E. COLI AND MICROCYSTIN

Escherichia coli (E. coli) is a bacterium found in the intestines of humans and animals. While most strains are harmless, some can cause illness. Because harmful bacteria and viruses are invisible to the naked eye, water testing and advisories are essential.

E. coli serves as a reliable stand-in for detecting broader water contamination risks. It is used as an indicator species, meaning its presence in water signals fecal contamination and the potential for dangerous, disease-causing pathogens to also be present. Where E. coli is found in high levels, other harmful microorganisms are likely to follow. E. coli is used as an indicator because it is easy to detect and relatively inexpensive to test for, making widespread monitoring practical.

There are many pathways for E. coli to enter the environment and contaminate water bodies. In Iowa, runoff from agricultural livestock operations is a significant source of E. coli contamination, along with human waste from failing or overloaded septic systems and wildlife. Beach sand, particularly sand near the water's edge, can also harbor and concentrate E. coli, acting as an incubator that releases bacteria back into the water. When water is high in nutrients, such as nitrate and phosphorus, bacteria have an additional food source that can fuel rapid growth to unsafe levels.

Microcystin is a toxin produced by blue-green algae (also known as cyanobacteria) during algae blooms. These blooms may look like pea soup or spilled green paint, appear as green streaks on the water's surface, or take on red or brown hues; they also can emit a foul odor. However, microcystin cannot always be identified by sight. Toxins can be present in the water even when a bloom is not apparent, making it an invisible water safety hazard much like E. coli.

Blue-green algae blooms thrive in warm, slow-moving water with elevated nitrate and phosphate levels. The same sources that drive E. coli contamination — fertilizer runoff from agricultural and urban areas, livestock manure, and septic system discharges — also fuel the nutrient pollution that feeds these blooms. This means the two hazards often share the same conditions and, in many cases, the same waterways.

HEALTH IMPACTS

Exposure to E. coli and microcystin can be dangerous to public health. Children, immunocompromised individuals, and elderly adults are most at risk to these effects. Dogs are particularly vulnerable to illness from microcystin.

Symptoms of E. coli Exposure:

- skin, ear, or respiratory infections
- diarrhea
- bloody stool
- in rare cases, permanent damage to the kidneys

Symptoms of Microcystin Exposure:

- cold-like symptoms
- breathing problems
- upset stomach
- rashes
- liver damage

When in doubt, stay out!

- Check water quality and advisories before you go. Remember that not all public beaches in Iowa are tested for E. coli and microcystin! Contact the entity that manages the beach if you're unsure.
- Do NOT swim and keep pets away if there is an advisory sign at the beach.
- Avoid contact with fecal matter or algae blooms in the sand or water.
- Avoid ingesting any water or putting your head under the water.
- Shower immediately after you swim in the water.
- Speak with a medical professional immediately if you develop symptoms of E. coli or microcystin exposure.

Source: Iowa Department of Health and Human Services

Iowa Environmental Council