

The Food Industry Center

UNIVERSITY OF MINNESOTA

NATIONAL CENTER FOR
FOOD PROTECTION AND DEFENSE
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Westland/Hallmark: 2008 Beef Recall **A Case Study by The Food Industry Center**

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A Humane Society video, made secretly at the Westland/Hallmark plant in late 2007 and released in early 2008, led to the recall of 143 million pounds of beef. This case study illustrates the complexity of the food industry and the food recall process.¹ Although ultimately, the incident had more to do with animal welfare than food safety — no sicknesses were tied to the recalled beef, it resulted in changes to the nation's food safety procedures. The 2008 Westland/Hallmark beef recall, the largest beef recall in U.S. history, is a stepping-off point to examine the beef supply chain generally and the ground beef supply chain specifically.



USDA

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¹ This case is the third in a series of three food recall cases. Castleberry's 2007 botulism recall was the subject of the first, and the 2006 *E. coli* recall of fresh spinach the subject of the second. Thank you to Donald W. Schaffner, Extension Specialist in Food Science and Professor at Rutgers, and Timothy L. Sellnow, Professor of Communication at the University of Kentucky, for their contributions to the cases. Schaffner and Sellnow are subject matter experts for the National Center for Food Protection and Defense.

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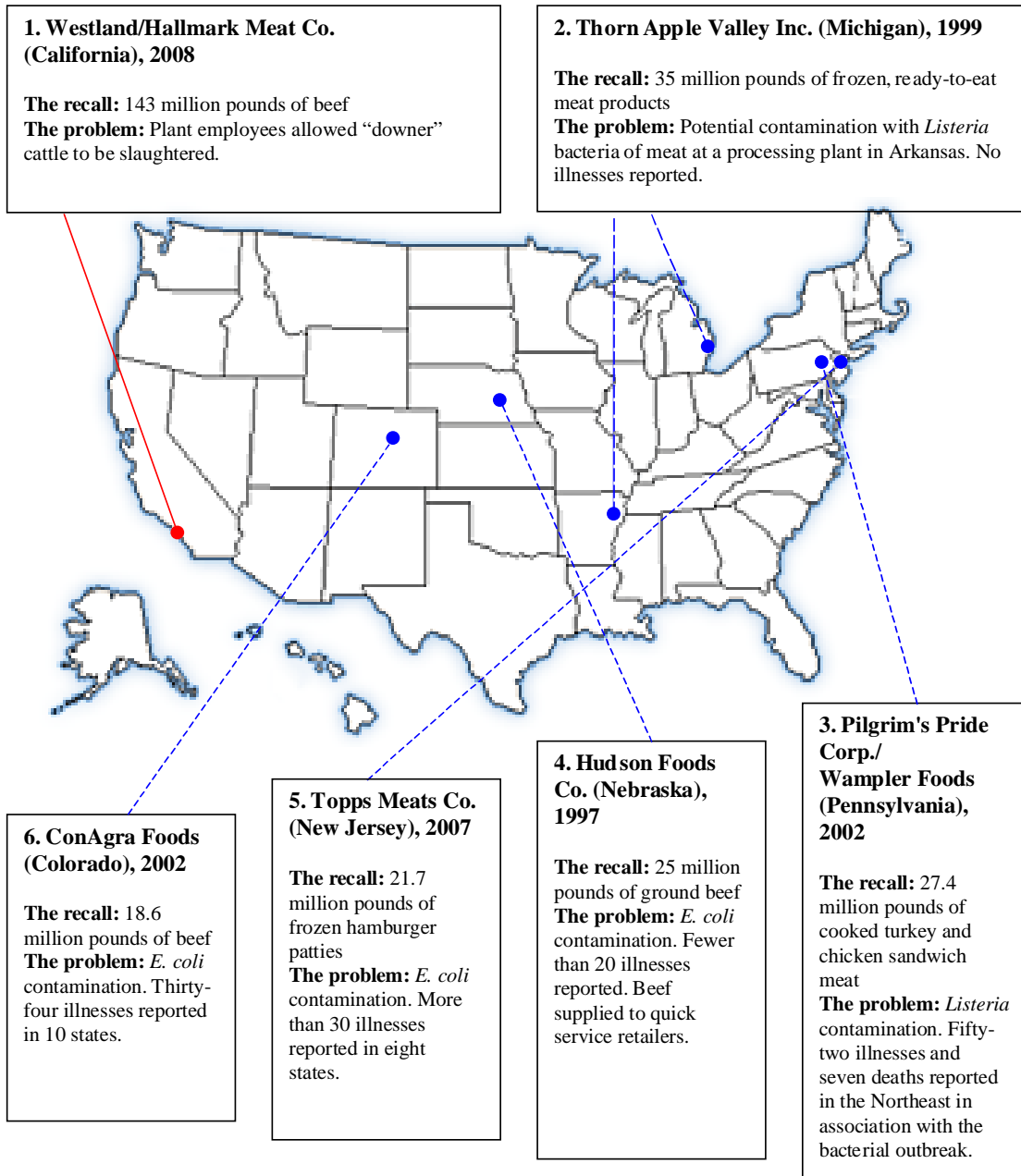
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FIGURE 1: Top Six Meat Recalls in U.S. History



Sources: U.S. News and World Report, February 20, 2008, usda.gov, cnn.com, Associated Press

The Largest Beef Recall in U.S. History

On February 17, 2008, the U.S. Department of Agriculture (USDA) issued a recall release stunning in its scope, the largest beef recall in U.S. history. The release began: “Hallmark/Westland Meat Packing Co., a Chino, Calif., establishment, is voluntarily recalling approximately 143,383,823 pounds of raw and frozen beef products (mostly from aging dairy cows²) that FSIS (the Food Safety and Inspection Service, part of the USDA) has determined to be unfit for human food because the cattle did not receive complete and proper inspection.” The recalled products had been sent to wholesale distributors across the nation. Some were purchased for federal food and nutrition programs, including the National School Lunch Program.³ In most cases, ground beef was delivered to companies that processed it into other items.⁴ More than 10,000 establishments received the recalled meat, according to USDA Undersecretary for Food Safety Richard Raymond.⁵ In California alone, more than 5,000 supermarkets, restaurants, retailers and school districts received meat recalled by Westland/Hallmark.⁶



CBS News

It was not just size — two years of product from the plant — that made the recall unusual. The recall was designated as Class 2 “due to the remote probability that the beef being recalled would cause adverse health effects if consumed,”⁷ rather than a more dangerous Class 1. Ultimately, no sicknesses were tied to the recalled beef. Perhaps most significantly, the incident resulted in changes to the nation’s food safety procedures. Finally, Westland/Hallmark went out of business, and two employees were convicted of criminal behavior.

All of this came as the result of video footage shot by an undercover investigator for the Humane Society who worked at the Westland/Hallmark plant. He secretly filmed abuse between October 7, 2007, and November 20, 2007.⁸ On January 30, 2008, after showing footage to USDA officials and U.S. Agriculture Secretary Ed Schafer, the Humane Society released a video of two Westland/Hallmark workers abusing “downer” cattle — those too sick or injured to stand for slaughter. The video, posted on YouTube, showed employees kicking, beating, jabbing and dragging the cattle, spraying them in the face with high-pressure hoses and shoving them with heavy machinery, apparently in attempts to move them to

² Michael Jacobson, executive director of Center for Science in the Public Interest, Nutrition Action Health Letter, “Playing dinner table roulette,” May 2008

³ USDA, “California firm recalls beef products derived from non-ambulatory cattle without the benefit of proper inspection,” February 17, 2008

⁴ USDA, “Questions and answers Hallmark/Westland Meat Packing Co.,” updated March 6, 2008

⁵ Mary Waters, Frozen Food Age, “Hallmark/Westland recall: Where’s the beef?” March 2008

⁶ Julie Schmit, USA Today, “California lists where recalled beef was shipped,” March 5, 2008

⁷ USDA, “California firm recalls beef products derived from non-ambulatory cattle without the benefit of proper inspection,” February 17, 2008

⁸ A sample of the video can be seen at www.youtube.com/watch?v=CrxxewC-gA, but be warned that some viewers will find the footage disturbing.

slaughter. The video provided evidence that downer cattle – animals that couldn't walk – were illegally slaughtered for food, a federal violation that spurred the recall.⁹

Federal regulations mandate that cattle must be able to stand and pass inspection to be fit for the food supply, and if an animal fell after inspection, a veterinarian had to reexamine it and approve it for slaughter. The law was intended to prevent problems such as *E. coli* O157:H7, *Salmonella* and mad cow disease from entering the food supply. Westland/Hallmark “did not consistently contact the FSIS public health veterinarian in situations in which cattle became non-ambulatory after passing ante-mortem inspection, which is not compliant with FSIS regulations. Such circumstances require that an FSIS public health veterinarian reassess the non-ambulatory cattle which are either condemned and prohibited from the food supply, or tagged as suspect. Suspect cattle receive a more thorough inspection after slaughter than is customary.”¹⁰ (In May 2008, Agriculture Secretary Ed Schafer announced that the USDA was dropping its opposition to an absolute ban on downer cattle in the food supply.¹¹ As of late 2009, legislation pertaining to downer cattle was still being discussed.¹²)

The images caused outrage, even inside the beef industry. “What happened in that video was indefensible by any standards,” said Kelli Ludlum, Director of Congressional Affairs for the American Farm Bureau, an organization of ranchers and farmers.¹³ The video led to a temporary decrease in beef consumption and prompted questions about how federal inspectors at the plant missed the abuse.¹⁴

Westland/Hallmark, which had slaughtered 500 cattle a day and was one of the top providers of beef to the National School Lunch Program, shut down. San Bernardino County authorities arrested two plant employees. USDA officials investigated, and Congress held more than a dozen hearings. On February 17, 2008, federal officials told Westland/Hallmark President Steve Mendell to begin the recall.¹⁵

Mendell viewed the video in front of Congress in March 2008. He said the conduct was against company policies. He conceded that cattle had been illegally slaughtered, that the meat most likely went into the food supply, and that much of it had already been eaten.¹⁶ Asked whether Westland/Hallmark could reimburse schools for lost meat, Mendell said, “I’m not sure if that’s going to be possible.”¹⁷

In April 2008, the Agricultural Marketing Service (AMS), part of the USDA, notified owners of Westland/Hallmark that they were liable for \$67.2 million in costs associated with the recall.¹⁸ Mark Dopp, general counsel for the American Meat Institute in Washington, said the cost well exceeded \$67.2 million. Meat processors and distributors had to identify meat that originated at Westland/Hallmark and destroy it, which also meant losing large amounts of meat that had been mixed with small quantities of the meat in question.¹⁹

⁹ Ben Goad and Janet Zimmerman, Riverside Press-Enterprise, “Role in recall reshaped Humane Society’s image,” August 17, 2008

¹⁰ USDA, “California firm recalls beef products derived from non-ambulatory cattle without the benefit of proper inspection,” February 17, 2008

¹¹ Ben Goad, Riverside Press-Enterprise, “Video, beef recall change agenda,” August 17, 2008

¹² Farm Futures, “Changes in slaughter of downer cattle sought,” November 13, 2009

¹³ Ben Goad and Janet Zimmerman, Riverside Press-Enterprise, “Role in recall reshaped Humane Society’s image,” August 17, 2008

¹⁴ Ben Goad, Riverside Press-Enterprise, “Video, beef recall change agenda,” August 17, 2008

¹⁵ Ben Goad, Riverside Press-Enterprise, “Video, beef recall change agenda,” August 17, 2008

¹⁶ Ben Goad, Riverside Press-Enterprise, “Video, beef recall change agenda,” August 17, 2008

¹⁷ Ben Goad, Riverside Press-Enterprise, “Meat plant still owes for cost of recall,” December 23, 2008

¹⁸ Ben Goad, Riverside Press-Enterprise, “Meat plant still owes for cost of recall,” December 23, 2008

¹⁹ Ben Goad and Janet Zimmerman, Riverside Press-Enterprise, “Role in recall reshaped Humane Society’s image,” August 17, 2008

Felony-Abuse Convictions

The video also led to the nation's first felony-abuse convictions of slaughterhouse workers. Westland/Hallmark employee Rafael Sanchez Herrera and supervisor Daniel Ugarte Navarro pleaded guilty to the criminal charges. At his sentencing hearing, Navarro blamed the company's supervisors and owners. "They're the ones who bought the downer cows, not me," he said. "If there were no downer cows, nothing would have happened to me."²⁰ He said that in his 23 years of working for Westland/Hallmark, illegal practices to move downed cattle were widespread. If he had refused to participate, he said, he would have been fired.²¹

Westland/Hallmark regularly purchased sickly cattle because they were less expensive, Navarro said. "They came crippled, very disabled," he said. "They couldn't even stand."²²

Navarro said that plant President Steve Mendell condoned the abuse and slaughter of downer cattle, and that supervisors ordered workers to carry it out. Mendell testified at congressional hearings that he was unaware of animal cruelty or food safety violations. He characterized the abuses as a breakdown in company controls and training. Donald Hallmark Sr., a former owner of the slaughterhouse, defended the plant's management and said the meat was safe. He said Navarro was making false accusations in an effort to get a more lenient sentence.²³

Rich Sumner, a trucker from Lebec, CA, said he transported cattle to the Chino plant in the 1980s and '90s. He said he lost work there when he complained to the Hallmarks about sick cattle. Sumner said he transported cattle to many plants, but Westland/Hallmark purchased some of the worst. "The dairyman would get the last gallon of milk, the last cent out of the cow and then take it to auction," he said. "But those were the ones they could get the most profit off of." Hallmark responded that his plant followed slaughter laws. To an untrained eye, he said, older cattle might look sick even if they are not. Inspections ensured that bad meat did not enter the food supply, he said. "There is no chance for a mad cow to get through there, no chance for a pneumonia cow to get through. There is no chance for a cancer cow to get through," he said. "I never had anybody complain or get sick from that meat."²⁴

Insiders' View of the Recall

Agriculture officials said that rules were broken and the recall was ordered as a consequence. Many disagreed with the decision.

"The recall wasn't warranted," said Mark Dopp, the general counsel for the American Meat Institute. "There was no food safety risk."²⁵

The American Farm Bureau said the recall should have been designated as Class 3 — one with zero health risk and no mandate to destroy the recalled beef. Instead, the recall was Class 2, meaning a remote health risk that required destruction of the beef.²⁶

²⁰ Neil Nisperos, Inland Valley Daily Bulletin, "Meat mess marks 2008 for Chino," January 1, 2009

²¹ Will Bigham, Inland Valley Daily Bulletin, "Slaughterhouse worker sentenced to 270 days in jail for cow abuse," September 25, 2008

²² Julia Glick, Riverside Press-Enterprise, "Ex-worker: Cow abuse common," September 13, 2008

²³ Julia Glick, Riverside Press-Enterprise, "Ex-worker: Cow abuse common," September 13, 2008

²⁴ Julia Glick, Riverside Press-Enterprise, "Ex-worker: Cow abuse common," September 13, 2008

²⁵ Ben Goad and Janet Zimmerman, Riverside Press-Enterprise, "Video, beef recall change agenda," August 17, 2008

“The food’s safe,” Craig Wilson, assistant vice president of food safety and quality assurance at Costco, said at the time. “We’re going to recall all this food and destroy it. This is morally and ethically wrong.” Wilson said Costco had to pull 400,000 pounds of frozen beef items because it might have contained meat from the Westland/Hallmark plant that was mixed with beef from other suppliers.²⁷

History of Westland/Hallmark

Hallmark Meat Packing Co. began slaughtering cattle at the Chino plant in 1960, according to former owner Donald Hallmark Sr. For years it bought spent dairy cows – older cows no longer producing sufficient amounts of milk to make them profitable – from farms in the Inland Valley, east of Los Angeles.

Steve Mendell established Westland Meat Co. in Commerce, CA, near Los Angeles, in 1990, and later moved the company to Chino. The company bought fresh beef from companies such as Hallmark and turned it into ground beef and other products.

Mendell gained control of Hallmark’s company in 2003, Hallmark said. One reason was that Westland wanted to become a supplier of fresh beef to the National School Lunch Program and needed a slaughterhouse, said Anthony Magidow, general manager of Westland/Hallmark. The plant began supplying beef to the lunch program in 2003 and became one of its largest suppliers. The USDA named the company its Supplier of the Year for the lunch program for 2004-05. Westland/Hallmark supplied 27 million pounds of beef for revenue of \$39 million to food-nutrition programs in the year ending Sept. 30, 2007.²⁸

The USDA’s Agricultural Marketing Service (AMS) had awarded 141 weekly ground-beef contracts to Westland/Hallmark since 2003, according to Craig Morris, a deputy administrator of the AMS. During the recall period — February 1, 2006, to February 2, 2008 — prices paid for 68 weekly contracts ranged from \$1.29 to \$1.63 per pound. Quantities ranged from 40,000 pounds to 2.5 million pounds weekly. At the time of the recall, Westland/Hallmark was supplying about 20 percent of the ground beef used by the USDA in the federal food and nutrition program.²⁹

Westland/Hallmark also sold beef to companies such as Jack in the Box and In-N-Out Burger. The company’s sales reached about \$100 million annually and it was profitable, said Magidow, the Westland/Hallmark general manager.³⁰

New Owners

After the recall, the Westland/Hallmark plant was sold to American Beef Packers, co-owned by Marvin Roberts and Pat Carrigan, both of Arizona. Roberts said he had been in the cattle business for more than 30 years. His father owned a packing business and as a result he worked in the slaughterhouse and

²⁶ Ben Goad and Janet Zimmerman, Riverside Press-Enterprise, “Video, beef recall change agenda,” August 17, 2008

²⁷ Janet Adamy, Wall Street Journal, “Food companies become frustrated with meat recall,” February 26, 2008

²⁸ David Kesmodel, Wall Street Journal, “Oversight ‘flaw’ led to meat recall,” March 11, 2008

²⁹ Elizabeth Williamson, Wall Street Journal, “School lunch at risk for years” March 3, 2008

³⁰ David Kesmodel, Wall Street Journal, “Oversight ‘flaw’ led to meat recall,” March 11, 2008

processing plant. Roberts said he called Steve Mendell soon after the recall was announced, expressing interest in buying the property.³¹

The plant reopened in November 2008, processing about 100 head of cattle a day. By April 2009, the plant was processing about 200 to 300 a day. “We hope to get up to (500) in the next six months,” Carrigan said. “You know you got to walk before you run.”³²

Chino officials said they welcomed the plant’s reopening.³³

New Practices

Roberts said he was trying to keep his business clear of the problems with Westland/Hallmark. “That regime is gone,” he said. “We’re trying to run a different business.” He said he had installed surveillance cameras and improved training on animal handling.

Training: The new company brought in animal-handling expert Erika Voogd to train employees. Voogd spent 20 years performing quality assurance for Oscar Meyer and OSI Industries, a supplier of McDonald’s hamburgers.

Video monitoring: The company also contracted with Arrowsight, a company that specializes in remote “video auditing,” to monitor whether employees comply with animal handling guidelines adopted in 2007 by the American Meat Institute. Sixteen cameras were placed throughout the pen and slaughter areas. At various times each day, Arrowsight staff pull up video feeds and scan still images. An audio feed allows Arrowsight staff to listen for cattle that are signaling distress.³⁴

Jeremy Russell, spokesman for the National Meat Association, which represents about 400 meatpackers and processors, said it made sense to continue operations at the Chino plant. “The problem that created that publicity was not the equipment,” he said. “It was not the facility itself, but the practices.”³⁵

National Policy Changes

Soon after the incident, the USDA announced two significant changes to national food safety policy.

1) In May 2008, Agriculture Secretary Ed Schafer announced that the USDA was dropping its long-held opposition to an absolute ban on downer cattle in the food supply.³⁶

2) In July 2008, the USDA announced it would begin telling consumers during recalls whether their local grocery store was stocking contaminated meat or poultry. Previously the USDA did not tell consumers where such products had gone. Schafer said the rule change would apply only to recalls involving “a reasonable probability of serious health consequences or death for those with weakened immune systems,” he said. Food retailers criticized the move, saying it would not provide consumers with

³¹ Douglas Quan and Sean Nealon, Riverside Press-Enterprise, “Facility at center of recall has buyer,” July 30, 2008, and Neil Nisperos, Inland Valley Daily Bulletin, “Image upgrade,” April 12, 2009

³² Neil Nisperos, Inland Valley Daily Bulletin, “Image upgrade,” April 12, 2009

³³ Douglas Quan, Riverside Press-Enterprise, “New slaughterhouse promises humane handling of cows,” October 10, 2008

³⁴ Douglas Quan, Riverside Press-Enterprise, “New slaughterhouse promises humane handling of cows,” October 10, 2008

³⁵ Douglas Quan and Sean Nealon, Riverside Press-Enterprise, “Facility at center of recall has buyer,” July 30, 2008

³⁶ Ben Goad, Riverside Press-Enterprise, “Video, beef recall change agenda,” August 17, 2008

additional helpful information. “The most important information for consumers to have in a USDA recall is the brand name, container size and manufacturer coding information marked on meat and poultry products,” said Robert Brackett, Chief Science Officer of the Grocery Manufacturers Association, citing information already made available during a recall. “This information ... is far more timely, reliable and current than a generic list of retailers that might change over time and could very well be inaccurate to begin with.”³⁷

On March 14, 2009, President Barack Obama announced the creation of a Food Safety Working Group to advise him on upgrading the U.S. food safety system. The Working Group recommended an approach to food safety based on three principles: 1) prioritizing prevention, 2) strengthening surveillance and enforcement, and 3) improving response and recovery. Among the steps the Obama administration announced were stepped-up enforcement in beef facilities to reduce the threat of *E. coli* 0157:H7 and creation of a national traceback and response system.³⁸

A Closer Look at the Meat Industry

The meat and poultry industry makes up a large part of U.S. agriculture. Total meat and poultry production in 2007 reached more than 91 billion pounds. In 2007, the meat and poultry industry processed 9 billion chickens, 34.2 million cattle, 271 million turkeys, 2.7 million sheep and 109 million hogs and lambs. The same year, American meat companies produced 36.6 billion pounds of chicken, 26.5 billion pounds of beef, 21.9 billion pounds of pork, 6 billion pounds of turkey and 334 million pounds of veal, lamb and mutton. In 2007, Americans, on average, consumed 86.3 pounds of chicken; 65 pounds of beef; 50.5 pounds of pork; and 17.5 pounds of turkey.³⁹ In 2008, corn was worth just more than \$50 billion in cash receipts to farmers; cattle and calves were worth just less than \$50 billion. None of the other top 12 U.S. agriculture commodities topped \$40 billion. Poultry was worth about \$35 billion, and hogs about \$16 billion.⁴⁰

The way by which meat is delivered to consumers has changed over time. In the first part of the 20th century, fresh meat was processed into carcasses and sent to retail stores, where the carcasses were cut and packaged. In the 1960s, meatpackers began offering “boxed meats.” Instead of receiving full carcasses, retail stores could order portions that were already vacuum-packaged and boxed. This made distribution easier and made meat easier for retailers to handle, and evolved into “case-ready” meat.⁴¹

In 2007, more than 600 federally inspected establishments nationwide slaughtered cattle. The majority slaughtered primarily younger “fat cattle,” a class of beef cattle of any age but usually older than one year, judged ready for slaughter to provide prime cuts of beef. Westland/Hallmark was representative of about 100 of the establishments that slaughtered cull cows, the often spent dairy cows that have been sold off by their dairies when they can no longer produce milk in sufficient quantities to make them profitable. Because of their age and use, dairy cull cows tend to be in poorer physical condition than fat cattle.⁴²

³⁷ Nicole Gaouette, Los Angeles Times, “USDA to list stores in recalls of meat,” July 12, 2008

³⁸ President’s Food Safety Working Group <www.foodsafetyworkinggroup.gov/> and Marler Blog <www.marlerblog.com>

³⁹ American Meat Institute <www.meatami.com>

⁴⁰ USDA Economic Research Service-Farm Income <www.ers.usda.gov/briefing/farmincome/data/cr_t3.htm>

⁴¹ American Meat Institute, “AMI fact sheet: Case-ready meats/modified atmosphere packaging,” June 2009

⁴² USDA Office of Inspector General Great Plains Region, “Audit report: Evaluation of FSIS management controls over pre-slaughter activities,” November 2008

Beef Cattle Production

Most beef calves in the United States are born on cow-calf operations. Many ranchers plan calving for the spring, ensuring that the calves are strong enough to handle winter. The calves remain with their mothers for the first several months of life, grazing in herds on large pastures.

As calves reach six to 10 months of age, they are weaned from their mothers. Most cow-calf operators sell the weaned calves at livestock auction markets to cattle producers called stockers and backgrounders. Like cow-calf operations, these are ranches and farms where cattle graze on pasture or start receiving grain to supplement their diets. Once most cattle reach approximately 12 to 18 months of age, they are taken to a feedlot.

FIGURE 2: U.S. Meat Production by Percentage in 2007

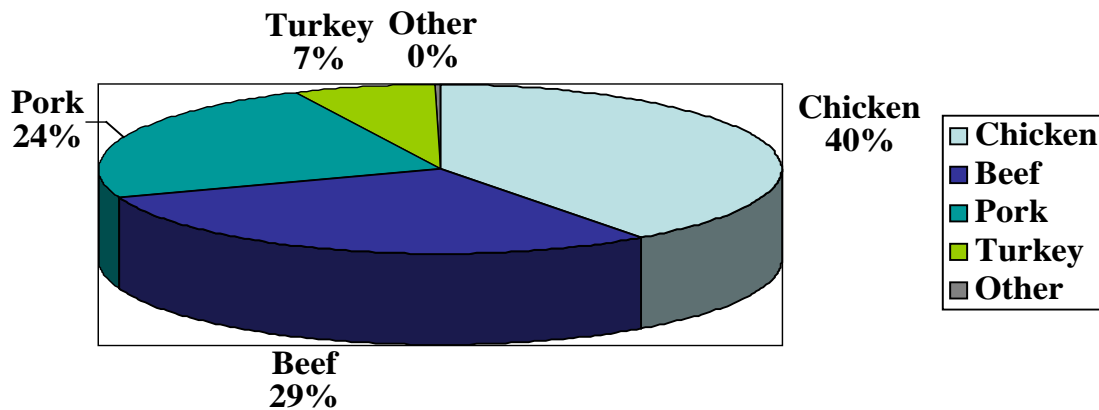
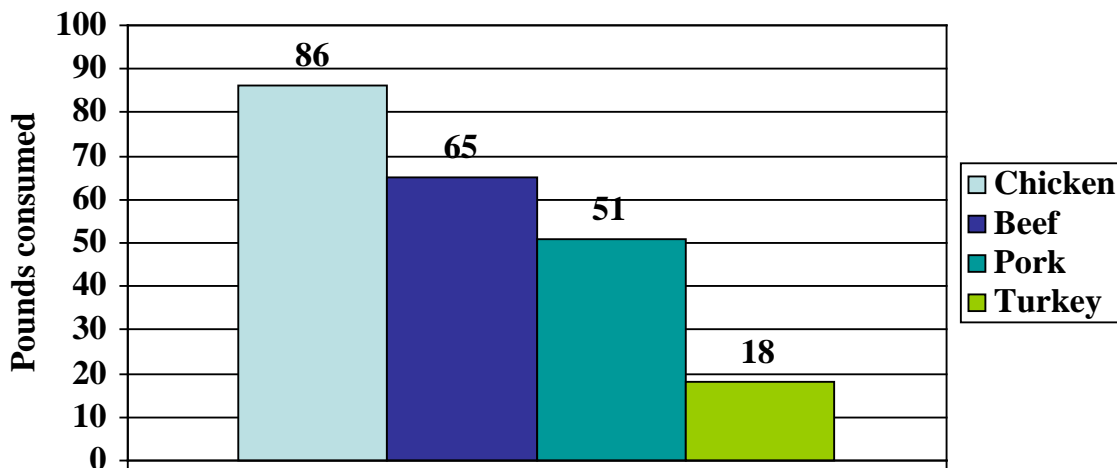


FIGURE 3: U.S. Per Capita Meat Consumption in 2007

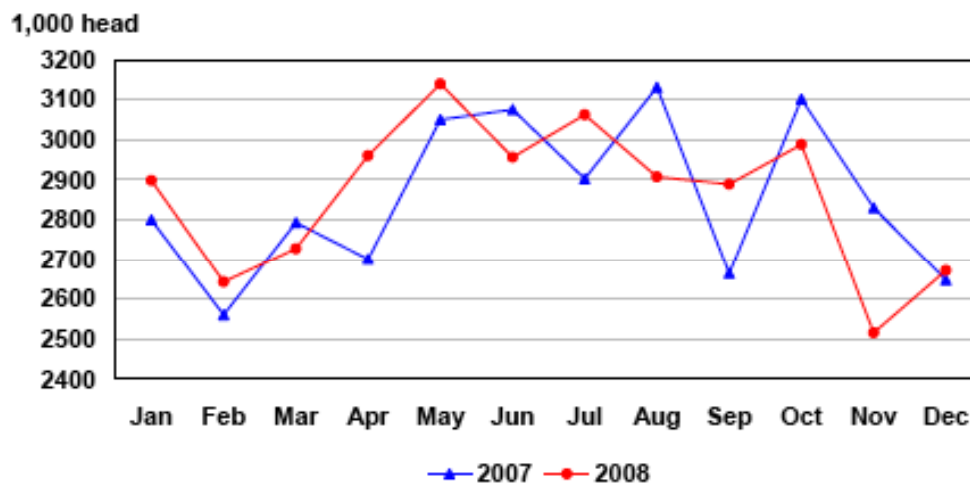


Source: American Meat Institute

When cattle arrive at a feedlot, they are unloaded and led through a processing barn, tagged for identification purposes, vaccinated and entered into the operation's record-keeping system. Before being grouped into pens by age, the animals may be given growth-enhancing supplements. Cattle usually spend four to six months in a feedlot, during which they are fed a ration averaging 70 percent to 90 percent grain, and have access to water.

Once cattle have reached 18 to 22 months old or weigh between 1,100 and 1,250 pounds, they are typically considered "finished" and are transported to packing plants to be slaughtered and processed.⁴³

FIGURE 4: U.S. Monthly Commercial Slaughter Cattle



Source: USDA, "Livestock slaughter 2008 summary," March 2009

Dairy Cattle Production

More than 9.3 million cows were used for milk production in the United States in 2008.⁴⁴ About 2.6 million dairy cows were slaughtered in the United States in 2008, making up about 8 percent of the total head of cattle slaughtered⁴⁵ and at least 17 percent of the ground beef produced in the United States.⁴⁶

⁴³ National Cattlemen's Beef Association, "Beef from pasture to plate: Stages in beef production," <www.beeffrompasturetoplate.org/stagesinbeefproductionprocess.aspx>

⁴⁴ USDA National Agricultural Statistics Service, "Milk cows and production," <www.nass.usda.gov/QuickStats/indexbysubject.jsp?Pass_group=Livestock+%26+Animals>

⁴⁵ USDA, "Livestock slaughter 2008 summary," March 2009

⁴⁶ H.F. Troutt and B.I. Osburn, "Meat from dairy cows: Possible microbiological risks and hazards," Scientific and Technical Review 16(2), 1997

A cow typically remains in the dairy herd until it is about 5 years old. The leading reasons dairy cows are removed from the herd are low production, infertility, mastitis (inflammation of the udder), and lameness.⁴⁷

Packing Plants

When cattle arrive at packing plants, they are moved inside. Packing plant technicians then use a mechanical stunning device to quickly render animals unconscious.

The Humane Slaughter Act (passed in 1958 and updated in 1978 and 2002) dictates strict animal handling and slaughtering standards for packing plants.

When beef leaves the packing plant, it is in the form of large sections, either primal cuts, like the chuck, round rib and loin, or subprimals, which are smaller cuts of meat such as the bottom round, top round, eye round and round tip. Some plants sell subprimals to meat processing facilities where workers break them down into individual steaks and roasts that are sent to supermarkets and restaurants.⁴⁸

Case-Ready Meats

Case-ready meats are packaged at plants and delivered to retailers ready to be placed in the retail case. They require no additional cutting or processing. They have longer shelf lives (as much as three weeks for ground beef) than meat packaged in the retail store (three or four days for ground beef), and fewer human hands touch them (which means fewer possible points of entry for contaminants). Stores can order cuts they know will sell well and avoid cuts that do not, and because the products need no additional cutting, labor costs are lower.

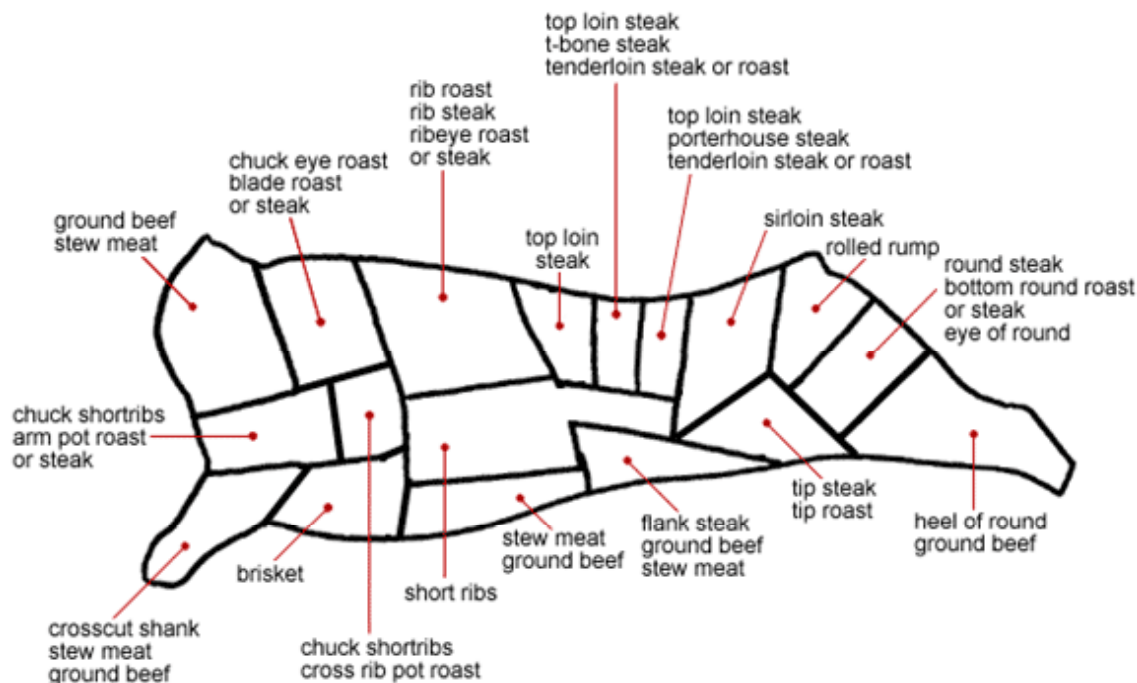
Case-ready meats are typically sold in vacuum packaging or modified atmosphere packaging. Vacuum packaging removes oxygen, preventing oxidation, which can lead to a decline in flavor and color and can cause an odor. Modified atmosphere packages are tamper-proof packages that leave a space between the meat on the tray and the top of the package. Various combinations of gases are put into the package to achieve a desired effect, particularly for antimicrobial effect or stabilization of the meat's color, which can be important to consumers.⁴⁹

⁴⁷ EPA, "Ag 101: Lifecycle production phases," <www.epa.gov/oecaagct/ag101/dairyphases.html>

⁴⁸ National Cattlemen's Beef Association, "Beef from pasture to plate: Stages in beef production," <www.beeffrompasturetoplate.org/stagesinbeefproductionprocess.aspx>

⁴⁹ American Meat Institute, "AMI fact sheet: Case-ready meats/modified atmosphere packaging," June 2009

FIGURE 5: Cuts of Beef



Source: Rivercrest Farm <www.rivercrestbeef.com/faqs.asp>

The Retail Meat Case

A 2008 Nielsen report found that in the United States and globally, consumers ranked “good value for money” as the most important factor in where they buy their groceries, and “better selection of high quality brands and products” as the second most important factor, leading Nielsen to conclude that “schizophrenic shoppers” expect the best of both worlds from retailers today. “On the one hand, shoppers are inclined to be bargain hunters and demand good quality for their grocery dollar, and on the other, they also expect retailers to stock a wide variety of high quality brands. This ‘dual demand’ indicates that the same consumers want the ‘cheapest of the cheap’ in some categories and the ‘best of the best’ in others.”⁵⁰

That could describe the meat department itself, or even just the beef selection within the department. Customers have choices ranging from ground beef, an inexpensive source of protein, to more expensive cuts such as filet mignon or t-bone steaks. The meat

TABLE 1: Sales Distribution by Grocery Category

Grocery	35.81%
Meat	15.60%
Dairy	10.18%
Produce	8.98%
Frozen	5.87%
Deli	5.16%
Health, beauty	4.42%
Tobacco	3.53%
RX	2.72%
Bakery	2.43%
Floral	0.94%
Seafood	0.79%
Other	3.57%
Total	100.00%

Source: FMS, “2009 Independent Grocers Survey”

⁵⁰ Nielsen, “Grocery store choice and value for money: A global Nielsen consumer report,” January 2008

department is consistently identified as second only to the produce department as the factor driving store selection. Product quality, variety of product offered and friendly and knowledgeable service personnel – butchers – are the factors that influence consumer perception of this department.

In-Store Meat Cutting

Every department in the grocery store makes a contribution to the total store presentation to the consumer, but the meat department is unique. A store can make the decision to offer a fully staffed service meat counter or do no custom-cutting (and not have the capability to cut a particular piece of meat to the specification of an individual consumer). Generally, conventional grocery stores that compete on service rather than primarily on price will have a service meat counter. A price operator/warehouse store will offer limited or no service.

For store operators that choose to offer a full-service meat counter and cut meat, there is a question about what to do with the trim – the residuals from cutting primals – from their store-level cutting. Store-level trim is generated in too large of quantities to be discarded without making the department uncompetitive, so the store-level trim is almost always ground into ground beef and priced to sell in one to two days as its shelf life of three to four days is much shorter than the 21 days of case-ready product. There is an irony in “ground today” or “ground in the store” – a consumer might expect that a product that is ground today is fresher and will last longer, but this is not the case.

While a store that offers store-level cutting may prefer to grind only the product that is a by-product from its primal cuts, the store may need to augment this by-product with purchased trim. At the same time, another store could decide to regularly purchase trim to grind into primary products because of consumers’ preference for beef “ground today” or “ground in the store.”

Store operators realize that they must have the same production and sanitary conditions as the larger processors of case-ready product, although on a much smaller scale. Therefore, retailers that choose to offer a full-service meat counter must accept the sanitizing requirements of handling raw ground beef. However, stores are not required to validate sanitizing efforts by testing for microbial contamination. When meat is ground, more of the meat is exposed to harmful bacteria. *E. coli* O157:H7 can colonize in the intestines of animals, which can contaminate muscle meat at slaughter. O157:H7 is a strain of *E. coli* that produces large quantities of a potent toxin that forms in the intestine of humans and causes severe damage to the lining of the intestine and occasionally damages other organs. *E. coli* O157:H7 survive refrigerator and freezer temperatures. Once they get in food, they can multiply very slowly at temperatures as low as 44° Fahrenheit. Most scientists believe it takes only a small number of this strain of *E. coli* to cause serious illness and even death, especially in children. It is killed by thorough cooking to 160 degrees Fahrenheit.⁵¹

As one supermarket operator explained, “In the meat department we are in food production as well as food retailing. We want to offer a service meat counter but recognize the vulnerability that we have with this product.” He went on to say, “We keep a full log of our grinding, and are reducing the number of suppliers that we buy from to help manage and simplify our reporting. Nevertheless, we may be only one major recall away from eliminating in-store cutting and subsequent grinding.”⁵²

⁵¹ USDA, “USDA fact sheet: Meat preparation/ground beef,” June 2002

⁵² Confidential interview

Figure 6: USDA “Gold Standard” Log Example

Time of Grind	Lot/ Batch Number (lot = same source material)	Exact Name/ Type of Product Produced	Package Size of Product Produced	Amount (in pounds) of Product Produced	Production Code of Product Produced	Manufacturer Name of Source Material Used for Product Produced	Product Code and/or Pack Date of Source Material Used	Establishment Number of Source Product Used	Comments	Initials
0700-0830 AM	Lot 001	91/9 Gold Standard Ground Chuck	Catch-weight retail trays	1,250 lbs total of 91/9 Ground Chuck	033109-01 GSGC; Sell-by 04/02/09	Boneless Chuck, twenty-one 60 lb boxes from USA Beef Company	BC031509US A Packed on 03/15/09; BC031709US A Packed on 03/17/09	Est. 00321 M	Cleaned and sanitized grinder after Lot 001; excess source material (approx. 10 lbs) made into RTE chili; switched source materials	John Doe ID # 222

TABLE 2: Pounds of Product in an Animal

Beef “choice” (under 24 months)		Dairy cull (36 months)	
Pounds	Status	Pounds	Status
1000	Alive	1000	Alive
600-620	Hot/ rolled into cooler	550	Hot/ rolled into cooler
580-600	Chilled/ 24-hour evaporation	530-532	Chilled/ 24-hour evaporation
300-360	All boneless cuts	265-318	All boneless cuts
470-480	Primal cuts		
120-130	Minimum trim if primal cuts Are taken out of chilled carcass.		

Source: Pete Nelson, Meat Lab Supervisor, Department of Animal Science, University of Minnesota

Ground Beef

Ground beef is a dynamic product; depending on the time of year and demand for primal cuts and other factors, the trim that goes into ground beef may be a product specifically produced to meet immediate demand or an efficient way to store product for future consumption.

In addition, as was the case in Westland/Hallmark, trim is also sourced from older dairy cows that are no longer competitively producing milk. If the price of milk rises, dairy farmers will build their herds by holding older animals longer. Similarly, when the price of fluid milk falls, dairy farmers reduce their herds – cull – by selling more animals for slaughter. In addition, more animals will be brought to slaughter when there is a government dairy cow buyout designed to help raise the price of milk.

The ground beef supply chain can flex to accommodate the seasonal demand for ground beef and other meat products both by varying the amount of each animal that is processed into trim and by using frozen imported trim. As seen in Table 2, a live animal (choice) will yield a minimum of 120 pounds of usable trim for ground beef. This can go as high as 300 to 360 pounds if the entire animal is butchered for trim. A dairy cow will yield between 265 and 318 pounds of usable trim for ground beef.

The ability to “flex” results in a more competitively priced product, using trim from multiple sources, enables processors to produce a frozen product less expensively – 25 percent – than if the product was produced from a single source with current slaughter.⁵³ Using foreign sourced trim provides a \$0.05 advantage over processors that only source domestically. Given the competitive nature of the food industry, both in grocery stores and restaurants, these cost differences must be considered.

While multiple sourcing options help reduce costs, the multitude of choices also increases complexity, and vulnerability, in the supply chain.

Ground Beef Patties

A leader of a company that supplies ground beef patties to a major fast food chain, described the path from cattle operations to processors to suppliers to restaurants:⁵⁴

Raw materials for the burgers come from three sources: 1) Domestic 90 percent lean beef trim, which can be fresh or frozen, typically from cow-slaughter operations but could be whole beef or dairy cows, and are usually older; 2) 50 percent lean beef trim, which is usually fresh, from cattle operations that produce steaks and other cuts of beef; and 3) Foreign 90 percent lean beef trim, which is frozen, comes from Australia, New Zealand or Uruguay, and typically is grass-fed and young cattle. Several industry insiders said the meat is leaner and tastes better, but not enough to notice when it is part of a hamburger with various toppings and condiments.

The three products must be blended to get 76 percent lean patties. The breakdown is roughly two-thirds leaner beef trim and one-third fatter beef trim. In order to ensure product consistency, the amount of frozen materials cannot exceed 60 percent.

Prices are determined using the USDA’s Agricultural Marketing Service’s (AMS) Market News. The USDA describes the Market News this way: For more than 90 years, AMS has provided current, unbiased price and sales information to assist in the orderly marketing and distribution of farm commodities.

⁵³ Michael Moss, New York Times, “*E. coli* path shows flaws in beef inspection,” Oct, 4, 2009

⁵⁴ Confidential interview

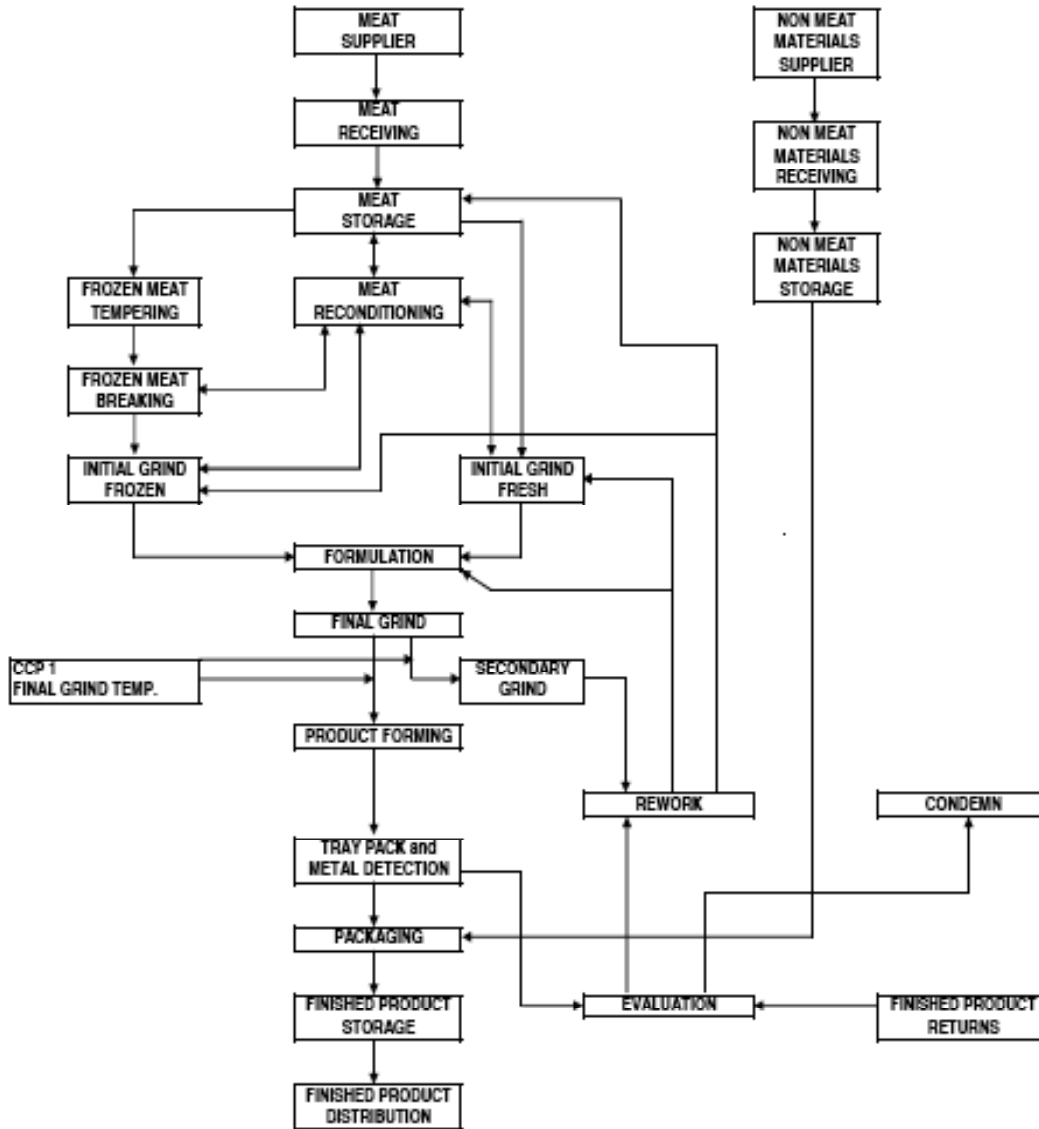
Reports include information on prices, volume, quality, condition, and other market data on farm products in specific markets and marketing areas. Reports cover both domestic and international markets. The data is disseminated within hours of collection via the Internet and made available through electronic means, in printed reports, by telephone recordings and through the news media.⁵⁵

Based on a five-day moving average of prices ending every Thursday, the supplier determines the lowest-cost formula for mixing domestic vs. imported ground beef.

Raw material add-on costs include: 1) Allowance for inbound freight – taking materials from the source to the processing facility (for imports, from the point of entry to the processing facility). Freight is negotiated and fixed for a year, and is about 2 to 4 cents a pound; 2) Shrink and loss, about 1.5 to 2.5 cents a pound; 3) Processing cost – what the factory charges, about 13 to 16 cents a pound; 4) *E. coli* O157:H7 testing, about 0.5 cent a pound; and 5) Outbound freight – from factory to distribution center – about 0.4 to 3.5 cents a pound, based on miles, and subject to semiannual adjustments because of the volatility of fuel prices.

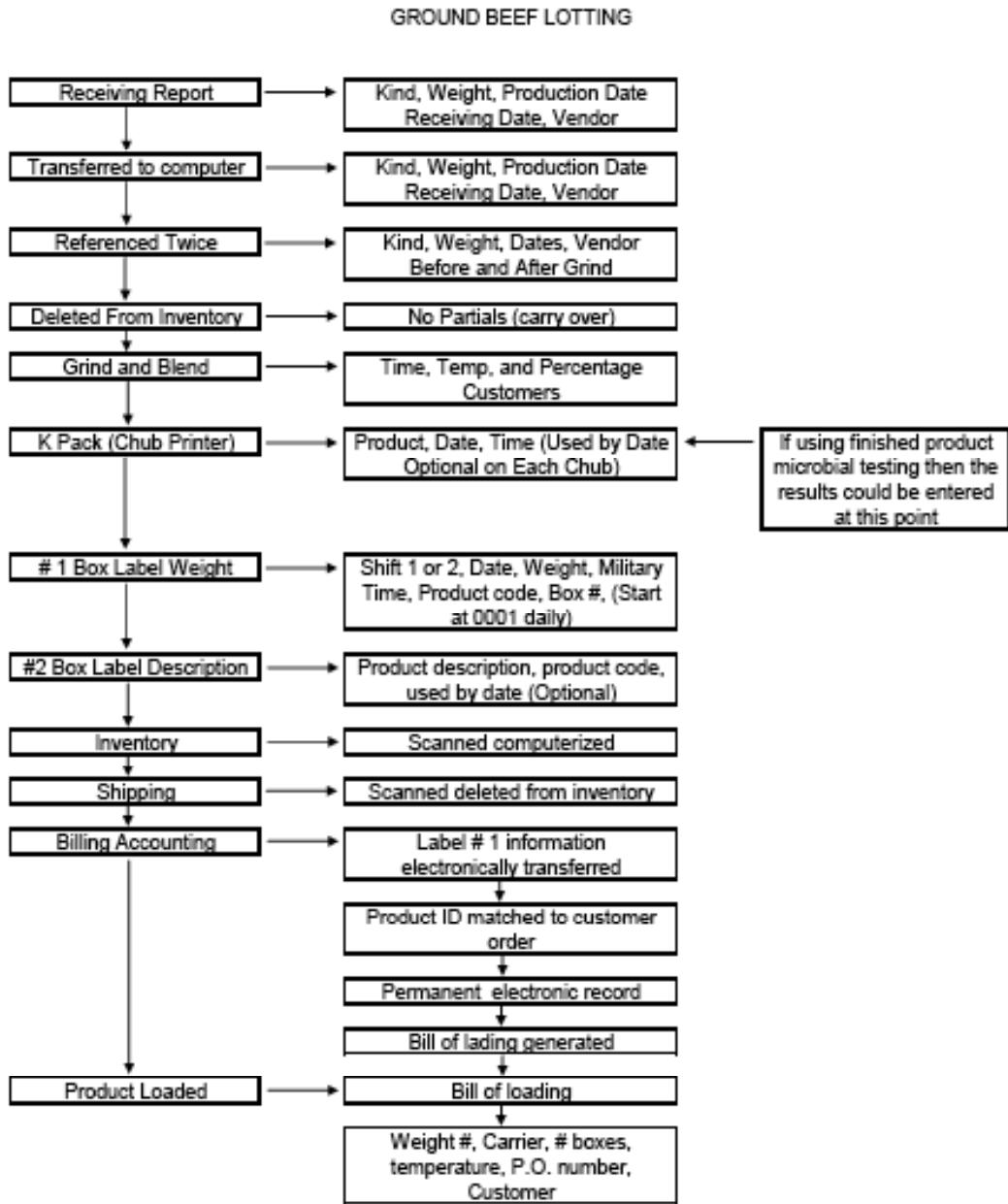
⁵⁵ USDA Agricultural Marketing Service Market News <www.ams.usda.gov/AMSV1.0/marketnews>

FIGURE 7: 100% Ground Beef Fresh Flow Chart



Source: Beef Industry Food Safety Council Executive Committee, “Best Practices for Raw Ground Products, March 2008

Figure 8: Ground Beef Lotting



Source: Beef Industry Food Safety Council Executive Committee, “Best Practices for Raw Ground Products, March 2008

When the System Fails

An obvious question in the case of Westland/Hallmark is: Where were the USDA regulators/inspectors assigned to the plant? The FSIS employs about 7,800 in-plant inspectors at about 6,200 federally inspected establishments, of which more than 600 slaughter cattle. A USDA audit report found problems specific to Westland/Hallmark and with slaughter plants in general. In the case of Westland/Hallmark, the report said, employees deliberately bypassed required inspections, supervisory and other management controls did not detect or prevent the incidents, and FSIS inspectors did not comply with required inspection procedures. Though the investigation found varying degrees of FSIS noncompliance and inconsistent implementation of required inspection procedures, the report concluded that the events that occurred at Westland/Hallmark were not a systemic failure of the FSIS inspection processes and system. The report did say that in general, there is a vulnerability and that human handling violations can occur and not be detected by FSIS inspectors because the FSIS does not provide continuous surveillance of all operating areas within a slaughter plant at all times.⁵⁶

A New York Times report in the fall of 2009 reinvigorated national discussion about some of the darker aspects of the ground beef industry:

Ground beef is usually not simply a chunk of meat run through a grinder. Instead, records and interviews show, a single portion of hamburger meat is often an amalgam of various grades of meat from different parts of cows and even from different slaughterhouses. These cuts of meat are particularly vulnerable to *E. coli* contamination, food experts and officials say. Despite this, there is no federal requirement for grinders to test their ingredients for the pathogen.

The frozen hamburgers that the Smiths ate, which were made by the food giant Cargill, were labeled “American Chef’s Selection Angus Beef Patties.” Yet confidential grinding logs and other Cargill records show that the hamburgers were made from a mix of slaughterhouse trimmings and a mash-like product derived from scraps that were ground together at a plant in Wisconsin. The ingredients came from slaughterhouses in Nebraska, Texas and Uruguay, and from a South Dakota company that processes fatty trimmings and treats them with ammonia to kill bacteria.

Using a combination of sources — a practice followed by most large producers of fresh and packaged hamburger — allowed Cargill to spend about 25 percent less than it would have for cuts of whole meat.

Those low-grade ingredients are cut from areas of the cow that are more likely to have had contact with feces, which carries *E. coli*, industry research shows. Yet Cargill, like most meat companies, relies on its suppliers to check for the bacteria and does its own testing only after the ingredients are ground together. The United States Department of Agriculture, which allows grinders to devise their own safety plans, has encouraged them to test ingredients first as a way of increasing the chance of finding contamination.

Unwritten agreements between some companies appear to stand in the way of ingredient testing. Many big slaughterhouses will sell only to grinders who agree not to test their shipments for *E. coli*, according to officials at two large grinding companies.

⁵⁶ USDA Office of Inspector General Great Plains Region, “Audit report: Evaluation of FSIS management controls over pre-slaughter activities,” November 2008

Slaughterhouses fear that one grinder's discovery of *E. coli* will set off a recall of ingredients they sold to others.⁵⁷

The excerpt makes clear that two goals conflict: a low cost and a high degree of product safety. Companies use a combination of suppliers in order to minimize costs. Increased safety efforts and increased testing come at a cost, which is inevitably passed on to consumers.

In the audit report that followed the Westland/Hallmark incident, the USDA Office of the Inspector General concluded that food safety risks are higher at slaughter plants that use cull cows. The spent dairy animals are more likely than fat cattle to have pathological conditions that would render them unfit for use as human food and are more likely to have been administered antibiotics or other drugs before arrival at the slaughter plant, thus increasing the risk that they will contain high levels of drug residues.⁵⁸

Ground Beef Safety Measures

Even at its best, the meat industry “is a messy business,” said Jeffrey Bender, Director of the Center for Animal Health and Food Safety and an Associate Professor, Veterinary Public Health at the University of Minnesota. “Slaughtering animals is dirty.”⁵⁹

E. coli O157:H7 is a significant cause of foodborne illness in the United States. From 1982 to 2002, there were 350 reported outbreaks of *E. coli* O157:H7 in which 8,958 people became ill, 1,493 were hospitalized, and 40 died. More than 40 percent of food-related *E. coli* O157:H7 outbreaks were associated with the consumption of contaminated ground beef.⁶⁰

“Producers of raw ground products, including ground beef, recognize that these products have inherent food safety risks due to the nature of the process and the lack of a sufficient ‘kill’ step for biological hazards within the process,” reads a 2008 meat industry best practices document. “Therefore, it is extremely important that grinders implement Best Practices to produce the safest products possible by increasing total process control throughout the grinding operation and in sourcing safe raw materials.”⁶¹

The beef industry employs various strategies to decrease the risk of contamination from *E. coli* O157:H7 and other sources, and the FSIS provides regulatory oversight. Under the Federal Meat Inspection Act and the Poultry Products Inspection Act, the FSIS inspects all meat, poultry and processed eggs sold in interstate commerce to ensure that it meets U.S. food safety standards. The FSIS is responsible for verifying that slaughter and processing establishments implement food safety systems that comply with Pathogen Reduction and Hazard Analysis and Critical Control Points (HACCP) standards. HACCP requires that all significant hazards with the products and production environment be identified and controlled. The FSIS employs public health veterinarians, food inspectors and consumer safety inspectors who are responsible for inspecting animals before slaughter as well as carcasses after slaughter. The consumer safety inspectors are primarily responsible for conducting regulatory oversight activities inside

⁵⁷ Michael Moss, New York Times, “*E. coli* path shows flaws in beef inspection,” Oct, 4, 2009

⁵⁸ USDA Office of Inspector General Great Plains Region, “Audit report: Evaluation of FSIS management controls over pre-slaughter activities,” November 2008

⁵⁹ Interview of Jeffrey Bender, November 9, 2009

⁶⁰ Charles Dodd and Douglas Powell, “Regulatory management and communication of risk associated with *Escherichia coli* O157:H7 in ground beef,” *Foodborne Pathogen and Disease* 6(6), 2009, and J.M. Rangel et al, “Epidemiology of *Escherichia coli* O157:H7 outbreaks, United States, 1982-2002,” *Emerging Infectious Diseases* 11, 2005

⁶¹ Beef Industry Food Safety Council Executive Committee, “Best practices for raw ground products,” March 2008

establishments relating to sanitation performance standards, sanitation operating procedures, pathogen reduction verification procedures, and other food security verification procedures.⁶²

Before slaughter, animals might be cleaned or washed with water or chemical solutions. After slaughter, carcass decontamination efforts might include spot cleaning before evisceration by knife trimming or steam and vacuum; and spraying, rinsing or deluging of carcasses with hot water, steam or chemical solutions immediately after hide removal; at the end of carcass dressing; and during production after chilling.⁶³

Individual beef processing plants and the FSIS collect and test ground beef and beef trim samples for *E. coli* O157:H7 contamination. Ground beef production is divided into lots and sub-lots. The better the tracking of lots and sublots, the less ground beef might be implicated when a sample of a subplot tests positive for a contaminant. “All grinding operations must have a lotting mechanism for coding and recording finished products to allow for tracing the product back through the system and for tracing the product forward through the chain,” reads the 2008 meat industry best practices document.⁶⁴

One issue is what to do with product left over at the end of the day. The best practices document recommends that carry-over (rework) from one day’s production not be reintroduced into later production dates because if a problem arises, this practice can increase the amount of product implicated. “Rework should be discarded within a set time period, to avoid the carryover from being continuous,” the document says.⁶⁵

The document recommends written protocols for testing for *E. coli* O157:H7 and other contaminants, using laboratory services that are reputable and accredited and a testing method that is accredited, “and it is incumbent upon the grinder to ensure the proper method is being followed.” Additionally, all grinding operations must develop a recall program.⁶⁶

“The meat and poultry industry has made great strides. The produce industry has a long way to go to catch up,” said Michael Doyle, a microbiologist who heads the University of Georgia’s Center for Food Safety, in 2006.⁶⁷

⁶² USDA Office of Inspector General Great Plains Region, “Audit report: Evaluation of FSIS management controls over pre-slaughter activities,” November 2008

⁶³ J.N. Sotos, “ASAS centennial paper: Developments and future outlook for postslaughter food safety,” *Journal of Animal Science* 87, 2009

⁶⁴ Beef Industry Food Safety Council Executive Committee, “Best practices for raw ground products,” March 2008

⁶⁵ Beef Industry Food Safety Council Executive Committee, “Best practices for raw ground products,” March 2008

⁶⁶ Beef Industry Food Safety Council Executive Committee, “Best practices for raw ground products,” March 2008

⁶⁷ Associated Press, “Despite *E. coli* outbreak, food safer than ever,” Oct. 1, 2006

***E. coli* O157:H7 Testing Guidance for Trim and Ground Beef Producers**

The 2008 beef industry best practices documents offers the following recommendations:

For trim producers:

- Test (using a recognized methodology) *all* raw materials intended for raw ground use with a scientifically sound sampling program – that way if an FSIS sample tests positive for *E. coli* O157:H7, the only product implicated will be the combos from which FSIS sampled. If the establishment does not conduct any testing, the entire day is suspect.
- Work with the FSIS IIC now, so that there is no confusion as to what product is implicated when FSIS begins its regulatory sampling and analyses.
- Obviously, if FSIS' sample tests positive, the agency will expect the establishment to conduct a review of its total food safety system for all slaughter dates and fabrication dates involved, just as if the establishment's sampling yielded a positive.

For grinders:

- Purchase raw ground beef components which have been tested for *E. coli* O157:H7 using a scientifically "sound" sampling program.
- Understand the suppliers' lotting or sub-lotting procedure so combos/boxes within the same lot can be identified and kept separate when necessary,
- When ground beef is to be sampled for *E. coli* O157:H7, identify the lots of raw materials in the blend at the time the sample is drawn and hold any unused combos/boxes from these lots and any finished product previously made from the lots until the test results are back. If finished product has shipped, let inspector know before the sample is sent to the FSIS laboratory.
- Manage raw material inventory so that partial lots are not held any longer than necessary.
- Work with the inspector to ensure that he/she understands the establishment's lotting/scheduling procedures so that the product selected to be sampled by FSIS at a random time can nonetheless be run at the beginning of the shift.

Source: Beef Industry Food Safety Council Executive Committee, "Best practices for raw ground products," March 2008

Is Irradiation an Answer?

Despite strides forward, food safety issues continue to hamper the ground beef industry. One alternative that has existed for many years in the food industry in general and for almost a decade in a small portion of the ground beef industry is irradiation. Irradiation inactivates *E. coli* O157:H7 and other microorganisms and parasites that cause foodborne illnesses.

“It will become the standard at some point in time,” said Ron Eustice, Executive Director of the Minnesota Beef Council. “We have not solved the problem of foodborne illness despite spending millions of dollars on research and equipment. Companies are now taking a very serious look at irradiation. There is nothing that can provide the same level of food safety.”⁶⁸

How is Food Irradiated?

Irradiation is a process that exposes food to ionizing energy for a specific length of time, depending on the purpose of treatment. Food is irradiated in a special processing facility where it is exposed to gamma rays, electron beams or x-rays. The food is monitored to assure that the exact treatment level is achieved.

Source: Food Irradiation Processing Alliance, International Irradiation Association and Minnesota Beef Council, “Food irradiation facts,” March 2009

The FDA approved the use of radiation for killing or sterilizing insects in wheat and wheat flour and for inhibiting sprouting in potatoes in the mid-1960s. It approved the use of irradiation to sterilize spices in 1983. It approved irradiation of poultry in 1990 and of fresh and frozen red meats in 1997. States were permitted to offer school districts irradiated ground beef beginning in January 2004.⁶⁹

The USDA’s Food Safety and Inspection Service, which oversees the irradiation of raw meat and poultry, cautions that the process is not a substitute for good sanitation and safe food handling. Establishments that use irradiation must meet the same sanitation and processing standards required of all meat and poultry plants. And while irradiation reduces pathogens, it does not make the meat or poultry sterile. “The process does not replace proper cooking or food handling practices by producers, retailers, and consumers,” a USDA publication says.⁷⁰

Wegmans Food Market, a 70-store East Coast supermarket chain, began offering irradiated fresh ground beef and ground beef patties in 2002, as both a safety effort and to allow more choice in how consumers cook their meat and to please “those who remember what a good hamburger used to taste like.”⁷¹

“We see the number of people who suffer from food related illness each year, and we need to do better for our customers,” Daniel Wegman, the company’s Chief Executive Officer, testified before a congressional subcommittee in 2008.⁷²

The chain offers 80 percent lean and 90 percent lean irradiated fresh ground beef year-round, and irradiated fresh ground beef patties during warmer months when consumers are more apt to be grilling. The beef comes from Nebraska and is irradiated at a Sadex Corporation plant in Sioux City, IA. The

⁶⁸ Interview of Ron Eustice, November 9, 2009

⁶⁹ USDA’s Agricultural Research Service, “ARS continues advances in irradiation of ready-to-eat foods,” February 2005

⁷⁰ USDA’s Food and Nutrition Service, “Irradiation of raw meat and poultry: Questions and answers,” May 2003

⁷¹ Mary Ellen Burris, senior vice president of consumer affairs, Wegmans, “Irradiated fresh ground beef is Back,” August 16, 2006

⁷² Daniel Wegman, testimony before the Subcommittee on Oversight and Investigations of the House Committee on Energy and Commerce regarding “Regulatory failure: Must America live with unsafe food?” March 12, 2008

level of irradiation is such that it causes a reduction in *E. coli* O157:H7 equal to that achieved by cooking the meat to 160 degrees Fahrenheit. Wegmans charges its customers about 30 to 40 cents more per pound for the irradiated fresh ground beef, and the products account for about 2 percent of the chain's total ground beef sales. The company heard negative feedback from customers when it first put the irradiated products on its shelves, said Wegmans Chief Scientist Kathleen O'Donnell-Cahill, "but we really don't hear much anymore."⁷³

"If people are educated about it, they're fine with irradiation," said Jeffrey Bender, the University of Minnesota professor.⁷⁴

"There is not a good argument against irradiation," said Ron Eustice of the Minnesota Beef Council. He said informed consumers will readily accept, and even prefer, the product, and points to the growing availability of irradiated produce. "Those companies that have been marketing irradiated meat and produce for several years know that there's minimal consumer resistance," he said. "For the vast majority, it's a non-issue."

He said cost is among the reasons holding back the increased use of irradiation on meat. He estimated the cost of irradiating fresh ground beef to be 25 to 60 cents more per pound, but pointed out that "it costs you less to market a product that's safer" and to avoid lawsuits. "We've got to irradiate trimmings," he said. "We've got to implement whole carcass irradiation at some point."⁷⁵

Other familiar companies that offer irradiated products include Omaha Steaks and Schwan's, both of which irradiate all their ground beef, and Publix Super Markets. In addition to Sadex, other meat irradiation facilities in the United States include Food Technology Service, Inc. in Mulberry, FL; and a commercial facility at Texas A&M University in College Station, TX. Hawaii Pride of Keaau, HI, irradiates fruit for export to the mainland United States.⁷⁶

⁷³ Interview of Kathleen O'Donnell-Cahill, November 17, 2009

⁷⁴ Interview of Jeffrey Bender, November 9, 2009

⁷⁵ Interview of Ron Eustice, November 18, 2009

⁷⁶ Interview of Ron Eustice, November 18, 2009

A Wegmans Q and A on Irradiated Fresh Ground Beef

The following is from the Wegmans website:

We're proud to offer Wegmans Irradiated Fresh Ground Beef as a choice to our customers. This is 100% ground beef with the added food safety benefit of the FDA and USDA-approved irradiation process. By choosing this product, you can enjoy great-tasting burgers cooked the way you like them. Curious about irradiation? Here are a few questions and answers to help you understand the facts.

Q. What does irradiation do?

A. The irradiation process can benefit many kinds of foods in different ways. In ground beef, the process helps to eliminate bacteria such as *E. coli*.

Q. How is food irradiated?

A. Irradiation occurs when food is passed over, or through, an electrical energy field. For Wegmans Irradiated Fresh Ground Beef, a concentrated beam of electrical energy is used to help reduce any bacteria that may be in the meat. Our packaged ground beef passes through these beams and comes out the other side as a safer product. It's then loaded on the truck and delivered fresh to our door.

Q. Is irradiated ground beef safe?

A. Yes. Every major health organization has given irradiation its seal of approval. American astronauts have eaten irradiated foods in space since the early 1970s, and patients with weakened immune systems are sometimes fed irradiated foods to reduce the chance of a life-threatening infection. This process does not cause radioactivity in the food.

Q. Does irradiation affect the nutrition of food?

A. No. Irradiated foods are wholesome. At doses used to control bacteria, the nutrition changes are less than or about the same as cooking and freezing.

Q. Why does the color of irradiated ground beef look different at first?

A. The wrapper used in our packaging is airtight. Therefore, the meat appears in its natural darker color. However, within a few minutes of opening, the oxygen in the air will change the meat to the normal cherry red you expect. This change has nothing to do with the irradiation – it is merely a result of the protective packaging.

Q. How can I identify irradiated products?

A. The Radura symbol is required on the product label. You'll find our irradiated products in the meat case along with the other ground beef choices. The protective packaging also gives you extra days of freshness in your refrigerator.



Source: Wegmans <www.wegmans.com>

What is a Recall?

A recall of any kind is complex, possibly involving multiple huge companies, small retailers, levels of government and, of course, consumers. Westland/Hallmark recalled 143 million pounds of beef, covering two years of production.

A recall is a company's removal of distributed product from commerce when there is reason to believe that the product is adulterated or misbranded, mislabeled or unsafely contaminated. Two federal agencies, the Food and Drug Administration (FDA) and the U.S. Department of Agriculture (USDA), are involved in recall administration but do not have the legal power to order a recall, except in the case of baby formula, biological products, or medical devices that might present a serious hazard to health. Recalls are almost always voluntary.

The FDA handles recalls of all food and food-related products except meat, poultry and eggs, which are handled by the USDA. If a food company institutes its own recall, it is generally under no obligation to notify the FDA, but it is strongly encouraged to do so and take advantage of the FDA's assistance. The FDA can request (but not mandate) a recall, but this is done, generally, only when public health is in danger. It operates on a principle of protection after an incident.

In the case of the USDA, reports of an unsafe product can come from the manufacturer, routine testing performed by the USDA's Food Safety and Inspection Service (FSIS), or consumer complaints. Additionally, FSIS field inspectors might come across a situation in a facility that flags a potentially unsafe food. About 7,800 USDA personnel provide inspections at about 6,200 federally inspected establishments, of which about 600 are beef-harvest facilities, according to an FSIS spokesman.⁷⁷ A company-initiated recall is handled similar to the FDA method. An FSIS-initiated recall usually occurs only in instances of serious health threat. The FSIS operates on the principle of prevention.

Recalls may originate in two ways. Sometimes a company discovers on its own that there is a problem with a product and institutes its own corrective recall. Other times, a routine inspection visit or test by an FDA or USDA inspector will discover a problem and inform the company. At that point, if the company does not start a recall process, the product may be seized via court action and the media notified. In the case of USDA-inspected companies, inspectors can be withdrawn from the plant, effectively banning the product from interstate commerce. (This happened in the Westland/Hallmark Case.) Both the FDA and the USDA can order a factory to close or refer it for criminal prosecution.

The Centers for Disease Control (CDC) has a complementary role, serving as the lead federal agency for conducting disease surveillance and investigations of foodborne illness outbreaks. Surveillance systems coordinated by the CDC, in collaboration with the states, provide an essential early-information network to detect dangers in the food supply.⁷⁸

The FDA and the USDA guidelines categorize all recalls into one of three classes according to the level of hazard involved: **Class 1 recalls** are for dangerous or defective products that predictably could cause serious health problems or death. **Class 2 recalls** are for products that might cause a temporary health problem, or pose only a slight threat of a serious nature. **Class 3 recalls** are for products that are unlikely to cause any adverse health reaction, but that violate federal labeling or manufacturing regulations.

⁷⁷ Wes Ishmael, Beef Magazine, "More questions," April 2008

⁷⁸ FDA Consumer, "How the FDA Works to Keep Produce Safe," March-April 2007

With all food recall situations, the overseeing government agency expects a company to have a recall plan, with such elements as:

- Identification of recall personnel
- Evaluation of health hazards
- Depth of recall
- Public notification
- Returned product control and disposition
- Recall procedures
- Scope of recall
- Recall communication
- Effectiveness checks
- Recall simulations

Even in a best-case scenario, however, when a company has planned well and communicates the recall well, there are difficult hurdles because of the complexity of the food supply system. Food takes many routes to get from producers to consumers. As organizations in the middle of the supply system find themselves with too much of one product in one place, they might divert it to other parts of their operation (perhaps in a different part of the country), sell it to other organizations, or even donate some product to a charitable organization. The more twists and turns a product takes within the food supply system, the more difficult it becomes to track, and the more vital the UPC product codes become. For the purposes of a recall, citing information such as brand names, use-by dates and manufacturer production codes often causes confusion.

In the Westland/Hallmark case, all products subject to the recall bore the establishment number “EST. 336” inside the USDA mark of inspection. The products were produced on various dates from February 1, 2006, to February 2, 2008.⁷⁹

Two weeks after the recall, the USDA was unsure how many schools had been affected, and about 10 percent of the recalled beef supplied to the National School Lunch Program by Westland/Hallmark had not been tracked down, a USDA official told the House Education Committee. The USDA faced a couple of big hurdles in tracking the beef: 1) The agency relied on states to tell it where the meat went after they got it from the USDA, and states relied on schools to give them that information; and 2) about 60 percent of the meat was processed to make meatballs, hamburger patties and other products, and that meat was often mixed with other products. Distributors and state warehouses classified meat by product type, not by manufacturer.⁸⁰

Much of the recalled meat likely ended up in landfills. Federal regulations dictate that any school with more than 50 cases of the recalled meat must take them to a landfill or incinerator. The Seattle Times reported that a local landfill expected to receive thousands of cases from area school districts. A waste official said the meat was kept in its boxes and mixed with other waste before it was buried and covered by six inches of dirt.⁸¹

⁷⁹ USDA, “California firm recalls beef products derived from non-ambulatory cattle without the benefit of proper inspection,” February 17, 2008

⁸⁰ Jane Zhang, Wall Street Journal, “Tracing beef supply is hurdle for U.S.,” March 5, 2008

⁸¹ Chris Carlson, Waste Age, “Salisbury steaks,” March 2008

The 2008 beef industry best practices document describes a grinding operation recall program:

The program must include mock recalls conducted on a periodic basis to ensure that the program works as planned. The recall program must include identification and tracking of raw materials, packaging, and finished products. The program must cover all raw materials (meat, non-meat ingredients), packaging materials to the finished product. The program must identify all suppliers, customers, distributors and everyone involved in the process and must include their contact information. There must be a primary and secondary contact available at all times, especially for after hours and weekends and include contact phone numbers, fax numbers and emails. The more details that are put in place prior to having a problem, the easier the recall or withdrawal will be when there is a problem.⁸²

HACCP

HACCP stands for Hazard Analysis and Critical Control Points, a systematic preventive approach to food safety and pharmaceutical safety that addresses physical, chemical, and biological hazards by means of prevention rather than finished product inspection. HACCP is used in the food industry to identify potential food safety hazards, so that key process steps, known as Critical Control Points (CCPs), can be managed to reduce or eliminate food safety risks. The system is used at all stages of food production and preparation processes, including packaging, distribution, etc. Mandatory meat and poultry HACCP systems are regulated by the USDA. These include canned meat products. The FDA requires mandatory HACCP programs for juice and seafood production. In addition, the mandatory requirements in the Pasteurized Milk Ordinance and the canned food regulations follow the principles of HACCP. The use of HACCP is currently voluntary in other industry segments.

The 2008 beef industry best practices document says this about HACCP in a grinding operation:

HACCP is a process control system designed to prevent, eliminate or reduce to an acceptable level food safety hazards. The establishment must consider biological, physical, and chemical food safety hazards. This is a raw product that has no scientific CCP for preventing, eliminating or reducing to an acceptable level microbial food safety hazards, such as *E. coli* O157:H7. (It is noted that irradiation of the finished product will reduce, but not eliminate, microbial contamination, but it is not widely used in grinding facilities at this time.) Therefore, grinders must focus on what can realistically be applied during the process to minimize the potential for growth of pathogens, if present on a raw material. These steps often involve time and temperature controls (i.e., raw material and finished product temperature during processing, cold storage or other steps) to minimize the potential for growth. While the control of growth does not truly meet the definition of a CCP because one microorganism in the raw material may be too many, it is a best practice that can be applied in a grinding operation.

All grinders must be able to support the decisions that are made in the HACCP program and to use the documentation generated from the program to demonstrate product safety. Those establishments that have determined through their hazard analysis that *E. coli* O157:H7 is not reasonably likely to occur may need specific data on prevalence rates of *E. coli* O157:H7 in raw beef ingredients along with some knowledge of the interventions used to achieve appropriate level of control. Some plants using a hold/test/release program for *E. coli* O157:H7 have determined through their hazard analysis that this

⁸² Beef Industry Food Safety Council Executive Committee, "Best practices for raw ground products," March 2008

hazard is reasonably likely to occur. In this case, the establishment may choose to adopt a “product disposition” CCP whereby product disposition is made based on testing results. Product that has tested positive for *E. coli* O157:H7 is sold for cooking only.⁸³

What if Contamination Were Intentional?

Donald W. Schaffner, an Extension Specialist in Food Science, Professor at Rutgers and subject matter expert for the National Center for Food Protection and Defense (NCFPD), addressed ground beef’s attractiveness as a “carrier” in an incident of intentional tampering with the food supply:

Since ground beef is likely going to be cooked by the consumer, this makes it less attractive as a target of intentional tampering, at least when dosed with a heat sensitive agent (like *E. coli* O157:H7 or *Salmonella*).

Interestingly, ground beef has been used previously as an agent of terror. The insecticide nicotine was used by a supermarket employee to poison ground beef in Michigan in 2003. In the end, 111 people were made ill, including 40 children.⁸⁴

The Westland/Hallmark 2008 recall case raises interesting issues regarding federal oversight since, in this instance, we clearly had employees doing something wrong, if not the company itself, and some might argue that federal oversight was lacking. The simple fact of the matter is that we will never have 100 percent continuous monitoring of the safety of the food supply by inspectors, at least not without hiring every person in the country to work for the FDA or the USDA. Modern thinking about food safety (i.e., HACCP) places the responsibility squarely on the shoulders of the food company. The regulatory agencies are charged with auditing the work that the company is doing, and making sure that the company is following all the needed precautions, and not running the food safety/security program for the company itself.

The case does point out the power a disgruntled or dishonest worker has to affect the food supply. One critical aspect of the counterterrorism advice provided by both the FDA and the USDA notes the importance of employee screening (pre-hiring, at hiring, post-hiring), including appropriate background checks. The advice notes the importance of daily work assignments, and noting who is working and where in the facility. Simple items like identification, including name tags and photo IDs, can ensure employees behave responsibly. Restricting access to certain areas of the plant might also be important, including requiring the appropriate keys, key cards, etc. Restricting personal items to work areas and employee lockers can prevent both deliberate and accidental contamination. Training in food security procedures, including periodic reminders, can help employees assist in managing the risk of terrorism. Unusual behavior like arriving early, staying late, asking lots of questions and bringing a camera to work can be an indication that an employee may be planning to contaminate the food.⁸⁵

⁸³ Beef Industry Food Safety Council Executive Committee, “Best practices for raw ground products,” March 2008

⁸⁴ CDC, “Nicotine poisoning after ingestion of contaminated ground beef – Michigan,” Morbidity and Mortality Weekly Report 52, 2003, and James Prichard, South Bend Tribune, “Ex-grocery worker sentenced to nine years for poisoning supermarket beef,” Sept 20, 2003

⁸⁵ Donald W. Schaffner, personal communication, January 2010

Conclusions and Questions

Timothy L. Sellnow, a Professor of Communication at the University of Kentucky and a subject matter expert for the NCFPD, said the Westland/Hallmark case exemplifies four complexities in the perception and reception of risk and crisis messages:

First, the video was shared via YouTube. Such social media outlets allow the viewing of unedited footage by an audience that, in such compelling cases, seems to grow exponentially. Hence, the public was made aware of this case quickly and via a highly disturbing video. Preliminary research by the Risk Communication Theme of the NCFPD reveals that crises enabled by YouTube are very difficult for organizations to address. For example, when Domino's Pizza was plagued by a hoax video claiming that employees had served contaminated food, the company was largely ineffective in its routine public relations response. Westland/Hallmark experienced similar problems. The YouTube audience is diverse and less likely to rely on standard media than a less computer-literate audience. In short, the content of the video and the channel through which it was shared contributed to the difficulty in Westland/Hallmark's response.

Second, identifying the situation as a Class 2 Recall may well have been overstated. Still, the visual evidence of downer animals forced to slaughter was undeniable. The likelihood that the meat was contaminated, particularly when one considers the volume to the recall, may have been extremely low. Still, viewers had visible evidence of unacceptable animals cruelly delivered into the processing system. A verbal explanation is unlikely to overcome visible evidence. Thus, reducing the intensity of the classification may have actually increased public outrage.⁸⁶

Third, irradiation would certainly address part of the problem. The difficulty is that irradiating food is a direct contrast to learned behavior. The majority of the population sees radiation as something to avoid. Most people are aware of the dangers and complexities of radiation without an equal awareness of its potential benefits. Although there is a preponderance of evidence that irradiation of food products is safe, this message contradicts an established "truth" in the minds of consumers.⁸⁷ Thus, despite the opportunities irradiation brings to food safety, the conflicting perception is that consuming irradiated food is dangerous.

Fourth, the challenges faced by the new owners of the facility are expected. The fact that this facility was host to consistent food safety violations is a perceptual challenge the new owners must overcome. The new owners' commitment to sterilization, high food safety standards, and openness constitute a discourse of renewal.⁸⁸ Previous research indicates that a complete willingness to begin anew and to impose standards far higher than those used in the past can allow for a company to be "renewed" in the eyes of consumers. This case is novel in that we have a new company seeking to renew an old facility. Previous research on the discourse of renewal suggests that the new company will be successful.⁸⁹

⁸⁶ William Leiss, "Searching for the public policy relevance of the risk amplification framework," in Pidgeon et al, "The social amplification of risk," 2003

⁸⁷ Timothy L. Sellnow et al, "Effective risk communication: A message-centered approach," 2009

⁸⁸ Robert Ulmer et al, R. R., "Effective crisis communication: Moving from crisis to opportunity," 2007

⁸⁹ Timothy L. Sellnow, personal communication, January 2010

Finally, examining the Westland/Hallmark 2008 recall raises two questions specific to the recall and five general questions that form the “Diamond Decision.”

1) Where were the USDA inspectors at Westland/Hallmark? What role should they have been playing prior to this “event?” (Unless one assumes that the incident captured on video was a one-time event, the result of actions by the two charged and convicted employees, then the role of the USDA plant inspectors is a topic that merits further discussion and exploration.)

2) a. Should this have been a Class 2 Recall, as it was, or a lesser Class 3 Recall – one with zero health risk and no mandate to destroy the recalled beef? b. How does the different classification of the recall affect other companies that purchased product from Westland/Hallmark? c. Is it appropriate for all purchasing companies to have to bear losses too? (Proponents of a Class 2 Recall can point to specifications for how animals need to be treated in order to help keep certain diseases out of the food supply, show that these procedures were not followed at Westland/Hallmark and argue that all products potentially containing product from the plant should be recalled. Opponents can argue that no illness was identified as the result of product from Westland/Hallmark. “The food’s safe,” Craig Wilson, Assistant Vice President of Food Safety and Quality Assurance at Costco, said at the time. “We’re going to recall all this food and destroy it. This is morally and ethically wrong.”⁹⁰)

Looking more broadly at the industry, there are five general questions that provide the industry, policymakers and consumers with two decisions – the Supply Decision and the Kill Step Decision – that warrant further discussion.

The Supply Decision

1) How many animals should be used for any one production lot? How does that affect the integrity of an individual lot and the cost of recall? (The larger the lot, the larger the amount of product that will have to be recalled if there is a problem.)

2) What are the advantages of a heterogeneous lot – one that contains beef from several sources? (The more different sources of supply of domestic trim, foreign trim and dairy cows used by a processor, the less expensive the product can become, but the more complicated, and vulnerable, the supply chain becomes.)

The Kill Step Decision

3) a. Who is responsible for ensuring that the ground beef eaten by humans is safe? b. How can the food system better ensure the proper handling of ground beef to minimize contamination? (Raw ground beef is a highly perishable product that can carry disease. Experience has shown that proper food handling and cooking can minimize if not eliminate this issue. This responsibility rests with the person or entity who ultimately prepares the final product. Food service operators have developed multiple procurement and preparation procedures to address this. Consumers are instructed to follow the safe-handling procedures on each package they purchase. An argument can be made that food service operators and consumers know and understand their responsibilities when handling a product like raw ground beef and that additional steps are not warranted.)

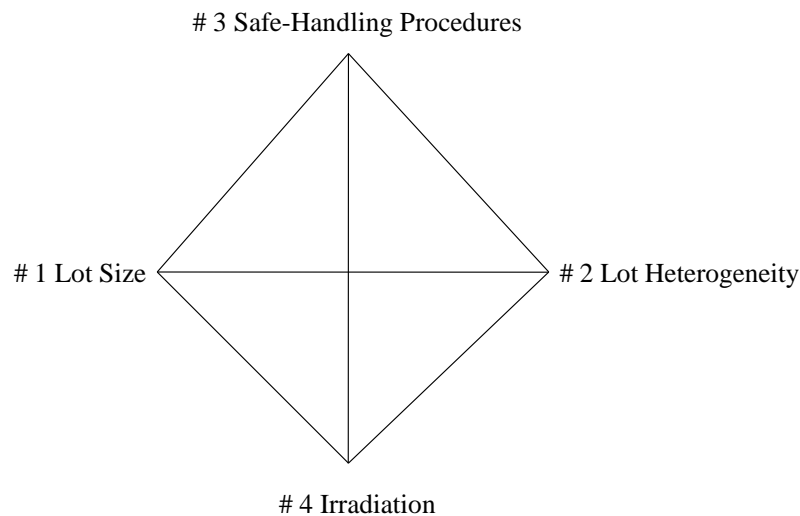
4) Prepare an argument that all ground beef should be irradiated and an argument that it should not. (Perhaps an additional step – mandatory irradiation – should be implemented to provide additional safeguards. Is this additional step warranted?)

⁹⁰ Janet Adamy, Wall Street Journal, “Food companies become frustrated with meat recall,” February 26, 2008

5) How did the new owners of the Westland/Hallmark plant change the procedures? Will the new procedures help ensure safer ground beef?

These final five questions should be discussed individually and cumulatively as part of the Decision Diamond that depicts the trade-offs in the Supply Decision and the Kill Step Decision.

FIGURE 9: The Decision Diamond



Supply Decision is on the horizontal axis. Kill Step Decision is on the vertical axis.

Further Discussion

Irradiation, as discussed in this case study, is just one method for attempting to deliver safer beef to consumers. Another method, injecting beef with ammonia, is discussed in a New York Times article included in Appendix VIII. The article may serve as a beginning point for discussion about the pros and cons (including costs) of various methods of delivering safe foods, as well as about the sometimes conflicting missions of subagencies within the USDA.

Glossary

Boxed Meat: Meat that is cut down from the original carcass into portions called primals and subprimals. These cuts are then vacuum-packaged and boxed. These proportions are cut down upon arrival at retail stores and restaurants.

Case-ready: The broad term for any meat that is packaged in a meat processing plant and ready to be placed directly into display cases upon arrival at a retail store.

Cull Cows: The often spent dairy cows that have been sold off by their dairies when they can no longer produce milk in sufficient quantities to make them profitable.

Downer Animal: Non-ambulatory disabled livestock are livestock that cannot rise from a recumbent position or that cannot walk, including, but not limited to, those with broken appendages, severed tendons or ligaments, nerve paralysis, fractured vertebral column, or metabolic conditions.

Fat Cattle: A class of beef cattle of any age but usually older than one year, judged ready for slaughter to provide prime cuts of beef.

Modified Atmosphere Packaging: Products sold “case-ready” are often sold in packages that have been designed to contain unique mixtures of various gases. This process can help to maintain flavor and color and can prevent spoilage. Certain gases are anti-microbial.

Primals: Cuts of beef such as the chuck, round rib and loin.

Trim: The residuals from cutting primals.

Vacuum-packaged: These products are sold in a tightly sealed packaging from which air has been “vacuumed out.” The removal of oxygen-rich air extends shelf life.

Appendices

I: 2008 Beef Recall Timeline

(source: USDA, Inland Valley Daily Bulletin)

October-November, 2007: An undercover worker from the Humane Society of the United States gets a job with the Westland/Hallmark Meat Co. in Chino and records video of animal abuse.

Dec. 18, 2007: The Humane Society presents video and other evidence of abuse to the San Bernardino County District Attorney's Office.

Jan. 30, 2008: Humane Society releases video depicting abuse. The U.S. Department of Agriculture announces an investigation. Two fast-food chains cut ties with Westland/Hallmark.

Jan. 30: The USDA tells schools across the country to stop serving Westland/Hallmark beef.

Feb. 1: Westland/Hallmark voluntarily ceases operations.

Feb. 4: The USDA pulls its inspectors, effectively closing the Chino factory.

Feb. 8: Criminal charges are filed against two employees of the company alleging animal cruelty and the illegal moving of so-called "downer" cattle, those unable to move on their own.

Feb. 15: The District Attorney's Office files felony animal-cruelty charges against two employees of Westland/Hallmark. The two employees are subsequently arrested.

Feb. 17: The USDA notified States that beef produced by the Hallmark/Westland Meat Packing Company from Feb. 1, 2006, to Feb. 4, 2008 was voluntarily recalled due to regulatory noncompliance.

Feb. 27: The Humane Society sues the USDA over what it says is a legal loophole that allows sick or crippled cattle, called "downers," into the food supply through a rule change in July.

March 5: Steven Mendell, chief executive of Westland/Hallmark, is ordered to appear before the House Energy and Commerce Subcommittee on Oversight on March 12.

Also on March 5, trash trucks dump 155,000 pounds of recalled Westland/Hallmark meat from the Los Angeles Unified School District at the Puente Hills Landfill in Industry.

March 12: Mendell admits to a House of Representatives subcommittee that cattle too sick to stand apparently were forced into the food supply at his plant.

March 20: Daniel Ugarte Navarro, a former pen manager at the Chino plant, pleads not guilty to two counts of felony animal cruelty and three misdemeanor charges of illegal moving of downed cattle.

March 21: Rafael Sanchez Herrera, as part of a plea agreement, admits to three misdemeanors by using a forklift to illegally move cattle that were too sick or injured to stand. The plea also resolves two other unrelated cases against him. Herrera is sentenced to 180 days in jail, two years of probation and a fine.

April 1: The Assembly Public Safety Committee advances legislation that would fine meat packers that sell meat from so-called "downer" cattle, swine, sheep or goats.

April 4: The federal government bills Westland/Hallmark more than \$67 million for expenses associated with the recall.

April 8: Navarro's attorney asks a judge to dismiss the criminal charges against the pen supervisor. A hearing on the request is set for April 17 in Chino Superior Court.

April 17: A judge refuses to dismiss the five felony and three misdemeanor charges against Navarro.

II. Distributors Affected by the Recall

(source: California Department of Health

<www.cdph.ca.gov/HealthInfo/Pages/FDB%20Beef-WestlandHallmarkRecall.aspx>)

888 Foods Retail Distribution
AI Foods Retail Distribution
Burnett and Sons Retail Distribution
Clougherty Packing Retail Distribution
Con Agra Products Retail Distribution
Del Real Retail Distribution
Dolores Canning Retail Distribution
General Mills Progresso Soup Retail Distribution
Jobbers Meat Retail Distribution
Juanitas Retail Distribution
MCI Retail Distribution
Mohawk Retail Distribution
Nestle Retail Distribution
Overhill Farms Retail Distribution
Papanga Foods Retail Distribution
Pocino Foods Retail Distribution
Ricefield Retail Distribution
Richwood Meat Retail Distribution
Rose Shore Retail Distribution
Serv Rite Retail Distribution
Stampede Retail Distribution
Unibright Foods Retail Distribution
White Apron Retail Distribution
Windsor Foods Retail Distribution

III. Deaths and Illnesses Caused by Food Contamination

(source: U.S. News and World Report, “Timeline: Deaths and Illnesses Caused by Food Contamination,” May 20, 2007 <health.usnews.com/usnews/health/articles/070520/28food.timeline.htm> and CDC)

2009

November 2008-early 2009: *Salmonella*-tainted peanut products manufactured by the Peanut Corporation of America and used in many other products sickened hundreds of people in 45 states and might have contributed to nine deaths.

2008

April-August: *Salmonella* sickened 1,442 people in 43 states, the District of Columbia and Canada. The investigation showed that jalapeno peppers were a major source of contamination, that serrano peppers were also a source, and that tomatoes were possibly a source. The infection might have contributed to two deaths. The jalapeno peppers were traced back to distributors in the United States that received produce grown and packed in Mexico.

2007

August 2006–February 2007: *Salmonella*-tainted peanut butter from the Peter Pan and Great Value brands sickened hundreds of people in 44 states.

2006

November–December: 71 people became sick with *E. coli* after eating at Taco Bell restaurants in New Jersey, New York, Pennsylvania and Delaware. The fast-food chain initially blamed its green onion supply, though investigations by the CDC later suggested that lettuce was the source of the problem.

September–October: Prewashed, bagged spinach from Dole was contaminated with *E. coli*. At least 205 consumers fell ill; three died. Investigators traced the strain back to a field in California.

2002

Fall: Pilgrim's Pride recalled over 27 million pounds of frozen and prepared poultry products after *Listeria* was found at one of its Pennsylvania processing plants. Eight people died, and 50 became seriously ill.

1998

The Malt-o-Meal cereal company recalled approximately 3 million pounds of its Toasty-O's cereal after the product was found to contain *Salmonella*. Nearly 200 people, many of them children, got sick.

Hot dogs and lunch meats from Sara Lee became tainted with *Listeria* following mechanical work at the manufacturing plant. At least 15 died, and six miscarriages were attributed to the outbreak. Eighty customers also became seriously ill.

1997

August: After 17 people in Colorado contracted *E. coli* from eating hamburgers, supplier Hudson Foods recalled 25 million pounds of frozen patties.

Spring: The CDC noticed something unusual: Hundreds of Michigan children and schoolteachers were diagnosed with hepatitis A. Investigators discovered that a contaminated shipment of strawberries had been imported the previous year and mislabeled as domestic. The strawberries were used in frozen desserts and served with school lunches. Ultimately, over 9,000 students were vaccinated.

1996

Shipments of Guatemalan raspberries were contaminated with the intestinal parasite *cyclospora*. An estimated 1,500 in the U.S. and Canada became infected before the cause was found. Investigators blamed the problem on unhygienic growing conditions. In response, the U.S. halted importation of the Guatemalan fruit. The ban was partially lifted in 1999.

Mid-1990s

In the past decade, thousands have become sick with food-borne illnesses like *E. coli* and *Salmonella* after eating raw sprouts. Over 22,000 illnesses and two deaths have been traced to these outbreaks. The FDA estimates that 20 percent of all produce-related illnesses are from sprouts and recommends that diners avoid eating the vegetable raw.

1993

January: Four children died and at least 700 became ill after eating hamburgers from Washington state Jack in the Box fast-food restaurants. The meat was tainted with *E. coli*, and the burgers had not been cooked to a high-enough temperature to kill the bacteria..

1985

In one of the first large-scale *Listeria* outbreaks in the United States, shipments of Jalisco's Mexican-style soft cheese were found to contain the bacterium. Eighteen people died, and 30 infant deaths and stillbirths were connected to the contamination.

April: *Salmonella* in milk sickened thousands and killed at least three throughout the Midwest. Investigators cited improper pasteurization at the processing plant.

1984

In Oregon, members of a commune led by guru Bhagwan Shree Rajneesh tried to influence a local land-use vote by spreading *Salmonella* to their neighbors. Members of the group produced the bacterium in a lab and poisoned food at 10 local restaurants. No one died, but 751 people became ill.

IV. History of Beef

(Source: Cattlemen's Beef Board and National Cattlemen's Beef Association)

1493: Christopher Columbus introduces cattle to the Western Hemisphere on his second voyage to the New World.

1519: Hernando Cortez brings first cattle to North American continent, setting up ranches in Mexico. Often the cattle roamed wild and later came to the United States by way of Texas and California. Around the same time, a cattle industry is also emerging in Florida.

1620: An estimated 500-head herd of cattle is established in Virginia; by 1639, there are 30,000.

1625: Cattle from England and northern Europe begin arriving in New York.

1779: First cattle trail in North America, from San Antonio, Texas to the Louisiana Territory.

1805: First recorded Northern cattle drive from Circleville, Ohio. Western farmers seek livestock markets in populous East.

1852: Railroads reach Chicago from East, adding to the westward spread of livestock raising and feeding. Five different railroads establish their own stockyards there.

1862: President Abraham Lincoln creates the USDA to administer agricultural programs. It is called the “people’s department” because farmers make up more than half of the population.

1865: Union Stockyards in Chicago become hub of livestock industry.

1867: Kansas Pacific Railroad reaches Abilene, Kansas, establishing a gateway for Texas trail herds to reach eastern consumer markets. Cattle drives begin. First shipment of cattle from Abilene to Chicago.

1875: Chilled beef is transported from New York to Europe in refrigerated ships, followed by a frozen shipment to England the following year.

1878: Meat packer Gustavus Swift perfects the refrigerated railcar, greatly expanding the market for perishable products.

1880: Western cattle boom begins.

1883: First national gathering of cattlemen called by U.S. Commissioner of Agriculture, George Loring. A permanent organization, The National Cattle Growers Association, is established at a second meeting in 1884.

1884: Along with the establishment of the Bureau of Animal Industry, the Animal and Plant Inspection Service is established as part of USDA.

1886: Worst ever recorded winter for cattle producers, putting many western producers out of business.

1900: First International Livestock Exposition in Chicago.

1904: First livestock auction market opened in Union, Iowa. By 1952, there are 2,500 public auctions.

1904: A reporter for the New York Tribune writes from the St. Louis World's Fair of a new sandwich called a hamburger. Fletcher Davis is credited with inventing the hamburger, which consisted of fried ground beef patties served with hot mustard and sliced onions on homemade bread.

1906: U.S. Food and Drug Administration established to ensure wholesome and truthfully labeled foods; first Food Administrator, Herbert C. Hoover, appointed in 1917.

1906: Upton Sinclair writes "The Jungle"; leads to Meat Inspection Act.

1911: First motor truck delivery of livestock reaches Indianapolis. Prior to that, all livestock were transported via railroad.

1922: National Live Stock and Meat Board ("Meat Board") is founded to conduct meat promotion, research and education efforts funded by a voluntary, per-head checkoff fee collected from livestock producers and voluntarily matched by packers.

1922: First voluntary checkoff deductions of 5 cents per carload (25 head of cattle per car) are requested by the Meat Board.

1926: USDA introduces beef grading standards so packing plants can better meet customer needs for different beef qualities.

1930: Voluntary checkoff deduction rate increases to 25 cents per carload (or 1 cent per head).

1933: First Farm Bill, called the "Agricultural Adjustment Act" passed by Congress to establish and maintain a balance between the production and consumption of agricultural commodities.

1934: Taylor Grazing Act passed to regulate the use of public lands for grazing of cattle and sheep and prevent overgrazing, by leasing public lands to ranchers.

1941: War time price controls are placed on beef; a large "black market" emerges.

1945: "Nutrient Requirements of Beef Cattle" is published providing cattle producers with a guide for feeding cattle.

1947: Beef consumption reaches the highest level in 40 years.

1953: Voluntary checkoff deduction rate increases to 2 cents per head.

1953: "Great Cattle Bust" begins, brought on by drought, grasshoppers and fire. Continues until 1957.

1958: Humane Slaughter Act passed to govern livestock handling procedures in meat packing plants.

1960: Transportation shifts from rail to truck; slaughter operations built near feedyards and moved from centralized city stockyards.

1962: Voluntary checkoff deduction rate increases to 3 cents per head.

1964: Meat Import Act passed; formula limits imports to 6.7 percent of domestic production.

1967: Boxed beef is introduced providing more conveniently sized cuts for retailers and butchers.

1968: Cattle-Fax is established to provide cattle and beef industry statistics and market and economic analysis.

1973: Texas Cattle Feeders Association proposes uniform Beef Checkoff Program. Task force appointed to study proposal.

1978: The Humane Slaughter Act of 1978 dictates strict animal handling and slaughter practices which are closely monitored by government inspectors.

1985: Farm Bill creates Beef Promotion and Research Act establishing the Beef Checkoff Program and enabling cattle producers to create, finance and carry out a coordinated program of research, industry and consumer information and promotion. Beef checkoff collections of \$1 per head begin.

1987: Beef Quality Assurance program officially started to help beef producers meet customer expectations for safety and quality.

1987: American Heart Association endorses beef as a healthy food.

1987: Cattle first sold via satellite in “video auctions.”

1988: Beef producers approve continuation of The Beef Checkoff in a national referendum.

1989: Veal Quality Assurance program initiated.

1991: Beef industry’s Environmental Stewardship Award Program (ESAP) established to provide opportunity to showcase the environmental stewardship and profitable business practices that exist together on progressive farms and ranches.

1994: USDA mandates safe food handling instructions on labels of fresh and frozen meat and poultry items packaged in retail supermarkets.

1994: Beef industry Blue Ribbon Task Force reports on ways to eliminate E. coli O157:H7 in beef.

1996: Beef Quality Assurance Advisory Board develops first structured animal care guidelines known as the “Producer Code of Cattle Care.”

1996: National Cattlemen's Beef Association (NCBA) is formed from a merger of the National Cattlemen’s Association and the Beef Industry Council of the National Live Stock and Meat Board.

1997: Beef producers join with government and other industry groups to fund launch of the Partnership for Food Safety Education and the consumer program, Fight BAC!

1997: Beef Industry Food Safety Council (BIFSCo) formed to develop industry-wide, science-based strategies for addressing E. coli.

1998: Meat packing facilities implement Food and Drug Administration Hazard Analysis and Critical Control Point (HACCP) system aimed at preventing hazards that could cause foodborne illness. The HACCP principles apply science-based means of assuring food safety from harvest to consumption.

1999: Parity study published in Archives of Internal Medicine finds beef works as well as chicken in a cholesterol-lowering diet.

2000: Muscle-profiling study findings presented to industry to help find new, convenient ways of preparing the 39 muscles from the chuck and the round detailed in study.

2001: Flat Iron Steak introduced after research on undervalued cuts of beef finds new ways to cut the steaks from the chuck.

2002: USDA national standards for organically grown agriculture products implemented.

2002: Task force organized to develop a plan of work for creating a national animal identification program.

2003: Bovine genome sequencing project initiated. Researchers announce first phase of sequencing work complete in 2004.

2003: Industry leaders approve expanded version of “Guidelines for the Care and Handling of Cattle.”

2004: Carcass Merit project completed, validating DNA markers for economically important carcass and consumer satisfaction traits.

2005: USDA announces E. coli O157:H7 prevalence dropped by more than 80 percent in four years.

2005: Nutrient database shows 29 cuts of beef meet government guidelines for lean.

V. Stages in Beef Production

(Source: Cattlemen's Beef Board and National Cattlemen's Beef Association)

Birth

Cattle have a nine-month gestation period, and while calves can be born year round, many ranchers plan calving for the spring of each year. Especially in colder climates, this ensures that calves are strong enough to handle harsh winters. Calves remain with their mothers for the first several months of life on farms or ranches.

Cow-calf operation

Most beef calves are born on cow-calf operations. These are farms and ranches like those you may see along highways and country roads. During this stage, cattle graze in herds on large pastures within sight of their mothers.

Most cattle farms and ranches are family owned and operated and daily life revolves around caring for the animals, pastures, barns and fence-lines. For many producers, raising cattle is a family tradition passed down through generations.

Weaning

As calves reach six to 10 months of age, they are weaned from their mothers. Weaned male calves (steers) may graze until about one year old (yearlings) and then be sold to a cattle feeder or a stocker/backgrounder who will prepare the animal for the feedlot.

Livestock auction markets

Most cow-calf operators sell their weaned calves to the highest bidder at livestock auction markets, where calves are bought by cattle producers called stockers and backgrounders. There are approximately 815 fixed auction facilities throughout rural America, according to the U.S. Department of Agriculture (USDA).

Stockers and backgrounding

As weanlings, cattle may be transferred from cow-calf operations to backgrounders or stockers. Like cow-calf operations, these are mostly family-owned ranches and farms where cattle graze on pasture or start receiving grain to supplement their diets. Once most cattle reach approximately 12-18 months of age, they are taken to a feedlot.

Arrival at the feedlot

When cattle arrive at a feedlot, they are carefully unloaded and led through a processing barn, where they are tagged for identification purposes, vaccinated and entered into the operation's record-keeping system. Before being grouped into pens by age, the animals may receive a growth promotant.

Most growth promotants are administered in the form of a small pellet placed under the skin behind an animal's ear. It releases tiny amounts of hormone and safely dissolves as the treatment is completed. Most growth promotants contain naturally occurring hormones like estrogen. Growth promoting hormones help cattle build more muscle – producing a leaner beef product for consumers. Growth promoting products are approved by the Food and Drug Administration (FDA) after rigorous scientific tests, similar to those required for human medications, and their use in cattle production has been declared safe by scientific organizations worldwide.

Life at the feedlot

Feedlots look different than cow-calf and backgrounding operations because cattle do not graze on pasture. Rather, they typically are separated into herds of 100 animals and live in pens that allow about 125 to 250 square feet of room per animal. Cattle usually spend four to six months in a feedlot, during which they are fed a scientifically formulated ration averaging 70 percent to 90 percent grain, and have constant access to water.

Environmental factors such as water quality, air quality and land utilization are monitored and managed in feedlots daily. Operators are not only responsible for constantly monitoring the health and well-being of cattle, but also for protecting the environment. In fact, most large feedlots have environmental engineers on staff or on contract to ensure the operation is in compliance with the strict Environmental Protection Agency regulations that govern concentrated animal feeding operations.

Animal care at the feedlot

Cattle can become ill at the feedlot because of changes in weather and geographic location, and mingling with other cattle that come from a variety of operations. For this reason, feedlot veterinarians may take preventive measures and give cattle vitamin supplements, vaccinations and parasite treatments to maintain their health. Similar to other stages of production, sick cattle may be given antibiotics and moved into a separate hospital pen away from their herdmates for treatment. This prevents the spread of illness and allows feedlot operators to closely monitor the animal's health.

Transportation

Once cattle have reached 18 to 22 months old or weigh between 1,100 and 1,250 pounds, they are typically considered "finished" and are transported to packing plants to be slaughtered and processed. Precautions during transportation minimize stress and injury to the animals. Cattle are carefully loaded and unloaded into trailers that are specially designed to avoid injury and strain.

Arriving at the packing plant

When cattle arrive at packing plants, they are moved inside in a quiet and orderly manner. There is little excess movement or unnecessary noise so cattle are not unduly stressed. Packing plant technicians then use a mechanical stunning device to quickly and effectively render animals unconscious.

The slaughter process has evolved over the years based on scientific research to ensure both humane animal treatment and the production of safe food. The Humane Slaughter Act (passed in 1958 and updated in 1978 and 2002) dictates strict animal handling and slaughtering standards for packing plants. These facilities are under continuous federal inspection, with Food Safety and Inspection Service (FSIS) personnel present in plants to ensure compliance with all regulations.

Safety inspections/federal regulations

There are a number of interventions in place that decrease and attempt to eliminate potential food safety concerns at packing plants. Because this is the last stage before beef is packaged, plants use multiple interventions to ensure that products are safe.

USDA inspectors oversee the slaughter practices, food safety interventions and carcass grading that take place at packing plants. To grade carcasses, inspectors evaluate characteristics including marbling (distribution of internal flecks of fat, contributing to tenderness and taste) and the age of the animal.

Fabrication

When beef leaves the packing plant, it is in the form of large sections, either primals, like the chuck, round rib and loin, or subprimals which are smaller cuts of meat such as the bottom round, top round, eye round and round tip. Some plants sell subprimals to meat processing facilities where workers skillfully break them down into individual steaks and roasts that are sent to supermarkets and restaurants.

Supermarkets and restaurants

Retailers and foodservice operators sell beef products in supermarkets and restaurants, where steps are taken to ensure the final safety and quality of the products. Ultimately, consumers dictate the actions of the beef production chain, from pasture to plate, by determining what kinds of beef they will buy and at what price.

Beef producers read demand signals from the meat case and customers throughout the production chain. For instance, beef cattle are now much leaner than just a decade ago as a result of the consumer demand for products with less fat. Consequently, there are now 29 cuts of beef that meet government guidelines for lean, such as the tenderloin, sirloin and 95% lean ground beef. (sic)

VI. A Closer Look at Ground Beef

(Source: USDA, "USDA Fact Sheet/Meat Preparation/Ground Beef," June 2002)

Questions about "ground meat" or "hamburger" have always been in the top five food topics of calls to the USDA's Meat and Poultry Hotline. Here are the most frequently asked questions.

What's the difference between "hamburger" and "ground beef"?

Beef fat may be added to "hamburger," but not "ground beef," if the meat is ground and packaged at a USDA-inspected plant. A maximum of 30% fat by weight is allowed in either hamburger or ground beef. Both hamburger and ground beef can have seasonings, but no water, phosphates, extenders, or binders added. They must be labeled in accordance with Federal Standards and Labeling Policy and marked with a USDA-inspected label.

Most ground beef is ground and packaged in local stores rather than in food processing plants under USDA inspection. Even so, the Federal labeling laws on fat content apply. Most states and cities set standards for store-packaged ground beef which, by law, cannot be less than Federal standards. If products in retail stores were found to contain more than 30% fat by weight, they would be considered "adulterated" under Federal law.

Is ground beef inspected and graded?

All meat transported and sold in interstate commerce must be federally inspected. The larger cuts are usually shipped to local stores where they are ground. The Food Safety and Inspection Service carries out USDA's responsibilities under the Federal Meat Inspection Act. These laws protect consumers by ensuring that meat products are wholesome, unadulterated, and properly marked, labeled, and packaged.

For meat being transported and sold within a state, state inspection would apply. State inspection programs must enforce requirements at least equal to those of Federal inspection laws.

Grades are assigned as a standard of quality only. It is voluntary for a company to hire a Federal inspector to certify the quality of its product. Beef grades are USDA Prime, Choice, Select, Standard, Commercial, Utility, Cutter, and Canner. They are set by the USDA Agricultural Marketing Service. Most ground beef is not graded.

From what cuts of beef are ground beef and hamburger made?

Generally, ground beef is made from the less tender and less popular cuts of beef. Trimmings from more tender cuts may also be used. Grinding tenderizes the meat and the fat reduces its dryness and improves flavor.

What is the significance of the "Sell-By" date on the package?

"Sell-By" dates are a guide for retailers. Although many products bear "Sell-By" dates, product dating is not a Federal requirement. While these dates are helpful to the retailer, they are reliable only if the food has been kept at proper temperature during storage and handling. USDA suggests that consumers cook or freeze ground beef within 2 days after purchase for maximum quality.

What is the safe food handling label now on meat and poultry packages?

A safe food handling label should be on all raw or partially precooked (not ready-to-eat) meat and poultry packages. The label tells the consumer how to safely store, prepare, and handle raw meat and poultry products in the home.

What kind of bacteria can be in ground beef? Are they dangerous?

Bacteria are everywhere in our environment. Any food of animal origin can harbor bacteria. Pathogenic bacteria, such as Salmonella, Escherichia coli O157:H7, Campylobacter jejuni, Listeria monocytogenes, and Staphylococcus aureus, cause illness. These harmful bacteria can not be seen or smelled.

When meat is ground, more of the meat is exposed to the harmful bacteria. Bacteria multiply rapidly in the "Danger Zone" — temperatures between 40 and 140 °F. To keep bacterial levels low, store ground beef at 40 °F or less and use within 2 days, or freeze. To destroy harmful bacteria, cook ground beef to 160 °F.

Other bacteria cause spoilage. Spoilage bacteria are generally not harmful, but they will cause food to deteriorate or lose quality by developing a bad odor or feeling sticky on the outside.

Why is the E. coli O157:H7 bacterium of special concern in ground beef?

E. coli O157:H7 can colonize in the intestines of animals, which could contaminate muscle meat at slaughter.

O157:H7 is a strain of E. coli that produces large quantities of a potent toxin that forms in the intestine and causes severe damage to the lining of the intestine. The disease produced by the bacteria is called Hemorrhagic Colitis.

E. coli O157:H7 survive refrigerator and freezer temperatures. Once they get in food, they can multiply very slowly at temperatures as low as 44 °F. The actual infectious dose is unknown, but most scientists believe it takes only a small number of this strain of E. coli to cause serious illness and even death, especially in children. It is killed by thorough cooking.

Illnesses caused by E. coli O157:H7 have been linked with the consumption of undercooked ground beef. Raw milk, apple cider, dry cured sausage, and undercooked roast beef have also been implicated.

Can bacteria spread from one surface to another?

Yes. It is called cross-contamination. Bacteria in raw meat juices can contaminate foods that have been cooked safely or raw foods that won't be cooked, such as salad ingredients. Bacteria can also be present on equipment, hands, and even in the air.

To avoid cross-contamination, wash your hands with soap and hot water before and after handling ground beef to make sure you don't spread bacteria. Don't reuse any packaging materials. Use soap and hot water to wash utensils and surfaces which have come into contact with the raw meat. Don't put cooked hamburgers on the same platter that held the raw patties.

What's the best way to handle raw ground beef when I buy it?

At the store, choose a package that is not torn and feels cold. If possible, enclose it in a plastic bag so leaking juices won't drip on other foods. Make ground beef one of the last items to go into your shopping cart. Separate raw meat from ready-cooked items in your cart. Have the clerk bag raw meat, poultry, and fish separately from other items.

Plan to drive directly home from the grocery store. You may want to take a cooler with ice for perishables.

How should raw ground beef be stored at home?

Refrigerate or freeze ground beef as soon as possible after purchase. This preserves freshness and slows growth of bacteria. It can be refrigerated or frozen in its original packaging if the meat will be used soon.

If refrigerated, keep at 40 °F or below and use within 1 or 2 days.

For longer freezer storage, wrap in heavy duty plastic wrap, aluminum foil, freezer paper, or plastic bags made for freezing. Ground beef is safe indefinitely if kept frozen, but will lose quality over time. It is best if used within 4 months. Mark your packages with the date they were placed in the freezer so you can keep track of storage times.

What is the best way to thaw ground beef?

The best way to safely thaw ground beef is in the refrigerator. Keeping meat cold while it is defrosting is essential to prevent growth of bacteria. Cook or refreeze it within 1 or 2 days.

To defrost ground beef more rapidly, you can defrost in the microwave oven or in cold water. If using the microwave, cook the ground beef immediately because some areas may begin to cook during the defrosting. To defrost in cold water, put the meat in a watertight plastic bag and submerge. Change the water every 30 minutes. Cook immediately. Do not refreeze ground meat thawed in cold water or in the microwave oven.

Never leave ground beef or any perishable food out at room temperature for more than 2 hours.

Is it dangerous to eat raw or undercooked ground beef?

Yes. Raw and undercooked meat may contain harmful bacteria. USDA recommends not eating or tasting raw or undercooked ground beef. To be sure all bacteria are destroyed, cook meat loaf, meatballs, casseroles, and hamburgers to 160 °F. Use a food thermometer to check that they have reached a safe internal temperature.

Are there people who are more at risk from eating ground beef that is undercooked or mishandled?

The very young, the very old, and those with immune systems that have been weakened by cancer, kidney disease, and other illnesses are most at risk and vulnerable to illnesses associated with contaminated food. The symptoms of foodborne illness — such as diarrhea or vomiting, which can cause dehydration — can be very serious. Safe food handling practices at home or anywhere food is served is especially important for those in the "at-risk" group.

Are microwaved hamburgers safe?

Yes, if cooked properly to destroy harmful bacteria. Since microwaves may not cook food as evenly as conventional methods, covering hamburgers while cooking will help them heat more evenly. Turn each patty over and rotate midway through cooking. Allow patties to stand 1 or 2 minutes to complete cooking. Then use a food thermometer to check that the internal temperature is 160 °F.

Is it safe to partially cook ground beef to use later?

No. Partial cooking of food ahead of time allows harmful bacteria to survive and multiply to the point that subsequent cooking cannot destroy them.

Can I refrigerate or freeze leftover cooked hamburgers? How should they be reheated?

If ground beef is refrigerated promptly after cooking (within 2 hours; 1 hour if the temperature is above 90 °F), it can be safely refrigerated for about 3 or 4 days. If frozen, it should keep its quality for about 4 months.

When reheating fully cooked patties or casseroles containing ground beef, be sure the internal temperature reaches 165 °F or it is hot and steaming.

Why is pre-packaged ground beef red on the outside and sometimes dull, grayish-brown inside?

Oxygen from the air reacts with meat pigments to form a bright red color which is usually seen on the surface of meat purchased in the supermarket. The pigment responsible for the red color in meat is oxymyoglobin, a substance found in all warm-blooded animals. Fresh cut meat is purplish in color. The interior of the meat may be grayish brown due to lack of oxygen; however, if all the meat in the package has turned gray or brown, it may be beginning to spoil.

Why does ground beef release a lot of "juice" while cooking?

In making ground beef, some retail stores grind the meat while it is still frozen. Ice crystals in the frozen meat break down the cell walls, permitting the release of meat juices during cooking. The same thing happens after ground meat is frozen at home.

What causes ground beef patties to shrink while cooking?

All meat will shrink in size and weight during cooking. The amount of shrinkage will depend on its fat and moisture content, the temperature at which the meat is cooked, and how long it is cooked. Basically, the higher the cooking temperature, the greater the shrinkage. Cooking ground beef at moderate temperatures will reduce shrinkage and help retain juices and flavor. Overcooking draws out more fat and juices from ground beef, resulting in a dry, less tasty product.

(sic)

VII. A Closer Look at the USDA and the FSIS

(source: USDA <www.usda.gov/wps/portal/!ut/p/_s.7_0_A/7_0_1OB?contentidonly=true&contentid=2008/02/0055.xml>

THE FOOD SAFETY AND INSPECTION SERVICE

•USDA's Food Safety and Inspection Service (FSIS) is responsible for ensuring the safety and wholesomeness of meat, poultry, and processed egg products and ensures accurate labeling.

•FSIS enforces the Federal Meat Inspection Act, the Poultry Products Inspection Act and the Egg Products Inspection Act. These laws require Federal inspection and regulation of meat, poultry, and processed egg products prepared for distribution in commerce for use as human food. FSIS also verifies

compliance with the Humane Methods of Slaughter Act for livestock. This statute is enforced through the Federal Meat Inspection Act.

- FSIS employs about 7,800 in plant inspection program personnel. They inspect more than 6,200 federally inspected establishments. These establishments vary greatly in size and type of activity conducted.

INSPECTION BASICS

- Industry is accountable for producing safe food.

- Government is responsible for conducting inspections on each animal carcass, setting appropriate food safety standards, verifying those safety standards through inspection, and maintaining a strong enforcement program when plants do not meet these standards.

- Slaughter facilities cannot conduct slaughter operations if FSIS inspection personnel are not present.

- Only federally inspected establishments can produce products that are destined to enter interstate commerce or for export to foreign countries.

- To receive Federal inspection, an establishment must receive an official Grant of Inspection. To obtain this, an establishment must have Sanitation Standard Operating Procedures, conduct a hazard analysis, develop and validate a Hazard Analysis and Critical Control Point (HACCP) Plan, and agree to abide by all FSIS regulations.

- FSIS conducts carcass-by-carcass inspection at all federally inspected slaughter facilities and verifies that establishments follow all food safety and humane handling regulations.

- FSIS inspection program personnel verify that the establishment maintains proper sanitation procedures, also that the establishment follows its HACCP plan and complies with all FSIS regulations pertaining to slaughter and processing operations.

- If the establishment fails to maintain sanitation, does not follow its HACCP plan or violates other regulations, FSIS inspection program personnel will issue a citation to the establishment documented as a “noncompliance record.” If necessary, inspectors can also take regulatory control actions.

- Livestock slaughter and processing establishments must maintain written procedures for removing, segregating and disposing of specified risk materials (SRMs) to prevent their entry into the food supply.

- SRMs are high-risk tissues that could carry the material associated with bovine spongiform encephalopathy (also known as BSE or “mad cow disease”).

- Some examples of SRMs are the brain, skull, eyes, trigeminal ganglia, spinal cord, vertebral column, and dorsal root ganglia of cattle 30 months of age and older; the tonsils of all cattle; and the distal ileum of all cattle.

INSPECTING ANIMALS

Arrival of live animals

- Establishments are required to notify FSIS for the inspection of animals prior to slaughter.

- Inspection at a slaughter establishment begins in an area or pen where FSIS inspection program personnel review live animals that arrive before slaughter.
- An establishment has the responsibility to follow the Humane Methods of Slaughter Act. Egregious violations of humane handling requirements would lead to suspension of FSIS inspection activity, and prevent the plant from operating.
- Less egregious noncompliance for humane handling — such as not having water available for the animals in their pens — are also violations which are recorded.
- During animal inspection, all animals are viewed at rest and in motion for abnormalities as well as indications of disease or health conditions that would prohibit the animal from entering the food supply.
- The law requires that if an animal goes down or shows signs of illness after receiving and passing inspection before slaughter, the establishment must immediately notify the FSIS veterinarian to make a case-by-case disposition of the animal's condition. Or, the establishment may humanely euthanize the animal.
- The FSIS veterinarian may determine the animals are to be labeled “U.S. Suspect” and keep them segregated for additional examination by an FSIS veterinarian.
- FSIS veterinarians and other inspection personnel review the day's supply of animals brought to slaughter, and then randomly return to the holding area to verify humane handling, as well as during the slaughter process where the animals are stunned and then bled.
- FSIS inspectors are not confined to the slaughter line and may also work “off-line” around many areas throughout the facility once they have completed live animal inspections.

Review of the carcass and examination of the meat

- FSIS inspectors stationed at fixed positions along the slaughter line are known as “on-line” inspectors who look for signs of disease or pathological conditions that would render a carcass or even a portion of the carcass as unwholesome or unfit for human consumption.
- Any carcass in need of further diagnosis or disposition is segregated and the veterinarian is summoned.
- The establishment must maintain the identity of every carcass and ensure that the segregated carcasses do not enter the food supply unless passed without restriction by FSIS inspectors.
- Only if FSIS inspectors determine a carcass is without general signs of disease or pathological condition, it can be passed without restriction and may enter the food supply. Partial and limited conditions in the carcass must be removed, or the carcass is not permitted into the food supply.
- “Off-line” FSIS inspectors also review sanitary conditions in other areas of the facility — such as where hides are removed — even though some functions are not directly related to carcass inspection.

VIII: Selected Readings on the Beef Recall and Ground Beef Safety

Safety of Beef Processing Method Is Questioned

By MICHAEL MOSS, New York Times, Dec. 31, 2009. page A1

Eight years ago, federal officials were struggling to remove potentially deadly E. coli from hamburgers when an entrepreneurial company from South Dakota came up with a novel idea: injecting beef with ammonia.

The company, Beef Products Inc., had been looking to expand into the hamburger business with a product made from beef that included fatty trimmings the industry once relegated to pet food and cooking oil. The trimmings were particularly susceptible to contamination, but a study commissioned by the company showed that the ammonia process would kill E. coli as well as salmonella.

Officials at the United States Department of Agriculture endorsed the company's ammonia treatment, and have said it destroys E. coli "to an undetectable level." They decided it was so effective that in 2007, when the department began routine testing of meat used in hamburger sold to the general public, they exempted Beef Products.

With the U.S.D.A.'s stamp of approval, the company's processed beef has become a mainstay in America's hamburgers. McDonald's, Burger King and other fast-food giants use it as a component in ground beef, as do grocery chains. The federal school lunch program used an estimated 5.5 million pounds of the processed beef last year alone.

But government and industry records obtained by The New York Times show that in testing for the school lunch program, E. coli and salmonella pathogens have been found dozens of times in Beef Products meat, challenging claims by the company and the U.S.D.A. about the effectiveness of the treatment. Since 2005, E. coli has been found 3 times and salmonella 48 times, including back-to-back incidents in August in which two 27,000-pound batches were found to be contaminated. The meat was caught before reaching lunch-rooms trays.

In July, school lunch officials temporarily banned their hamburger makers from using meat from a Beef Products facility in Kansas because of salmonella — the third suspension in three years, records show. Yet the facility remained approved by the U.S.D.A. for other customers.

Presented by The Times with the school lunch test results, top department officials said they were not aware of what their colleagues in the lunch program had been finding for years.

In response, the agriculture department said it was revoking Beef Products' exemption from routine testing and conducting a review of the company's operations and research. The department said it was also reversing its policy for handling Beef Products during pathogen outbreaks. Since it was seen as pathogen-free, the processed beef was excluded from recalls, even when it was an ingredient in hamburgers found to be contaminated.

The Beef Products case reveals a schism between the main Department of Agriculture and its division that oversees the school lunch program, a divide that underscores the government's faltering effort to make hamburger safe. The U.S.D.A. banned the sale of meat found to be contaminated with the O157:H7 strain of E. coli 15 years ago, after a deadly outbreak was traced to Jack in the Box restaurants. Meat tainted with salmonella is also a hazard. But while the school lunch program will not buy meat contaminated with salmonella, the agriculture department does not ban its sale to the general public.

Even so, E. coli outbreaks nationwide have increased in recent years. And this summer, two outbreaks of particularly virulent strains of salmonella in hamburger prompted large recalls of ground beef across several states.

Although no outbreak has been tied to Beef Products, officials said they would thoroughly scrutinize any future industry innovations for fighting contamination “to ensure that they are scientifically sound and protect public health,” and that they were examining the government’s overall meat safety policies.

The founder and owner of Beef Products, Eldon N. Roth, declined requests for interviews or access to the company’s production facilities. Responding to written questions, Beef Products said it had a deep commitment to hamburger safety and was continually refining its operation to provide the safest product possible. “B.P.I.’s track record demonstrates the progress B.P.I. has made compared to the industry norm,” the company said. “Like any responsible member of the meat industry, we are not perfect.”

Beef Products maintains that its ammonia process remains effective. It said it tests samples of each batch it ships to customers and has found E. coli in only 0.06 percent of the samples this year.

The company says its processed beef, a mashlike substance frozen into blocks or chips, is used in a majority of the hamburger sold nationwide. But it has remained little known outside industry and government circles. Federal officials agreed to the company’s request that the ammonia be classified as a “processing agent” and not an ingredient that would be listed on labels.

Within the U.S.D.A., the treated beef has been a source of friction for years. The department accepted the company’s own study as evidence that the treatment was effective. School lunch officials, who had some doubts about its effectiveness, required that Beef Products meat be tested, as they do all beef used by the program.

School lunch officials said that in some years Beef Products testing results were worse than many of the program’s two dozen other suppliers, which use traditional meat processing methods. From 2005 to 2009, Beef Products had a rate of 36 positive results for salmonella per 1,000 tests, compared to a rate of nine positive results per 1,000 tests for the other suppliers, according to statistics from the program. Beef Products said its testing regime was more likely to detect contamination.

Despite some misgivings, school lunch officials say they use Beef Products because its price is substantially lower than ordinary meat trimmings, saving about \$1 million a year.

Another snapshot of processed beef’s performance emerges from confidential records of tests in 2007 by the food giant Cargill. In the preceding year and a half, Cargill, which used more than 50 vendors, suspended three facilities for excessive salmonella; two were Beef Products plants, records show.

Since introducing the treated meat, Beef Products has faced the challenge of balancing safety with taste, records and interviews show.

Pathogens died when enough ammonia was used to raise the alkalinity of the beef to a high level, company research found. But early on, school lunch officials and other customers complained about the taste and smell of the beef. Samples of the processed beef obtained by The Times revealed lower levels of alkalinity, suggesting less ammonia was used.

Beef Products acknowledged lowering the alkalinity, and the U.S.D.A. said it had determined that “at least some of B.P.I.’s product was no longer receiving the full lethality treatment.”

Beef Products said it had submitted new research to the agriculture department showing that its treatment remained effective with lower alkalinity. Agriculture officials said Beef Products' latest study is under review.

A Safety Solution

Headstrong and self-assured, Eldon N. Roth had the good fortune of being in the right place at the right time.

Mr. Roth spent the 1990s looking to give Beef Products a competitive edge by turning fatty slaughterhouse trimmings into usable lean beef.

Mr. Roth and others in the industry had discovered that liquefying the fat and extracting the protein from the trimmings in a centrifuge resulted in a lean product that was desirable to hamburger-makers.

The greater challenge was eliminating *E. coli* and salmonella, which are more prevalent in fatty trimmings than in higher grades of beef. According to a 2003 study financed by Beef Products, the trimmings "typically includes most of the material from the outer surfaces of the carcass" and contains "larger microbiological populations." Beef Products said it also used trimmings from inside cuts of meat.

Mr. Roth was well suited to tackle the problem, friends say. Though lacking a science background, he had a knack for machinery and obtained patents for over two dozen pieces of equipment and methods used in processing beef.

"He looked and looked at stuff and always wondered, why can't it be done this way?" said Dr. David M. Theno, a food safety consultant and friend of Mr. Roth. "He is like a lot of inventors. Not everyone sees Eldon's vision."

One of Mr. Roth's early trials involved running electricity through the trimmings to kill bacteria, Dr. Theno and others said. Mr. Roth eventually settled on ammonia, which had been shown to suppress spoilage. Meat is sent through pipes where it is exposed to ammonia gas, and then flash frozen and compressed — all steps that help kill pathogens, company research found.

The treated beef landed in Washington in 2001, when federal officials were searching for ways to eliminate *E. coli*. Beef Products already had one study showing its treatment would do that; another company-sponsored study by an Iowa State University professor that was published in a professional journal seconded that finding.

Mr. Roth asserted that his product would kill pathogens in untreated meat when it was used as an ingredient in ground beef — raising the prospect of a risk-free burger. "Given the technology, we firmly believe that the two pathogens of major concern in raw ground beef — *E. coli* O157:H7 and salmonella — are on the verge of elimination," Mr. Roth wrote to the department.

The Food and Drug Administration signed off on the use of ammonia, concluding it was safe when used as a processing agent in foods. This year, a top official with the U.S.D.A.'s Food Safety and Inspection Service said, "It eliminates *E. coli* to the same degree as if you cooked the product."

Carl S. Custer, a former U.S.D.A. microbiologist, said he and other scientists were concerned that the department had approved the treated beef for sale without obtaining independent validation of the potential safety risk. Another department microbiologist, Gerald Zirnstein, called the processed beef "pink

slime" in a 2002 e-mail message to colleagues and said, "I do not consider the stuff to be ground beef, and I consider allowing it in ground beef to be a form of fraudulent labeling."

One of the toughest hurdles for Beef Products was the Agricultural Marketing Service, the U.S.D.A. division that buys food for school lunches. Officials cited complaints about the odor, and wrote in a 2002 memorandum that they had "to determine if the addition of ammonia to the product is in the best interest to A.M.S. from a quality standpoint."

"It is our contention," the memo added, "that product should be labeled accordingly."

Represented by Dennis R. Johnson, a top lawyer and lobbyist for the meat industry, Beef Products prevailed on the question of whether ammonia should be listed as an ingredient, arguing that the government had just decided against requiring another company to list a chemical used in treating poultry.

School lunch officials said they ultimately agreed to use the treated meat because it shaved about 3 cents off the cost of making a pound of ground beef. "Several packers have unofficially raised concern regarding the use of the product since the perception of quality is inferior," the 2002 memo said. "But will use product to obtain lower bid."

In 2004, lunch officials increased the amount of Beef Products meat allowed in its hamburgers to 15 percent, from 10 percent, to increase savings. In a taste test at the time, some school children favored burgers with higher amounts of processed beef.

Beef Products does not disclose its earnings, but its reported production of seven million pounds a week would generate about \$440 million in annual revenue, according to industry records.

Dr. Theno, the food safety consultant, applauds Mr. Roth for figuring out how to convert high-fat trimmings "with no functional value."

"There were some issues with that," Dr. Theno said. "But he, and God bless him, amassed a tidy fortune for it."

As sales took off, Mr. Roth started offering a buy-back guarantee: If any of the most virulent E. coli was found in ground beef containing Beef Products meat, the company would buy the tainted meat.

This was based on Mr. Roth's initial prediction that his treated beef could kill E. coli in any meat it was mixed with. The company acknowledges that its subsequent study found no evidence to back that up, although it says it is now trying with an enhanced treatment. The guarantee remains on the company Web site: "Contact a B.P.I. sales representative today to take the challenge!"

Odor and Alkalinity

As suppliers of national restaurant chains and government-financed programs were buying Beef Product meat to use in ground beef, complaints about its pungent odor began to emerge.

In early 2003, officials in Georgia returned nearly 7,000 pounds to Beef Products after cooks who were making meatloaf for state prisoners detected a "very strong odor of ammonia" in 60-pound blocks of the trimmings, state records show.

"It was frozen, but you could still smell ammonia," said Dr. Charles Tant, a Georgia agriculture department official. "I've never seen anything like it."

Unaware that the meat was treated with ammonia — since it was not on the label — Georgia officials assumed it was accidentally contaminated and alerted the agriculture department. In their complaint, the officials noted that the level of ammonia in the beef was similar to levels found in contamination incidents involving chicken and milk that had sickened schoolchildren.

Beef Products said the ammonia did not pose a danger and would be diluted when its beef was mixed with other meat. The U.S.D.A. accepted Beef Product's conclusion, but other customers had also complained about the smell.

Untreated beef naturally contains ammonia and is typically about 6 on the pH scale, near that of rain water and milk. The Beef Products' study that won U.S.D.A. approval used an ammonia treatment that raised the pH of the meat to as high as 10, an alkalinity well beyond the range of most foods. The company's 2003 study cited the "potential issues surrounding the palatability of a pH-9.5 product."

Soon after getting initial approval from the agriculture department, the company devised a plan to make a less alkaline version of the beef, internal company documents show. Beef Products acknowledged in an e-mail exchange that it was making a lower pH version, but did not specify the level or when it began selling it.

In 2008, after the school lunch program temporarily suspended a Beef Products plant for salmonella contamination, the company wrote in a letter that its effort to combat ammonia "aroma" might have reduced the alkalinity below the initial target levels. It said it was taking steps to ensure that the alkalinity remained elevated.

Samples of the treated beef obtained by The Times this month showed a pH as low as 7.75, according to an analysis by two laboratories. Dr. Michael P. Doyle, a food industry consultant and director of the Center for Food Safety at the University of Georgia, said one point on the exponential pH scale was a considerable difference, and "could have a significant effect on the antimicrobial effectiveness of the ammonia."

This month, Beef Products provided The Times with new research that the company said showed that *E. coli* and salmonella were undetectable at a pH level of 8.5. The agriculture department said it did not learn that Beef Products was using lower levels until October, after inquiries by The Times, and that it was studying the company's research.

McDonald's, whose hamburgers have contained Beef Products meat since 2004, declined to say if it monitored it for pH. But Danya Proud, a chain spokeswoman, said, "We expect the pH level to meet the specifications that are approved by the U.S.D.A."

Contamination and Notification

At 6:36 a.m. on Aug. 10, the Beef Products plant in South Sioux City, Neb., started up its production line for the school lunch program. In 60 minutes, the plant produced a batch of 26,880 pounds of processed beef that tested positive for *E. coli*.

Six days later at the same plant, another 26,880-pound lot was found to have salmonella, government records and interviews show.

Within hours of confirming the contamination, the school lunch division of the Agriculture Department in Washington began investigating.

Just down the hall at department headquarters, the division that oversees meat for the general public did not conduct its own inquiry for another month and half, after receiving questions from The Times.

The problems in South Sioux City came shortly after school lunch officials had suspended a Beef Products plant in Holcomb, Kan., for excessive salmonella. The main U.S.D.A. was not notified of the suspension by school lunch officials, and the plant continued to supply other customers.

Agriculture Secretary Tom Vilsack has since directed school lunch officials to share information about their suspensions with the department's meat safety division.

In addressing the latest contamination cases in Nebraska, Beef Products said it suspected a glitch in its treatment operations, referring to ammonia gas by its chemical name, NH₃, according to an e-mail message to school lunch officials.

"The system was stopped for two minutes in order to install a new valve," the company said. "When the system was restarted, there was product flow for approximately one minute without NH₃ flow."

After the school lunch officials replied that the glitch might explain only one of the two episodes, Beef Products shifted focus to its suppliers, saying it would more closely scrutinize them for contamination.

Under the U.S.D.A.'s new policy for Beef Products, the company itself is also likely to get more scrutiny.

Cargill, one of the nation's largest hamburger makers, is a big buyer of Beef Products' ammoniated trimmings for its patties. Company records show that Beef Products, like other suppliers, has periodically exceeded Cargill's limits on acceptable bacteria levels. That led Cargill to stop buying meat from two Beef Products plants for several months in 2006 after company tests showed excessive levels of salmonella.

But the following year, when Cargill faced an E. coli outbreak, it ruled out Beef Products as a possible culprit, citing the U.S.D.A.'s view that the ammonia treatment provided a "lethality step" for the pathogen. In addition, Cargill officials said recently, they suspect that another supplier, not Beef Products, was the problem. As a result, Beef Products did not face as wide a recall as other Cargill suppliers.

Recently, another E. coli outbreak was traced to a hamburger maker in upstate New York that also used multiple suppliers, including Beef Products. This time, the agriculture department said Beef Products was being recalled with other suppliers, although a source of the contamination had not been identified.

"This will continue to be our approach going forward," the department said.

Griff Palmer contributed reporting.

E. Coli Path Shows Flaws in Beef Inspection

By MICHAEL MOSS, New York Times, Oct. 4, 2009. page A1

Stephanie Smith, a children's dance instructor, thought she had a stomach virus. The aches and cramping were tolerable that first day, and she finished her classes.

Then her diarrhea turned bloody. Her kidneys shut down. Seizures knocked her unconscious. The convulsions grew so relentless that doctors had to put her in a coma for nine weeks. When she emerged, she could no longer walk. The affliction had ravaged her nervous system and left her paralyzed.

Ms. Smith, 22, was found to have a severe form of food-borne illness caused by *E. coli*, which Minnesota officials traced to the hamburger that her mother had grilled for their Sunday dinner in early fall 2007.

“I ask myself every day, ‘Why me?’ and ‘Why from a hamburger?’ ”Ms. Smith said. In the simplest terms, she ran out of luck in a food-safety game of chance whose rules and risks are not widely known.

Meat companies and grocers have been barred from selling ground beef tainted by the virulent strain of *E. coli* known as O157:H7 since 1994, after an outbreak at Jack in the Box restaurants left four children dead. Yet tens of thousands of people are still sickened annually by this pathogen, federal health officials estimate, with hamburger being the biggest culprit. Ground beef has been blamed for 16 outbreaks in the last three years alone, including the one that left Ms. Smith paralyzed from the waist down. This summer, contamination led to the recall of beef from nearly 3,000 grocers in 41 states.

Ms. Smith’s reaction to the virulent strain of *E. coli* was extreme, but tracing the story of her burger, through interviews and government and corporate records obtained by The New York Times, shows why eating ground beef is still a gamble. Neither the system meant to make the meat safe, nor the meat itself, is what consumers have been led to believe.

Ground beef is usually not simply a chunk of meat run through a grinder. Instead, records and interviews show, a single portion of hamburger meat is often an amalgam of various grades of meat from different parts of cows and even from different slaughterhouses. These cuts of meat are particularly vulnerable to *E. coli* contamination, food experts and officials say. Despite this, there is no federal requirement for grinders to test their ingredients for the pathogen.

The frozen hamburgers that the Smiths ate, which were made by the food giant Cargill, were labeled “American Chef’s Selection Angus Beef Patties.” Yet confidential grinding logs and other Cargill records show that the hamburgers were made from a mix of slaughterhouse trimmings and a mash-like product derived from scraps that were ground together at a plant in Wisconsin. The ingredients came from slaughterhouses in Nebraska, Texas and Uruguay, and from a South Dakota company that processes fatty trimmings and treats them with ammonia to kill bacteria.

Using a combination of sources — a practice followed by most large producers of fresh and packaged hamburger — allowed Cargill to spend about 25 percent less than it would have for cuts of whole meat.

Those low-grade ingredients are cut from areas of the cow that are more likely to have had contact with feces, which carries *E. coli*, industry research shows. Yet Cargill, like most meat companies, relies on its suppliers to check for the bacteria and does its own testing only after the ingredients are ground together. The United States Department of Agriculture, which allows grinders to devise their own safety plans, has encouraged them to test ingredients first as a way of increasing the chance of finding contamination.

Unwritten agreements between some companies appear to stand in the way of ingredient testing. Many big slaughterhouses will sell only to grinders who agree not to test their shipments for *E. coli*, according to officials at two large grinding companies. Slaughterhouses fear that one grinder’s discovery of *E. coli* will set off a recall of ingredients they sold to others.

“Ground beef is not a completely safe product,” said Dr. Jeffrey Bender, a food safety expert at the University of Minnesota who helped develop systems for tracing *E. coli* contamination. He said that while

outbreaks had been on the decline, “unfortunately it looks like we are going a bit in the opposite direction.”

Food scientists have registered increasing concern about the virulence of this pathogen since only a few stray cells can make someone sick, and they warn that federal guidance to cook meat thoroughly and to wash up afterward is not sufficient. A test by *The Times* found that the safe handling instructions are not enough to prevent the bacteria from spreading in the kitchen.

Cargill, whose \$116.6 billion in revenues last year made it the country’s largest private company, declined requests to interview company officials or visit its facilities. “Cargill is not in a position to answer your specific questions, other than to state that we are committed to continuous improvement in the area of food safety,” the company said, citing continuing litigation.

The meat industry treats much of its practices and the ingredients in ground beef as trade secrets. While the Department of Agriculture has inspectors posted in plants and has access to production records, it also guards those secrets. Federal records released by the department through the Freedom of Information Act blacked out details of Cargill’s grinding operation that could be learned only through copies of the documents obtained from other sources. Those documents illustrate the restrained approach to enforcement by a department whose missions include ensuring meat safety and promoting agriculture markets.

Within weeks of the Cargill outbreak in 2007, U.S.D.A. officials swept across the country, conducting spot checks at 224 meat plants to assess their efforts to combat *E. coli*. Although inspectors had been monitoring these plants all along, officials found serious problems at 55 that were failing to follow their own safety plans.

“Every time we look, we find out that things are not what we hoped they would be,” said Loren D. Lange, an executive associate in the Agriculture Department’s food safety division.

In the weeks before Ms. Smith’s patty was made, federal inspectors had repeatedly found that Cargill was violating its own safety procedures in handling ground beef, but they imposed no fines or sanctions, records show. After the outbreak, the department threatened to withhold the seal of approval that declares “U.S. Inspected and Passed by the Department of Agriculture.”

In the end, though, the agency accepted Cargill’s proposal to increase its scrutiny of suppliers. That agreement came early last year after contentious negotiations, records show. When Cargill defended its safety system and initially resisted making some changes, an agency official wrote back: “How is food safety not the ultimate issue?”

The Risk

On Aug. 16, 2007, the day Ms. Smith’s hamburger was made, the No.3 grinder at the Cargill plant in Butler, Wis., started up at 6:50 a.m. The largest ingredient was beef trimmings known as “50/50” — half fat, half meat — that cost about 60 cents a pound, making them the cheapest component.

Cargill bought these trimmings — fatty edges sliced from better cuts of meat — from Greater Omaha Packing, where some 2,600 cattle are slaughtered daily and processed in a plant the size of four football fields.

As with other slaughterhouses, the potential for contamination is present every step of the way, according to workers and federal inspectors. The cattle often arrive with smears of feedlot feces that harbor the *E.*

coli pathogen, and the hide must be removed carefully to keep it off the meat. This is especially critical for trimmings sliced from the outer surface of the carcass.

Federal inspectors based at the plant are supposed to monitor the hide removal, but much can go wrong. Workers slicing away the hide can inadvertently spread feces to the meat, and large clamps that hold the hide during processing sometimes slip and smear the meat with feces, the workers and inspectors say.

Greater Omaha vacuums and washes carcasses with hot water and lactic acid before sending them to the cutting floor. But these safeguards are not foolproof.

“As the trimmings are going down the processing line into combos or boxes, no one is inspecting every single piece,” said one federal inspector who monitored Greater Omaha and requested anonymity because he was not authorized to speak publicly.

The E. coli risk is also present at the gutting station, where intestines are removed, the inspector said

Every five seconds or so, half of a carcass moves into the meat-cutting side of the slaughterhouse, where trimmers said they could keep up with the flow unless they spot any remaining feces.

“We would step in and stop the line, and do whatever you do to take it off,” said Esley Adams, a former supervisor who said he was fired this summer after 16 years following a dispute over sick leave. “But that doesn’t mean everything was caught.”

Two current employees said the flow of carcasses keeps up its torrid pace even when trimmers get reassigned, which increases pressure on workers. To protest one such episode, the employees said, dozens of workers walked off the job for a few hours earlier this year. Last year, workers sued Greater Omaha, alleging that they were not paid for the time they need to clean contaminants off their knives and other gear before and after their shifts. The company is contesting the lawsuit.

Greater Omaha did not respond to repeated requests to interview company officials. In a statement, a company official said Greater Omaha had a “reputation for embracing new food safety technology and utilizing science to make the safest product possible.”

The Trimmings

In making hamburger meat, grinders aim for a specific fat content — 26.6 percent in the lot that Ms. Smith’s patty came from, company records show. To offset Greater Omaha’s 50/50 trimmings, Cargill added leaner material from three other suppliers.

Records show that some came from a Texas slaughterhouse, Lone Star Beef Processors, which specializes in dairy cows and bulls too old to be fattened in feedlots. In a form letter dated two days before Ms. Smith’s patty was made, Lone Star recounted for Cargill its various safety measures but warned “to this date there is no guarantee for pathogen-free raw material and we would like to stress the importance of proper handling of all raw products.”

Ms. Smith’s burger also contained trimmings from a slaughterhouse in Uruguay, where government officials insist that they have never found E. coli O157:H7 in meat. Yet audits of Uruguay’s meat operations conducted by the U.S.D.A. have found sanitation problems, including improper testing for the pathogen. Dr. Hector J. Lazaneo, a meat safety official in Uruguay, said the problems were corrected immediately. “Everything is fine, finally,” he said. “That is the reason we are exporting.”

Cargill's final source was a supplier that turns fatty trimmings into what it calls "fine lean textured beef." The company, Beef Products Inc., said it bought meat that averages between 50 percent and 70 percent fat, including "any small pieces of fat derived from the normal breakdown of the beef carcass." It warms the trimmings, removes the fat in a centrifuge and treats the remaining product with ammonia to kill E. coli.

With seven million pounds produced each week, the company's product is widely used in hamburger meat sold by grocers and fast-food restaurants and served in the federal school lunch program. Ten percent of Ms. Smith's burger came from Beef Products, which charged Cargill about \$1.20 per pound, or 20 cents less than the lean trimmings in the burger, billing records show.

An Iowa State University study financed by Beef Products found that ammonia reduces E. coli to levels that cannot be detected. The Department of Agriculture accepted the research as proof that the treatment was effective and safe. And Cargill told the agency after the outbreak that it had ruled out Beef Products as the possible source of contamination.

But federal school lunch officials found E. coli in Beef Products material in 2006 and 2008 and again in August, and stopped it from going to schools, according to Agriculture Department records and interviews. A Beef Products official, Richard Jochum, said that last year's contamination stemmed from a "minor change in our process," which the company adjusted. The company did not respond to questions about the latest finding.

In combining the ingredients, Cargill was following a common industry practice of mixing trim from various suppliers to hit the desired fat content for the least money, industry officials said.

In all, the ingredients for Ms. Smith's burger cost Cargill about \$1 a pound, company records show, or about 30 cents less than industry experts say it would cost for ground beef made from whole cuts of meat.

Ground beef sold by most grocers is made from a blend of ingredients, industry officials said. Agriculture Department regulations also allow hamburger meat labeled ground chuck or sirloin to contain trimmings from those parts of the cow. At a chain like Publix Super Markets, customers who want hamburger made from whole cuts of meat have to buy a steak and have it specially ground, said a Publix spokeswoman, Maria Brous, or buy a product like Bubba Burgers, which boasts on its labeling, "100% whole muscle means no trimmings."

To finish off the Smiths' ground beef, Cargill added bread crumbs and spices, fashioned it into patties, froze them and packed them 18 to a carton.

The listed ingredients revealed little of how the meat was made. There was just one meat product listed: "Beef."

Tension Over Testing

As it fed ingredients into its grinders, Cargill watched for some unwanted elements. Using metal detectors, workers snagged stray nails and metal hooks that could damage the grinders, then warned suppliers to make sure it did not happen again.

But when it came to E. coli O157:H7, Cargill did not screen the ingredients and only tested once the grinding was done. The potential pitfall of this practice surfaced just weeks before Ms. Smith's patty was made. A company spot check in May 2007 found E. coli in finished hamburger, which Cargill disclosed

to investigators in the wake of the October outbreak. But Cargill told them it could not determine which supplier had shipped the tainted meat since the ingredients had already been mixed together.

“Our finished ground products typically contain raw materials from numerous suppliers,” Dr. Angela Siemens, the technical services vice president for Cargill’s meat division, wrote to the U.S.D.A. “Consequently, it is not possible to implicate a specific supplier without first observing a pattern of potential contamination.”

Testing has been a point of contention since the 1994 ban on selling ground beef contaminated with *E. coli* O157:H7 was imposed. The department moved to require some bacterial testing of ground beef, but the industry argued that the cost would unfairly burden small producers, industry officials said. The Agriculture Department opted to carry out its own tests for *E. coli*, but it acknowledges that its 15,000 spot checks a year at thousands of meat plants and groceries nationwide is not meant to be comprehensive. Many slaughterhouses and processors have voluntarily adopted testing regimes, yet they vary greatly in scope from plant to plant.

The retail giant Costco is one of the few big producers that tests trimmings for *E. coli* before grinding, a practice it adopted after a New York woman was sickened in 1998 by its hamburger meat, prompting a recall.

Craig Wilson, Costco’s food safety director, said the company decided it could not rely on its suppliers alone. “It’s incumbent upon us,” he said. “If you say, ‘Craig, this is what we’ve done,’ I should be able to go, ‘Cool, I believe you.’ But I’m going to check.”

Costco said it had found *E. coli* in foreign and domestic beef trimmings and pressured suppliers to fix the problem. But even Costco, with its huge buying power, said it had met resistance from some big slaughterhouses. “Tyson will not supply us,” Mr. Wilson said. “They don’t want us to test.”

A Tyson spokesman, Gary Mickelson, would not respond to Costco’s accusation, but said, “We do not and cannot” prohibit grinders from testing ingredients. He added that since Tyson tests samples of its trimmings, “we don’t believe secondary testing by grinders is a necessity.”

The food safety officer at American Foodservice, which grinds 365 million pounds of hamburger a year, said it stopped testing trimmings a decade ago because of resistance from slaughterhouses. “They would not sell to us,” said Timothy P. Biela, the officer. “If I test and it’s positive, I put them in a regulatory situation. One, I have to tell the government, and two, the government will trace it back to them. So we don’t do that.”

The surge in outbreaks since 2007 has led to finger-pointing within the industry.

Dennis R. Johnson, a lobbyist for the largest meat processors, has said that not all slaughterhouses are looking hard enough for contamination. He told U.S.D.A. officials last fall that those with aggressive testing programs typically find *E. coli* in as much as 1 percent to 2 percent of their trimmings, yet some slaughterhouses implicated in outbreaks had failed to find any.

At the same time, the meat processing industry has resisted taking the onus on itself. An Agriculture Department survey of more than 2,000 plants taken after the Cargill outbreak showed that half of the grinders did not test their finished ground beef for *E. coli*; only 6 percent said they tested incoming ingredients at least four times a year.

In October 2007, the agency issued a notice recommending that processors conduct at least a few tests a year to verify the testing done by slaughterhouses. But after resistance from the industry, the department allowed suppliers to run the verification checks on their own operations.

In August 2008, the U.S.D.A. issued a draft guideline again urging, but not ordering, processors to test ingredients before grinding. “Optimally, every production lot should be sampled and tested before leaving the supplier and again before use at the receiver,” the draft guideline said.

But the department received critical comments on the guideline, which has not been made official. Industry officials said that the cost of testing could unfairly burden small processors and that slaughterhouses already test. In an October 2008 letter to the department, the American Association of Meat Processors said the proposed guideline departed from U.S.D.A.’s strategy of allowing companies to devise their own safety programs, “thus returning to more of the agency’s ‘command and control’ mindset.”

Dr. Kenneth Petersen, an assistant administrator with the department’s Food Safety and Inspection Service, said that the department could mandate testing, but that it needed to consider the impact on companies as well as consumers. “I have to look at the entire industry, not just what is best for public health,” Dr. Petersen said.

Tracing the Illness

The Smiths were slow to suspect the hamburger. Ms. Smith ate a mostly vegetarian diet, and when she grew increasingly ill, her mother, Sharon, thought the cause might be spinach, which had been tied to a recent E. coli outbreak.

Five days after the family’s Sunday dinner, Ms. Smith was admitted to St. Cloud Hospital in excruciating pain. “I’ve had women tell me that E. coli is more painful than childbirth,” said Dr. Phillip I. Tarr, a pathogen expert at Washington University in St. Louis.

The vast majority of E. coli illnesses resolve themselves without complications, according to the Centers for Disease Control and Prevention. Five percent to 10 percent develop into a condition called hemolytic uremic syndrome, which can affect kidney function. While most patients recover, in the worst cases, like Ms. Smith’s, the toxin in E. coli O157:H7 penetrates the colon wall, damaging blood vessels and causing clots that can lead to seizures.

To control Ms. Smith’s seizures, doctors put her in a coma and flew her to the Mayo Clinic, where doctors worked to save her.

“They didn’t even think her brain would work because of the seizuring,” her mother said. “Thanksgiving Day, I was sitting there holding her hand when a group of doctors came in, and one looked at me and just walked away, with nothing good to say. And I said, ‘Oh my God, maybe this is my last Thanksgiving with her,’ and I stayed and prayed.”

Ms. Smith’s illness was linked to the hamburger only by chance. Her aunt still had some of the frozen patties, and state health officials found that they were contaminated with a powerful strain of E. coli that was genetically identical to the pathogen that had sickened other Minnesotans.

Dr. Kirk Smith, who runs the state’s food-borne illness outbreak group and is not related to Ms. Smith, was quick to finger the source. A 4-year-old had fallen ill three weeks earlier, followed by her year-old

brother and two more children, state records show. Like Ms. Smith, the others had eaten Cargill patties bought at Sam's Club, a division of Wal-Mart.

Moreover, the state officials discovered that the hamburgers were made on the same day, Aug. 16, 2007, shortly before noon. The time stamp on the Smiths' box of patties was 11:58.

On Friday, Oct. 5, 2007, a Minnesota Health Department warning led local news broadcasts. "We didn't want people grilling these things over the weekend," Dr. Smith said. "I'm positive we prevented illnesses. People sent us dozens of cartons with patties left. It was pretty contaminated stuff."

Eventually, health officials tied 11 cases of illness in Minnesota to the Cargill outbreak, and altogether, federal health officials estimate that the outbreak sickened 940 people. Four of the 11 Minnesota victims developed hemolytic uremic syndrome — an unusually high rate of serious complications.

In the wake of the outbreak, the U.S.D.A. reminded consumers on its Web site that hamburgers had to be cooked to 160 degrees to be sure any *E. coli* is killed and urged them to use a thermometer to check the temperature. This reinforced Sharon Smith's concern that she had sickened her daughter by not cooking the hamburger thoroughly.

But the pathogen is so powerful that her illness could have started with just a few cells left on a counter. "In a warm kitchen, *E. coli* cells will double every 45 minutes," said Dr. Mansour Samadpour, a microbiologist who runs IEH Laboratories in Seattle, one of the meat industry's largest testing firms.

With help from his laboratories, The Times prepared three pounds of ground beef dosed with a strain of *E. coli* that is nonharmful but acts in many ways like O157:H7. Although the safety instructions on the package were followed, *E. coli* remained on the cutting board even after it was washed with soap. A towel picked up large amounts of bacteria from the meat.

Dr. James Marsden, a meat safety expert at Kansas State University and senior science adviser for the North American Meat Processors Association, said the Department of Agriculture needed to issue better guidance on avoiding cross-contamination, like urging people to use bleach to sterilize cutting boards. "Even if you are a scientist, much less a housewife with a child, it's very difficult," Dr. Marsden said.

Told of The Times's test, Jerold R. Mande, the deputy under secretary for food safety at the U.S.D.A., said he planned to "look very carefully at the labels that we oversee."

"They need to provide the right information to people," Mr. Mande said, "in a way that is readable and actionable."

Dead Ends

With Ms. Smith lying comatose in the hospital and others ill around the country, Cargill announced on Oct. 6, 2007, that it was recalling 844,812 pounds of patties. The mix of ingredients in the burgers made it almost impossible for either federal officials or Cargill to trace the contamination to a specific slaughterhouse. Yet after the outbreak, Cargill had new incentives to find out which supplier had sent the tainted meat.

Cargill got hit by multimillion-dollar claims from people who got sick.

Shawn K. Stevens, a lawyer in Milwaukee working for Cargill, began investigating. Sifting through state health department records from around the nation, Mr. Stevens found the case of a young girl in Hawaii

stricken with the same E. coli found in the Cargill patties. But instead of a Cargill burger, she had eaten raw minced beef at a Japanese restaurant that Mr. Stevens said he traced through a distributor to Greater Omaha.

“Potentially, it could let Cargill shift all the responsibility,” Mr. Stevens said. In March, he sent his findings to William Marler, a lawyer in Seattle who specializes in food-borne disease cases and is handling the claims against Cargill.

“Most of the time, in these outbreaks, it’s not unusual when I point the finger at somebody, they try to point the finger at somebody else,” Mr. Marler said. But he said Mr. Stevens’s finding “doesn’t rise to the level of proof that I need” to sue Greater Omaha.

It is unclear whether Cargill presented the Hawaii findings to Greater Omaha, since neither company would comment on the matter. In December 2007, in a move that Greater Omaha said was unrelated to the outbreak, the slaughterhouse informed Cargill that it had taken 16 “corrective actions” to better protect consumers from E. coli “as we strive to live up to the performance standards required in the continuation of supplier relationship with Cargill.”

Those changes included better monitoring of the production line, more robust testing for E. coli, intensified plant sanitation and added employee training.

The U.S.D.A. efforts to find the ultimate source of the contamination went nowhere. Officials examined production records of Cargill’s three domestic suppliers, but they yielded no clues. The Agriculture Department contacted Uruguayan officials, who said they found nothing amiss in the slaughterhouse there.

In examining Cargill, investigators discovered that their own inspectors had lodged complaints about unsanitary conditions at the plant in the weeks before the outbreak, but that they had failed to set off any alarms within the department. Inspectors had found “large amounts of patties on the floor,” grinders that were gnarly with old bits of meat, and a worker who routinely dumped inedible meat on the floor close to a production line, records show.

Although none were likely to have caused the contamination, federal officials said the conditions could have exacerbated the spread of bacteria. Cargill vowed to correct the problems. Dr. Petersen, the federal food safety official, said the department was working to make sure violations are tracked so they can be used “in real time to take action.”

The U.S.D.A. found that Cargill had not followed its own safety program for controlling E. coli. For example, Cargill was supposed to obtain a certificate from each supplier showing that their tests had found no E. coli. But Cargill did not have a certificate for the Uruguayan trimmings used on the day it made the burgers that sickened Ms. Smith and others.

After four months of negotiations, Cargill agreed to increase its scrutiny of suppliers and their testing, including audits and periodic checks to determine the accuracy of their laboratories.

A recent industry test in which spiked samples of meat were sent to independent laboratories used by food companies found that some missed the E. coli in as many as 80 percent of the samples.

Cargill also said it would notify suppliers whenever it found E. coli in finished ground beef, so they could check their facilities. It also agreed to increase testing of finished ground beef, according to a U.S.D.A. official familiar with the company’s operations, but would not test incoming ingredients.

Looking to the Future

The spate of outbreaks in the last three years has increased pressure on the Agriculture Department and the industry.

James H. Hodges, executive vice president of the American Meat Institute, a trade association, said that while the outbreaks were disconcerting, they followed several years during which there were fewer incidents. “Are we perfect?” he said. “No. But what we have done is to show some continual improvement.”

Dr. Petersen, the U.S.D.A. official, said the department had adopted additional procedures, including enhanced testing at slaughterhouses implicated in outbreaks and better training for investigators.

“We are not standing still when it comes to E. coli,” Dr. Petersen said.

The department has held a series of meetings since the recent outbreaks, soliciting ideas from all quarters. Dr. Samadpour, the laboratory owner, has said that “we can make hamburger safe,” but that in addition to enhanced testing, it will take an aggressive use of measures like meat rinses and safety audits by qualified experts.

At these sessions, Felicia Nestor, a senior policy analyst with the consumer group Food and Water Watch, has urged the government to redouble its effort to track outbreaks back to slaughterhouses. “They are the source of the problem,” Ms. Nestor said.

For Ms. Smith, the road ahead is challenging. She is living at her mother’s home in Cold Spring, Minn. She spends a lot of her time in physical therapy, which is being paid for by Cargill in anticipation of a legal claim, according to Mr. Marler. Her kidneys are at high risk of failure. She is struggling to regain some basic life skills and deal with the anger that sometimes envelops her. Despite her determination, doctors say, she will most likely never walk again.

Gabe Johnson contributed reporting.

Ex-worker: Cow abuse common

A man convicted of animal cruelty says the plant made a practice of buying sick cattle

JULIA GLICK. The Press-Enterprise. Riverside, Calif.: Sep 13, 2008. pg. A.1

The Chino slaughterhouse that triggered the nation’s largest-ever beef recall regularly bought sick, crippled and emaciated cows and forced them to their feet so they could be slaughtered for food, said a former employee who worked 23 years at Westland/Hallmark Meat Co.

Daniel Ugarte Navarro, a pen worker who awaits sentencing on animal cruelty convictions, agreed to an interview more than six months after a Humane Society investigator’s undercover tapes showed collapsed cows dragged, repeatedly shocked, rammed with forklifts and illegally taken to slaughter at the plant.

Ugarte, 49, of Pomona, said the candid footage seen worldwide on TV and the Internet depicted business as usual at Westland/Hallmark, which was a key beef supplier for the national school lunch program. Ugarte said that plant President Steve Mendell knew about and condoned the abuse and slaughter of “downer” cows, and that lower-level supervisors ordered workers to carry it out.

When asked about Ugarte's allegations, Mendell's attorney, Asa Hutchinson, pointed to his client's testimony at this spring's congressional hearings.

Mendell testified there that he had no knowledge of any animal cruelty or food safety violations. He characterized the abuses shown in the footage as a breakdown in the controls and the training he provided his employees.

Donald Hallmark Sr., a former owner of the slaughterhouse, defended Mendell and the plant's management and said the meat was always safe.

Hallmark Sr. said Ugarte is leveling false accusations, trying to get a more lenient sentence. Ugarte may be angry that the management did not back him during the trial, he added.

Ugarte pleaded no contest to two felony counts of animal cruelty and two misdemeanors of moving a non-ambulatory animal. He faces sentencing Sept. 24. He agreed last month to cooperate with federal investigators in exchange for immunity from further charges that might stem from his testimony.

Federal regulations stipulate that cattle must be able to stand and pass inspection to be fit for the food supply. If a cow falls down after inspection, a veterinarian must re-examine it and approve it for slaughter. The law is intended to prevent ailments such as E. coli, salmonella and mad cow disease from entering the nation's food supply.

State anti-cruelty law forbids using equipment such as forklifts to lift downer cows.

The undercover tapes show workers, including Ugarte, lifting collapsed cows with forklifts, dragging them with chains and shocking them in the face with cattle prods to move them to slaughter.

The images prompted the February recall of 143 million pounds of beef produced over two years that went into school lunches, fast food, grocery stores and packaged goods. The recall led to the plant's closure.

Ugarte and fellow pen worker Rafael Sanchez Herrera are the only people arrested so far. Sanchez, an illegal immigrant, accepted a plea deal, served his time and was deported to Mexico, officials said.

Ugarte's sentence could range from 210 days to a year under house arrest or in a weekend work-release program.

`CRIPPLED' COWS

Ugarte, a legal U.S. resident who speaks little English, said he was the most experienced and senior of six men assigned to unload, feed, wash and move hundreds of cows to slaughter each day.

Westland/Hallmark regularly purchased sickly cattle from auctions around the region because those cows were cheaper, he said.

"They came crippled, very disabled," Ugarte said in Spanish. "They couldn't even stand."

Between 50 and 100 cows collapsed each day on the way to slaughter, he said. His supervisor, Pablo Salas, pressured workers to slaughter 500 cows a day, and ordered them to make the downer cows stand, Ugarte said.

Donald Hallmark Jr., a former owner and the plant's cattle buyer, also occasionally ordered them to lift fallen animals, Ugarte added.

Ugarte said if a fallen cow was made to stand, workers did not call a veterinarian to reinspect the animal in accordance with federal regulations. Instead, it went to slaughter and into the food supply, he said.

Salas could not be reached for comment, but in the past, he declined to comment and denied any wrongdoing. Hallmark Jr. could not be reached for comment despite several calls and a visit to his business.

Hallmark Jr. and his father sold the plant more than five years ago, with the younger Hallmark becoming a cattle purchaser for Mendell.

Hallmark Jr. would buy from local auctions, and cows also came in from buyers in Arizona and elsewhere, Ugarte said. Ugarte said he complained to Salas about the condition of some of the cows.

Ugarte said truckloads of cows would arrive by night and a few animals already would have collapsed in the pen by the time he arrived about 5:30 a.m.

Mendell made the rounds of the plant about twice a day and saw cows coming off trucks, he said.

Hallmark Sr. defended his son, saying Hallmark Jr. never bought "downer" cows and was a good buyer.

"Out of 500 cows, there are going to be a few that look droopy," he said, adding that some older, less costly cows can look skinny or scruffy, but still be perfectly fine for processing.

LONG HISTORY

Ugarte said the Chino plant was buying sick and injured cows for as long as he worked there, including when it was owned by the Hallmarks.

Rich Sumner, a trucker from Lebec, south of Bakersfield, said he hauled cows to the Chino plant for about five years in the 1980s and '90s during the Hallmarks' ownership.

He said he lost his work there in the late 1990s when he complained to the Hallmarks about sick cows. He saw one bloated animal slice open its side going through a chute, revealing blackened flesh and pus, Sumner said.

Sumner said he transported cattle from auction to many different meat plants, but the Chino slaughterhouse purchased some of the worst.

"The dairyman would get the last gallon of milk, the last cent out of the cow and then take it to auction," he said. "But those were the ones they could get the most profit off of. It was advantageous for them to buy those cows."

Hallmark Sr. responded that his plant followed laws on cattle slaughter and never bought collapsed cows. He said he did not remember Sumner, but to an untrained eye, older cows might look sick even if they are not.

A battery of inspections right after slaughter ensured that bad meat did not enter the food supply, he said.

“There is no chance for a mad cow to get through there, no chance for a pneumonia cow to get through. There is no chance for a cancer cow to get through,” he said. “I never had anybody complain or get sick from that meat.”

Staff writer Paul LaRocco contributed to this report.

VIDEO, BEEF RECALL CHANGE AGENDA Chino footage outraged nation, continues to prompt actions

BEN GOAD. The Press - Enterprise. Riverside, Calif.: Aug 17, 2008. pg. A.1

The cows were caked in manure and mud. Sick or hurt, they couldn't stand long enough to be slaughtered.

So they were beaten, kicked, jabbed in their eyes and shocked. They were dragged with chains, rammed with a forklift and blasted with a powerful hose in a manner later described in congressional hearings as akin to water-boarding.

The mistreatment and illegal slaughter of “downer” cows at the Westland/Hallmark Meat Co. in Chino, captured on video by an undercover investigator posing as a plant employee, sparked the largest U.S. beef recall in history.

Six months later, the recall is over, but its impact is clear and far-reaching.

It was felt at school cafeterias around the nation, where officials had to dump millions of pounds of meat they had counted on for children's lunches, and it was felt in South Korea, where it set back beef trade negotiations and added fuel to protests raging in the streets.

The recall prompted both the federal and state governments to strengthen laws against the slaughter of downed cattle. Federal officials intensified their scrutiny of slaughterhouses, and campaigners gained traction in their push for a ballot measure to outlaw small cages for chickens and some other farm animals.

WHY THE RECALL?

What is not clear is exactly why Agriculture Department officials initiated the recall, considering their continuing assertions that there was never a threat to public health.

Requests for information about the decision, made under the Freedom of Information Act, were fruitless. In some cases, officials said the documents sought didn't exist. In others, they were withheld pending the outcome of federal investigations into how the inspection system at Westland/Hallmark broke down and whether what happened there was isolated or evidence of a more widespread problem.

Newly installed U.S. Agriculture Secretary Ed Schafer reported for his first day in office at the end of January, prepared to delve into the Farm Bill and issues surrounding free trade and renewable fuels. That day, a package arrived at his Washington office that would change his plans.

Inside was a compact disc containing footage shot by Sean Thomas, an undercover investigator for The Humane Society of the United States who worked at the Westland/Hallmark plant and secretly filmed the abuse between Oct. 7 and Nov. 20.

“That CD showed some very disturbing things,” Schafer recalled. “Based on that experience, I determined that we would aggressively address our food safety system and see what improvements could be made.”

The day after Schafer reviewed the footage, Humane Society officials put the video on their Web site.

It spread like wildfire, prompting questions about how federal inspectors stationed at the plant could have missed the abuse and widespread concern among consumers.

The video and recall coincided with a temporary dip in beef consumption, both in Southern California and beyond.

Tom Reingrover, owner of Gerrards Market in Redlands, said news of abuses at the beef plant initially hurt his business, even though he has never gotten meat from Westland/Hallmark. He put out signs reassuring shoppers. Still, customers bought about 10 percent less beef the week after the news broke, he said.

BEEF PRICES FALL AFTERWARD

Nationally, beef prices - an indicator of demand - declined slightly in February and March, compared with the same months last year, but monthly variations are not unusual. Sales appear robust - Americans purchased more than 400 million pounds of beef in June. But some meat eaters remain concerned.

Norman Olsen, 51, a retired baker from Riverside, said news of the abuse reinforced his distrust for highly processed foods and persuaded him to eat even less nonorganic beef.

“I’m scared of the beef,” he said, adding that he worries about hormones and antibiotics given to cows. “You never know what they are doing to it these days.”

In the days after the tape was released, Westland/Hallmark shut down. The company had slaughtered 500 cows a day and, as one of the top providers of beef to the National School Lunch Program, was named “Supplier of the Year” for 2004-05.

San Bernardino County authorities who had been given an advance copy of the video arrested two plant employees

As Agriculture Department officials launched an investigation into the conduct at Westland/Hallmark, members of Congress put the nation’s meat inspection system on trial, holding more than a dozen hearings in Washington.

On Feb. 17, federal officials told Westland/Hallmark President Steve Mendell to begin the unprecedented recall of 143 million pounds of beef that had come from the Chino slaughterhouse - virtually all the beef produced in the previous two years.

Appearing under subpoena in March, Mendell viewed the video. Mendell told lawmakers the conduct was against company policies. He then conceded that cows had been illegally slaughtered and that it was logical to conclude that meat went into the national food supply.

Much of the beef had already been consumed.

RECALL QUESTIONED

Under the law, downed cows are generally prohibited from being slaughtered for food because they are more likely to have mad cow disease or other illnesses that could be passed on to people. Exceptions, however, can be made for cows that go down after an initial inspection at the slaughterhouse - provided that they are approved for slaughter by an on-site federal veterinarian.

The video provided evidence that downed cows were slaughtered without the required second inspection. It was that violation - not the abuse - that led to the recall.

No illnesses were reported, and officials described the public health threat as “vanishingly small.”

“The recall wasn’t warranted,” said Mark Dopp, general counsel for the American Meat Institute, an organization that represents much of the meat industry. “There was no food safety risk.”

Agriculture officials, who have placed the cost of the recall in excess of \$67 million, repeatedly have said that rules were broken and the recall was ordered as a consequence. But critics say the explanation is disingenuous.

“They’ve been a little too cute in characterizing it as ‘rules are rules,’” said Humane Society President Wayne Pacelle, who emphasized that his group never sought a recall.

“The rules are there to protect the public health,” he said. “They’ve downplayed the health risk the entire time.”

Rosemary Mucklow, director emeritus of the Oakland-based National Meat Association, said the recall was overkill.

“You get into the politics of Washington,” she said. “In a moment like that, they faced huge pressure from Mr. Pacelle.”

The American Farm Bureau, an organization of ranchers and farmers, didn’t view the recall as inappropriate but believed it should have been designated as a Class 3 recall - one with zero health risk and no mandate to destroy the recalled beef, said Kelli Ludlum, the group’s director of congressional affairs. Instead, the recall was a Class 2, meaning a remote health risk that required destruction of the beef.

Health Officers of California, sponsor of the law that created the state’s recall program, approved of the recall, Executive Director Bruce Pomer said.

“Even if you err on the side of safety, what’s wrong with that?” he asked.

INTERNATIONAL IMPLICATIONS

In 2003, a cow in Washington state tested positive for mad cow disease, leading a handful of countries, including South Korea, to ban U.S. beef. Ever since, the U.S. has sought to persuade them to reopen their markets.

The Chino recall didn't help.

"As people look for reasons to protect their own marketplaces . . . they say, 'You can't even send us safe meat,'" Schafer told a group of meatpackers and processors in the days after the recall.

But in a recent interview, Schafer said concerns about South Korean trade had nothing to do with his reasoning for a recall.

"I wasn't even tuned into global trade issues at that point in time," he said.

Recent months have seen almost-daily beef protests in South Korea, as that nation's government decided to lift the ban.

"Some of those giant protests were triggered by this case," Pacelle said "The South Korean public was up in arms about the potential for mad cow disease in American beef."

In the U.S., the South Korean media flocked to news conferences related to the Humane Society investigation and the recall.

Several industry groups, including the California Cattlemen's Association, said they did not think the South Korean market was an issue in the recall. At the same time, the industry and government must send the world the proper message on food safety, said Matt Byrne, the group's executive vice president.

"What's absolutely critical is that we show consumers in the U.S. and around the world that we show zero tolerance when there could be a danger to the food supply," he said.

With the Agriculture Department intent on appeasing the South Korean government and large amounts of money at stake, Pacelle said he had no doubt that the trade issues factored into the department's handling of the recall.

"It would be foolish to think them immaterial," he said.

CRACKING DOWN

In May, Schafer announced that the Agriculture Department was dropping its long-held opposition to an absolute ban on downer cows in the food supply. He made it clear that consumer confidence - both among Americans and U.S. trading partners - led to the decision.

The move, sought for years by animal advocates, is expected to take effect by September.

Also in May, the California Assembly passed a bill that would outlaw the sale of meat from a downer cow. If passed, the law would effectively place a statewide ban on slaughtering hurt and sick cows.

In the wake of the recall, Schafer also announced progress on a regulation proposed in 2006 that would require the department to release to the public the names of all stores and markets that receive meat subject to Class 1 recalls - those considered to carry a significant public health risk. That rule, expected to take effect this month, would not have applied to the Class 2 Westland/Hallmark recall.

Also pending are a proposed federal law setting strict penalties for slaughterhouses caught processing downer livestock and the California proposition that would set new restrictions on the treatment of chickens and other farm animals.

Meanwhile, the Agriculture Department's Office of Inspector General is quietly conducting investigations that could have significant ramifications, both for those involved with the Westland/Hallmark recall and the industry at large.

The first is an audit of the nation's slaughterhouses and meat plants to determine whether the conduct observed at the Chino plant is, as Agriculture Department officials contend, an isolated incident. The second is a probe of Westland/Hallmark, which could lead to criminal charges against the plant's operators or employees.

Agriculture Department officials have said they hold Mendell, the Westland/Hallmark president, liable for the recall's \$67.2 million cost and have filed a claim against him for the amount. To date, they have received no response and are considering legal recourse.

The Westland/Hallmark plant remains shuttered, though a longtime rancher from Arizona is buying it for an undisclosed price.

Through his attorney, Mendell declined a request for an interview. He also declined to comment when contacted one recent morning at his oceanview Newport Beach home, where he was watering his flowers while wearing an In-N-Out Burger T-shirt.

Staff writers Jim Miller, Shirin Parsavand, Sean Nealon, Douglas Quan, Mark Muckenfuss, Julia Glick and Jose Arballo Jr. as well as The Associated Press contributed to this report.