

MxNS knowledge journal | 2301

STEC | Shigatoxins

Webinar on Thursday November 2nd, 2023
11.00 - 12.00 AM Dutch version
03.00 - 04.00 PM English.

What is STEC?

Escherichia coli (*E. coli*) is a bacterium that is part of the intestinal flora. Some variants of this bacterium can pose a threat to our health as they are capable of producing 'shigatoxin.' This toxin is named after the Japanese bacteriologist who discovered it in the early 20th century in another bacterium, which is also named after him; *Shigella*. You can become infected with these Shigatoxin-producing *E. coli*, abbreviated as STEC, through food and water.

When the presence of a specific gene (stx gene) is detected in the accumulation of a product after incubation (screening), suspected STEC colonies can be confirmed by isolating them on a selective medium and demonstrating the stx gene (confirmation). Finally, additional research can be conducted to determine the specific STEC variant, known as serotyping of STEC.

How dangerous is STEC?

In most cases, a STEC infection results in diarrhea. For some individuals, this diarrhea may be mild, but in many cases, it presents as bloody diarrhea, often accompanied by severe abdominal cramps and sometimes vomiting. In the worst-case scenario, one may develop hemolytic-uremic syndrome (HUS), which can lead to severe and prolonged symptoms, such as kidney failure. Unfortunately, it is not uncommon for individuals to succumb to the infection eventually. STEC variants that cause severe gastrointestinal symptoms and bloody diarrhea are also referred to as Enterohemorrhagic *E. coli*, abbreviated as EHEC.

Source: [RIVM -Shigatoxineproducerende E.coli \(STEC\)-infectie](#)

STEC outbreak 2011

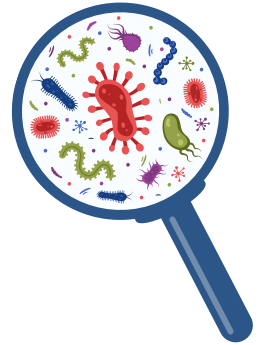
In 2011, there was a significant outbreak of STEC in Germany, with over 4,000 reported cases of illness. More than 800 of those infected suffered severe kidney problems, and ultimately, 52 people lost their lives as a result of this outbreak. The source of the outbreak was traced back to a sprout producer in Hamburg. It was discovered that the producer had used contaminated fenugreek seeds from Egypt. The specific STEC variant involved in this case was EHEC O104:H4, which was found to be resistant to several antibiotics.



Research on STEC

Infections caused by Shigatoxin-producing E. coli (STEC) experienced a significant increase, reaching their highest levels since 2016 in 2022. The exact cause of this rise remains unclear. This information is derived from the annual report for 2022 on the surveillance of enteric infections and zoonoses from the Rijksinstituut voor Volksgezondheid en Milieu (RIVM), the National Institute for Public Health and the Environment.

Through research, it is possible to determine whether food items are contaminated with STEC. This research always involves a step to encourage the growth of STEC to levels that make detection easier. Subsequently, the research is focused on identifying the genes (genetic information) necessary for the production of these Shigatoxins. Once these genes are detected, it is crucial to confirm that they are indeed present in an E. coli isolate, as other bacteria are also capable of producing these toxins. Furthermore, additional research can be conducted to determine if it is a specific STEC variant known to be highly dangerous.



STEC analysis

With the exception of sprouts, no microbiological criteria have been established in Regulation (EC) No. 2073/2005. However, through the policy document titled 'Intervention in the Presence of STEC in Food' dated April 14, 2014, the NVWA (Netherlands Food and Consumer Product Safety Authority) has specified that companies must consider the risk of STEC in their HACCP-analysis/HACCP-plan.

Article 14 of Regulation (EC) No. 178/2002 provides the NVWA with the authority to remove products from the market if STEC is found in them.

Mérieux NutriSciences is capable of examining food and water on the presence of STEC and can offer all necessary follow-up steps to determine the level of danger associated with the specific variant.

Webinar STEC | November 2nd 2023

To provide you with all the necessary information regarding STEC specifically, we are organizing a webinar on this topic. This webinar will be conducted in both Dutch and English and will take up to an hour. Below, you can sign up for the desired webinar(s).

The English version of the webinar will start at 03:00 PM. For the English version, you can register via [this link](#).

The Dutch version of this webinar will start at 11:00 AM. You can register for it via [this link](#).