

AMI Foundation News

A quarterly update on research, education and information

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BOARD

Rich Armstrong
Sara Lee Food & Beverage

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Meat, Milk Products from Cloned Animals and Offspring Are Safe, FDA Draft Assessment Says

Meat and milk products from cloned animals and their offspring are safe, according to a draft risk assessment released Dec. 28, 2006, by the Food and Drug Administration (FDA).

After reviewing hundreds of studies, the agency said that meat and milk from cloned animals are "virtually indistinguishable" from conventional livestock, removing any health-related reason to halt the introduction of such products into the marketplace. A final decision about labeling those products is still under review.

"Clones can be thought of as identical twins born at a different time," said Dr. Stephen Sundlof, director of the FDA's Center for Veterinary Medicine.

A 90-day public comment period began Jan. 3, 2007, initiating the FDA's "interaction with the public" on this matter. During the comment period, and the subsequent review time while the agency analyzes feedback, the FDA will keep a voluntary moratorium on the sale of meat and milk from cloned animals in place.

"We agree with the report's conclusion that meat and milk from cloned animals are the same as those from conventional animals," said AMI Foundation President James H. Hodges, in response to the report. "In our view, cloning is part of the evolution of breeding practices and technology that has significant potential to

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Industry-Specific OSHA Training Course Highlight of 2007 Worker Safety Conference

An all-new Occupational Safety and Health Administration (OSHA) General Industry (10-hour) Standards Seminar designed to apply specifically to the meat and poultry industry will debut as part of the 2007 Conference on Worker Safety, Health & Human Resources, April 2-4, 2007, at the Hyatt Regency Denver at Colorado Convention Center.

Experts from across the industry and academia developed the course, which is the first OSHA General Industry training course to address specific meat and poultry industry exposure and standards. John Wallace, professor at the University of North Carolina at Chapel Hill, will present the course.

The conference will open with a session led by Bill Robbins. Robbins' Hooked On Safety presentation is a unique, behavioral-based, fast-paced, highly motivational, safety presentation that changes the attitudes of all who attend. Believing that "changed attitudes produce safety," Robbins blends humor, audience participation and the story of his own accident to produce a

positive and immediate outcome.

A special general session will feature Assistant Secretary of Labor Edwin G. Foulke, Jr. In his talk, Foulke will detail the agency's plans for new initiatives in workplace safety and will offer his thoughts on the importance of industry-government partnerships.

Two popular sessions have been greatly expanded to provide more depth for attendees. A two-part Workplace Violence Workshop will analyze root causes and provide tools that individual plants can implement to prevent possible incidents. A longer session on Immigration and Employee Eligibility will discuss a systematic approach to scrutinizing new job applicants for verification purposes.

Other sessions for this year's conference include the Basic Pilot program, fall protection, ergonomics, public relations for the meat industry, succession planning and managing

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Science Soundbites: A Review of Recent Research

***E. coli* Numbers Not Affected by Production Method**

The prevalence and concentration of *Escherichia coli* O157 in feces of cattle were not affected by the production systems used, an Australian study found. Researchers collected fecal samples from grass-fed (pasture) and lot-fed (feedlot) cattle at slaughter. A total of 310 samples, 155 from each group, were tested for the presence of *E. coli* O157. The bacteria was found in 13 percent of feces with, “no significant difference between grass-fed and lot-fed cattle.” Results from the study on prevalence of *E. coli* can be used to formulate intervention strategies and in quantitative risk assessments.

Journal of Applied Microbiology 97 (2), 362-370.

RNA Interference Possible Approach to Treating Prion Diseases

In a study published last month, German researchers have developed what could be a treatment for prion diseases, including bovine spongiform encephalopathy (BSE) and Creutzfeldt - Jakob Disease (CJD). Researchers silenced the prion protein gene (Prnp) in primary neuronal cells in mice through RNA interference (RNAi), resulting in an efficient and stable suppression of PrP^{Sc} accumulation, currently believed to cause prion diseases. After intracranial injection, the reformed RNA reduced the expression of cellular prion proteins in transgenic mice carrying multiple copies of Prnp. To test the potential therapeutic applications, researchers generated chimeric mice derived from lentivector-transduced embryonic stem cells. In highly chimeric mice, survival after scrapie infection was significantly extended. Data from the study suggest that lentivector-mediated RNAi could be an approach for the treatment of prion disease; however, an accompanying commentary states that, “much more research is needed before RNAi can be harnessed to treat” neurodegenerative disorders.

J. Clin. Invest. 116:3204-3210 (2006).

doi:10.1172/JCI29236.

Prevalence of *E. coli* in Feedlot Relative to Prevalence in Cooler

A study to determine the effect of *Escherichia coli* O157 prevalence in fecal pats collected from feedlot pen floors on subsequent *E. coli* O157 prevalence on carcasses at various points in the slaughter process was recently completed by researchers with Colorado State University and the Agricultural Marketing Service. Fecal pats from the feedlot pen floor were collected within three days before slaughter and during cattle processing at the slaughter facility from the hide, colon and carcasses before and after evisceration and after final decontamination. Of 15 lots sampled, 87 percent had at least one positive fecal pat from the feedlot floor, 47 percent had a positive hide sample, 73 percent had a positive colon/fecal sample and 47 percent had a positive carcass sample preevisceration. Only 8 percent of lots had a positive carcass sample post-evisceration or after final intervention. Pens with higher prevalence levels were also found to have higher prevalence levels at preevisceration, post-evisceration and after final intervention while pens with lower prevalence levels were found to have lower pathogen prevalence at the same stages. Data from this study can be used as part of risk assessment processes in order to identify mitigation strategies to minimize *E. coli* O157 prevalence on fresh beef carcasses.

Journal of Food Protection, Vol 69, No. 12, 2006, Pages 2824-2827.

Standard *Lm* Strain Collection Made Available

Researchers with Cornell University and the International Life Sciences Institute North America have developed a standard *Listeria monocytogenes* strain collection that has not been previously available. The strain collection includes a diversity set of 25 isolates chosen to represent a genetically diverse set of *L. monocytogenes* isolates as well as a

single hemolytic *Listeria innocua* strain and an outbreak set, which includes 21 human and food isolates from nine major human listeriosis outbreaks that occurred between 1981 and 2002. The diversity set also represents all three genetic *L. monocytogenes* lineages and nine different serotypes. Subtype and source data for all isolates in this strain collection are available online and are linked to the PathogenTracker database, which allows for the addition of new information. The researchers believe that a core strain collection, like those previously developed for other foodborne pathogens, will provide a resource for *L. monocytogenes* research and development efforts with centralized Internet-based data curation and integration.

Journal of Food Protection, Vol. 69, No. 12, 2006, Pages 2929-2938.

Seasonal Prevalence of *E. coli* O157:H7 in Cattle Studied

Kansas State University researchers have completed a study to assess the prevalence of *E. coli* O157:H7 in feces of feedlot cattle by month of the year and found that prevalence of *E. coli* O157:H7 in beef cattle feces is not necessarily season dependent. Of 891 fecal samples collected, 9.2 percent were positive for *E. coli* O157:H7. No significant difference in prevalence was detected among summer, fall and winter months. The highest monthly prevalence (18.1 percent) was detected in February. The study also aimed to characterize *E. coli* O157:H7 by screening for virulence factors. All tested isolates were positive for Shiga-toxin 2 and intimin genes. Fourteen isolates also carried Shiga-toxin 1.

Journal of Food Protection, Vol. 69, No. 12, 2006, Pages 3018-3020.

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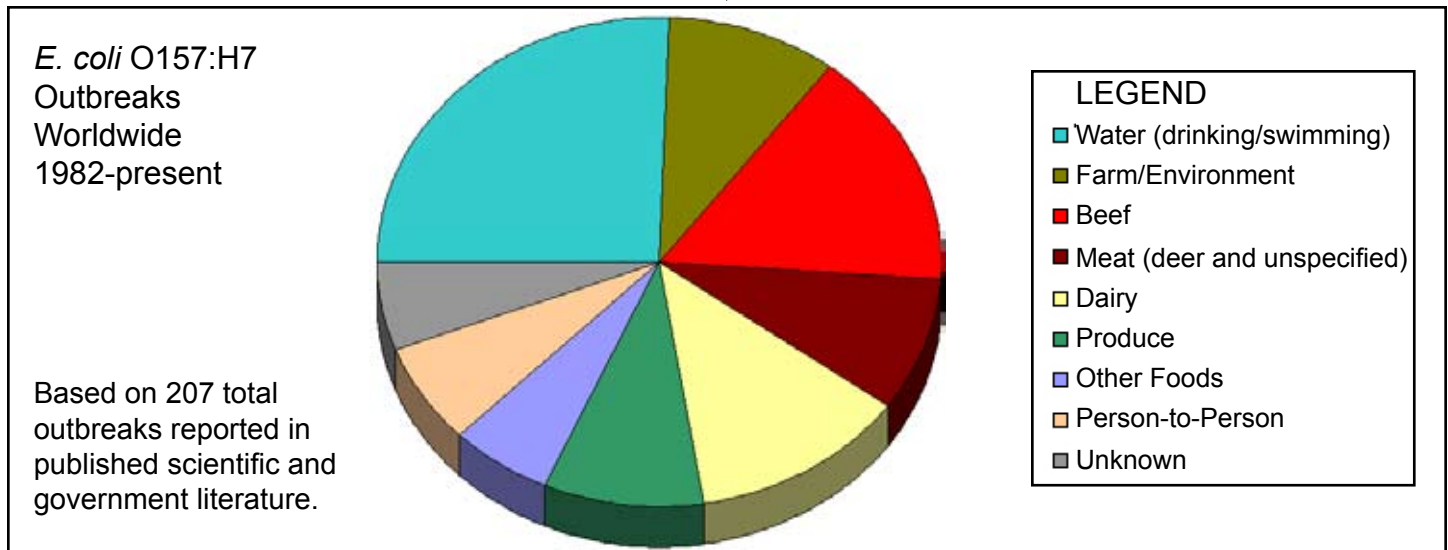
E. coli White Paper Updated Following Recent Outbreak

The AMI Foundation-sponsored “White Paper on Human Illness Caused by *E. coli* O157:H7 from Food and Non-Food Sources” released in August 2006 was reissued recently following a large multistate outbreak of *E. coli* O157:H7 associated with packaged fresh spinach.

The paper, compiled by researchers at the Food Research Institute at the University of Wisconsin-Madison and the Wisconsin Division of Public Health’s Bureau of Communicable Diseases and Preparedness, Communicable Disease

Epidemiological Section, outlines all human illnesses caused by the pathogen from 1982 to the October 2006 that were reported in published scientific and government literature.

In addition to the updated information, the report now includes three charts illustrating the root causes of all outbreaks of *E. coli* O157:H7 worldwide from 1982 to the present. To read the entire report online, visit AMIF.org and navigate to “Research.” ■



Meat Industry Research Conference Priorities Out for Review

Seeing the need for a unified voice in communicating current research needs and relative priorities in meat science, the American Meat Science Association (AMSA) and the American Meat Institute Foundation (AMIF) conducted a research priority symposium as part of the 2006 Meat Industry Research Conference.

During the conference, held October 4-5 at the Westin Diplomat Resort & Spa in Hollywood, Fla., sixty-five scientists from academia, industry and government heard presentations from key thought leaders in four broad research areas:

1. Product Quality
2. Food Safety
3. Processing, Packaging and Ingredients
4. Consumer Needs

Conference participants then worked in break-out groups for each research area. For each area, they brainstormed current research needs, assigned a relative priority score and identified the most urgent needs.

Reports from each breakout group were presented at the conference and are summarized in a coming report being published by AMSA.

Presentations on low oxygen CO packaging, bacteriophages, cloning, natural claims and sodium nitrite rounded out the two-day program. ■

Ohio State Annual Thermal Processing Short Course Scheduled

The 8th Annual Ohio State University Thermal Processing of Ready-to-Eat Meat Products Short Course will be held March 13-15, 2007 at the University Plaza Hotel in Columbus, Ohio.

The course provides the latest regulatory and technical information regarding all aspects of cooking, chilling and post-

packaging pasteurization of ready-to-eat meat products, with presentations made by meat industry experts.

For additional information, including online registration, go to <http://www.ag.ohio-state.edu/~meatsci/thermal.htm>.

Cloned Animals: Despite Science Consumer Concern Remains

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improve the quality of food products derived from animals.”

However, there still remains considerable consumer opposition to the technology. A September 2006 poll by the Pew Initiative on Food and Biotechnology found that 64 percent of people polled said they were uncomfortable with food from cloned animals. As such, the Foundation urged caution with the introduction of such products to consumers.

“As confident as we are in the science of cloning, we also recognize that consumers may have concerns with the notion of

consuming meat and milk from cloned animals. We value our customers’ confidence and we take their concerns seriously,” Hodges said.

“We believe that FDA should be cautious about allowing meat and milk from cloned animals to be introduced into the marketplace if most consumers are unwilling to accept the technology. We urge the government not simply to affirm its safety in the policy arena, but to assist consumers in understanding what cloning is, and what it is not, so that overall consumer confidence in the food supply is maintained.” ■

Biotech Feed, Manure Subjects of Recent CAST Papers

Meat, milk and eggs produced by animals fed biotechnology-derived crops are as wholesome, safe and nutritious as similar products produced by animals fed conventional crops, is the conclusion of a new paper released in mid-September by the Council for Agricultural Science and Technology (CAST).

Bill Price, Ph.D., of the Food and Drug Administration’s Center for Veterinary Medicine, authored the paper, entitled “Safety of Meat, Milk, and Eggs from Animals Fed Crops Derived from Modern Biotechnology.” It provides an overview of regulatory assessments for biotechnology-derived crops modified for agronomic input traits, and addresses food safety concerns.

In the paper, Price notes that “the regulatory processes in place to assess the safety of biotechnology-derived crops have been effective in safe-guarding public health,” adding that, “to date, there has been no authenticated case of an adverse health-related incident” associated with the consumption of food or feed from modern biotechnology.

CAST also released a paper on biotechnology and manure

management. The paper, “Biotechnological Approaches to Manure Nutrient Management,” written by Dr. Cecil Forsberg of the University of Guelph assesses the environmental impacts of biotechnology-derived crops on the management of animal manure. The paper notes that “targeted modifications can be based strategically on plants, animal, ruminal and intestinal microorganisms and diets.” Plant-based approaches “include genetic and chemical modifications of feeds.” Animal-based approaches “feature genetically engineering or modifying key enzymes and pathways in tissues for enhancing nutrient digestion and use.”

The papers were released to the public during a one-hour informational program held on Sept. 13, 2006, in Washington, D.C. They are part of an ongoing series of issue briefs on a variety of issues facing agriculture. CAST is a non-profit organization that assembles, interprets and communicates science-based information.

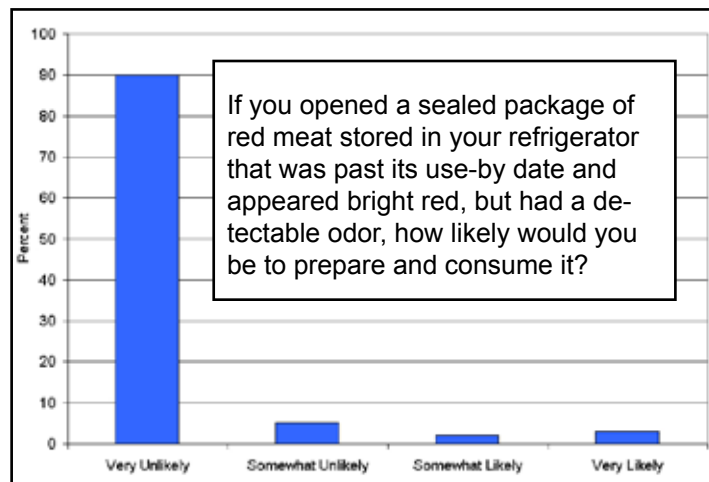
To review copies of these papers, visit <http://www.cast-science.org>. All current and future papers are listed. ■

AMI Poll Finds Consumers Unlikely To Purchase Bulging Meat Packages, Prepare Meat with Odor

Nearly 90 percent of the public indicated that they were unlikely to buy meat in which the packaging appeared excessively bulging, even if it appeared bright red, a recent consumer poll found. In addition, 90 percent of those polled indicated that they are very unlikely to prepare and consume meat that is past its use-by date and has a detectable odor, even if the meat is bright red.

The survey data contradict a primary concern raised by opponents of low oxygen modified atmosphere packaging (MAP) using minute levels of carbon monoxide (CO), who claim that consumers will purchase and consume product that has spoiled or is beyond its use-by date, or both.

The poll was conducted by Opinion Dynamics in late 2006 of 1,000 primary shoppers in random households across the country. ■



Translating Values Into Action Leads Animal Handling Conference Popular Pig, Cattle and Management Tracks Return

Tom Hayes, president of Cargill Meat Solutions, will offer his perspective on translating corporate value into sustained action in his keynote address at the 2007 Animal Care and Handling Conference, March 29-30, 2007 at the Sheraton Overland Park in Overland Park, Kan.

Hayes and his company have been leaders in animal welfare within the meat industry, which has led to improvements in all areas of their operations, from employee morale to community relations. Hayes will discuss how this has worked in areas of animal care and handling, specifically with the implementation of a respectful and appropriate animal welfare program. Hayes currently serves as a commissioner of the National Commission on Industrial Farm Animal Production.

The conference will again feature three distinct tracks – Applied Pig Handling, Applied Cattle Handling and the Management and Policy Track – to provide in-depth instruction on specific topics.

Attendees going through the Pig Handling track will attend sessions on electric and CO₂ stunning and pig handling, handling challenges with sows and non-ambulatory pigs and the connection between proper handling techniques and quality.

Sessions in the Cattle Handling Track will discuss the connection between proper handling techniques and quality, a case study on religious slaughter and cattle stunning, handling challenges within the cattle population and basic cattle handling and behavior principles.

The Management and Policy Track will include sessions on response to enforcement actions, welfare for the natural and organic sector with Andrew Gunther, animal compassion product development and sourcing specialist with Whole Foods Market, Inc., animal welfare in Latin America, the current status of international welfare guidelines and an update on audits and the Professional Animal Auditor Certification Organization (PAACO).

The 2007 Conference will also feature a panel discussion on livestock transportation. Dr. John Deen, an expert from the University of Minnesota and Dr. Jennifer Woods of Reflected J Livestock/J Woods Livestock Services will discuss specific challenges and methods for improving the ride for cargo that is constantly moving.

Registration can be completed online or by submitting a registration form. Early Bird Registration – prior to Jan. 31, 2007 – is \$325 per person (\$295 for three or more registrations from the same company). After Jan. 31, attendees pay the regular conference rate of \$425 per person (\$395 for three or more registrations from the same company). Non-AMI members pay the full conference rate of \$450 per person.

The conference will be held at the Sheraton Overland Park, in Overland Park, Kan., just outside of Kansas City, Mo. For the special conference rate of \$139 for a single or double room, contact the hotel directly at 913/234-2100 prior to March 7, 2007. For complete details and a full conference agenda, go to MeatAMI.com and navigate to the Events/Education section. ■

After 235,000 Samples, No High Path H5N1 Avian Flu Found in U.S.

None of the 90,000 samples taken from wild birds, nor the 145,000 samples taken from live bird markets in the U.S., tested positive for the high pathogenic (HPAI) H5N1 avian influenza virus. The wild bird testing consisted of 60,000 cloacal samples and 30,000 fecal samples. They were taken from birds in all major U.S. migratory bird flyaway zones.

The wild and live market bird surveillance plan is one of several firewalls in place to detect, isolate and eradicate HPAI should it enter the U.S. “Surveillance is conducted in four key areas, live bird markets, commercial markets, backyard flocks and migratory bird populations,” according to Karen Eggert, with the Animal and Plant Health Inspection Service.

There are two types of avian influenza that are identified as H5N1. The difference exists in the virus classification – with one type being low pathogenic (LPAI) and the other type being high pathogenic. Pathogenicity refers to the ability of the virus to produce disease.

HPAI H5N1, often referred to as the “Asian” H5N1, is the

type causing worldwide concern. HPAI H5N1, which is often fatal to poultry and spreads rapidly, has not been detected in the United States. However, other strains of HPAI have been detected and eradicated three times in the United States: in 1924, 1983 and 2004. No significant human illness resulted from these outbreaks.

In 1924, HPAI was contained and eradicated in East Coast live bird markets. In 1983, the outbreak resulted in the euthanization of 17 million domestic fowl in Pennsylvania and Virginia, and the disease was eradicated. In 2004, the disease was identified and quickly eradicated in Texas.

LPAI H5N1, often referred to as the “North American” H5N1, is of less concern, and commonly occurs in wild birds. LPAI causes minor sickness and no noticeable signs of disease, and is rarely fatal in birds. LPAI strains are not of concern to humans, and have been detected in North America since 1975. In 2006, USDA confirmed 6 cases of LPAI in the U.S. as part of their surveillance program. ■

Meat Products Important to a Complete Diet, Concludes Review

“Meat and meat products can make an important contribution to nutrient intakes in the diet,” notes the British Nutrition Foundation’s (BNF) Review “Red Meat in the Diet.” The paper, published in the BNF Nutritional Bulletin, provides an overview of existing scientific literature on the role of red meat in the diet. Specifically, it examines the nutritional benefits of red meat consumption, dietary and lifestyle factors associated with meat consumption and the effect of red meat consumption on overall health and its association with chronic diseases.

On the role of red meat in the diet, the authors noted that many essential nutrients are “more bioavailable in meat than alternative food sources.” These include protein, long-chain n-3 fatty acids, iron, zinc, selenium, vitamin D and vitamin B12. In fact, the report states that lean meat contributes about 20 percent of the bioavailable iron in the diet of persons in developed countries.

In their review of literature comparing meat-eaters to vegetarians, and the growing global problem of obesity, they found that while vegetarians had a lower Body Mass Index (BMI) than meat-eaters, the “association cannot be attributed to meat intake per se.” They explain that obesity is a complex disorder with a diverse range of causal factors and therefore identifying one dietary factor as the sole cause “would be a gross oversimplification of a complex problem.” Actually, to the contrary, they point out evidence from short-term studies that “suggest that higher-protein diets lead to increased satiety and reduced subsequent energy intake and may therefore help

enhance weight loss, compared with lower protein diets, in the short term.”

They also examined the prevalence of type 2 diabetes, which is affecting 120 million people worldwide, and its link to obesity. They note that there are a number of risk factors to the illness, with the most important being genetic predisposition, obesity and the level of physical activity. Researchers found “no evidence” suggesting that moderate amounts of lean red meat cannot be recommended as part of a balanced diet for people suffering from type 2 diabetes. “In fact, single-meal intervention studies suggest that an energy restricted, high-protein, low-fat diet (that includes lean red meat) may actually help improve overall glucose control in type 2 diabetes.”

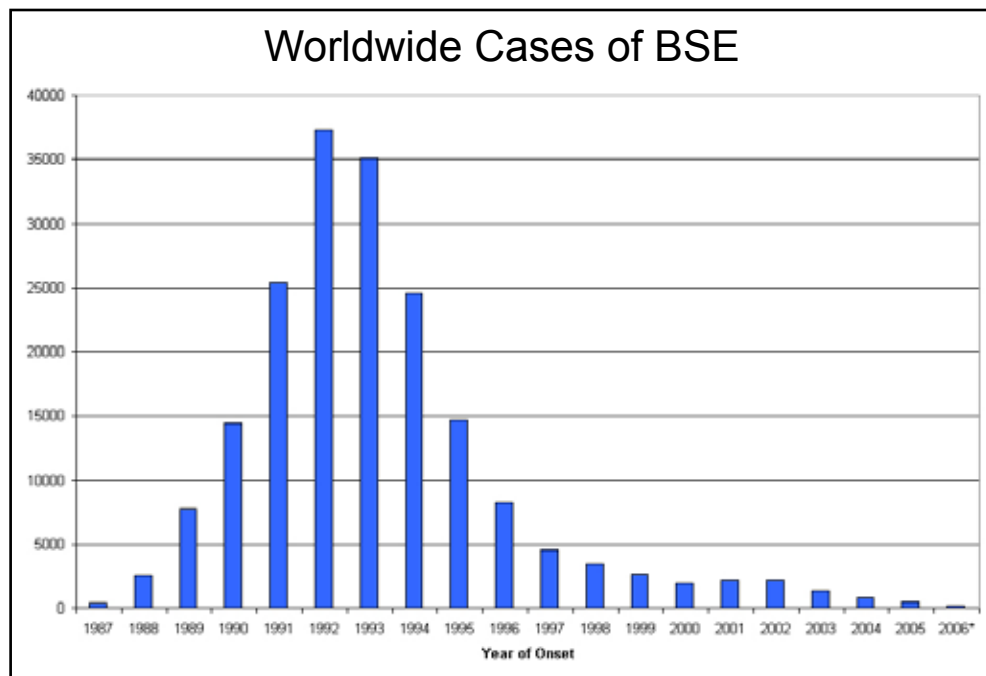
The British Nutrition Foundation is an independent, scientific organization dedicated to promoting “the nutritional wellbeing of society through the impartial interpretation and effective dissemination of scientifically based nutritional knowledge and advice. It works in partnership with academic and research institutes, the food industry, educators and government.” Many distinguished academics comprise the Foundation’s various scientific committees, and advise on the scientific quality of its work.

The BNF review was published in Nutrition Bulletin, December 2005, Volume 30, Issue 4, Pages 323 – 335. For more information, contact the lead author, Claire S. Williamson (c.williamson@nutrition.org.uk). ■

Worldwide Cases of BSE Continue Steady Decline

Worldwide cases of Bovine Spongiform Encephalopathy (BSE) have declined by more than 99 percent, with only 206 cases being reported in 2006. In the U.S., which is a low-risk country for BSE, the Animal and Plant Health Inspection Service (APHIS) has sampled 787,711 high-risk cattle since June 1, 2004, and to date, only three cases have been discovered.

BSE, an animal disease that causes cattle to appear anxious, lose physical coordination and ultimately die, was first discovered in the United Kingdom in 1986. By the time scientists discovered that the disease was being spread through animal feed, a global epidemic had started. In 1992 – the peak of the BSE outbreak – 37,316 cases of the disease were identified worldwide, with the vast majority of those cases from the UK. ■



Source: Office International des Epizooties
* OIE information as of November 14, 2006

Second AMIF *Listeria* Workshop Scheduled for Spring 2007

The AMI Foundation will hold a second Advanced *Listeria* Intervention and Control Workshop in April following the highly successful, and highly rated, event held in November in Denver, Colo.

Attended by nearly 100 representatives from the industry and academia, the November conference covered both basic control methods and advanced intervention techniques. The concurrent sessions provided in-depth information to specific audiences. The “Back to the Basics” track covered sanitary equipment and facility design and sanitation best practices, while the Advanced Intervention Techniques track featured presentations from expert researchers. Representatives from Colorado State University, University of Nebraska – Lincoln, Kansas State University, Cornell University and Ohio State University discussed their research and potential applications to commercial production facilities.

Two breakout sessions – one covering verification and validation techniques and the second discussing best practices – were especially well received. Both sessions provided an opportunity for attendees to discuss their experiences with a variety of techniques to learn from one another and practice critical thinking skills.

Loren Lange, the deputy assistant administrator with the U.S. Department of Agriculture’s Food Safety and Inspection Service, provided an update on the *Listeria* Rule and its implementation.

The second workshop, to be held later this spring, will follow the same schedule as the first and will again feature industry experts such as John Butts, Ph.D., vice president of research with Land O’Frost Inc. and Bob Reinhard, director of food safety at Sara Lee Food and Beverage. Butts will lead discussions on equipment and facility design and corrective actions, while Reinhard will give his presentation on successfully completing a Routine *Lm* and Food Safety Assessment. Other experts presenting valuable information include Joe Meyer, Kraft Foods Global, Inc.; Rory Redemann, Kraft Foods North America; Dale Fredell, Ecolab, Inc.; Gene Bartholomew, John Morrell & Company; Tim Freier, Ph.D., Cargill, Inc.; and, John Weisgerber, Weisgerber Consulting, LLC.

Once location and dates are finalized, registration for the upcoming conference will be available online. AMI members receive the special conference rate of \$595. Three or more registrations from the same member company receive a discounted rate of \$495. All other attendees pay the full conference rate of \$695. Please note, registration is limited to 60 attendees. ■

AMI Tells FSIS That Risk-Based Inspection Important to Increasing Food Safety

Shifting to a risk-based inspection system (RBI) will help improve food safety by targeting inspection resources at critical junctures during meat and poultry processing, according to the American Meat Institute (AMI) and the Food Products Association (FPA). The two groups submitted joint comments to the USDA on Oct. 27, 2006, in response to a call for comments following a recent USDA-sponsored public meeting.

The comments were submitted as part of an ongoing industry effort to push for an open, collaborative process to bring consumer groups, industry, academia and federal and state authorities together to identify and prioritize the key issues associated with achieving certain objectives for food safety that support the goals of Healthy People 2010.

The concept of a RBI system, which has been discussed for decades, is being developed by USDA’s Food Safety and Inspection Service’s (FSIS) and would subject establishments manufacturing products with the highest likelihood of causing human illness, particularly in establishments with lesser risk control, to a more intense application of inspection resources.

The comments point out that discussions about RBI – and specifically the relative risk posed by any plant or company – need to take place under the common assumption that all plants monitored by FSIS and bearing the mark of inspection are producing wholesome product.

In addition, the two associations suggested that FSIS consider long-term plans to apply RBI over the broader food supply chain continuum from farm to table. Currently, the proposal is focused on risk-based application of resources in meat and poultry processing establishments. AMI and FPA also encouraged FSIS to use indisputable objective measures in any RBI system to avoid subjective disagreements and provide for the most orderly categorization of establishments for resource allocation purposes as well as that the agency ensure that RBI does not adversely affect international trade or the concept of equivalency with trading partners.

AMI has long noted that one of the greatest challenges associated with RBI is defining the criteria used to assess and measure risks associated with FSIS-inspected establishments. The key criteria to be considered in making decisions about risk-based allocation of inspection resources should include the following primary considerations:

- Compliance history of the establishment,
- Nature of the product,
- Nature and reliability of the food safety controls,
- Production volume when considered in conjunction with the other factors,
- Seasonal and regional factors,
- Complexity of operations; and,
- Competence of operations’ staff. ■

Neither Conventional Nor Organic Foods Superior to One Another, IFT Study Concludes

It is premature to conclude when comparing organic to conventional foods that either food system is superior to the other, according to the Institute of Food Technologists' (IFT) latest Scientific Status Summary, "Organic Foods." The study comes on the heels of significant growth in sales of organic foods, which has been led largely by perceptions of greater health benefits.

According to data from the Organic Trade Association, organic foods constitute more than two percent of all food in the United States and organic sales are estimated to have increased nearly 20 percent annually since 1990, reaching \$13.8 billion in 2005. The IFT study, completed by Carl K. Winter and Sarah F. Davis and published in the November/December 2006 issue of *Journal of Food Science*, found that in each category studied, data does not currently exist to ascertain which production system is better – refuting beliefs of consumers driving market growth.

Pesticide Residues

Findings of the study suggest that pesticide residues are found at a lower frequency on organic foods. However, the authors recommend considering the risks presently posed by pesticide residues in foods before determining health benefits from organic foods. Estimated exposures to pesticides from food is less than one percent of the United Nations Food and Agriculture Organization and World Health Organization's Acceptable Daily Intake (ADI) value for 34 of 38 pesticides. The remaining four pesticides all ranged between 1 and 4.8 percent.

Nutrients and Toxins

Of those polled, 67 percent stated health and nutritional benefits as one of the main reasons they purchase organic products. According to the review, most comprehensive studies

comparing nutrient levels in organic and conventional foods have been inconclusive, yielding mixed results – with the exception of nitrate levels, which are typically lower in organic foods. Two major hypotheses exist to explain increases in polyphenols – a group of compounds with potential human health benefit – in organically produced foods, but neither have been proven.

In addition, the report states that while organic fruits and vegetables may have lower synthetic pesticide residues, the plants may be stimulated to produce naturally occurring toxins when the plant is subjected to increased pressure from pests, weeds and diseases. These naturally occurring toxins could have negative health implications.

Microbiological Risks

Because of the use of animal manure as fertilizer for both conventional and organic agriculture, the potential microbiological risks are present with all products – with organic agriculture more likely to use animal manure because of the prohibition of synthetic fertilizers. The most comprehensive study of microbiological safety of organic and conventional produce did not demonstrate that conventional produce is at a higher microbiological risk than certified organic produce.

The paper concludes that while studies have demonstrated qualitative differences between organic and conventional foods, data does not exist to determine if the differences in levels of pesticide residues, naturally occurring toxins, nitrites and polyphenolic compounds are of biological significance. The study does not conclude that data support the common perception that organic foods are safer than those produced using conventional farming methods. ■

Worker Safety Conference: Canadian Plants Eligible to Participate in Annual Awards Program for First Time

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generations, safety measures and incentive programs, compliance with OSHA's new hexavalent chromium rule, containing costs for benefit and wellness programs, internal audits and a closing session from Neil Wasser, Attorney and Chairman, Costangy, Brooks, Smith, LLC. Wasser will provide a review of OSHA in 2006 and give his expectations for the agency in the coming year.

The conference will close with the annual Worker Safety Recognition Awards Ceremony. The program recognizes plants that have achieved a high level of safety performance as part of a continuing effort to reduce occupational injury and illness.

This year, for the first time, Canadian packing and processing plants will be eligible to participate. Details regarding the 2007 program have been distributed to individual plants. Plants looking to participate for the first time can contact the AMI Education and

Professional Development department at 202/587-4200.

Registration for the conference can be completed online or by submitting a registration form. Early Bird Registration – prior to March 8, 2007 – is \$625 per person (\$565 for three or more registrations from the same company). After March 8, attendees pay the regular conference rate of \$675 per person (\$615 for three or more registrations from the same company). Non-AMI members pay the full conference rate of \$865 per person.

The Hyatt Regency Denver at Colorado Convention Center is the premier hotel choice in downtown Denver. For the special conference rate of \$164 for a single or double room, contact the hotel directly at 303/436-1234 prior to March 8, 2007.

For complete details and a full conference agenda, go to MeatAMI.com and navigate to the Events/Education section. ■

Media Coverage of Recent Study Misleading; *Dietary Guidelines*, Not Miscellaneous Studies Should Guide Habits

Media coverage of a recent study alleging a link between red meat and breast cancer illustrates the problems with treating epidemiological studies as if they establish cause and effect according to the AMI Foundation and other experts. The study, “Red Meat Intake and Risk of Breast Cancer Among Premenopausal Women,” was completed by researchers at the Harvard Medical School and was published in the Nov. 13, 2006 issue of the *Archives of Internal Medicine*.

Epidemiology is the branch of medicine that deals with the study of causes, distribution and control of disease in populations. Epidemiological studies begin with an inference related to cause and effect. Epidemiologists analyze previously gathered data and test the connections and relationships of a broad range of biomedical and psychosocial theories to generate or expand their theory, test a hypothesis and finally to make educated and informed assertions concerning how one thing may relate to another. A common, and simplistic, misunderstanding about epidemiological studies is that one cause equals one effect. Most outcomes, epidemiologists suggest, are caused by a chain or web consisting of many component causes.

“The media coverage of this study is a fairly typical example of the abuse of epidemiological studies by the press to make assertions that have not been proven scientifically,” said Randy Huffman, Ph.D., vice president of scientific affairs for the AMI Foundation. In comments released to the national media about the Harvard study, Huffman pointed out “the authors themselves reference that a much larger recent analysis of eight combined studies that recently found no association between red meat and breast cancer. In other words, this study represents a departure from the body of recent epidemiological research on the causes of breast cancer.”

Researchers for this study used data collected from questionnaires submitted three times over the course of 12 years from nearly 100,000 women aged 26 to 46. By the end of the study period, 1,021 cases of invasive breast cancer, the more serious variety, had been documented.

This type of data collection that relies on participant memory is a drawback of epidemiological studies. “Drawing inferences from what people think they remember that they ate years ago is one of the limitations of studies of this nature,” said Huffman.

While no statistically significant correlation between the consumption of red meat and breast cancer was found, an apparent statistical correlation between red meat intake and “hormone receptor-positive” breast tumors – tumors in which estrogen and progesterone are thought to play a key role – was observed. Researchers reported that study subjects who consumed nearly 11 or more servings per week of red meat had twice the rate of hormone receptor-positive breast cancer as study subjects

who consume three or fewer servings of red meat per week.

Steve Milloy, a biostatistician and columnist for FOX News, noted in his online column that these findings are probably not meaningful for a variety of reasons typically associated with epidemiological studies of human populations. Problems with this specific study include:

- A small study size – only 52 cases of breast cancer were among the group of women with the highest intake of red meat;
- Poor quality data – there is no certainty how much red meat was consumed by each woman due to the questionnaire format every four years;
- Weak statistical associations; and,
- A lack of biological plausibility – the study does not provide data that proves causation.

Milloy also observed inconsistency within the study. For example, eating one to three hamburgers was associated with an increased risk for hormone receptor-positive tumors, but eating more than three beef sandwiches was not. Moreover, while bacon

and hot dogs were not associated with risk for hormone receptor-positive tumors, other processed meats, such as bologna, which differs from the hot dog only in the diameter of the casing, were. Milloy represents one of many in the scientific community who have doubts about this study, as well as many others that base correlations between dietary habits and specific diseases or illnesses.

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“Instead of relying on the wide variety of studies released each year, including many that contradict one another, consumers should base

their dietary habits on the *Dietary Guidelines for Americans*,” noted Huffman. The *Guidelines* are published every five years by the Departments of Health and Human Services and Agriculture and provide advice to people on how good dietary habits can promote health and reduce risk for major chronic diseases. They are the most comprehensive review of nutrition, exercise and health and are widely accepted by physicians, nutritionists and academia.

To support the *Guidelines* and explain their incorporation into daily life, the USDA has created the helpful MyPyramid. For additional information, visit <http://www.MyPyramid.gov>. ■

Much Unknown About Antibiotic Resistance, Study Finds

Many questions remain regarding the possible threat of antibiotic resistant bacteria, a recent comprehensive review of scientific studies found. The study, “Antimicrobial Resistance: Implications for the Food System,” was completed by researchers with the Institute for Food Technologists (IFT) and looked at what must be done to determine any adverse effects resistant bacteria may have on human health, food manufacturing, the environment, trade and the economy.

Antimicrobials provide for high quality or good physical condition of crops, good health of food animals entering the food chain and effective sanitation during food processing. According to the Centers for Disease Control and Prevention (CDC), antibiotic resistance occurs when bacteria change in a way that reduces or eliminates that effectiveness of antibacterial treatments. To the food industry, antibiotic resistance undermines the effectiveness of antimicrobial and antibiotic applications throughout the production system.

However, the study found that the prevalence and mechanism of resistance among most food-use antimicrobial compounds is often unknown and needs to be advanced.

“Various factors complicate our ability to fully understand the transfer of resistance bacteria through the food chain to human illness causation,” the author of the summary report, Michael P. Doyle, Ph.D. writes. Doyle points to unique resistance genes among various foodborne pathogens, aspects of animal production and distribution prior to slaughter, processing practices and consumer food preparation practices, among others.

In addition, differences in surveillance programs across the country and the world make comparisons to track resistance difficult. Data from the National Resistance Monitoring System for Enteric Bacteria (NARMS) – a collaborative effort between the CDC, the Food and Drug Administration and the U.S. Department of Agriculture, are beginning to reveal resistance trends, which are inconsistent in any one direction.

Despite the conflicting data, “trends in prevalence of resistance among microorganisms do not necessarily reflect trends in the incidences of either foodborne illnesses or resistance infections, which in many cases have declined in recent years,”

the study notes. “Additionally, it is difficult to correlate antibiotic resistance among foodborne pathogens with antibiotic uses on the farm.”

Most concern on the development of resistant bacteria relates to human health. Studies have found evidence that points to, but by no means proves that the use of antibiotics in food animals poses a threat to human health. “There are very few data regarding food animal-human transfer of antimicrobial resistance to indicate more frequent or severe infections or increased morbidity and mortality,” Doyle writes. Additionally, antibiotic use in plant production and antibacterial cleaning agents for home use has yet to be linked to specific resistance in humans.

The study acknowledges that while risk-management strategies to minimize and contain antibiotic-resistant foodborne bacteria are in place throughout the food chain, they must be improved.

To study the continued development of resistant microbes, the group recommends that science-based risk assessments focused on individual microorganisms exposed to specific agents under specific conditions of use should guide selection of risk-management actions to minimize unintended consequences.

The group also recommended:

- Prudent-use guidelines for food antimicrobial agents and sanitizers be developed, validated and implemented, while also exploring effective alternatives to antibiotics.
- Studies to confirm that microbial interventions are equally effective for antimicrobial-susceptible and antimicrobial-resistant microorganisms.
- Government regulations that weigh the possible public health benefit with the possible risk.
- A Hazard Analysis Critical Control Point (HACCP) approach applied throughout the food system is the most-effective measure to control pathogens and reduce foodborne illness.

The complete report appeared in the July 2006 issue of *Comprehensive Reviews in Food Science and Food Safety*. ■

Science Soundbites:

Airborne Contamination Not Main Contributor During Dressing

A recent study of airborne contamination by British researchers concluded that airborne particles are not a major contaminant along slaughter lines. Scientists analyzed exposure levels of beef and lamb carcasses along slaughter lines in normal slaughterhouse air and ultraclean air provided from a unit fitted with a HEPA filter. On the cattle line, airborne particles

did contribute to the contamination, but the study found other vectors were more important. Further examination, for example, showed that knives transfer contamination from the hide. In lamb slaughterhouses, there was no clear link between measured counts and the concentration of organisms in the air, indicating that the airborne route in lamb slaughterhouses contributes less to carcass contamination than do the surface contacts.

Journal of Food Protection, Vol. 69, No. 12, 2006, Pages 2828-2836. ■

Ongoing AMI Foundation Research

E. coli O157:H7

<u>Investigator</u>	<u>Institution</u>	<u>Project Title</u>
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 <i>E. coli</i> O157:H7 in Combo-Bins of Beef Trimmings and Inside (in the interior) Beef Cuts Subjected to Blade/ Needle or Moisture-Enhancement Tenderization

Listeria monocytogenes

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

Targeted Research

<u>Investigator</u>	<u>Institution</u>	<u>Project Title</u>
Mindy Brashears, Mark Miller, Chance Brooks, John Blanton, Christine Alvarado, Guy Loneragan	Texas Tech University, West Texas A&M University	Risk Factors and Consequences Associated With Condensation in Fresh and Ready-to-Eat Processing Facilities
Bradley Marks, Alicia Orta-Ramirez, Alden Booren, Elliot Ryser	Michigan State University	Determine the Likelihood that <i>Salmonella</i> Develops Heat Resistance During Thermal Processing of Commercial, Whole-Muscle, Ready-to-Eat Meat Products
Catherine Cutter, Ed Mills	Pennsylvania State University	Determination of the Efficacy of Chlorine Dioxide as an anti-Listerial Agent in RTE Brine Chilling Solutions

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.

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. Information is available online at <http://www.meatconference.com>.

Annual Animal Care and Handling Conference

When: March 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. The conference includes three concurrent tracks allowing participants to go in depth on the information most important to them. Attendees can select from Pig Handling, Cattle Handling and Management/Policy.

Worker Safety, Health and Human Resources Conference

When: April 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. Attendees will have the opportunity to participate in a 10-hour OSHA General Industry course designed specifically for the meat and poultry industry. The conference also features the AMI/National Safety Council Worker Safety Awards Program.

Executive Education Program for the Meat and Poultry Industry

When: April 11 – 13, 2007

Where: Northwestern University, Evanston, Ill.

What: AMI has teamed with Northwestern's top-ranked business school to offer a custom executive education program for the meat and poultry industry. This special three-day, education program will help teams renew their management, marketing and leadership abilities in a retreat-like setting on Northwestern's breathtaking lake front campus just north of Chicago.

Advanced *Listeria* Intervention & Control

When: Spring 2007

Where: To be determined.

What: After receiving an excellent response to the last workshop, AMIF is pleased to present this event for a second time. 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.

AMI Foundation Contacts

All AMI Foundation staff can be reached at:
1150 Connecticut Avenue, NW, 12th Floor, Washington, D.C. 20036
202/587-4200 or at the email address below.

James Hodges

president
jhodges@meatami.com

Janet Riley

senior vice president, public affairs & professional development
jriley@meatami.com

Susan Backus

director of research
sbackus@meatami.com

Randall Huffman, Ph.D.

vice president, scientific affairs
rhuffman@meatami.com

David Ray

vice president, public affairs
dray@meatami.com

Patrick Wilson

manager, public affairs & online editor
pwilson@meatami.com