points to improvements in recent years that have led to a decline in outbreaks and cases of *E. coli* O157:H7. These include:

- Increased emphasis on HACCP and pathogen control by industry and government.
- Increased educational efforts targeted at doctors, workers and consumers.
- Increased cooperation and information sharing between federal and state agencies with the Centers for Disease Control and Prevention and the Food and Drug Administration.
- Improved training to make Food Safety and Inspection Service inspectors more knowledgeable about risk-based inspection.
- Litigation surrounding some high profile outbreaks of foodborne disease alerting consumers to important food safety issues.

To read the entire report online, visit AMIF.org and navigate to "Research." ■

USDA Conference Focuses on Reaching At-Risk Populations

Innovative information and research about reaching at-risk and other populations with information on foodborne illness was the theme of the 2006 Food Safety Education Conference. The event, sponsored by the U.S. Department of Agriculture's Food Safety Inspection and Service (FSIS), was held Sept. 27-29 in Denver, Colo. The conference drew international, federal, state and local experts who discussed options and detailed ideas about reaching targeted, at-risk populations with educational materials and preventative strategies.

Expert presenters stressed that while foodborne illness can strike anyone in the general population, some individuals are more susceptible – including pregnant women, young children, older adults and those with weakened immune systems – who make up the at-risk population. The primary goal of the conference was to share current data on foodborne illness, present strategies to enhance food safety knowledge and effect attitudinal and behavioral modification in general and at-risk populations and communicate the latest science-based safe handling practices.

In addition, the conference emphasized the need for all groups with a stake in communicating and forming public health policy – including public health professionals, food safety educators, food industry professionals and scientific writers and journalists - to work together to create positive behavior modification during food preparation and consumption.

The conference focused on five main themes, including:

- Foodborne Illness Surveillance and Epidemiological Insights;
- Food Safety Behavioral and Attitudinal Research;
- Social Marketing, Educational Interventions, and Program Research;
- Role of Foodservice and Food Industries; and
- New Technologies.

In addition to FSIS, the conference was sponsored by NSF International, the Food and Drug Administration, the Centers for Disease Control and Prevention, USDA's Cooperative State Research, Education and Extension Service, USDA's Food and Nutrition Service and NSF/World Health Organization Collaborating Center for Food Safety.

To view presentations and information from the conference, go to http://www.fsis.usda.gov/denver2006/. ■

CO_2 System Useful in Reducing Bacteria in Ground Beef

Bacteria counts in ground beef can be reduced with the use of a controlled phase carbon dioxide ($_{CP}CO_2$) system, researchers at the Kansas State University Food Science Institute concluded in a recent AMI Foundation-funded study, "Elimination of *Escherichia coli* O157:H7, Generic *Escherichia coli*, and *Salmonella* Spp. on Beef Trimmings Prior to Grinding Using a Controlled Phase Carbon Dioxide ($_{CP}CO_2$) System."

The experiment was designed to evaluate antimicrobial, quality and shelf life effects of $_{CP}CO_2$ beef trimmings destined for ground beef. The most significant results demonstrated that using $_{CP}CO_2$ on beef trimmings before grinding can reduce *E. coli*, coliforms, *Salmonella* spp. and aerobic bacteria in ground beef. Additionally, the use of $_{CP}CO_2$ had minimal effects on color or odor characteristics of ground beef.

The investigation was divided into four separate studies. The first evaluated the effect of $_{CP}CO_2$ as an antimicrobial on sterile filter papers challenged with various foodborne pathogens. The second study assessed the effects of $_{CP}CO_2$ on non-challenged and challenged beef trimmings. The third phase of the study confronted concerns raised during the previous phase by analyzing the quality of ground beef treated with $_{CP}CO_2$. The final stage evaluated the effects of $_{CP}CO_2$ as an antimicrobial intervention process for beef trimmings destined for grinding.

The highest lethality in challenged beef trimmings and ground beef occurred with 1500 psi $_{CP}CO_2$ for 15 minutes. Total Plate Count, generic *E. coli*, *E. coli* O157:H7 and *Salmonella* spp. reached 0.83, 0.96 , 1.00 and 1.06 log reductions, respectively. Ground beef and beef trimmings saw similar bacterial reductions.

Food processing applications of $_{CP}CO_2$ are becoming more popular as economically viable alternatives to heat treatments. The most potential for $_{CP}CO_2$ application is for products that are sensitive to heat and pressure, such as fresh produce, fruit juice and beverages, fresh and smoked fish and fresh meats.

The team of KSU researchers, including Curtis Kastner, Ph.D., James L. Marsden, Ph.D., Daniel Y.C. Fung, Ph.D. and Carlos Arturo Tanus, believe this technology should not only improve the microbial safety of ground beef, but also promote extended ground beef color shelf life.

"This research demonstrates a promising food safety application for beef trimmings and ground beef," said AMI Foundation President James H. Hodges. "Additional research will help to further validate and refine the process."

To read the entire report online, visit AMIF.org and navigate to "Research."

Second Quarter *Salmonella* Testing Data Released

The Food Safety and Inspection Service's (FSIS) released its second report for the revised *Salmonella* Verification Testing Program.

The new procedures focus inspection and laboratory resources on establishments that have had the most samples test positive for *Salmonella* and the most samples with serotypes most frequently associated with human salmonellosis cases.

The agency also began testing turkey carcasses using "baseline guidance results" that were originally published in the *Federal Register* in February of 2005 and based on results from the turkey carcass sponge baseline study conducted from July 1997 through June 1998.

Because of this restructuring, comparisons of results for this year to previous years will be inappropriate. Until a solid body of data is established, FSIS will use the results of an upcoming nationwide baseline study to provide valid estimates of the prevalence of certain pathogens of public health concern and permit valid statistical comparisons to be made over time.

A 12-month Young Chicken (Broiler) Baseline Study is scheduled to begin shortly and additional baseline studies are under development.

Risk-Based Sampling Closes Out *Listeria* Conference

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Some highlights for the afternoon include a breakout session on verification and validation, led by Randy Huffman, Ph.D., vice president of scientific affairs at the AMI Foundation, a discussion of data analysis by John Butts, Ph.D., and a session on developing a routine sampling plan for process control with Tim Freier, Ph.D., corporate microbiologist with Cargill, Inc.

The second day of the conference will kick off with a case study on root cause identification by John Weisgerber, director of corporate safety with Weisgerber Consulting, LLC. Bob Reinhard, director of food safety at Sara Lee Foods, will discuss successfully completing a routine *Lm* risk-based sampling and food safety assessment by FSIS. In between, sessions on investigation and corrective actions, lot and line segregation and a breakout session on best practices are sure to keep attendees interested and focused.

Registration can be completed online in the Events/Education section of MeatAMI.com. AMI members receive the special conference rate of $595. Three or more member company attendees receive a discounted rate of $495. All other attendees may register for the regular rate of $695.

For additional conference information, visit MeatAMI.com.

Bacteria Approved For Use As Anti-Listerial Agent

A food additive petition to use bacteriophage as an antimicrobial agent against *Listeria monocytogenes* (*Lm*) on ready-to-eat meat (RTE) and poultry products has been approved by the Food and Drug Administration (FDA).

Intralytix, Inc. uses a mixture of equal proportions of six individually purified phages that is sprayed directly on the surface of the RTE food product at a level of approximately 1 milliliter per 500 square centimeters of the food surface area just prior to packaging. The formulation consists of multiple phages to minimize the possibility of *Lm* developing a resistance to the treatment.

The process was ruled safe by the FDA as the phages used infect only bacteria, and not mammalian or plant cells. Additionally, humans are routinely and naturally exposed to phages at high levels through food, water and the environment without adverse effect. Phages are also a part of the normal microbial population of the human digestive system.

The FDA evaluated the safety of the additive after reviewing 1) the safety of the six phages constituting the food additive, 2) the safety of potential residues from *Lm* used in the manufacture of the food additive and the need for limits related to their levels, 3) whether undesirable genes are potentially carried by the food additive, and 4) the need for additional identity and safety specifications.

The petition to use phages was originally filed in July 2002 for use on foods, including fresh meat, meat products, fresh poultry and poultry products; however, the company amended the petition for use only on RTE products. The final rule was published in the Aug. 18, 2006 *Federal Register*.

The Food Safety and Inspection Service (FSIS) has also reviewed the technology and has determined that it was effective in controlling *Lm* on meat and poultry and that it would not mislead consumers. FSIS will require products treated with the phage preparation to contain a label declaration on the package and in the ingredient statement. ■

Canadian Meat Council Symposium Explores Keys to Maintaining Meat Safety, Quality

The latest developments in food preservation and safety, including extending the shelf-life of meat while maintaining optimum quality, were the focus the Canadian Meat Council's (CMC) first-ever symposium on "Advanced and Rapid Methods in Quality Control of Meat and Meat Products." The two-day event, which attracted more than 90 participants and 12 supplier sponsors from throughout North America, was held Aug. 10-11, 2006 in Calgary, Alberta.

The conference's keynote speaker, Daniel Y.C. Fung, Ph.D. of Kansas State University, discussed the last 25 years of developments in rapid microbiological methods and offered some predictions for the future. Conferees discussed the remarkable advances the North American meat industry has made over the years. "The methods we have today have never been better," said CMC Technical Services Director Parthi Muthukumarasamy. "Over the years it has evolved and now we are talking a matter of 10 to 15 minutes [to detect and identify pathogens] compared to days for culture tests so we are really fast and most of the methods are accurate."

Presentations covering food safety, laboratory methods for sampling and testing meat products, and the interpretation of collected data were all examined in detail on the first day of the conference. On the second day, Mansel Griffiths, Ph.D., the director of the Canadian Research Institute for Food Safety at the University of Guelph and senior industrial research chair in dairy microbiology, outlined Molecular Methods for Detection of Foodborne Pathogens. "Currently we use culture-based methods. That is, we rely on growth of the organism on media that selects for the specific pathogen that we are looking for. The problem with these methods is that they're slow because they require the organism to grow," he said in his presentation.

Rick Holley, Ph.D., a professor in the department of food science at the University of Manitoba, outlined how scientists are currently investigating the various causes of meat and meat product spoilage and methods of control. He noted that over the last 15 years, "we've seen shelf life extensions from 30 days with pork to 55 days, largely as a result of improvements in plant sanitation, temperature control as well as improvements in packaging materials and also packaging approaches using some of those materials."

Holley stated that while excellent technology exists for keeping meat fresh over a lengthy period of time, temperature is the key to success. "The best possible opportunity for attaining shelf life is keeping the temperature as low as possible without freezing the meat. What that means is using temperatures that are in the vicinity of about minus 1.5 C, plus or minus a half degree. That type of temperature control is expensive and requires equipment that's very precise so you don't freeze the meat. As soon as you freeze the meat you lose quality."

"This conference was an excellent avenue for the exchange of new ideas and different approaches, and benefited the entire North American meat industry," said Randall Huffman, Ph.D., vice president of scientific affairs for the AMI Foundation, who attended the event. ■

2006 MIRC Focused on Industry Research Needs

The annual Meat Industry Research Conference, co-sponsored by the American Meat Institute Foundation (AMIF) and the American Meat Science Association (AMSA), held Oct. 4-5 at the Westin Diplomat Resort & Spa in Hollywood, Fla. was driven by attendee contributions toward five year meat science research goals. Additional details are available online now at AMIF.org with a complete conference summary in the January 2006 *AMIF Newsletter*.

Wednesday, October 4, 2006

General Session:
Keynote Address

To welcome attendees and set the tone of the event, Associate Dean at the University of Florida's Institute of Food and Agricultural Sciences, Douglas Archer, Ph.D., discussed the challenges academia has the opportunity to solve.

Development of a Long Range Plan for
Meat Science Research – Setting the Stage

While several key government, academia and industry groups set research priorities for meat science, the discipline itself lacks a cohesive and coordinated long-term plan. Conference Chairman and Pennsylvania State University Professor, Edward Mills, Ph.D., initiated the day-long sessions to being the process of prioritizing meat science research needs for the next five years.

Research Priority A: Product Quality

University Distinguished Professor and Monfort Chair at Colorado State University, Gary Smith, Ph.D., lead the review of current research related to meat product quality. The session included a discussion of practical genetic tools to predict quality and biochemical events to time and temperature interactions during processing on muscle quality parameters.

Research Priority B: Food Safety

Dane Bernard, vice president of food safety and quality assurance at Keystone Foods led the discussion on the current state of food safety in the U.S. meat supply and how meat safety research has led to recent changes throughout the industry. Topics included emerging pathogens, production unit-specific microbial loads and ecology, pathogen intervention strategies and validation studies. Bernard also led the conversation on what tools the industry needs to meet the potential food safety challenges of the next five years.

Research Priority C: Processing and Packaging

Iowa State University Professor of Animal Science, Food Science and Human Nutrition Joseph Sebranek, Ph.D. led this session on the current state of technology in processing and packaging and how new and innovative methods are being developed to meet changing consumer needs.

Research Priority D: Consumer Needs

A discussion of how the meat science research agenda should be targeted based upon recent consumer research was led by Bucky Gwartney, director of research and technical services for the National Cattleman's Beef Association. The session also explored future trends in nutritional and quality traits that consumers value.

General Session: Research Priorities 2007 and Beyond

Facilitators and attendees participated in an exciting session to develop long-term research goals.

Thursday, October 5, 2006

Hot Topic: Low Oxygen CO Packaging Update

Randy Huffman, Ph.D., vice president of scientific affairs for the AMI Foundation and Janet Riley, senior vice president of public affairs and professional development for AMI discussed the benefits of modified atmosphere packaging for processors, retailers and consumers and the source of all the questions being raised by the press concerning the use of carbon monoxide in these systems.

Bacteriophage: Leveraging Nature To Treat Bacteria

Developing one of the first bactericides based on phage technology, Justin Reber, President & CEO of OmniLytics, Inc. demonstrated the potential impact for phage technology as an application for various food processing operations.

Fight for the Cure: Sodium Nitrite Status Report

New research continues to affirm nitrite's safety and benefits. Nevertheless, nitrite continues to face challenges. James Coughlin, Ph.D., president of Coughlin & Associates and Andrew Milkowski, Ph.D., adjunct professor at the University of Wisconsin – Madison presented information on the true state of science behind nitrites and the latest from the international scientific arena.

Cloning: Vision for the Future

Cloning holds promise as a means to maximize the potential of superior genetics within livestock herds. Mark Walton, president of ViaGen, discussed his perspective on cloning technology and the expected implications on relevant national and international policy issues.

USDA Perspective on Natural Claims

Unlike organic meat products, natural meats are not yet officially defined. Martin O'Connor, branch chief for the U.S. Department of Agriculture's Agricultural Marketing Service, discussed the latest concerning the definition and the possible implications for product labeling.

Hentges: 'Balanced Consumption Across All Food Groups' Key

(continued from page 1) five, are open to the public, including the press. All of the meetings are announced in the *Federal Register* and all of the proceedings are posted on government websites. The public has more than one opportunity to provide comments. We make every effort to make the development of the guidelines open and transparent.

Q: USDA recommends two to three servings of meat per person, per day. Can you expand on the role meat and poultry products play as a component of a healthy, balanced diet?

A: The new food patterns of the USDA Food Guide have dropped the term "servings" and now use measurements such as cups and ounces (or ounce equivalent). The basic food group of meat and beans includes meat, poultry, fish, eggs, dry beans and nuts. Traditionally we think of this food group as providing high quality protein to the diet, but additionally the group is a good source of iron, zinc, and B-vitamins. However, for good health and weight maintenance it is important to more often choose lean, low fat or skinless products from this food group.

Q: Frequently we hear the concept that meat is considered a "nutrition dense" food source. Do you agree with this assertion and if so, what factors are used to make this determination?

A: One of the key recommendations of the *Dietary Guidelines* is to "consume a variety of nutrient-dense foods and beverages within and among the basic food groups." The consumer brochure that accompanies the guidelines policy document advises, "Get the most nutrition out of your calories." The nutrient density concept is very important as we seek to reverse the current trends of overweight and obesity in America. Lean meat fits into this concept in that three ounces may average ten percent of your daily caloric needs, but provides more than ten percent of the daily requirement for protein, iron, zinc, B-12 and several other nutrients.

Q: What should people know about the 2005 ***Dietary Guidelines*** **and MyPyramid guidance? Has USDA attempted to measure the awareness and use of MyPyramid?**

A: The *Dietary Guidelines* are the science based federal nutrition recommendations and MyPyramid interprets these recommendations into actionable implementation for consumers. The original Food Guide Pyramid was released in 1992 and the new MyPyramid and its website, MyPyramid.gov, were released in April 2005. To date, we have had over 2 billion hits to our Web site, which is enormous. We were told that if we received 5 million hits on the day of the launch, it would be a red-letter day. MyPyramid received 50 million hits browning out the entire system. The response to the interactive education tools has been overwhelming. Now we have stabilized at about 25 million hits a week.

We have implemented an online customer satisfaction survey. Our overall satisfaction rating is 17 percent above the average for all government Web sites. When consumers were asked their reason for coming to the Web site, the number one reason was "change diet/eat healthier," followed by "find nutrition information" and "lose weight." Additionally we know that depending on the time of year 18-36 percent of the visitors are students, which is a very important audience in terms of education for long-term behavior changes.

Q: Can you offer some insight into the steps the meat industry has taken recently to improve both production efficiency and respond to consumers' health concerns about dietary fat. What is the significance of these changes for consumers?

A: Dietary fat and the type of fatty acids consumed was a growing health concern in the '70s. The most prominent of these issues was the consumption of saturated fat and cholesterol and the relation to heart disease. Both the producer and the process segments of the industry took this very seriously and set out to reduce the fat content of their products. Through practice in breeding, feeding and food technology, they were able to accomplish their fat reduction goal such that the USDA's nutrient composition databases were revised in the late 80's and early 90's for beef, pork, lamb and veal. These efforts have continued and more revision to these databases have been made in the past few years. The end result is that consumers are seeing much less fat in the meat case today and have more lean or low-fat choices in their meat products.

Q: There are occasionally reports in the media about epidemiological studies that try to link meat consumption with adverse health effects. Can you put those studies in perspective?

A: Epidemiological studies are useful for identifying potential trends between groups or among populations. They can also point to potential relationships between factors that were not previously observed. However, they do not determine cause and effect in the same way as human clinical trials. Due to the expense of randomized human clinical trials, few trials have been conducted examining meat consumption and health outcome and those trials have also been smaller in scale. However, these few trials generally have not detected adverse affects of meat consumed in appropriate portions as part of a balanced diet. The *Dietary Guidelines* again point to the importance of balanced consumption across the food groups, while making choices that limit the intake of saturated and trans-fat, added sugars, salt and alcohol.

Q: Food in the U.S. is both abundant and inexpensive, yet 74 percent of the U.S. population has a diet that USDA classifies as needing improvement. What is going wrong?

A: USDA has done a good job over the years of reaching its goal of a safe, abundant, and affordable food supply. The two biggest issues for us now are balancing our choices among all the food groups and doing so *(continued on page 9)*

Ongoing AMIF Research – E. coli O157:H7

Investigator	Institution	Project Title
John Scanga, J.N. Sofos, K.E. Belk, G.C. Smith	Colorado State University	Use of Warm (55°C) 2.5% or 5.0% Lactic Acid for: (A) Reducing Microbial Counts on Beef Subprimal Cuts and Beef Trimmings Following Fabrication, and (B) Reducing Incidence of *E. coli* O157:H7 in Combo-Bins of Beef Trimmings and Inside (in the interior) Beef Cuts Subjected to Blade/ Needle or Moisture-Enhancement Tenderization

Ongoing AMIF Research – Listeria monocytogenes

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

Ongoing AMIF Research – Targeted Research

Investigator	Institution	Project Title
Mindy Brashears, Mark Miller, Chance Brooks, John Blanton, and Christine Alvarado, Guy Loneragan	Texas Tech University, West Texas A&M University	Risk Factors and Consequences Associated With Condensation in Fresh and Ready-to-Eat Processing Facilities
Bradley Marks, Alicia Orta-Ramirez, Alden Booren, Elliot Ryser	Michigan State University	Determine the Likelihood that *Salmonella* Develops Heat Resistance during Thermal Processing of Commercial, Whole-Muscle, Ready-to-Eat Meat Products
Catherine Cutter, Ed Mills	Pennsylvania State University	Determination of the Efficacy of Chlorine Dioxide as an anti-Listerial Agent in RTE Brine Chilling Solutions
Charles Kaspar, Ellin Doyle, Ronald Weiss	University of Wisconsin-Madison	White Paper on Human Illness Caused by *E. coli* O157:H7 from Food and Non-Food Sources

To view status reports for these projects, visit www.amif.org.

Hentges: Importance of Physical Activity Cannot Be Forgotten

(continued from page 8) without exceeding our caloric needs. MyPyramid education messages and the interactive tools seek to correct this imbalanced food selection by providing more personalized food patterns and allowing individuals to monitor and track their behavior. It has been said that as a nation we are overfed and undernourished. The concept of nutrient density discussed above is again very important in achieving this balance within our caloric budget.

Q: How does USDA evaluate the full breadth of both negative and positive studies that are published addressing diet and health, and eventually reach a sound, science-based conclusion on a given issue?

A: As we all know, it seems that there is a new study or research report featured in the press every day. Many of these featured studies are not ready for prime time reporting and it is the body of work on a subject over time that is important rather than an individual study. Obviously, not all research is of equal quality or of equal strength for making nutrition policy. The advisory committee for the 2005 Dietary Guidelines used a systematic, evidence-based review for analysis of the scientific research much the same as the medical community has employed for years. Use of an evidence-based system further assures the public, the policy makers, and scientists that the quality of nutrition research is of the highest caliber.

Q: Do you have any final thoughts concerning the nutritional health of the U.S. population in relation to other countries?

A: There are great commonalities between the health of the U.S. population and other developed nations. This should be expected as our global economy and communication make our food supply and cultural behaviors more similar. I recently participated in a European Union/United States conference looking at action on diet, physical activity and health. The concept here is that we both are experiencing increases in overweight and obesity and that together we may identify common "good practices" that can reverse this trend. We have mainly discussed diet and nutrition above, but we should not forget the importance of physical activity in obtaining energy balance within our diets. New emphasis was placed on this issue in the 2005 Dietary Guidelines and it was a new concept addition to MyPyramid. ■

Calendar of Events

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

Advanced *Listeria* Intervention & Control Conference

When: Nov. 14 – 15, 2006
Where: Hyatt Regency Denver at Colorado Convention Center, Denver, Colo.
What: AMIF is pleased to present the new Advanced *Listeria* Intervention and Control Workshop. This highly rated educational opportunity is designed to help manufacturers of ready-to-eat (RTE) meat and meat products examine the issues surrounding testing and to provide experience in developing appropriate sanitation standards and procedures for processing RTE products. In addition to assuring optimal product safety, implementing best practices for RTE processing offers a key benefit: helping to assure compliance. Note: Registration is limited to 60 participants.

2007 Annual Meat Conference

When: Feb. 18 – 20, 2007
Where: Caribe Royale All-Suites Resort and Convention Center, Orlando, Fla.
What: The Annual Meat Conference is the premier educational event for retailers of meat and poultry products. Conference programming examines the hottest trends from ethnic marketing to flavor innovation, details pressing public policy issues in areas such as nutrition and labeling and offers training in key areas such as crisis management and media relations. Attendees also sample hundreds of meat and poultry products at the conference's most popular event: the Product Tasting Reception. A special Tech Fair Luncheon offers exhibits of new technologies of interest to retailers and processors. The conference also provides ample networking opportunities to gather new ideas – and new customers.
On the web: www.meatconference.com

Annual Animal Care and Handling Conference

When: Mar. 28 – 30, 2007
Where: Sheraton Overland Park, Overland Park, Kan.
What: Featuring the leading academic experts in the field, this conference provides a wealth of information on the latest trends and ideas for implementing change and improvement to animal care at the plant level.

Worker Safety, Health and Human Resources Conference

When: Apr. 3 – 4, 2007
Where: Hyatt Regency Denver at Colorado Convention Center, Denver, Colo.
What: Leading experts provide attendees to this conference authoritative and practical instruction for improving working conditions and employee relations. The conference also features the AMI/National Safety Council Worker Safety Awards Program.

AMIF Request For Proposals Closed

The AMI Foundation's 2006 Request For Proposals closed on July 28, 2006. The pre-proposals are currently under review by the AMIF Research Advisory Committee. Funding recommendations will be made to the AMI Executive Committee at their January 2007 meeting. For additional information about the process, visit amif.org or contact Susan Backus at sbackus@meatami.com.

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