Could blockchain be the food chain's answer to romaine lettuce E. coli and other outbreaks?

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Credit: CC0 Public Domain

The romaine lettuce E. coli scare is over, but it's taken consumers a while to toss the vitamin rich leafy greens in a salad again.

That's a concern for everyone up and down the [food supply chain](#), from growers to grocers. So the food industry is turning to a [new technology](#) to help quash the spread of food-borne illness: blockchain.

While it has become a buzzword as the basis of cryptocurrencies such as Bitcoin, blockchain is a 10-year-old technology that's being put to work in the grocery business. It has the capability of identifying the source of a food item suspected in an outbreak faster, food safety experts say. Right now, it can take several weeks to track down where a food item became contaminated. Sometimes, that information is not traceable at all.

Walmart is testing the technology as part of an IBM-led pilot that began last summer. Major food companies including Dole, Driscoll's, Tyson Foods, Unilever and Kroger are also in the program.

It's still new. There are 45,000 items in a traditional supermarket, and it takes time for the $700 billion grocery business to adopt a new supply chain tool, even one that's billed as solving big problems.

Within the next year, with all the large companies already on board, the industry adoption in produce and fresh foods will generally be moving quickly, said Suzanne Livingston, a director in IBM's food trust program.

"With every incident, we always look at the devastating results and see what would have been different," she said. "All we need now is more companies."

Blockchain provides a digital record that can't be changed without all the parties agreeing to change it. That can create a secure and quickly accessible record of every step that a food item, say a package of sliced mangoes, has traveled along the way to the consumer's table.

Competitors don't necessarily want to share data with each other and assume that's part of the blockchain deal. But in fact, IBM developed a model where information can be accessed within a trusted group on a need-to-know basis, Livingston said. Also, no one party owns all the data or the system.

Frank Yiannas is vice president of food safety at Walmart and is leading an effort with IBM to put block chain technology at work to quickly end food illness outbreaks. (Tom Ewart/NWA Photo 2013/Walmart)

Why it's needed

In addition to potentially saving lives, there are financial incentives to solving the mystery of where food contamination began faster and with more precision.

Expensive recalls hurt the entire food industry.

"Food product is guilty until proven innocent," said Frank Yiannas, vice president of food safety for Walmart. He is leading the effort at Walmart and first came to IBM with the concept to apply blockchain to food safety. ,

Well into May, romaine lettuce sales were still down 45 percent from a year ago, according to Nielsen data. The Food and Drug Administration learned about a cluster of E. coli infections a month earlier, on April 4. As of June 1, there were five reported deaths and 89 hospitalizations among 197 people reported ill due to E. coli infections linked to romaine lettuce across several states including Texas, according to the Center for

Disease Control.

"There's a need for greater food traceability with attributes available in real time about how the food was produced, packaged, shipped, delivered, stored and stocked in a store," Yiannas said. He spoke at a blockchain conference in April at the University of Texas McCombs School of Business in Austin.

What's being tried

Yiannas said he was a big skeptic about a holy grail of food traceability but said blockchain has the goods vs. today's paper records and manual inspections.

He became convinced last year, working with small farms in South America to get a baseline for how long it would take to trace a package of sliced mangoes back to a field.

It took six days, 18 hours and 26 minutes.

With the mangoes tracked in a blockchain, it took seconds to find the farm, he said. This year, Walmart has moved beyond the pilot and is using the blockchain platform on two dozen fresh foods in the poultry, produce and dairy aisles. The product is in Walmart stores in North Texas.

While it's a work in progress, Walmart is making plans to expand it to additional suppliers and items by the end of this year, Yiannas said.

"The legal requirement for traceability today is one step up and one step back and it's all on paper, which is outdated for the 21st century," he said. "Farmers, processors and distributors and each segment of food system do it their own way."

The one-step method often works, but it still took several days to find the distributor of melons contaminated with salmonella this week in the Midwest.

The romaine lettuce was finally traced to fields in Yuma, Ariz.

According to the FDA, the last shipments of romaine lettuce from the Yuma growing region were harvested on April 16. It has a 21-day shelf life so it's unlikely that lettuce from Yuma is still in stores, restaurants or peoples' homes, the FDA said.

Walmart is working with IBM, other retailers and food suppliers to develop a system that uses blockchain technology in the grocery aisles. It would quickly identify the source of outbreaks such as the spring 2018 illnesses and deaths linked to romaine lettuce contaminated with E. coli. Walmart tested the system in 2017 with sliced mangoes.(Courtesy Photo/Walmart)

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But the public is still wary.

Two months after the FDA first noticed, leafy romaine was on sale for 99 cents a bunch at Kroger and packaged hearts of romaine at Tom Thumb displayed big stickers that read "Grown in California." According to Nielsen, iceberg lettuce and prepackaged salad mixes also posted sales declines in April and May.

Major grocery chains contacted, even Walmart, declined to talk about their stores' lettuce sales. Romaine has been "an overall [food industry](link) issue," said Walmart spokeswoman Molly Blakeman.

The future

The customer wants to know more about what they're eating, and the blockchain concept has been proven, but putting it to [work](link) widely will take some time, Yiannas said.

"We're all wondering what would have happened with the romaine incident if we had it," said Doug Baker, vice president, technology at the Food Marketing Institute.

Kroger, the second largest U.S. grocer after Walmart, and Wegmans, a strong regional supermarket chain in the Northeast, are using the technology, Baker said. "So are the big food suppliers. So it's the right group. And having Walmart step out makes a big statement that everyone should do it."

Most others are still learning, Baker said."It's needed. Perishable isn't about days, it's about hours."

Yiannas and others say the digital ledger democratizes information. All that's needed is a smart device like a phone and access to the internet. So far, millions of [food](link) packages have been traced with [blockchain](link) by the participating companies.

The whole system gets blamed when something spoils or is contaminated with salmonella or E. coli, or a distribution center fails to store product at the right temperature.

"We need to shift this from fault-finding to fact-finding," Yiannas said.

"If no one is eating romaine, the entire system loses."

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