Of Microbes and Men: The Effects of Men, Meat, Media and a Microbe on an Industry

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Of Microbes and Men

The Effects Of Men, Meat, Media, And A Microbe On An Industry

by

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December 1, 2017
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Abstract

This paper will investigate the relationships between men, meat, media, and microbes. It begins with the discovery of the microbe itself, *Escherichia coli*. A brief discussion of the physical qualities of the microbe and its toxicity follows. The next section reviews several important discoveries made in the twentieth century regarding *E. coli*. These discoveries reveal the growing concern of the scientific community in regards to the public health threat presented by *E. coli*. Then, in 1993, several children ingested the microbe and died. After this tragic event, the United States government held an extensive hearing investigating food safety practices. The interactions in this hearing reveal several shortcomings of regulatory and handling practices, despite scientific evidence. Throughout these events, the outbreak and the hearing, the reports of the media provide profound insight into the parties widely blamed for the outbreak. There is a strong tendency to assign blame to solely to a company, instead of analyzing the complex interactions between business, science, and government. Finally, a similar outbreak occurred in 2015, revealing a trend between public pressure and widespread change.
Introduction

*Escherichia coli.* People cannot see it with the naked eye. It lives in public pools. It lives in lakes. It lives on lettuce. It flourishes on meat products. It swims in your gut. It can make you sick, with symptoms ranging from minor nausea to life threatening diarrhea, kidney failure, and even death. *Escherichia coli* causes roughly 265,000 illnesses per year in the United States alone. Scientists connected it to food borne illness in 1982, but the public didn’t know about it until 1993. It made headlines by causing approximately four hundred people, predominately children, in the Pacific Northwest to fall ill. It skyrocketed to fame with the deaths of three children attributed to a particularly virulent strain, O157:H7. The number of deaths eventually rose to four children, all under the age of seven. To contract the bacteria that eventually claimed their lives, they had merely eaten a burger from their favorite restaurant.

Jack in the Box, the restaurant that had supplied the tainted burgers, complied with all federal laws regarding food safety. Evidence suggested that an internal cooking temperature of 155°F would dramatically lower the risk of transmitting food-borne illness. Despite the evidence suggesting that the temperature needed raising, federal regulations only required a cooking temperature of 140°F. *E. coli* was a known threat to public health since 1983 and scientific inquiry had determined that federal regulations were too relaxed. However, when the outbreak reached the public, blame fell not primarily on the federal government, or the failure to utilize scientific discovery. Instead, the company that served the burgers received much of the backlash.

The failure to utilize the latest scientific evidence to improve regulations lead to the illness of hundreds of people and the deaths of four children. The media praised the government for the measures taken after the outbreak occurred: hiring new inspectors, investigating the outbreak, adding warning labels to raw meat. However, these measures were retroactive, instead
of the proactive measures that could have saved lives. The media focused on the company that served the contaminated burgers, instead of the system that allowed an avoidable contamination to reach hundreds of consumers. The failures of the Jack in the Box outbreak stem from the refusal from all responsible parties—from the government to business managers—to pass stricter regulations, despite scientific evidence, and the focus the media brought to the company, instead of the faulty system. The Jack in the Box outbreak reveals that connections between scientific evidence, communication between scientists and regulators, the priorities of federal regulatory agencies, the prerogatives of business managers, the media, and pressure generated by the public are key components for system modification.

The newspapers following the outbreak, a Senate subcommittee hearing, the public relations efforts by the Jack in the Box Company, and scientific journals on *E. coli* form the evidence for this study. These sources establish the difference between public and specialized knowledge. They confirm that experts knew of the potential threats of *E. coli*. They demonstrate the reaction the media promoted. However, each of these sources must analyzed for their initial intent, and the biases resulting from these intents. For example, some decisions by Jack in the Box sought to save the reputation of the company in the face of crisis, such as offering to pay the medical expenses of the victims. Newspapers reported the news, but with the goal of selling copies. Since, these sources originate from a disaster, they run the risk of containing the highly emotional biases of those caught in a confusing and frightening time.

Some experts have studied the outbreak. Jeff Benedict’s analysis of the Jack in the Box outbreak looks into the causes, responses, and consequences surrounding the crisis. While his book *Poisoned* is an excellent addition to medico-legal thrillers, it fails to investigate the pathology of *E. coli*. He focuses on the impact of one exceptional man, Bob Marler, the leading
lawyer in the following lawsuits who "does thing most lawyers wouldn't dare." Benedict investigates the legal actions and dedication Marler brought to the issue of food poisoning. By focusing on Marler and the legal journey of the food poisoning case, he misses the opportunity to address causation of the event or proactive measures to avoid future outbreaks. He merely suggests the influences of scientific discovery and the impact of the media. It is an excellent summary of the event, but does not investigate these topics in-depth.

Jeffery Bradach investigates the retroactive measures the Jack in the Box company took in response to the E. coli outbreak. He specifically focuses on the challenges that large companies face when their credibility faces attacks. He argues that this is particularly challenging for companies that have franchised, they must maintain an image of uniformity across a system rife with small variations. These variations can cause a myriad of problems. His analysis falls short in its analysis of the outbreak specifically. It mentions it briefly, but his argument is based on chain management.¹

Robert Ulmer and Timothy Sellnow investigate the communication from Jack in the Box Robert Nugent following the outbreak of the crisis to analyze the ethics of the company. They suggest that companies reveal their ethical concerns after crises through communications to the public. They focus on three aspects of post-crisis communications: questions regarding evidence, intent, and locus. This analysis is useful for companies following high-stakes crisis. However it fails to analysis causation, but does imply that Jack in the Box's communications after the outbreak were "ethically suspect."²

² Robert R. Ulmer and Timothy L. Sellnow, "Consistent Questions of Ambiguity in
Investigating *Escherichia coli*

In the mid-nineteenth century, Theodor Escherich spent years studying illness in children, focusing on diseases of digestion. In Italy, he personally observed a cholera epidemic and the *Vibrio cholerae* bacterium responsible for the devastating illness. He was a believer in the germ theory, that organisms too small to see without a microscope could wreak havoc on entire societies. He used cutting-edge technology, from Gram staining to anaerobic culture methods, to investigate a rod-shaped bacterium known as *Bacterium coli commune*. In Munich, on July 14, 1885, he presented his research. He published it a year later, a one-hundred and seventy-seven page summary titled “The Intestinal Bacteria of the Infant and Their Relation to the Physiology of Digestion.” Later, the scientific community renamed the bacterium that he investigated to *Escherichia coli* in tribute to the man who catapulted *E. coli* to notoriety by connecting it to diarrhea in children.  

*Escherichia coli* is a Gram-negative rod-shaped bacterium, referring to the structure of its membrane and the overall shape of the organism. Figure 1 provides an image of *E. coli*. It is a facultatively aerobic organism, with few growth factors. Growth factors are certain nutrients that organisms need to survive. *E. coli* is concentrated in the gut of warm-blooded animals, such as humans, cattle, and chicken. It is comprised of 5, 594, 477 nucleotide base pairs, which is

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approximately one one-thousandth of a human genome. In invisible to the naked eye, it lives in the intestine, and can create calamity.


*Escherichia coli* produces a specific form of toxin, an AB toxin that hijacks cell operations, causing illness. Many other disease-causing bacterium, such as *Vibrio cholera*, the cause of cholera, produce this highly virulent form of toxin. *Shigella dysenteriae* produces an AB toxin, leading to dysentery. Two components, referred to as “A” and “B,” compose the toxin as a whole. Figure 2 illustrates the roles of each subunit and the mechanism of the toxin. Prior to intoxication of the cell, the B subunit recognizes and binds to the target cell. The A subunit enters the cytoplasm, disrupts functioning of the cell, preventing protein synthesis, and

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5 Madigan, 321.
ultimately leading to the death of the cell.\textsuperscript{6} The \textit{E. coli} O157: H7 subtype, the subtype connected to the 1993 outbreak, produces a form of AB toxin that is particularly virulent.\textsuperscript{7}

![Diagram of AB Toxin Mechanism](https://openoregonstate.pressbooks.pub/microbiology/chapter/bacterial-pathogenicity/)

One of the most malignant side effects of an \textit{E. coli} O157: H7 infection is hemolytic uremia syndrome, often abbreviated as HUS. In 1964, scientists connected HUS to kidney failure, distorted red blood cells, decreased blood platelets, and destruction of red blood cells. A common symptom is bloody diarrhea. HUS first became associated with \textit{E. coli} O157: H7 in 1970, and confirmed in human subjects in 1978. A paper, published in 1986, explicitly stated the links between HUS and ground beef. It called for the testing of all bloody diarrhea for \textit{E. coli} O157: H7, and stated that the organism "should be given the same consideration as other food

\textsuperscript{6} Madigan, 719.
\textsuperscript{7} Madigan, 487.
borne organisms in both clinical practice and public health control." By 1986, scientists raised public health concerns due to the well-established connection between HUS and *E. coli* O157:H7.

In 1975, scientists isolated *E. coli* O157: H7 for the first time, but did not connect it to food until 1982. In early 1982, an outbreak affected forty-seven people. It originated from eating at a chain fast-food restaurant, specifically branches in Oregon and Michigan. Research determined all of the patients had eaten a beef patty, rehydrated onions, and pickles. Further research determined that the beef patty, undercooked, was the culprit that carried the illness-causing agent to the unsuspecting consumers. However, the restaurant conducted research following the outbreak. As a result, it invested in new grills and instituted a higher cooking temperature for its burgers. However, lack of government regulation prevented the new research from proactively impacting the rest of the industry.

In Washington, during March 1984, three cases of illness due to *E. coli* O157:H7 progressed to HUS. In 1986, pathogenic *E. coli* reached one-hundred and seven children at a daycare center. Forty-eight percent of the exposed population under four years old contracted

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10 Benedict, 52-53.

illness. Thirty-one percent of the sick children exhibited bloody diarrhea. The outbreak culminated in three confirmed cases of HUS. None of the children died.\textsuperscript{12} In London, 1987, seventeen nursing home residents died due to HUS caused by \textit{E. coli} O157: H7 infections.\textsuperscript{13} By 1988, twelve total outbreaks of \textit{E. coli} O157: H7 in North America and Britain had led to HUS. It was known that \textit{E. coli} O157: H7 was in three to seven percent of beef samples. The continuing and increasingly frequent outbreaks proved the virulence of O157:H7. Its virulence emphasized the importance of being able to accurately identify O157: H7.

Early studies of \textit{E. coli} reveal the growing concerns of the scientific community. In 1984, a study determined that \textit{E. coli} can survive for months in frozen conditions. At 10\textdegree C, \textit{E. coli} does not grow, but is still alive. This study demonstrated that the common storage conditions of processed meat—frozen—does not eradicate the chances to contract diseases caused by \textit{E. coli}.

The study also criticized two methods to test for \textit{E. coli} that were growing in popularity, but did not detect O157:H7 reliably.\textsuperscript{14} Another study, conducted in 1986, criticized a popular but "nonspecific" test and recommended additional tests to specifically identify the O157:H7 strain.\textsuperscript{15} The ability to isolate and identify an organism is critical to the ability to effectively


respond to an outbreak. The concerns of scientific community regarding accurate identification demonstrate that the community understood the ability of O157:H7 to cause devastating illness by 1986, seven years prior to the Jack in the Box outbreak. These concerns, published in reputable and widely-read journals, repeatedly recommended better testing strategies.

A plethora of studies concerning *E. coli* screening, isolation, and identification emerged around 1986. A 1987 study isolated *E. coli* from various retail meats, such as pork, poultry, beef, and lamb. It determined that beef had the highest percentage of *E. coli*. A 1991 study confirmed the presence of *E. coli* O157: H7 in raw milk. This demonstrated that “cattle are a major reservoir of *E. coli* serotype O157:H7. It recommended continued studies into the various sources of *E. coli* and methods of identification “to prevent this growing health problem.”

Another 1991 study investigated the accuracy of existing procedures to rapidly detect *E. coli* and proposed a different testing method. It argued that direct plating methods were not sensitive to small concentrations of *E. coli*. The time-consuming and expensive methods occasionally signaled a false positive. A new method suggested by the study was “rapid, sensitive, and easy to perform.” It took less than twenty hours to specifically identify the O157:

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H7 strains. The interest in detection demonstrates that O157: H7 was an entrenched concern of the scientific community prior to the 1993 outbreak.

Prior to 1993, the scientific community understood *E. coli*, the O157: H7 strain, and its connections to food borne illness were well established. Scientists conducted many studies on the organism, usually concluding with public health concerns or the need to begin further studies. They knew the virulence of the O157: H7 strain. They knew the symptoms of bloody-diarrhea and hemolytic-uremia syndrome. They knew about the presence of *E. coli* O157: H7 in the food supply. Or, rather, the scientific community knew these facts. However, emerging evidence did not impact regulations. Additionally, the general public had limited knowledge of the dangers that they faced by O157: H7. They could not see the insidious risk inherent in enjoying a burger from their preferred fast food chain.

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https://www.ncbi.nlm.nih.gov/pmc/articles/PMC183642/?page=5
The Outbreak

It was the day after Christmas. The six-year-old had stayed home from school less than a week ago. Now, she laid comatose in a hospital bed, as her mother sang to her and painted her toenails one last time. She had gone to the hospital with a case of bloody diarrhea. Despite medical treatment, her kidneys shut down. After five days of rapidly deteriorating conditions, Lauren Rudolph’s parents removed her from life support.

Mid-January 1993, two-year-old Michael Nole checked into Mary Bridge Children’s Hospital. After two days, his diarrhea worsened and doctors recommended transfer to Children’s Hospital in Seattle, for kidney dialysis. His condition continued to disintegrate. After extensive surgery, his heart stopped on January 22, 1993. On January 28, Celina Shribbs perished due to heart failure.

All three children had eaten burgers at Jack in the Box shortly prior to their deaths. They all contracted hemolytic-uremia syndrome (HUS). Declaring an outbreak took several weeks, as illustrated by Figure 3. By late January, Children’s Hospital in Seattle had hundreds of patients with diarrhea, and approximately thirty patients with conditions that progressed to HUS. Survival rates of HUS victims were not encouraging. The illness, now connected to *E. coli* and Jack in the Box burgers, would certainly claim more young lives.19

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The Hearing

The outbreak in Seattle caused a stir. The public, previously unaware of the pathogen *E. coli*, rapidly lost trust in the safety of fast-food establishments. In effort to combat the growing concern and to establish a plan to avoid future outbreaks, Congress held a hearing on February 5, 1993. Senator Tom Daschle chaired the Subcommittee on Agricultural Research and General Legislation. The questions and comments of the subcommittee conducting the investigation provide invaluable insight into the concerns of the governing body. The drama of the hearing unfolded as various expert witnesses attempted to assign blame, defend themselves, and offer solutions to avoid future outbreaks.

During the opening remarks of the hearing, Daschle quickly admitted that the current testing methods required by federal law were not stringent enough. Inspectors visually checked meat for adulterants such as blood, bone fragments, and feces. This extremely outdated inspection method originated in the early 1900s. Federal law did not require testing for microbiological contaminants. Daschle criticized an “unresponsive government” for failing to enforce an increase in testing standards, recommended by the subcommittee in 1989. He stated that the *E. coli* O157:H7 strain was “relatively new,” despite its isolation in 1975 and connection to foodborne illness in 1982—roughly a decade prior to the outbreak. He omitted these dates from his opening address.20

“We don’t need another report on food safety, we need some action on food safety,” Senator Leahy demanded in his opening remarks. He continued by stating the known facts of *E.

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coli: refrigeration and freezing would not kill it and very small numbers of the organism could cause infection, wreaking havoc. He failed to include that this knowledge was not recently discovered—scientists had known *E. coli* is capable of surviving freezing since 1984. The next speaker, Senator Craig, carefully reminded the hearing that it had not gathered "to determine guilt or innocence." He then proceeded to subtly defend the legislative body from potential accusations of guilt by declaring that everyone—from lawmakers, to food processors, to restaurants, to the consumer—is responsible for food safety. He affirmed that food safety was "not the sole responsibility of the government."

The initial remarks of the subcommittee reveal deep concern over the potential culpability for the outbreak. By withholding information regarding the dates of scientific discoveries regarding *E. coli* and strain O157:H7, the senators created the illusion that this information surfaced shortly before or in result of the outbreak. The illusion contributed to a sense of action regarding the outbreak. The statements directly regarding responsibility for food safety carefully mitigate the role of the legislative body in determining standards of inspection and regulation. Daschle admitted the current system of inspection was outdated and called for a "science-based risk assessment" system. He and the other senators accepted that the government was partially at fault for the outbreak. Through the elimination of specific dates connected to the discovery of key evidence, they dramatically reduced the complete failure of the governing body to utilize scientific evidence in determining standards of inspection and regulation.

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21 *U.S. Meat Inspection: February 5, 1993*
22 *U.S. Meat Inspection: February 5, 1993*
23 *U.S. Meat Inspection: February 5, 1993*
The first panel of witnesses called forth in the hearing addressed issues within the system and proposed plans to prevent future outbreaks. Mike Espy, the recently sworn-in Secretary of Agriculture, Russell Cross of the Food Safety and Inspection Service, and Jill Hollingsworth of the Department of Agriculture comprised this first panel of witnesses.

By pleading with the public to ensure all meat was cooked thoroughly, Espy danced around the question of culpability. Espy’s initial statement, regarding food safety, included a plea to “stop trying to blame someone else... we must all share the responsibility.” He stated that all investigations indicate the meat inspectors had done their job successfully, according to the current system in place. He emphasized that the industry could never achieve “a zero-pathogen level,” warned the public to ensure the consistent cooking of their meat, and cautioned consumers of rare meat that “you assume the risk.”24

Espy later admitted that there were five-hundred and fifty vacant food inspector positions, with a total of seven-thousand and two hundred inspectors nationwide. Filling these vacancies required paying the new inspectors a salary, an issue of funding he foresaw. He mentioned future testing methods, but advised implementation of these methods would be costly. He gave an estimated cost of fifty-eight billion dollars to test only twenty percent of the industry’s meat products. Espy informed the committee that fourteen food safety strategies could be implemented within a year, based on “existing research.” These statements regarding the cost of improvements to the system, coupled with the admission of current research indicate that proactive measures—from properly filling the ranks of inspectors to the utilization of cutting-edge testing methods—were available but not pursued prior to the outbreak.25

24 U.S. Meat Inspection: February 5, 1993
25 U.S. Meat Inspection: February 5, 1993
When addressing the subcommittee, Russell Cross affirmed that "food safety is everyone's business" and a "nationwide effort." He proposed several "revolutionary" methods to fix flaws in a system that had existed, unaltered at its core, since 1906. Senator Craig questioned the logic in devoting more resources to the identification of chemical adulterants, which caused only one and a half percent of all food borne illnesses, when biological adulterants caused approximately ninety-five percent of illness. Cross explained that they could not simply stop monitoring for chemical adulterants and shift the resources to testing for biological contaminants.\textsuperscript{26} Again, the topics of funding, costs, and the admission of knowledge that better methods existed arise.

Cross confessed that qualified applicants could fill only one-hundred and sixty of the inspector vacancies. The system could not produce enough candidates to run effectively, even if funding was not an issue. Cross proposed a multi-point control system that covered food production from "farm to table." Craig described the proposal as a "massive undertaking," revealing an attitude hesitant to the critical changes for public health. On the relationship between his organization and researchers, Cross claimed that they utilized all available data, but later described the communication between with researchers as needing improvement.\textsuperscript{27} Once more, the breakdown between regulatory agencies, researcher, and the utilization of scientific evidence surfaced.

In stark comparison to the multi-person panel that preceded (and those that followed) him, Robert Nugent comprised the entirety of the second panel. He, the President and Chief Executive Officer of Jack in the Box, appeared before the subcommittee to provide testimony on

\textsuperscript{26} U.S. Meat Inspection: February 5, 1993
\textsuperscript{27} U.S. Meat Inspection: February 5, 1993
the events leading up to the outbreak. His opening remarks asserted that the meat served in his restaurants complied to the established federal standards and passed all federal inspections. He cited the Center for Disease control, stating that thousands of cases of *E. coli* O157:H7 had been reported—and that food served as the vehicle of transmission for some of those cases. He declared that “clearly the USDA meat inspection system and federal food preparation standards are not providing the protection Americans deserve. Better safeguards are needed.”

The committee responded to Nugent’s testimony by bombarding him with questions regarding the procedures at Jack in the Box specifically. These questions varied from concerns with the internal temperatures of the patties regarding established standards, to the frequency of grill and patty inspections, and the temperatures and types of the grills in Jack in the Box. The subcommittee grilled him with questions on the failure to exceed, rather than meet, minimum standards and the ages of the chefs in his restaurants. Nugent responded to all these questions with some confusion. This bewilderment seemed partially directed at the types of questions posed to him and partially due to confusion regarding his own answers. When asked about the execution process of internal checks of the patties, Nugent replied that the process was unknown to him, but that it created “a high degree of awareness to achieve an environment in which this situation won’t occur again.” The specificity of the questions, directed at Jack in the Box’s procedures, created a sense of culpability for the outbreak. Nugent’s confusing answers suggested a confirmation of the restaurant’s role in the outbreak.

Senator Leahy asked a nervous-looking Nugent to explain why Jack in the Box failed to follow the state standard for internal temperature of meat. Nugent clarified that Jack in the Box

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28 *U.S. Meat Inspection: February 5, 1993*
29 *U.S. Meat Inspection: February 5, 1993*
followed all *federal* standards—and held every intention of exceeding them. By the federal
standards, the restaurant could not be faulted. Senator Daschle, the chair of the subcommittee,
directly inquired into the microbiology experts presumably employed by Jack in the Box’s parent
company, Foodmaker Incorporated. Nugent defended the food preparation process in place—no
illnesses could be connected to Jack in the Box since its founding in the 1950s. He continued
“historically, we have relied on the government and our suppliers to provide us any information
that would suggest that we need to make adjustments in our standards.” With these two
responses, Nugent attempted to place the blame on the federal government for its failure to raise
federal standards. His endeavor fell flat. Jack in the Box’s unofficial, televised, trial ended—and
the restaurant appeared negligent. The guilty verdict fell resoundingly.

The third panel of witnesses comprised of representatives of the Centers for Disease
control—Dr. Paul Blake—and the Food and Drug Administration—Dr. Douglass Archer. Blake
testified that individual states determine which diseases should be reportable to the Centers for
Disease Control. According to him, each reportable disease burdened over-whelmed
departments. Despite the spotty reporting of *E. coli* O157:H7, the CDC knew thousands of prior
cases of illness caused by the disease. The CDC recognized a prevalence of the disease in
Northern states, a prevalence “observed for quite some time now.” He stressed the emergence
of more food-borne diseases was expected. He emphasized that the combination of food
dispersal from a few companies, the differences in animal husbandry, the use of antibiotics, and
other changes to the lifestyles of people forced many microbes to evolve. This ongoing evolution
created—and would continue to create—more diseases. Blake’s testimony further

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30 U.S. Meat Inspection: February 5, 1993
31 U.S. Meat Inspection: February 5, 1993
demonstrated the scientific community’s awareness, prior to the outbreak, of potential hazards associated with *E. coli* O157:H7. His testimony also stressed the expectation of similar future outbreaks, due to the emergence of new strains of food-borne, illness-causing bacteria.

Dr. Archer, the representative of the Food and Drug Administration, asserted in his testimony to the subcommittee that establishment of a new system for regulation must occur. At the time of the outbreak, the FDA did not regulate restaurants due to “finite resources.” Instead, the FDA recommended “model codes,” a set of uniform, minimum, standards that it encouraged states to adopt. The FDA relied on cooperation with states and restaurants to adhere to safety recommendations. After Senator Murray asked Archer to explain the dissemination process of information regarding new safety measures, Archer revealed that he did not know the method the material reached restaurants. When compared to Nugent’s previous statement that the restaurant industry relied on government regulation to determine safety standards, Archer’s statements reveals that the regulatory body severely lacked communication, as well as the necessary authority to enforce safety sanctions.

Regarding the needed changes, Archer reiterated that raising the internal cooking temperature of ground beef patties could not be the only step in preventing future outbreaks. He admitted that it could be the first, but not the only, step in illness avoidance. He endorsed farm to table regulation by the Hazard Analysis and Critical Control Point System, or HACCP. Figure 4 provides an illustration of the core principals of HACCP. Archer advocated this system because it focuses on critical control points—the places in production that could have the most detrimental effect if not regulated and controlled properly. In his opinion, this system “should

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32 U.S. Meat Inspection: February 5, 1993
force numbers of organisms down to a low and controllable level.” When queried on the feasibility of a system of detention, a system in which ground beef would be held until its safety could be scientifically proven, Archer simply stated “it can be done.” A similar system regulated the shrimp industry.\(^{33}\) Archer’s comments to the subcommittee, from his insistence on a HACCP system to regulate the beef industry to his revelation that a detention-based system existed for shrimp, confirmed an awareness that the outdated system regulating beef shouldered the responsibility, or at least part of it, for the devastating outbreak.


The fourth panel called forth in the hearing consisted of three witnesses. The first, Dr. James Marsden represented the American Meat Institute, while his counterpart Dr. John Marcy

\(^{33}\) *U.S. Meat Inspection: February 5, 1993*
represented the Institute of Food Technology. The final witness of the panel, Carol Tucker Foreman served as a representative for the SAFE Food Coalition.

The testimonies of Marsden and Marcy continued to confirm that the government system of regulation prior to the outbreak reeked of outdated techniques and standards. Marsden reassured the panel that the strain of *E. coli* could not resist heat, but condemned federal guidelines as “woefully inconsistent.” Marsden then cited a study conducted in 1985 by the National Academy of Sciences that recommended changes to the regulatory system and the implementation of a HACCP system. He referenced a guideline—set out in 1989—by the American Meat Institute that suggested an internal cooking temperature of 155°F for pre-cooked ground beef patties. He stated that pre-cooked ground beef patties adhering to those guidelines had no known associations with food born illness. He declared that “it has long been recognized that the system needs to be modernized and directed more to controlling microbiological hazards.”

Marcy’s testimony asserted the effectiveness of the HACCP system and its reliance on the knowledge-base of those involved in the system—from factory worker to consumer. Ignorant individuals are less likely to participate fully in the safety measures laid out by the program. However, according to Marcy, “we have a wealth of knowledge that we haven’t educated, communicated to other people.” The public lacked education and awareness on proper cooking of ground beef. Additionally, Marsden argued that improvement in communicating pertinent information and acting on available knowledge for proper cooking and handling of ground beef

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34 U.S. Meat Inspection: February 5, 1993
is paramount to public health. He maintained that dissemination of proper, science-based procedures to the national community served as an urgent step in preventing future outbreaks.\textsuperscript{35}

The testimonies of Marsden and Marcy declared that the failure to utilize science and update an antiquated system contributed to the culmination of the outbreak. Additionally, the disappointing lack of communication to the public increased the likelihood of easily-avoidable illness.

The testimony Foreman, the representative for the Safe Food Coalition, most directly indicted the government for its failure to proactively regulate the meat industry. In her words, "there's a pattern there, every time there's a serious food borne illness outbreak, there's a flurry of activity...and then it disappears and everyone seems to go back to business as usual."\textsuperscript{36}

Despite her assertion that food safety is a shared responsibility, she suggested that the Department of Agriculture—with its half a billion-dollar meat inspection budget—should be an "appropriate object of investigation." She criticized the USDA's practice of labeling meat with a "tested for wholesomeness" label, as she felt that the department failed to assure safety. She recommended the removal of the seal of reassurance and the replacement of a label detailing food handling warnings and instructions. Foreman denounced the department for its conflict of interest, for attempting to both protect the public and promote the sale of meat, for viewing "regulated industry as both its peer group and its constituency." For example, after the outbreak, Secretary Espy did not meet with public health officials. He met with industry representatives.

\textsuperscript{35} U.S. Meat Inspection: February 5, 1993
\textsuperscript{36} U.S. Meat Inspection: February 5, 1993
She remained cautious regarding the new plans proposed by the USDA because they lacked details on specific goals and their plans to accomplish them.  

Foreman reminded the subcommittee that the strain of *E. coli* responsible for the outbreak, O157:H7, had been well-documented since 1987. Compared to international meat regulatory systems, the one in place prior to the 1993 outbreak appeared painfully focused on animal health. According to Foreman, “the system that exists now is mired in the past. I don’t think that it puts people and their health first. Its oriented, in fact, towards animal health.”  

Foreman’s frank and refreshing analysis of the USDA’s shortcomings brought many important issues before the subcommittee, issues regarding the regulatory system itself. She did not pander with internal cooking temperatures. She did not advocate the addition of a HACCP system. She did not attack Jack in the Box for serving the burgers that caused the sickness. She did not reveal the many shortcomings of the existing system, shortcomings she surely felt too numerous to list. She criticized the source of these failings—the government agency at fault for the antiquated regulatory system in place.  

Overall, the Senate subcommittee hearing provided a wealth of insight into the attitudes of various agencies regarding food safety, the role of the government, the role of science, and those responsible for when an outbreak occurs. The first panel, which included the new Secretary of the Department of Agriculture, focused primarily on proposed changes to the current system. It carefully avoided discussing culpability at length. When it surfaced, the panel made comments that food safety could not be the sole responsibility of the government or emphasized future plans to address the issues that contributed to the outbreak. The subcommittee bombarded the

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37 *U.S. Meat Inspection: February 5, 1993*

38 *U.S. Meat Inspection: February 5, 1993*
second panel, composed entirely of a nervous Nugent—the President of Jack in the Box—with specific, detailed questions regarding practices and procedures within his specific restaurant chain. This, coupled with Nugent's uncertain replies, created a strong sense that the chain itself shouldered the blame for the outbreak. While the restaurant failed to follow the state cooking guidelines (the only state with a 155°F required cooking temperature), it adhered to the federal protocols. The burgers passed all federal inspections.

The third panel revealed inherent communication issues between the regulatory departments, the scientific researchers, and the industry itself. This panel also revealed an awareness, prior to the outbreak, of the obsoleteness of the regulatory system in place. The fourth panel confirmed awareness of *E. coli* O157:H7, the antiquated nature of the system, and an overall failure to communicate risks with the public. This panel—and only one witness on the panel—addressed the shortcomings of the regulatory body itself. The government failed the public through the lack of communication, refusal to update an archaic system, and by defying science-based warnings regarding emerging pathogens. The careful construction of the hearing prevented criticism of the regulatory body itself, and the valid accusations of this last witness paled in comparison to the apprehensive image of a CEO called in to a hearing to answer for the crimes of his company.
Media Madness

There would come all the way back from Europe old sausage that had been rejected, and that was moldy and white—it would be dosed with borax and glycerine, and dumped into the hoppers and made over again for home consumption. There would be meat that had tumbled out on the floor, in the dirt and sawdust, where workers had tramped and spit uncounted billions of consumption germs. There would be meat stored in great piles in rooms, and the water from leaky roofs would drip over it, and thousands of rats would race about on it.39

Upton Sinclair’s *The Jungle* created a frenzy for regulation after its 1906 publication. The novel, such as the above passage, vividly described the filthy conditions of the meat production industry. Initially written to draw attention to the plight of the men working under the terrible circumstances, the scenes depicting the cavalier attitude towards cleanly manufactured meat products stuck with Sinclair’s audience. After President Theodore Roosevelt read the popular novel and federal investigators confirmed the graphic scenes, he pushed the 1906 Meat Inspection Act through Congress.40 The use of media, in this case a novel, effectively generated the social pressure to force a change in the industry. The public did not want rats in their sausage and expected the government to ensure the safety of their meat.

Increased demands for meat supported the development of a system mired in flaws. Several common industry practices encourage the growth of microbes, such as *E. coli*. Cattle feedlots, saturated with manure, are a prime habitat for many contagions. Often, the cattle will ingest pathogen-carrying manure. Crammed feedlots spread disease rapidly through cattle herds. However, raising cattle in these feedlots represents the cheapest method of raising beef for


slaughter. 41 The spread of disease continues at the slaughterhouse, as infected knives and machinery carry microbes from one carcass to the next. 42 A new diet fed to cattle also creates issues. Cattle naturally eat grasses, not grains such as corn. The industry favors a diet of corn because corn is cheaper and fattens the animal more effectively. However, as cattle consume increasingly more corn, the environment in their stomach becomes more acidic. This acid-rich interior creates an ideal environment for *E. coli* O157:H7. 43 The practices of the meat industry encouraged, instead of discouraged, the spread of disease. As in 1906, regulating these practices at the federal level would require massive public outrage. As in 1906, the media wields the power to encourage and direct public outrage. However, after the 1993 outbreak the confused response of the media limited the pressure on the regulatory body to change industry practices.

Analyzing publications from the *New York Times* alone reveals the impotent response that emerged in the wake of the 1993 outbreak. Publication of most articles occurred between February and March of 1993. The short attention given to the outbreak by the media limited prolonged public outrage. Furthermore, these articles often failed to reveal the many flaws of the meat industry and its regulatory system. Instead, they brought attention to one company and a too-low cooking temperature.

Analyzation and condemnation of the company that served diseased burgers to kids appears frequently in the news coverage following the outbreak. The *New York Times* reported that the public, furious, bombarded the company with “anonymous telephone callers accusing them of being baby killers.” Stocks in the company plummeted after the outbreak. Public

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42 Schlosser, 203-204.
relations experts condemned the company for refusing to accept the blame for the outbreak.\textsuperscript{44} The newspaper contributed to the sense that Jack in the Box (and its parent company, Foodmaker) carried blame by announcing the cancellation of eighty-five new restaurant openings.\textsuperscript{45} The focus on Jack in the Box demonstrates the intense scrutiny the company faced because public suspicion its procedures caused the deaths of children. Language such as "poisonings like Jack in the Box" and "sale of undercooked, disease-ridden hamburgers from Jack in the Box," emerged following the outbreak.\textsuperscript{46} This language connected the outbreak to the company, but obscured the failures of the complex system that provided the beef.

The final 1993 coverage of the outbreak, published by the \textit{New York Times} on December 20, reaffirmed the connections between Jack in the Box and the illness. It reported on the actions of the administration following the outbreak, but detailed the litigation against Foodmaker and the failure by Jack in the Box to pay the medical bills of the victims in a timely manner.\textsuperscript{47} Once again, Jack in the Box emerged as a culprit, strengthening the association between this outbreak and the chain, as well as deterring attention from the flaws of the system it operated within.

A series of letters to the editor reveals the disorienting debate on the direction reform needed to take following the outbreak. One article recommended all food products should


undergo irradiation. Another letter to the editor entreated for the implementation of a "national meat free diet." According to the author, this diet "would save more in health care costs than any reform plan being discussed."48 One letter to the editor responded to the previous call for mandatory food irradiation, condemning irradiation.49 The myriad of recommended changes to the system failed to succinctly report on the flaws of the system. Instead, these recommendations obscured the past failure to regulate the system. The lack of public understanding of the system and its flaws led to confused debate on the best course of action.

A few articles did address the failings of the government's regulatory system, although often with the carefully neutral tone that frequently characterizes newspaper articles. The New York Times compared the five-hundred and fifty food inspector vacancies to a new bout of hiring, reporting that budget cuts and deregulation attributed to the recent decline of food inspector positions. It questioned the need for twelve regulatory agencies, rather than the institution of one agency. It also discussed the proposed future plans and actions already taken by the federal government.50 This created a more neutral and hopeful tone regarding the performance of the federal government in its regulatory duties. Overall, it suggested that the government and its system should fall under scrutiny, but not condemnation.

Another article detailed the outbreak, its victims, and the symptoms of the illness, including hemolytic uremia syndrome. The article reiterated the new FDA suggested cooking

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temperature of 155°F, emphasizing consumer responsibilities, instead of flaws in the system.\textsuperscript{51} The \textit{New York Times} very briefly criticized the failings of the federal government’s regulatory system.\textsuperscript{52} Mired in competing articles, the assignation of blame to the system established by the federal government lost effectiveness, much like Foreman’s testimony. The associations to Jack in the Box and debate over the next course of action overwhelmed the connections between the failings of the system and the incident.

The power of public outrage forced changes in 1906. It forced changes in 1993. However, the scattered approach of the media in assigning responsibility for the outbreak crippled the effectiveness of response. The public could not find a definite culprit to blame. Did the supplier to Jack in the Box fail to provide safe meat? Did Jack in the Box fail to cook the patties correctly? Where did the system fail that lead to so many illness caused by eating a Jack in the Box burger? The one consistent feature of the newspaper publishing regarding the outbreak: Jack in the Box made an appearance in almost all of them. Jack in the Box emerged as the culprit that caused the sickness and death of children. Jack in the Box became strongly associated with this outbreak, distracting from the antiquated federal regulatory system.


**After the Outbreak**

Despite the scattered response from the media, the public placed enough pressure on legislators to adjust the flawed system. Fear of future outbreaks forced the government to raise the federal cooking temperature to 155°F, set a goal to reduce the number of yearly *E. coli* infections by half, and increased the amount of beef sampled and tested. The industry adopted the HACCP system. Regulatory agencies continued to release warnings and reports on the organism and its associations with beef. They conducted investigations and issued new recommendations to reduce O157:H7 in the industry. Through the end of the 1990s and the early 2000s, outbreaks of *E. coli* O157:H7 continued to occur. They recalled millions of pounds of beef, tainted with *E. coli*. Outbreaks and recalls associated with *E. coli* gradually dropped. The 1993 outbreak generated enough pressure to force some change within the industry. The implementation of these changes required public concern. Recommendations from the scientific community did little to impact the industry until the involvement of the public.

However, the regulation of the industry remains largely retroactive. The conditions on feedlots have improved minimally, breeding new strains of disease. Following an outbreak in Europe during 2011, the federal government outlawed six strains of pathogenic *E. coli*.

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53 “Timeline of Events Related to *E. coli* O157:H7,” last modified June 23, 2013, [https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-factsheets/foodborne-illness-and-disease/escherichia/CT_Index/lut/p/a1jZDbTsMwDIafhQewnNIdL6d1aC2s1TRgWW6m0LqNpS6ZmojT01MEN0MMZl9Z_j7Z-IGjQu3MM7cmsgem-5z1ZC_WYpLmpcJeXijsuXxXd5KKWab8QDs_gCK9EL_TC3ef35-wYHrfiVXLeqjIRbYNYR5VsxGMCy_USB1SN9zUE01B8g8ZUEYy1lit-LJ987Au46yEMTg01BzKBuFGoLPvCW7ZQ-Y7BJ-OpnaKS9_vM1SKw9S41kK6kXxI6NIXqSIlhP0efgnwCzj0PHwoN7vFkvB2dUHmsZPMQ!/?1dmy&current=tr
54 Pollan, 82.
55 Benedict, 300.
Scientists discovered these strains and connected them to food borne disease in 1988. Once again, public fear of illness forced regulation. On January 4 2011, President Obama signed the Food Safety Modernization Act into law. This act contains many proactive policies to prevent outbreaks of food borne illness.

Five points addressing food safety summarizes the broad initiatives the FSMA seeks to achieve. Firstly, the FSMA shifts food safety from a reactive position to a proactive position by implementing comprehensive controls and the authority to prosecute intentional contamination. The second initiative mandates frequent safety inspections, dependent on the risk factors of the specific industries. A third initiative grants the FDA the power to mandate a food recall, if deemed necessary. The FSMA stipulates that the FDA must first offer the company distributing the suspect food to voluntarily recall it. Additionally, the FSMA sets the goal to address weaknesses in regulating imported food. Finally, the FMSA seeks to enhance cooperation between various food regulatory agencies.56

The Food Safety Modernization Act created over fifty new rules and guidance documents. Section 103 specifically describes a proactive approach to food industry regulation that mirrors HACCP principles. It states that the industry must evaluate hazards, create controls to limit hazards, record results, and maintain a standing record of hazard-prevention and outcomes. Any facility that makes over $500,000 per year must abide by these preventative measures. Section 111 represents another important section of the Food Safety Modernization Act, or FSMA. Section 111 details the requirements for safe and sanitary transport of food. This ensures that transportation of food to sites of distribution and consumption will not undermine

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safety measures taken at food production sites. Nearly two decades after the Jack in the Box outbreak, widespread regulation and reform to the food industry finally passed into law.

Despite this major victory in food-system regulation, the act did not receive funding. The FDA estimates that food borne illness affects forty-eight million Americans per year, roughly one out of every six people. One-hundred and twenty-eight thousand of these cases require hospitalization, with approximately three-thousand deaths. Many of these continue to be cases of \textit{E. coli} O157, transmitted through food, specifically meat products. Without adequate funding, the FSMA cannot implement the necessary changes to proactively prevent future outbreaks. Once again, the costs associated with regulation prevent modification—until the public becomes involved.

In the fall of 2015, a familiar problem consumed a popular food chain. Its guests, eagerly consuming the food it offered, also consumed something far more insidious. Multiple diners became ill. Some needed hospitalization. The culprit causing this calamity? Toxin-producing \textit{Escherichia coli}. After connections between six of its locations, the chain, Chipotle, closed forty-three restaurants. The \textit{E. coli} outbreak occurred as the FDA, utilizing authority granted in the FSMA, launched an investigation into Chipotle’s food safety practices, based on an unrelated

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58 Benedict, introduction, xii.
59 "President’s FY 2017 Budget Request: Key Investments for Implementing the FDA Food Safety Modernization Act: The Context and History of FSMA Funding."
outbreak earlier in the year.\textsuperscript{62} Those affected by the \textit{E. coli} outbreak filed a class-action lawsuit, just as victims of the Jack in the Box outbreak had done nearly twenty years earlier.\textsuperscript{63} Once again, media attitudes towards the outbreak pinned responsibility on the chain, instead of the regulatory body.

On the November 2, 2015, \textit{The New York Times} published its first article covering the outbreak. The article covered the measures that Chipotle took after the outbreak, including closing forty-three locations. The article quoted the Chipotle communications director as describing the closings as taken "out of an abundance of caution." This generated a sense that Chipotle took the outbreak very seriously and had the situation under control. In a calm, unsensational tone, the article referenced two other \textit{E. coli} outbreaks that occurred recently, and described both the symptoms of and treatment for \textit{E. coli}. The article contributes to a sense that the outbreak should not alarm the public, but that the public should be aware that Chipotle food caused illness.\textsuperscript{64} Two decades after the anxiety and confusion of the Jack in the Box outbreak, \textit{E. coli} causing widespread illness no longer panics the public or inspires the same media scrutiny.

The subsequent three articles, published in January, February, and September 2016, focused on the new health measures Chipotle implemented after the outbreak. The first details chain-wide store closings to retrain all employees.\textsuperscript{65} The second touches on the numbers of customers who contracted illness in the six separate food-poisoning outbreaks since the previous

\textsuperscript{64} Hauser
July. It also details the newest health measures at Chipotle: improved methods to clean lettuce and grated cheese, blanching vegetables, handling raw meat “differently,” and giving employees paid sick leave. The next article continues this vein by describing a handwashing timer, set to remind all Chipotle employees to wash their hands every half-hour, increased recording of safety procedures, and the creation of a new position in the restaurant, a food safety leader. It also reintroduces a familiar character to the food-poisoning scene: James Marsden, hired as a safety consultant. These articles contribute to the perception that Chipotle’s new procedures ensured safety at its restaurants. However, the public remained skeptical, despite media influence. The connection of the chain restaurant to the outbreak, instead of the handling processes that caused the outbreak and the failure to inspect these processes, pinned the responsibility of food safety solely on the restaurant.

Two more articles reveal the public blame for the outbreak. A September 2016 New York Times article describes a forty-five percent drop in the company’s shares, despite extensive marketing campaigns to restore its image as a healthy eating establishment. In this article, Marsden specifically mentioned the Jack in the Box crisis of 1993 and stated that “no one has ever had this kind of food safety crisis in the era of social media.” Food poisoning outbreaks in the world of social media have devastating consequences on a company’s reputation. Two years after the 2015 outbreak, an October 2017 New York Post article concludes that Chipotle still struggles to win back its customers. The emphasis on new health measures, the marketing campaign, delayed opening of new restaurants, and the introduction of new menu items all failed

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to recover the company to its former strength. Its reputation, like its food, became tainted in 2015.

Unlike after the 1993 outbreak, the articles did not discuss a need for system-wide adjustments, or even the relatively new FSMA. Government involvement in ensuring food safety did not factor into the discussion. At the end of 2014, the gap between funding and operational costs for the FSMA remained about three hundred million. By the end of 2016—after the Chipotle outbreak—funding increases nearly halved that gap. Once again, public concern over the safety of their food generated retroactive Congressional response. However, a gap remains to finance the FSMA to its fullest capacity. Pressure from the public will ultimately close this gap, ensure that food regulatory bodies remain funded, and that regulations are based on proactive measures and scientific understanding.

69 “President’s FY 2017 Budget Request: Key Investments for Implementing the FDA Food Safety Modernization Act: The Context and History of FSMA Funding.”
Conclusion:

The government must make decisions to protect the public—from foreign policy to debates over gun laws. This protection extends to public health concerns, particularly those within regulated industries. The outbreak of 1993 demonstrates the importance of effective communication between scientific communities and governing bodies. Furthermore, it reveals that disregarding pleas, supported by scientific evidence, to institute important, system-wide adjustments may cause avoidable devastation. Simple steps, such as cooking a hamburger patty at a higher temperature or screening all bloody diarrhea for a strain of bacteria, may have a profound impact on the ability to save lives.

The plethora of scientific data on *E. coli* O157: H7 available before the outbreak confirms awareness of the pathogen. Proactive measures based on emerging science could have mitigated the consequences caused by this microbe. The subcommittee hearing, with the reappearance of concerns regarding costs of reforms, revelations of poor communication, and the defensiveness of government agencies clearly reveal the low priority the government placed on inconvenient reforms. As long as reform remained a low priority to the public and the voters, it remained a low priority to the government tasked with protecting them.

Foreman stated in her testimony to the subcommittee, “there’s a pattern there, every time there’s a serious food-borne illness outbreak, there’s a flurry of activity…and then it disappears and everyone seems to go back to business as usual.” The scattered responses to food-borne illness contribute to the repeated failure to quickly overhaul a system rife with inefficiencies, poor communication, and conflicted interests. The habitual association between a specific company or product—in this case Jack in the Box and ground beef patties—hinders the generation of a focused demand for system-wide reformation.
The simple, but consistent, affiliation between a company and a crisis distorts the complexities of a defective system. Propagation of direct pressure on the system and its regulators is paramount in achieving the considerable reforms necessary to proactively address public health concerns. However, this pressure is the most effective after—not prior—to a crisis. System wide changes are unlikely to occur without media attention and public outrage. Unfortunately, in 1993, these both came with the cost of hundreds of sick children and ultimately the loss of four innocent lives.
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