



2008 Beef Industry Safety Summit

March 5-7, 2008
Dallas, Texas



Executive Summary

How We Got Here

- 1975 — *E. coli* O157:H7 first identified as a human pathogen
- 1982 — *E. coli* O157:H7 first associated with a foodborne disease outbreak
- 1993 — Major *E. coli* O157:H7 outbreak tied to ground beef served at a quick service restaurant chain on the west coast
- 1993 — Blue Ribbon Task Force of leading scientists commissioned by the beef industry to identify ways to improve the safety of beef processing systems and to prioritize research to support Hazard Analysis Critical Control Point (HACCP) programs
- 1994 — USDA declares *E. coli* O157:H7 an adulterant in raw ground beef
- 1994 — FSIS Notice 50-94 outlines mandatory microbiological testing of raw ground beef conducted by FSIS
- 1996 — HACCP inspection-based system made mandatory in meat processing facilities.
- 1997 — Beef Industry Food Safety Council (BIFSCo) founded to develop industry-wide, science-based strategies to solve food safety problems
- 2003 — BIFSCo hosts *E. coli* O157:H7 Summit
- 2004 — The overall incidence of foodborne illness attributed to *E. coli* declines significantly, meeting the United States Healthy People 2010 goal of 1.0 cases per 100,000 people six years ahead of schedule
- 2008 — BIFSCo hosts fifth annual Beef Industry Safety Summit

Introduction and Background

The Beef Industry Safety Summit is an effort to develop solutions for industry challenges. The first summit was held in 2003 and brought all industry sectors together to address one common goal—creating the safest beef supply possible. The goal for the 2008 Beef Industry Safety Summit was no different. National Cattlemen’s Beef Association (NCBA) president-elect Gary Voegt, summed it up when he said, “I think I speak for all cattle producers when I say, ‘Thanks for showing up.’ If there ever was a time we need to work together, it is now.”

The Beef Industry Safety Summit’s design creates an environment that encourages open discussion among competing companies that have all agreed safety is not a competitive issue. Media and regulatory officials are not present, which in turn encourages open dialogue about the best way to continue to address current and emerging beef safety challenges.

The Summit is funded by The Beef Checkoff and hosted by the Beef Industry Food Safety Council (BIFSCo) and represents the industry’s commitment to find science-based solutions to food safety challenges.

As part of his comments, Voegt remarked that it is important to celebrate the positive aspects of the business and how the beef harvest and processing sectors took beef safety initiatives to heart, thus creating a unique partnership between producers and packers to further the goal of beef safety. “As an industry, producers are beholden to you and this is not the time to change direction.”

Research Update

Research is essential to understanding safety challenges to the beef industry. Research is also critical to providing the solutions to deal effectively with those challenges and to further the goal of creating the safest beef supply possible. Beef safety research resources can be found at www.bifsc.org and www.beefresearch.org.

“The next steps for improving beef safety include continuing these types of forums where there is a candid dialogue between experts and the people who will be implementing safety programs in their businesses.”

Michael De La Zerda, Director of Corporate Food Quality and Safety Management, Coleman Natural Foods



Cattle Diets & Pathogens

Jim Droulliard, Ph.D., Kansas State University

Summary: Ration components for feedlot cattle may have some association with the prevalence of foodborne pathogens. However, further research is needed to accurately understand the causal relationship between diet and pathogen prevalence rates in cattle.

- A compilation of project results examined the effect of various grain-processing methods (dry-rolled corn

versus steam-flaked corn) and the replacement of ration components with dried distillers grains (DDGs) or wheat on pathogen shedding in cattle.

- Animals preselected for 100 percent prevalence rate were used in a study that determined that DDGs appeared to impact the prevalence of *E. coli* O157:H7. However, it is important to remember that a variety of factors, including the removal of starch in the diet, the alteration of the rumen microbial environment and the number of bacteria present, may also play roles in this phenomenon.

“Every time there is a recall, we learn something new that we can do better. We are going to continue to do that. The Beef Industry Safety Summit and BIFSCo bring people together to accomplish that goal of always trying to do better.”

Nick Nickelson, Chief Scientific Officer, Standard Meat Company

Residue Monitoring

Steven Lehotay, Ph.D., U.S. Department of Agriculture-ARS

Summary: Veterinary drug residues still present safety and regulatory issues for the beef industry and continue to be monitored and addressed by regulatory agencies. Research efforts are focused on improving screening methods to make them more cost-effective and to ensure that they meet industry needs.

- Chemical residue testing in beef slaughter facilities is conducted in a two-tiered approach with initial screenings performed by Food Safety Inspection Service (FSIS) inspectors in harvest facilities. Presumptive positive samples are sent to the FSIS laboratory for quantitative and qualitative analysis.
- Residue monitoring provides the beef industry with valuable information, and the industry supports efforts to enhance the program to ensure that violations are continually monitored and addressed.

Preharvest Pathogen Prevalence

Mohammad Koohmaraie, Ph.D., U.S. Meat Animal Research Center (MARC), U.S. Department of Agriculture-ARS

Summary: Research to control pathogens in the beef supply focused on work to improve test and hold procedures in beef processing facilities, attribution of antibiotic-resistant *Salmonella* to cull cows, and projects examining the effect of feeding wet distillers grains (WDG) on *E. coli* O157:H7 shedding in feedlot cattle.

- In the attribution study, *Salmonella*-positive fecal samples were more prevalent in cull dairy animals (70.2%) versus beef market animals (37.9%) and fed cattle (7.0%). Fecal sample prevalence of multi drug-resistant (MDR) *Salmonella* followed similar trends—32.5% dairy market animals, 16.2% of beef market animals and 0.8% fed cattle, were positive respectively.
- A two-phase project examined the effect of varying percentages of wet distillers grain on cattle performance, and the effect of WDG (40% of ration) on *E. coli* O157:H7 shedding. Results revealed variations in fecal sample prevalence rates between pens and among pens.



Postharvest Pathogen Prevalence

Mindy Brashears, Ph.D., International Center for Food Industry Excellence, Texas Tech University

Summary: Results from several studies addressing beef safety interventions, carcass sampling protocols and preharvest intervention practices were presented.

- A study that examined the timing of three safety interventions (lactic acid-producing bacteria, acidified sodium chlorite, and 3% lactic acid spray) on enhanced beef strip loins determined that, in general, all three treatments significantly reduced *E. coli* O157:H7 after 21 days of storage prior to enhancement.
- Carcass mapping of *E. coli* O157:H7 provided more insight for implementing targeted safety interventions. Researchers determined that the hindshank showed the highest level of contamination across several plants.
- The prevention of cross contamination through dust control was examined among cattle during load out at feedlot facilities. Controlling dust resulted in fewer pathogens being isolated from air samples, which could reduce subsequent contamination of cattle hides.

Multi Drug-Resistant Pathogens

Tom Edrington, Ph.D., Food and Feed Safety Research Unit, U.S. Department of Agriculture-ARS

Summary: Research results from multiple studies were presented.

- An examination of waste-milk pasteurization on incidence of MDR *Salmonella* in dairy cattle did not produce expected results. In fact, *Salmonella* prevalence was higher in all classes of dairy cattle on a farm feeding pasteurized waste milk versus a farm that was feeding unpasteurized milk.

- Researchers are also investigating the incidence of multi drug-resistant generic *E. coli*, which is common in young dairy calves and disappears with age. Results may provide information on how to eliminate these bacteria from the gut population at an earlier age in cattle.
- Other research projects are examining the effect of stressors on acquisition of multi drug resistance by *Salmonella*, as well as the role of bacteriophage in the acquisition of drug resistance by *Salmonella*.
- Chlorate as a preharvest intervention was awarded its first patent in 2002, however it is still under review by the Center for Veterinary Medicine, Food and Drug Administration.

“I think we still have a lot to do when it comes to beef safety, including some day eliminating E. coli O157:H7. I think we have heard some tremendous research at this meeting that will take us in that direction.”

Darren Blass, Director of Product and Quality Assurance, Jack in the Box

Preharvest Management Practices

Dave Smith, DVM, Ph.D., University of Nebraska, Lincoln

Summary: Results from several studies examining the effect of dietary components and other management practices in cattle-finishing systems on food safety were presented.

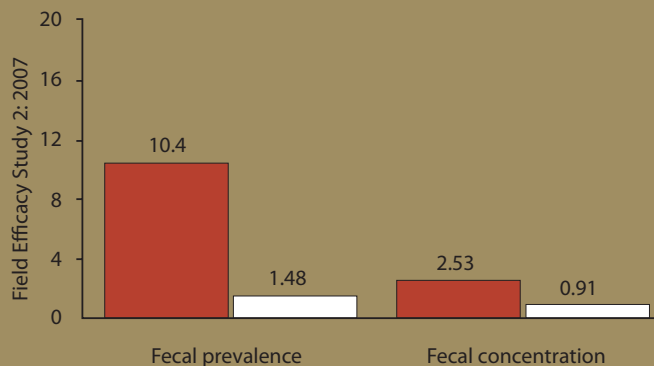
- The media’s interpretation of scientific studies should remind the research community that no conclusions can be made from any single study.
- Past research has demonstrated that cattle across feedlots differ in *E. coli* O157:H7 carriage, suggesting that the cattle-production system influences food safety outcomes. It seems reasonable that feed rations may affect the bacterial population in cattle; however, it is not yet clear how cattle rations affect *E. coli* O157:H7, or how to use cattle rations as a preharvest intervention.
- Research should focus on determining what affects the probability for cattle to shed *E. coli* O157:H7 and the most effective strategies for intervention by either limiting direct environmental exposure or reducing the duration of infection.
- A review of past research demonstrated that no clear recommendations can be made regarding ration formulation and its effect on pathogen shedding in feedlot cattle.

Cattle Vaccine

Guy Loneragan, B.V.Sc., DVM, West Texas A&M University

Summary: Preharvest beef safety research examining the potential of a siderophore receptor and porin protein (SRP) based vaccines for control of *E. coli* O157:H7 was presented.

- A vaccine that would inhibit bacteria’s ability to acquire iron was examined through a challenge study. Trends to decrease pathogen populations were seen; however, prevalence in study animals was so low that biological significance was questionable. A second field study demonstrated a vaccine efficacy of 86% with a 98% reduction in pathogen concentration in fecal samples.
- The vaccine did not negatively affect animal performance and demonstrated effectiveness in reducing the burden of *E. coli* O157:H7.
- A vaccine using the same technology is conditionally licensed and widely accepted in dairy production to control *Salmonella*, which unlike *E. coli* can negatively affect animal performance.
- The purpose of preharvest interventions such as vaccines is to reduce pathogen levels so that the entire safety system is enhanced.



Breakout Group Reports

Sector-specific groups met to review Best Practice documents, discuss research applications and share information. Each group provided a summary of their discussions for all conference attendees.

Harvest/Fabrication Breakout Group Report

- Research applications were discussed and the importance of collaborative efforts to expedite regulatory approval of preharvest interventions was determined to be a priority for BIFSCo. In discussing preharvest interventions, the group determined that a plant threshold for pathogen levels may not be definable, but the industry should continue to focus on creating safety intervention tools for the production segment.
- Sampling and testing procedures for primary and secondary beef trim, as well as imported product, were discussed. Best practices need to be disseminated to processors and other end users who do not regularly take part in industry programs. One idea was for processors to include best practice information in product boxes that are shipped to customers.
- On January 28, 2008, FSIS published in the Federal Register new policies related to the Salmonella Verification Sampling Program. The announcement may have broad implications for the beef industry. The serotyping methodology described in the notice is a new procedure that can be used in current outbreak investigations and link illnesses to processing facilities.
- The group discussed how to proceed to get carcass irradiation approved as a safety intervention.
- The Harvest/Fabrication group reviewed its Best Practice document. While animal welfare is not a safety issue, the industry is dedicated to quality animal care. The group added additional references to the Best Practice document for animal handling guidelines.

Processing Breakout Group Report

The group conducted a thorough review of Best Practice documents for raw ground product and reminded attendees that the Best Practices are not all-inclusive documents or a checklist for every individual facility. Rather, they offer a set of recommendations that facilities may incorporate into their own procedures. The review focused on the following topics:

- Sampling procedures for ground product
- Lotting, including how to address this procedure in imported product as well as reprocessed lots
- Validation of internal sampling procedures, as well as supplier testing programs
- Product engineering and design to enhance safety for consumers
- Microbiological sampling Best Practices, including the release of a new video demonstrating correct methods for sampling



Retail and Foodservice Preconference Workshops

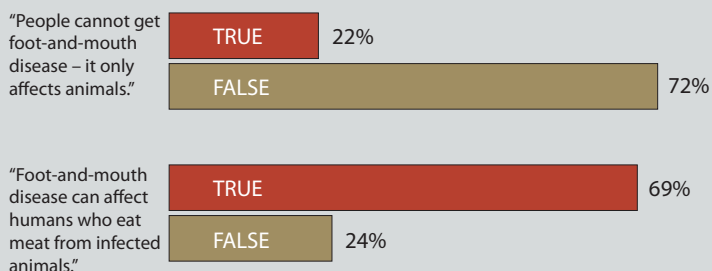
Beef Industry Safety Summit attendees had a special opportunity to attend two preconference sessions focusing on the retail and foodservice sectors. At a joint kick-off session, Mike Miller from CattleFax gave a brief snapshot of current economic factors affecting the beef industry. Retailers in attendance had an opportunity to hear results from a study examining the top beef safety concerns among the retail segment as well as the development of new communication tools for retailers to enhance their beef safety programs with staff and consumers. Participants from the foodservice sector attended a workshop focused on new cuts from the chuck roll. Input was solicited for education and safety information dissemination needs for this sector of end users.



Emerging Issues

The 2008 Beef Industry Safety Summit continued the tradition of discussing emerging challenges and their implication for beef safety. Foot and mouth disease (FMD) is not a human health issue, but checkoff-funded research demonstrates consumers do not have that perception. According to Jacque Matsen, Director of Issues Management for the National Cattlemen's Beef Association, "An FMD outbreak may affect the meat supply, and consumers will automatically make a connection with food safety." Checkoff-funded efforts are developing consumer communications tools for use in the event of an outbreak. The beef industry is also collaborating with other potentially affected species groups to create a cohesive message. More information can be found at www.fmdinfo.org.

Misconceptions Learned from Focus Groups



Presentations from Kevin Smith, U.S. Meat Export Federation (USMEF), and Matthew Lantz, Bryant Christie, Inc., highlighted the impact that safety issues, whether real or perceived, can have on trade opportunities. Residues from veterinary pharmaceuticals, growth-promoting agents, agricultural chemicals and environmental contaminants are an issue of critical importance. An International Maximum Residue Level (MRL) Database has been created to aid exporting companies in their international marketing efforts. This site summarizes established MRLs for all countries. Visit www.mrldatabase.com for more information.

The Beef Quality Assurance (BQA) Program is another industry example of finding a solution to an industry challenge. The original focus was to assure that beef was free of violative chemical residues. The program has since expanded to include educational programs for producers that focus on a variety of issues affecting animal well-being and product quality, such as animal handling, transportation practices and biosecurity. According to Bob Smith, DVM, and national BQA Advisory Board member, the program also educates producers about the impact production practices at the farm and ranch can have on end-product quality. The program's mission is to maximize consumer confidence in and acceptance of beef by focusing the industry's attention on beef quality assurance through the use of science, research and educational initiatives with producers. Visit www.bqa.org for more information.

"As a producer, beef safety is a critical component as it is about trust. When consumers are feeding their families, they have to have implicit trust their food is safe, and if we don't have that trust, we don't have a market."

**Gary Voogt, Cattle Producer and Officer,
National Cattlemen's Beef Association**

Connecting to the Consumer

Consumer education about food safety has always been a challenge according to Christine Bruhn, Ph.D., University of California, Davis. She gave summit participants a summary of past efforts, but emphasized that consumer education is only one aspect in the complete picture of beef safety. Implementing effective interventions throughout the process is critical. Using irradiation as an example, Bruhn discussed reluctance by retailers and consumer advocacy groups to accept the technology due to the perceived risks. “Do we have to wait to make a decision to use this technology until we know everything? We know the risks we face with pathogens. The risk is not using an intervention when it is available,” added Bruhn.

It all comes down to assuring consumers they are receiving the safest beef possible and that industry is making its best effort. The 2008 Beef Industry Safety Summit attendees had a unique opportunity to hear firsthand from consumers in a panel that was led by John Lundeen, Executive Director, Market Research, National Cattlemen’s Beef Association. What emerged is the reality that maintaining consumer trust is critical to maintaining a market for beef products. Consumers will often change their buying and consumption behavior when safety issues are discussed in the media. Their reactions are even more marked when the issue affects products locally.

In a presentation that compiled comments from the consumer panel and information gleaned from consumer hot lines, Lundeen emphasized that consumers want to be able to exert some sort of control when a safety issue emerges with a food product. Some of those behaviors can have negative repercussions on an eating experience. For example, consumers are tempted to overcook a beef product when they have no knowledge about proper internal temperatures or do not use thermometers when cooking.

The entire group discussed the need to make a better connection to consumers and create an everyday awareness of their role in food safety without creating alarm. “How do we tell our good stories?” asked one summit participant.



“By putting all of the segments of the industry together at the Beef Industry Safety Summit, we can work on the multiple hurdle interventions that can be put into place in each sector to make sure beef is safe when it gets to consumers’ homes.”

**Tim Biela,
Chief Food Safety &
Quality Officer,
American Food Service**



Telling the “good story” is one part of the Beef Industry Safety Summit, but it is also about identifying present and future challenges and creating effective strategies to address them. In the closing session one participant noted, “Our industry and all of our farm-to-fork partners have come through a lot in the past two decades. The Beef Industry Safety Summit has been an excellent opportunity to identify that progress and to find ways to continually move forward.”

“Beef safety is a shared responsibility throughout the line even down to the endpoint of cooking the product. The more we can all come together and work together to share our insights and the values we place on beef safety, the better we can make that end product for consumers.”

Rosemary Mucklow, Director Emeritus, National Meat Association



What is BIFSCo?



BIFSCo is a coalition of industry executives, beef producers, university and government scientists, industry association executives and experts representing each segment in the beef chain. All members are dedicated to the BIFSCo principle of collaboration to produce the safest possible American beef products. Since its 1997 inauguration, BIFSCo has been responsible for the implementation of numerous technological

innovations that continue to advance the safety of U.S. beef.

For more information about BIFSCo, go to www.bifsc.org.

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