

Why Is so Much Romaine Lettuce Toxic?

STORY AT-A-GLANCE

- Due to yet another breakout of E. coli, U.S. health agencies have advised American consumers to avoid eating romaine lettuce from all sources, including pre-chopped bags, salad mixes and whole heads
- The probable source of the contaminated lettuce has been narrowed down to the Central Coast of northern and central California
- A similar outbreak in the spring of 2018 involving Romaine lettuce grown in Yuma, Arizona, sickened 210 people across 36 states, resulting in five deaths
- You can limit your exposure to E. coli and other harmful bacteria by growing your own greens or purchasing them from a local organic farm or farmers market

The U.S. Centers for Disease Control and Prevention (CDC) says foodborne illnesses affect 1 in 6 (about 48 million) Americans every year, resulting in 128,000 hospitalizations and 3,000 deaths.¹ In 2018, those statistics include a few hundred individuals who contracted Escherichia coli (E. coli) after eating romaine lettuce.

As noted in the featured NBC News video, the latest alert involving suspected E. coli infections associated with romaine lettuce was issued by the CDC a few days before Thanksgiving.²

For your safety, the CDC advises you discard any romaine lettuce you may have on hand from California and avoid eating it until further notice. Romaine grown in greenhouses or hydroponically is not affected, according to the U.S. Food and Drug Administration.³ This is one in a series of romaine-related outbreaks to have taken place in recent years.

Other major E. coli infections were reported nationwide in the spring of 2018 and fall of 2017. Given the time of year, the current outbreak is thought to involve romaine lettuce grown in California.⁴ The probable source of the contamination is manure runoff from a nearby [concentrated animal feeding operation](#) (CAFO).

CDC Once Again Issues a Food Safety Alert for Romaine Lettuce

November 20, 2018, the CDC issued a food safety alert for [romaine lettuce](#) after a multistate outbreak of E. coli.⁵ A similar outbreak is being investigated in Canada, and U.S. and Canadian agencies are coordinating efforts to safeguard the health and well-being of consumers in both countries.

Working together with the U.S. Food and Drug Administration (FDA) and state and local agencies, the CDC has determined Shiga toxin-producing E. coli (STEC) O157:H7 illnesses are likely linked to romaine lettuce originating from California.⁶

November 26, 2018, the CDC and the FDA announced they had narrowed down the areas where the suspect romaine was grown to lettuce farms on the Central Coast of northern and central California.⁷ Since the suspect lettuce was a late-season crop, the two agencies now believe no more romaine lettuce will be coming from that region as other areas of the country take over the winter season.

As a result, the FDA has rolled back its call to avoid all romaine lettuce, and instead, is urging consumers to read labels and not eat or purchase romaine lettuce from the suspected California regions. If you can't determine where the lettuce was grown, don't buy it, or throw it out if you already have it on hand.

A genetic analysis of the E. coli strains collected from patients involved in the recent string of illnesses has linked the bacteria to an outbreak that happened in the fall of 2017.

At that time, E. coli was found on leafy greens in the U.S. and romaine lettuce in Canada.⁸ There is no genetic link between the current outbreak and the one that occurred in the spring of 2018. The CDC said, "People in the spring outbreak were infected with E. coli O157:H7 bacteria with a different DNA fingerprint."⁹

The Public Health Agency of Canada says a number of Canadians from at least two provinces have fallen ill with the same type of infection. The CDC alert stated, "Epidemiologic evidence from the U. S. and Canada indicates romaine lettuce is a likely source of the outbreak."¹⁰

Thankfully, there are many other salad greens and vegetables you can eat safely until this situation resolves. Later in this article, I will offer tips to help you enjoy salad greens and other produce safely.

There Are a Number of Health and Safety Issues With Salad Greens

It's no secret U.S. consumers love the convenience of prewashed produce that is sold in bags, clamshells and tubs. Unfortunately, those types of greens are precisely the ones continually implicated in outbreaks associated with foodborne illness.

In fact, says The Washington Post, food-safety experts suggest "convenience greens — those handy bags of prechopped and prewashed salads — carry an extra risk because they come in contact with more people and machinery before they arrive on your plate."¹¹

E. coli is quite common — its many strains are found in food and the environment and it also lives in animal and human intestines. Thankfully, most E. coli infections are tolerable,

if not harmless. The types of *E. coli* known to cause illness are often transmitted through contaminated food and water or through contact with animals or people.

For example, a large 2006 outbreak of *E. coli* involving [spinach](#) was thought to be triggered by wild pigs and well water.¹² The current strain of *E. coli* in question — STEC O157:H7 — is a particularly dangerous form. In the U.S., the CDC says an estimated 265,000 people suffer from STEC infections annually; the O157:H7 variety is responsible for more than one-third of those illnesses.¹³

While people of all ages are susceptible, the elderly and young children are most likely to be severely affected by STEC's unpleasant side effects. Generally, symptoms appear one to 10 days after eating the contaminated food item and may include bloody diarrhea, stomach cramps and [vomiting](#).

Before this outbreak, in the spring of 2018, another situation involving romaine and *E. coli* affected people who got sick after eating romaine or having close contact with another person who become ill after consuming the lettuce.

At the conclusion of their three-month investigation, the CDC reported, "Epidemiologic, laboratory and traceback evidence indicated that romaine lettuce from the Yuma, [Arizona], growing region was the likely source of this outbreak."¹⁴ The contamination affected 210 people in 36 states, resulting in five deaths and 27 suffering from *E. coli*-related kidney failure.¹⁵

Do You Know the Conditions Under Which Your Salad Greens Are Grown?

Due to the [industrialization of our food system](#), Americans eat produce from all over the world, regardless of whether it is in season locally. It's not unusual to go to the supermarket and return with fruits and vegetables grown and harvested in Canada and Mexico, as well as countries in Europe and South America, among others.

Although enjoying seasonal produce raised far from home has become the norm, this convenience is not without risk or cost. According to The New York Times,¹⁶ the majority of bagged romaine lettuce provided to grocery stores and restaurants across North America is grown in California's Salinas Valley.

That said, in late fall and winter, the industry makes a seasonal move to Yuma, which was the source of the *E. coli* contamination with respect to the outbreak in the spring of 2018. About the source of that outbreak, in June 2018 the CDC stated:¹⁷

"The FDA and state and local regulatory officials traced the romaine lettuce to many farms in the Yuma growing region. The FDA, along with CDC and state partners, started an environmental assessment in the Yuma growing region and collected samples of water, soil and manure.

CDC laboratory testing identified the outbreak strain of E. coli O157:H7 in water samples taken from a canal in the Yuma growing region. WGS (whole genome sequencing) showed the E. coli O157:H7 found in the canal water is closely related genetically to the E. coli O157:H7 from the ill people.”

It's worth noting CAFOs are a major source of water contamination throughout the U.S. The Arizona Department of Environmental Quality states, “Nationwide and in Arizona, the potential for surface and ground water pollution exists through livestock facility discharge of manure-contaminated runoff to natural waterways and through wastewater leaching to aquifers.”¹⁸

Lettuce Contamination Previously Traced to Nearby CAFO

It's likely you are accustomed to hearing about pathogens in undercooked meat and you probably know you need to be cautious when handling [raw chicken](#). That said, it might be difficult to understand how leafy greens like romaine lettuce can become tainted in a manner that could potentially cause a serious illness, or even death.

As mentioned above, the E. coli outbreak in the spring of 2018 appears to have been triggered by manure runoff from a nearby cattle farm that impacted a cluster of romaine lettuce farms nearby.¹⁹

In November 2018, the FDA issued a statement regarding an environmental assessment that confirmed the presence of E. coli O157:H7 in three samples of irrigation canal water collected as part of the Yuma investigation. FDA Commissioner Dr. Scott Gottlieb, said:²⁰

“The environmental assessment ... considers that the most likely way the romaine lettuce became contaminated was from the use of water from the irrigation canal, since the outbreak strain was not found in any of the other samples collected in the region.

How the water contaminated the lettuce is uncertain. But based on interviews with growers and pesticide applicators, possible explanations include direct application of irrigation canal water to the lettuce crop or the use of irrigation canal water to dilute crop-protection chemicals applied to the crops through both aerial and land-based spray applications.

We cannot rule out other ways the lettuce became contaminated. When and how the irrigation canal became contaminated with the outbreak strain of E. coli O157:H7 is also uncertain.

We know that a large concentrated animal feeding operation (CAFO) is located adjacent to this stretch of the irrigation canal where the samples were collected. This is one potential source.”

It's likely runoff from the CAFO's manure lagoons entered and contaminated the canal, after which the E. coli-tainted water may have been used to irrigate the lettuce fields. In

this scenario, it would be impossible to remove the bacterium by washing alone because the E. coli had likely become integral to the plant itself.

Given the reality a CAFO can hold in excess of 100,000 head of cattle at any one time,²¹ the potential for fecal runoff and contamination of nearby water supplies is quite high.

CAFO Pollution Continues to Endanger Public Health

CAFOs are a major source of pollution that threatens public health. Not only is CAFO meat far more prone to contamination with bacteria — including antibiotic-resistant strains, as evidenced by recent [food tests](#) — but these industrial farms also spread dangerous pathogens into the environment.

It's well-known that farm animals create plenty of manure. Normally, this is not a problem, provided cows and other livestock are free to roam on open pasture. In that model, the manure gets trampled into the ground and becomes part of the natural, [regenerative land management](#) cycle.

CAFOs, on the other hand, crowd animals into tight spaces. As highlighted in the video above, the manure and urine from thousands of CAFO pigs housed in huge buildings are funneled into massive open-air retention ponds.²² Though hard to imagine, many of these so-called ponds are the size of three or four football fields.

Should these retention areas overflow or leak, such as happened when Hurricane Florence devastated North Carolina in September 2018, dangerous microbes and nitrate pollution enter the groundwater and nearby waterways. (For more information, check out my article "[After the Hurricane: Swine Waste Swirls in North Carolina.](#)")

Equally horrific, the liquid waste from CAFO retention ponds is often sprayed directly into the air or onto nearby crops, showering homes and yards and damaging the health of countless individuals and families who live nearby. Given the reality North Carolina has thousands of CAFOs, the health-damaging potential of factory farms in that state alone is particularly alarming.

Filmmaker Mark Devries, who captured the drone footage for the video above, said, "I had previously seen these giant open-air cesspools of toxic manure from ... up in an airplane ... but with these drones, for the first time, I was able to see close-up how massive these facilities are and how close they are to people's homes."²³

Emissions from lagoons, which are distributed by commercial sprinklers, have been linked to neurological and respiratory problems.

At the conclusion of his mini-documentary Devries says, "These thousands of lakes of toxic waste must be among the most bizarre and disturbing environmental phenomena

that have ever confronted America.” I could not agree more. Learn more about the negative effects of CAFOs in my article [“The Factory Farm Toilet.”](#)

Ways to Safeguard Your Health When Eating Greens

While you may think washing your lettuce would eliminate the bacteria, the truth is it takes but a few cells of *E. coli* to make you sick. Despite the fact that rinsing your produce with water — even the brands that claim to be triple washed — may lower your risk of illness, it doesn’t eliminate your risk entirely.

[Washing is no guarantee](#) you will get rid of potential toxins. Beyond that, some experts suggest using commercial fruit and vegetable washes are not much more effective than water alone.²⁴

Although some recommend a light bleach solution, I cannot recommend bleach for household cleaning applications and even less so for food preparation. The best way to ensure the cleanliness of your food and food preparation area is to apply common sense. Below are a few tips that will guide you in handling produce and other foods safely.²⁵ Always:

- Wash your hands with soap and water before handling food, as well as after handling raw meat
- Use a scrub brush to remove dirt and debris from root vegetables or any fruit or vegetable with a rough skin
- Rinse all produce, even bagged varieties, well under running water
- When chopping more than one type of food, wash your counter, cutting board and utensils frequently to avoid cross contamination

Because some of the people affected by lettuce-related *E. coli* outbreaks became ill after eating at restaurants that used bagged, prechopped lettuce in their [salads](#),²⁶ you can dramatically reduce your risk of infection simply by avoiding salads when dining out.

Eating more meals at home is another way to safeguard your health. Beyond that, since raw greens pose the most risk, you may decide to cook more of your greens to reduce your risk of contamination.

In my opinion, your very best option is to grow your own food. Whether that be in a [vegetable garden](#), in containers or in trays, you won’t regret the time and energy you invest in cultivating healthy, homegrown food. The good news is greens such as lettuce are among the easiest garden vegetables to grow, and they are prolific.

By planting new seeds every couple of weeks, you can receive multiple harvests throughout the growing season. Depending on where you live, you may be able to grow certain greens year-round. If gardening is just not your thing, consider purchasing your greens from a local farmer or [farmers market](#).

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