

## Blue Bell Listeria Outbreak from 2013-2015

### **Introduction**

In 2015, Blue Bell recalled its products for the first time in its 100 year history due to listeria contamination that originated in its manufacturing facilities (Gillespie, 2015). The consumption of these contaminated products led to three deaths and ten cases of listeriosis over a five year span. Between 2010 and 2015, at least ten people across four states contracted Listeria monocytogenes (Ellis, 2015). The Listeria monocytogenes bacteria is commonly known as listeria and originates in raw ingredients that have come in contact with contaminated soil or water (CDC, 2015).

Poor maintenance of infrastructure, particularly pipelines, was a major contributor to the spread of listeria within a plant (FDA, 2015). Listeria thrives in cool and moist conditions, which makes it difficult to thoroughly sterilize equipment (Jalonick, 2015). Listeria causes a bacterial infection known as listeriosis. Severe listeriosis cases most severely affect people with weakened immune systems, elderly over 65 years of age, pregnant women, and newborns (CDC, 2015). Through bacterial analysis, the Centers for Disease Control and Prevention (CDC) positively linked the different cases to the same strains over the five year period (CDC, 2015). This indicates that the listeria problem persisted for years in Blue Bell facilities.

The Food and Drug Administration (FDA) launched an investigation to determine the cause of the listeria outbreak (FDA, 2015). The FDA discovered that Blue Bell plant managers enabled numerous violations of health and safety codes. Most shockingly, the FDA discovered 17 instances of listeria contamination in the Oklahoma plant between March 2013 and March 2015 (FDA, 2015). Other violations included poor sanitation of equipment, unhygienic methods of food storage, and overall negligence of health standards. The reports described similar issues

in the Texas manufacturing facility (FDA, 2015). Listeria contamination was identified at all three Blue Bell facilities, but no cases were linked to the Alabama plant (CDC, 2015). For this reason, the scope of this report is limited to the Oklahoma and Texas facilities.

Blue Bell management at both the Oklahoma and Texas facilities behaved unethically prior to the 2015 listeria outbreak primarily by enabling poor safety practices; this negligence led to contamination, which was covered up to prevent production shutdowns. The paper illustrates four main health and safety violations that contributed to the spread of listeria in both facilities and evaluates the decisions and actions leading up to the listeria outbreak with respect to the Kellogg's Code of Ethics. Kellogg has won multiple awards for its ethical decisions as a company, and its Code of Ethics serves as the primary criteria of evaluation (Kellogg, 2017) since Blue Bell does not have its own corporate guidelines.

The Blue Bell listeria outbreak requires attention because its consequences remind companies to prioritize health and safety standards. The sanitation issues uncovered through careful inspection of its plants are applicable to multiple fields but are especially important in the food industry due to the increased likelihood of contamination and sickness. A lack of adherence to health and safety codes jeopardizes the well-being of both workers and consumers; this report provides insight on the Blue Bell listeria outbreak to prevent similar disasters in the future.

### **Outbreak Impact**

The section illustrates how both the Oklahoma and Texas manufacturing facilities contributed to the listeria outbreak. It presents a timeline from the initial discovery of contamination to the different cases of listeriosis and closes by establishing links between the cases and their original sources of contamination.

## **Contamination Discovery**

The South Carolina Department of Health and Environmental Control (SCDHEC) discovered initial listeria contamination during a regular inspection of products at a Blue Bell distribution center in February 2015. The listeria was found on Chocolate Chip Country Cookie Sandwiches and Great Divide Bars (CDC, 2015). The Texas facility, located in Brenham, manufactured these two products, so the Texas Department of State Health Services (TDSHS) mandated a series of tests to determine whether the contamination was a random occurrence or more serious issue (CDC, 2015). Unfortunately, the results from the TDSHS showed that the two products identified at the distribution center as well as another product, Scoops, all contained strains of the same bacteria (CDC, 2015). All of these products were manufactured on the same production line in the Texas facility (FDA, 2015).

The CDC manages a national database called PulseNet which identifies different strains of bacteria and matches them to DNA sequences from patients who have contracted the bacteria (CDC, 2015). The fingerprinting technique utilizes DNA pattern recognition in order to determine which bacterial strains are related. PulseNet identified seven different but closely related strains of listeria in Blue Bell ice cream products from the Texas facility (CDC, 2015). One month later, health officials in Kansas found two individuals who contracted listeria and developed listeriosis. Through DNA analysis, officials discovered the listeria strains matched the same ones found in the Blue Bell ice cream products from the Texas facility (CDC, 2015).

## **Outbreak Consequences**

Three other listeriosis cases originated from the same hospital despite all five patients being treated for unrelated reasons. The development of listeriosis forms the only connection between those five individuals, which indicates that the listeria came from something at the

hospital (CDC, 2015). Using the DNA matching technique, health officials discovered that four of the five people contracted the same bacterial strains identified in products at the Texas manufacturing plant and the South Carolina distribution center (CDC, 2015). Upon further investigation, officials also determined that each hospitalized individual drank a milkshake that contained Scoops, one of the contaminated Blue Bell products. These five individuals contracted listeriosis over the course of a year beginning in January 2014, and three of the five eventually died from the disease (CDC, 2015).

Later that March, the CDC reported that a pre-packaged, single-serving chocolate ice cream cup sold in the Kansas hospital also tested positive for listeria (CDC, 2015). Blue Bell recalled all known, contaminated products from the market in March (Blue Bell, 2015). In early April, investigators linked six other listeriosis cases to the Oklahoma facility from three different states: Arizona (1), Oklahoma (1), and Texas (4) (CDC, 2015). These six cases occurred between 2013 and 2015 and were caused by the same strains of listeria found in the chocolate ice cream cups (CDC, 2015).

The CDC and FDA both traced back the contamination to at least 2013 which indicates that the listeria problem persisted over years (CDC, 2015). Blue Bell finally announced a total recall of all of its products from the market in late April after the company found listeria in other products that were manufactured in different production lines (Blue Bell, 2015). The CDC revealed that a total of 10 people were affected by the Blue Bell listeria outbreak, three of which resulted in death (CDC, 2015). The CDC traced back the listeria strains from the 10 cases to the two Oklahoma and Texas manufacturing facilities (CDC, 2015). The sheer magnitude of the outbreak and its widespread consequences severely damaged Blue Bell's long-standing

reputation as a reliable company. To this day, Blue Bell has not recovered from this listeria outbreak (Blue Bell, 2017).

### **Facility Investigations**

This section discusses the 2015 FDA investigations regarding the listeria outbreak. FDA inspectors reported numerous health and safety code violations in both the Texas and Oklahoma facilities during observations (FDA, 2015). The four main issues found in both plants were unhygienic process safety, lax employee hygiene, improper food conditions, and poor infrastructure maintenance (FDA, 2015).

#### **Unhygienic Process Safety**

The FDA determined that the unsanitary piping systems of both facilities significantly contributed to the listeria contamination (FDA, 2015). More specifically, multiple FDA reports describe observations of condensate dripping onto different products prior to packaging (FDA, 2015). Condensate refers to the water droplets that form on a surface due to a temperature difference (UCSB, 2017). The ambient air of an ice cream facility tends to be warmer than the frozen product passing through the piping system. This temperature difference causes condensation to occur along any surface exposed to both temperatures (UCSB, 2017). The figure below shows how condensate contaminates Blue Bell products.



*Figure 1.* The picture above captures the moment just before a drop of condensation falls in a Blue Bell production line (Collette, 2015, modified by authors).

The arrows on Figure 1 above highlight areas of condensation on unsanitary equipment which eventually drip down and contaminate the product (Collette, 2015). The top arrow indicates a major area of condensation and points out a group of visible droplets. The bottom arrow focuses on one specific droplet forming at the bottom of the flat surface. The position of the droplet enables it to fall directly into the next ice cream product that passes underneath the pipe (Collette, 2015). The FDA report from March 17, 2015 describes how condensate from the hoses directly above a production line dripped onto the steel containers in the third floor production area of the Texas facility (Steinmiller et al., 2015, p. 3). These containers were then filled with mixed berry ice cream and used to mold the final product (Steinmiller et al., 2015, p. 3). The very next day, a similar condensate drip issue was observed in the first floor production

unit. However, this time, the drops fell directly onto the mint chocolate chip ice cream itself (Steinmiller et al., 2015, p. 3).

Even more issues with condensate drip were noted at Oklahoma facility. Observations at the Oklahoma facility from March 26, 2015 indicate that condensate fell directly into large mixing tanks that combine raw ingredients (Payne et al., 2015, pp. 6-7). This type of condensate drip occurred repeatedly in multiple units across the facility and affected a variety of Blue Bell products including the Dutch Chocolate Supreme Ice Cream, Caramel Sundae Crunch Ice Cream, and Orange Sherbet (Payne et al., 2015, pp. 6-7). As discussed earlier, listeria thrives in moist and cool environments, and this makes piping systems ideal breeding grounds for bacteria (Jalonick, 2015). Further, listeria is primarily found in environments that tend to carry bacteria, such as soil and water. Condensate contains dirt and grime from the equipment and can potentially contain strains of bacteria. Dripping condensate creates a hazard on its own, but condensate dripping onto edible products violates federal health regulations (FDA, 2015).

### **Lax Employee Hygiene**

FDA reports also discussed a blatant disregard for employee hygiene practices in both plants. For example on March 26, 2015, inspection reports for the Oklahoma plant noted that the Mix Draw Operator, the Machine Operator, and the Freight Puller worked together to process large tanks of ingredients (Payne et al., 2015, p. 8). Yet, none of these employees changed their gloves or washed their hands despite the fact that each individual came in direct contact with food and equipment. Additionally, some production units neglected to enforce uniform and/or hairnet policies (Payne et al., 2015, p. 8).

At the Texas facility, similar problems persisted throughout several production units. The FDA reports from March 16, 2015 cited that at least 6 employees failed to cover their beards

and/or mustaches while they worked around open food ingredients and products (Steinmiller et al., 2015, p. 3). Employees had little regard for sanitation procedures prior to handling Blue Bell products (Steinmiller et al., 2015, p. 3). Later that week, both plants turned up evidence that employees wore soiled clothing or shoes into production areas (Steinmiller et al., 2015, p. 3; Payne et al., 2015, pp. 7-9). *Listeria* can easily be tracked in on soiled garments or shoes, and this process likely contributed to the spread of the contamination. Neither facility enforced hygiene rules, such as requiring employees to wash hands or wear hairnets (Steinmiller et al., 2015, p. 3; Payne et al., 2015, pp. 7-9).

### **Improper Food Conditions**

Improper food processing, storage, and distribution played another key factor in the growth and spread of the bacteria (FDA, 2015). The FDA reports from March 2015 showed that employees in various units at both Blue Bell facilities operated equipment like mix tanks, freezers, and fillers at different temperatures than those specified in equipment instructions (Steinmiller et al., 2015, p. 4; Payne et al., 2015, p. 6). This food safety violation doubles as an employee safety hazard due to improper use of machinery. One FDA report noted that certain products at the Texas facility were held at a higher temperatures than those mandated by health and safety regulations (Steinmiller et al., 2015, p. 3).

Similarly, at the Oklahoma facility, raw tanks containing unpasteurized ingredients, such as milk and cream, were held above the temperatures specified by Blue Bell's own guidelines (Payne et al., 2015, pp. 9-10). Dairy products, in particular, must be handled at the correct temperatures in order to prevent spoilage, fermentation, and even mold. The disregard for proper temperature and conditions carried into the lack of proper sanitation. Officials observing the Oklahoma facility noted that the water temperatures used to wash equipment and clean food

contact surfaces of equipment were not monitored or recorded as required (Payne et al., 2015, p. 6). This inconsistency likely caused the numerous citations of dirty equipment for both facilities (FDA, 2015).

### **Poor Infrastructure Maintenance**

The FDA reports emphasized that both plants operated unsanitary equipment and that neither plant maintained safe infrastructure (FDA, 2015). On March 16, 2015, many blenders in the main blending room at the Blue Bell facility had dirty lids, blades, and undersides despite the constant use of raw ingredients (Steinmiller et al., 2015, p. 3). Additionally, the ceiling directly above certain blenders in the room were damaged and crumbling (Steinmiller et al., 2015, p. 4). Small pieces could easily fall into the blenders and remain unnoticed due to the negligence in sanitation of equipment.

Similar reports described the chipped paint, rotting wood, and damaged infrastructure of the Oklahoma plant in March 2015 (Payne et al., 2015, p. 9). Various inspection reports during that month detailed the high humidity and lack of air circulation in storage units despite the fact that bacteria breeds exceedingly well in moist and humid environments (Payne et al., 2015, p. 9). Officials observed that freezer units for single-serve ice cream products had mold growing in the gaskets, which are structures that prevent fluid leakage (Payne et al., 2015, p. 10). Wooden pallets appeared soiled, broken, and unsanitary even though the pallets transported and stored many of the products (Payne et al., 2015, p. 9).

These four issues reflected a clear lack of health and safety standards in both facilities. Although the listeria outbreak gained attention in 2015, FDA investigations discovered the presence of the same strains back in 2013 (FDA, 2015). Blue Bell chose not to shut down its production units in favor of sales and allowed the listeria contamination to spread (FDA, 2015).

## Ethical Analysis

The ethical analysis section compares Blue Bell's responses to the listeria outbreak to the Kellogg's Code of Ethics. The Kellogg's Code of Ethics was chosen because Blue Bell does not have an ethical guideline to direct its corporate behavior. Kellogg is recognized as one of the most ethical companies in the world and has won numerous awards to reflect this title (Kellogg, 2017). Kellogg developed a code of ethics that details the responsibilities of every individual in the company. The code applies to managers, employees, trust holders, and contractors (Kellogg, 2013).

As a result of its achievements, Kellogg's Code of Ethics served as the criteria for evaluating decisions made by Blue Bell regarding the listeria outbreak. The Code of Ethics consists of an extremely lengthy document detailing all of the principles behind which Kellogg stands. The table below highlights four principles that are found in the Kellogg's Code of Ethics.

Table 1. The table displays the four codes through which the decisions of Blue Bell are analyzed (Kellogg, 2013, created by authors).

Four Codes taken from the Kellogg Code of Ethics
Using Equipment, Information & Communication Systems Responsibly (pg. 45)
Promoting a Safe and Healthy Workplace (pg. 44)
Promoting Honest Marketing Practices (pg. 14)
Delivering on Quality, Safety, and Value (pg. 26)

Blue Bell failed to follow four basic principles of food process safety found in the Kellogg's Code of Ethics and faced severe consequences as a result of its negligence (Kellogg, 2013). The following analysis discusses Blue Bell's ethical failures in its actions prior to the listeria outbreak.

## **Code 1: Using Equipment, Information, and Communication Responsibly**

An FDA inspection report details one instance that highlights a series of unethical decisions made by Blue Bell. On January 30, 2015, the production unit responsible for manufacturing the contaminated Blue Bell products was shut down for two weeks as part of a routine cleaning and safety inspection. However, the equipment tested positive for listeria in the drains of the freezer tunnel less than one week after the cleaning was completed. These results suggest that the cleaning procedures were lax, and consequently, the listeria contamination was not removed during the inspection. Further, the same unit resumed production despite the fact that its own tests confirmed the presence of listeria on the equipment used in the production line. The Texas Department of State Health Services (TDSHS) also tested products from this line for potential listeria contamination, and the tests returned positive results. The Texas facility received word from the DSHS on February 13, 2015 regarding the contamination. Blue Bell should have shut down its unit that day; however, the unit resumed operations on the same day that it received the notice and continued to manufacture until March 9, 2015 (Steinmiller et al., 2015, pp. 1-2).

Despite concrete evidence of contamination, Blue Bell chose to resume production without addressing the contamination issue (Steinmiller et al., 2015, p. 2). This decision violated the “Using Equipment, Information & Communications Systems Responsibly” code from the Kellogg’s Code of Ethics (Kellogg, 2013). Blue Bell acted unethically by disregarding the information provided by TDSHS laboratory and failed to communicate the listeria contamination to consumers (Steinmiller et al., 2015, p. 2). In this situation, Kellogg would have assigned an investigative team to evaluate the issue and develop a plan to take corrective actions. Blue Bell did not immediately shut down production at the contaminated plant or recall all presumably

contaminated products. Both of these steps have been taken by Kellogg in the past (Kellogg, 2016).

### **Code 2: Promoting a Safe and Healthy Workplace**

An FDA inspection report of the Blue Bell Oklahoma plant from March 2015 highlights the negligence in practicing basic hygiene and food safety. Some observations included employees operating machinery without wearing proper uniforms and handling products without wearing clean gloves. Some employees failed to cover facial hair, which increased the risk of contaminating any frozen products in the vicinity. Other workers wore soiled clothing into food production areas. Based on the report, it appeared that most employees refused to take proper health and safety precautions to prevent contamination of microorganisms (Payne et al., 2015, pp. 7-11).

Employees at Blue Bell violated the values of “Promoting a Safe and Healthy Workplace” as stated in the Kellogg’s Code of Ethics (Kellogg, 2013). The negligent actions of Blue Bell employees could have easily spread the bacteria from equipment surfaces to food products. If Blue Bell was held to the standards of the Kellogg’s Code of Ethics, the plant managers, workers, and contractors would all face disciplinary actions for their defiance of company policy (Kellogg, 2013). Blue Bell’s actions demonstrate the exact opposite of promoting a healthy and safe environment at work. They failed to enforce any sanitation protocols or hygiene procedures for employees to prevent the spread of contamination.

### **Code 3: Promoting Honest Marketing Techniques**

As briefly covered in the Investigations section, the FDA discovered at least four different instances of improper conditions for the processing and storage of ingredients (Payne et al., 2015, pp. 9-10). A report from the Oklahoma plant inspection in April 2015 described the

inconsistency of the temperatures at which unpasteurized dairy products were held (Payne et al., 2015, pp. 9-10). Unpasteurized products are not free of bacteria; this means that maintaining their specified temperatures is crucial to preserve their integrity (Grabianowski, 2005). On April 13, 2015, workers stored skim milk three degrees above the correct temperature, and then operators used the same milk one degree above the specified temperature in the mixing tank (Payne et al., 2015, pp. 9-10). Both cases depict scenarios that can adversely affect the product for which the milk is used.

Blue Bell failed to provide safe and quality products to its consumers by neglecting food safety standards. The company delivered products made of unpasteurized ingredients that were held at the wrong temperatures (Payne et al., 2015, pp. 9-10). Such products can make consumers sick even without bacterial contamination. This violation broke the Kellogg's "Promoting Honest Marketing Practices" code because Blue Bell falsely promoted advertisements that claimed its products were "high-quality" (Kellogg, 2013; Blue Bell, 2015). In reality, the quality of the ingredients were compromised due to conscious negligence. Blue Bell used family-oriented language to promote its products; however, this dishonest marketing strategy devastated at least ten families (Blue Bell, 2017). The Kellogg's Code of Ethics emphasizes corporate integrity, and Blue Bell failed to uphold this value in the marketing of its frozen products (Kellogg, 2016).

#### **Code 4: Delivering on Quality, Safety, and Value**

The most frequently noted observation in the FDA reports is the condensate drip issue. Poor maintenance of piping systems resulted in the condensation of impure water droplets on the rims of pipes (Steinmiller et al., 2015, p. 3; Payne et al., 2015, p. 6-7). Inspectors discovered condensate formation and drip in production units across both facilities (Steinmiller et al., 2015,

p. 3; Payne et al., 2015, p. 6-7). In some cases, condensate entered mixing tanks due to improperly sealed vessels as noted on March 26, 2015 at the Oklahoma plant (Payne et al., 2015, p. 6-7). In other cases, condensate either formed directly on product supply lines or fell from drainage piping onto products prior to packaging as noted on March 18, 2015 at the Texas facility (Steinmiller et al., 2015, p. 3). Condensate droplets include grime and soil, both of which can contain bacterial strains. In all of these cases, both the quality of the product and safety of the consumer are severely compromised due to improper sanitation and maintenance.

The condensate drip directly onto food products from unclean equipment resulted in the spread of listeria into Blue Bell products. These unsafe, unhygienic practices violated the Kellogg's "Delivering on Quality, Safety and Value" Code because the condensate drip contaminated the consumable goods and resulted in unsafe and poor-quality products (Kellogg, 2013). The condensate drip issue could have been avoided if Blue Bell participated in routine infrastructure maintenance and plant inspections. In this case, Kellogg would have assigned an investigation team to assess any contamination issues and immediately recalled any potentially hazardous food items as it has done in the past (Kellogg, 2016). Blue Bell failed to hold itself accountable to safety practices in its facilities and compromised its reputation and customer base.

### **Conclusion**

Blue Bell's lack of sanitary standards enforced in both of the Oklahoma and Texas manufacturing facilities led to the listeria outbreak (FDA, 2015). FDA investigation reports determined that unhygienic process safety, lax employee hygiene, improper food conditions, and poor infrastructure maintenance all contributed to the contamination and spread of listeria in both facilities (FDA, 2015). Commercial distribution of contaminated Blue Bell products resulted in ten major listeriosis cases and three deaths (CDC, 2015).

Blue Bell could have prevented these tragedies by maintaining sanitary facilities or halting product distribution. Instead, Blue Bell placed its production and sales above the health and safety of its consumers. Blue Bell claims to cater to families in its advertisements and slogans; however, families lost their loved ones due to the company's own negligence and unethical priorities (Blue Bell, 2017). Each of the unethical decisions highlighted in this report provides evidence of this distorted value. The Blue Bell listeria outbreak serves as a grim reminder of the importance of ethical behavior in all professional practices.

## Annotated References

Centers for Disease Control and Prevention. (2015, July 13). Multistate Outbreak of Listeriosis Linked to Blue Bell Creameries Products (Final Update). Retrieved from <https://www.cdc.gov/listeria/outbreaks/ice-cream-03-15/index.html>

The source provides quantifiable data regarding the aftermath of listeria outbreak (case counts of deaths, number of illnesses, key dates, etc.). It provides a CDC (Centers for Disease Control and Prevention) summary of each major step in the investigation. The source also provides background on the bacteria strain, its causes, and objectively presents results of the investigation.

Collette, M. (2015, May 22). It's unclear how Blue Bell, FDA responded to condensation.

*Houston Chronicle*. Retrieved from <http://www.chron.com/news/houston-texas/houston/article/Blue-Bell-had-condensation-problems-six-years-ago-6278480.php#photo-3125666>

This source provided an image that showed the condensate forming on the Blue Bell plant equipment. The image illustrates how the products in an assembly line can be contaminated by condensate drip. This image supports the observations made by the FDA investigators regarding the company's violation of basic health and safety regulations.

Davis, M. (1991). Thinking like an engineer: The place of a code of ethics in the practice of a profession. *Philosophy & Public Affairs*, 20(2), 150-167.

This article provides standard expectations of engineers during or to prevent large scale engineering crisis or disasters. The author supports the use of the engineering code of ethics with integrity and honesty by all engineers to provide a safer working environment.

Elkind, P. (2015). How Blue Bell Blew It. *Fortune*, 172(5), 122-126. Retrieved from

<http://fortune.com/2015/09/25/blue-bell-listeria-recall/>

This source gives a timeline of the Blue Bell disaster as well as insights on specific public actions taken by Blue Bell to minimize public exposure to listeria. The article provides quotes from experts, Blue Bell employees, and the company's PR agents that give us more information on the reasons behind the Blue bell company's actions ("recall creep") after the failures were publicized. This article also provides details on the changes made by Blue Bell because of the listeria outbreak. This source maintains its credibility by citing the FDA and CDC reports to support its claims of negligence shown by Blue Bell.

Ed Grabianowski. (2005, August 19). How Ice Cream Works. Retrieved from

<https://science.howstuffworks.com/innovation/edible-innovations/ice-cream.htm>

This website provided a summary of how ice cream is manufactured in the factories. The website included a description of each major step in the production process and explained the different equipment used to make ice cream. The source is key in providing general background for the ice cream production process.

Ellis, R., & Yan, H. (2015, April 21). CDC: Blue Bell listeria outbreak dates to 2010. *CNN*.

Retrieved from <http://www.cnn.com>

This source provides a detailed report on the origins of listeria in the Blue Bell facilities and effects of the outbreak which lasted from 2010-2015. The authors used quotations from the company spokesmen and food safety experts, and the timeline of listeriosis cases to further

navigate the audience through the listeria outbreak incident. FDA and CDC were referenced to support the claims made by the authors about the quality of the Blue Bell products.

Gillespie, C. (2015, August 28). Blue Bell Ice Cream Listeria Outbreak Timeline. Retrieved from <https://foodpoisoningbulletin.com/2015/blue-bell-ice-cream-listeria-outbreak-timeline/>

The source outlines the Blue Bell listeria outbreak through a comprehensive timeline from its onset. This makes the overall situation easier to understand how to proceed with research. The source is critical of Blue Bell's initial lack of action and makes certain claims that show a clear bias against Blue Bell for its lackluster health and safety protocols. The article is used not for factual information or statistics but as an overview to determine scope and depth of the research.

Jalonick, M. (2015, May 8). Listeria contamination in Blue Bell plants goes back 2 years. *The Associated Press*. Retrieved from <https://www.apnews.com>

The source summarizes discrepancies between Blue Bell's claims and FDA findings. The article includes a list of the safety violations found in the OK plant and details of the 2013 listeria warnings that were ignored. The author highlights the shortcomings in Blue Bell's approach to handling the listeria outbreak but cites different FDA reports to support its discussion, which boosts its credibility.

Kellogg Company Named One of The 2018 World's Most Ethical Companies By The Ethisphere Institute For The 10<sup>th</sup> Time. (n.d.). Retrieved November 2, 2017, from PR Newswire: <https://www.prnewswire.com/news-releases/kellogg-company-named-one-of-the-2018->

worlds-most-ethical-companies-by-the-ethisphere-institute-for-the-10th-time-300598700.html

This article is one of many that pop up when searching for examples of long-standing corporate ethics. This source, in particular, is chosen because of its concise summary of the awards won and behaviors displayed by Kellogg Company. The food manufacturing giant serves as an ethical leader in its industry, and this source just provides additional proof that its consistent, award-winning practices were recognized by the Ethisphere Institute.

Kellogg Company Recognition. (n.d.). Retrieved November 2, 2017, from Kellogg's website:

[http://www.kelloggcompany.com/en\\_US/awards-and-recognition.html](http://www.kelloggcompany.com/en_US/awards-and-recognition.html)

This website demonstrates the why Kellogg's Code of Ethics was chosen to be the criteria of evaluation for the Blue Bell listeria outbreak. The website lists all the ethical awards that were dedicated to Kellogg in the past three years. The source serves as proof for the ethical nature of Kellogg as a company.

Kellogg Company Voluntarily Recalls Certain Snacks For Potential Undeclared Peanut Residue

Due To Flour Supplier Recall. (2016, June 13). Retrieved from Kellogg's website:

<http://investor.kelloggs.com/news-and-events/press-releases/2016/06-14-2016-220032942>

This source provided the details of the Kellogg Company's peanut recall. The website stated the timeline of the incident and listed all the contaminated products. The source describes the actions taken by Kellogg's to rectify the situation from immediate recall of items to full refunds for customers.

“Kellogg Company’s Global Code of Ethics”; Kellogg Company; September 2013. Retrieved from <https://www.kelloggcompany.com/content/dam/kelloggcompanyus/PDF/KGlobalCodeofEthics.pdf>

This source serves as the criteria for evaluation for analyzing the Blue Bell facility conditions during the listeria outbreak. Kellogg’s efforts to deliver safe and quality products will be compared to the operation of the Blue Bell facilities. This source provides good credibility due to the company’s success on providing safe and quality food products.

Listeria hides in processing machinery. (2015). Food Engineering, 87(5), 13-14. Retrieved from <https://www.foodengineeringmag.com/articles/93906-listeria-hides-in-processing-machinery>

The author introduces the Maple Leaf Foods and the Jensen Farms’ listeria outbreaks. It contains general information of the spread and origins of listeria. The author also gives advice to processors trying to prevent listeria contamination of refrigerated foods. The author uses the FDA and CDC findings to explain how and what Blue Bell products were contaminated. This source is not very credible due to the anonymity of the author.

May Hua Ice Cream. (2015). Retrieved from <http://www.mayhuaicecream.com/about-us/>

The website provided the image that describe the general ice cream-making process. This image illustrated all section and order of the ice cream production assembly. The image also provided general description of every process from an ice cream manufacturing company.

Payne, L. D., Hipko, A. C., Dowdy, J. O., Harris, F. R., & Brown, T. D. U.S. Food and Drug Administration. (2015, April 23). Blue Bell Creameries, L.P. Broken Arrow, Oklahoma. (Report No. 1000118167). Retrieved from <https://www.fda.gov/downloads/AboutFDA/CentersOffices/OfficeofGlobalRegulatoryOperationsandPolicy/ORAElectronicReadingRoom/UCM445811.pdf>

This source is the Food and Drug Administration (FDA) inspection report which states the observations made by the FDA investigators on the production assembly of Blue Bell products in the Oklahoma facility. The FDA investigators clearly described all the violations observed in the plant.

Steinmiller, C. B., Le, H. V., Lyke, D., Harris, F. R., Maddox, M. R., Alridge, S. R., et al. U.S. Food and Drug Administration. (2015, May 1). Blue Bell Creameries, L.P. Brenham, Texas, 483 Issued 05/01/15. (Report No. 1682009). Retrieved from <https://www.fda.gov/downloads/AboutFDA/CentersOffices/OfficeofGlobalRegulatoryOperationsandPolicy/ORAElectronicReadingRoom/UCM446107.pdf>

This source is the Food and Drug Administration (FDA) inspection report which states the observations made by the FDA investigators on the production assembly of Blue Bell products in the Texas facility. The FDA investigators clearly described all the violations observed in the plant.

UCSB ScienceLine. (2017). Retrieved <http://scienceline.ucsb.edu/getkey.php?key=2216>

The website provides a general description of how condensation occurs on surfaces. The website states how a large temperature difference is required to form condensate. This website provides

information on how condensate is formed on framing structures such as pipes. The website also gives a detailed analyzes of the different conditions could result in the formation of condensate.

U.S. Food and Drug Administration. (2015, June 10). FDA Investigates *Listeria monocytogenes* in Ice Cream Products from Blue Bell Creameries. Retrieved from <https://www.fda.gov/food/recallsoutbreaksemergencies/outbreaks/ucm438104.htm>

The source presents details of correspondence with Blue Bell and evidence of taking steps with the company to try to rectify the outbreak situation. This report paints a positive image of Blue Bell due to its full cooperation with investigation and voluntary recall of some products. This report fails to mention the shortcomings of Blue Bell in its reporting and handling of the listeria at its facilities prior to the 2015 illnesses.