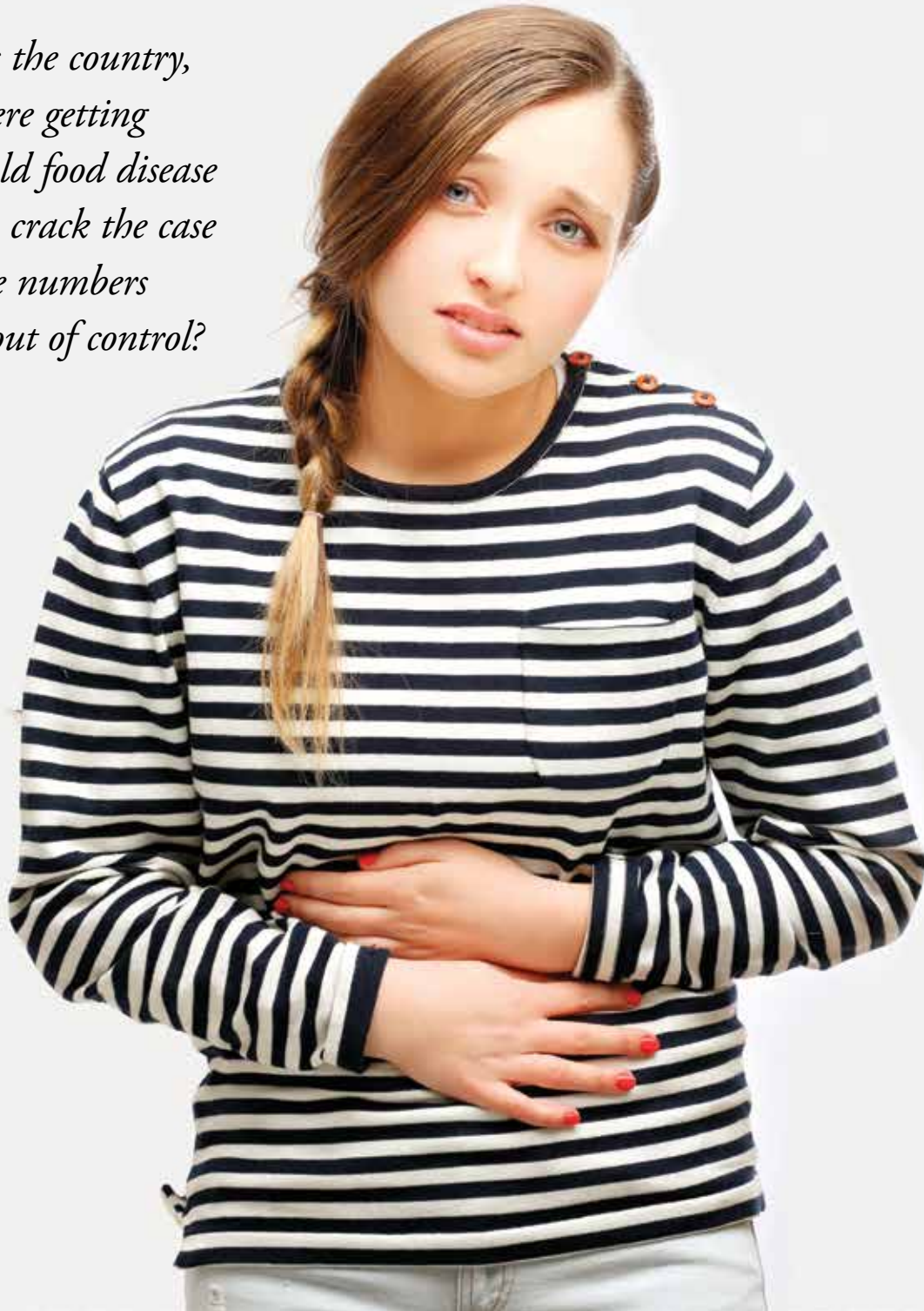


# The Case of “Something I Ate”

By Lela Nargi

*All across the country,  
people were getting  
sick. Could food disease  
detectives crack the case  
before the numbers  
spiraled out of control?*



**J**une 1, 2009. It was a warm and muggy night. Epidemic Intelligence Service officer Karen Niel slumped over her file-cluttered desk at the Centers for Disease Control (CDC) in Atlanta, Georgia. She was contemplating a cluster of infections that had broken out across the country. Back in May, 17 people in 13 states had gotten stomach cramps, nausea and diarrhea from something they'd eaten. Now that same something had sickened 44 people in 22 states. But Niel had no idea what that something was. Or how many more people would fall ill before she and her team could crack the case. She did know one thing, though: She had a full-blown outbreak on her hands.

How could Niel be sure that a few scattered people with nasty stomachaches had anything in common? Because the CDC's network of laboratories, called PulseNet, told her so. Scientists in those labs had analyzed bacteria taken from the sick people. They added enzymes to the bacteria, which broke down their DNA—that is, the map of their genes—into pieces. Then the scientists watched how the pieces traveled through tubes of electrified gel. This movement created a pattern, what Niel calls a “fingerprint” of the bacteria. They were all *Escherichia coli* (or *E. coli*) 0157:H57.

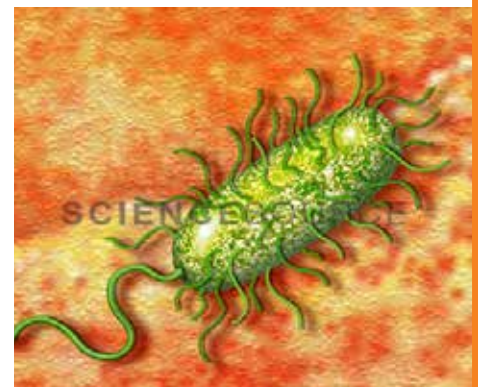
Right away, the CDC asked state and local health agencies to investigate what food this bacterium had come from.

**June 12, 2009.** Investigators started talking to people who'd gotten sick. But just a few weeks in, they were hitting a dead end. “Normally in these kinds of investigations, interviewers use a questionnaire that focuses on foods that were implicated in past outbreaks,” says Niel. For this strain of *E. coli*, which lives in the intestines of cows and sheep, that includes things like ground beef, leafy greens, lettuces, and beansprouts. People get sick when they eat an infected animal. Or when an infected animal poops into a field full of crops, or the water supply.

“Early on, some people were reporting that they'd eaten ground beef. But it didn't pan out,” Niel says. As the investigation wore on, “More people were not reporting ground beef. In fact, the questionnaire wasn't identifying any one thing. We weren't getting anywhere.”

The problem was the questionnaire itself. It asks the same questions, the same way, of every subject. But in order for it to work, it has to contain questions about the food that's actually making people sick. If the food is new or unusual, chances are it hasn't made its way onto the questionnaire. If it's not on the questionnaire, investigators aren't asking people if they ate it. Says Niel, “We had to take a step back and try a different method.”

**June 13, 2009.** Every year, 48 million Americans get sick from food poisoning. Most of these illnesses



Caption tk



## Which food could it be?



**Strawberries**



**Cookie Dough**



**Ground Beef**

are unrelated—maybe you finished up some old mayonnaise on your sandwich, or ate an undercooked egg, and you were the only one affected. That’s hardly an outbreak. Outbreaks of related foodborne illnesses from bacteria like *E. coli* usually infect between two and, say, 30 people. At the time Niel’s CDC team changed tactics in their investigation, the number of people sick with *E. coli* 0157 had grown to 60 people in 26 states. This was shaping up to be one of the biggest outbreaks Niel had ever seen.

The team decided to move on to a single-interviewer, open-ended method of questioning. Explains Niel, “You take one person—that would be me—and you have them interview several cases in a very conversational way.” Over the course of four days, Niel talked to five people in Washington State. She’d start off by saying, “Tell me everything you did in the seven days before you got sick.” In this way, she tried to re-create a person’s week, minute-by-minute and hour-by-hour.

“If they say they went to the park, you ask, What did you do there? Did you eat anything?” It could be tricky getting people to remember. Because by the time Niel reached them, a month had passed since they’d first gotten sick.

But, slowly, a gastronomic picture emerged. Most people Niel spoke to had eaten ground beef, strawberries, and pre-packaged refrigerated cookie dough. But which one was the culprit?

**June 17, 2009.** Sixty-five people in 29 states had fallen ill. It was becoming more crucial than ever for Niel to crack the case and put an end to this outbreak.

She was getting close, though—she could feel it. So she her team developed an even shorter questionnaire, called a case-control study. This one focused on the few foods that seemed most likely to have made people sick. They sent it out to investigators in several states. Each investigator interviewed multiple people. In a few days, they reported their results in a conference call. “What we found was a lot of people were eating this one brand of cookie dough,” says Niel. “And they were eating it raw.”

Samples of the dough were analyzed. They all came back positive for *E. coli* 0157. The offending food had been found!

That meant Niel's role in detecting the cause of the outbreak had come to an end. But the investigation wasn't over yet.

"The reason we do these investigations is because we want to find out how the food was contaminated in the first place, so it doesn't happen again," says Niel. Her team contacted the company that made the dough and told them they'd found *E. coli* in it. Within two days, the company took the dough off supermarket shelves. Consumers were told that if they had any dough left over in their refrigerators, they should throw it out.

Then the company started its own investigation. It tested all the ingredients in the cookie dough: the eggs, the sugar, the baking powder. They were clean. That left one ingredient: the flour. Says Niel, "People forget that flour is a raw agricultural ingredient. But unlike other raw agricultural ingredients, it doesn't usually go through a kill step"—that is, a heating process to kill off any bacteria. "Because normally you cook flour before you eat it." If you cook it, you're putting the flour, and any bacteria that might be living in it, through a kill step of your own.

In the end, 77 people in 30 states got sick in the *E. coli* cookie dough outbreak of the summer of 2009. An outbreak that likely would not have happened if people had baked the dough first, as the package instructed them to. Who was most affected? Children and teenage girls, some of whom had actually bought the dough planning to eat it raw. It had never occurred to the cookie dough company that anyone would opt for raw over baked. So, to keep any more people from getting sick, it started heat-treating its flour. And Karen Niel moved on to her next investigation, knowing she'd stopped a dangerous bacterium in its tracks.

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## Which ingredient could it be?



**Eggs**



**Sugar**



**Flour**