Virginia Cooperative Extension
Virginia Tech • Virginia State University
www.ext.vt.edu

Common Foodborne Pathogens: *Campylobacter jejuni*

Authored by Rakib Ehsan, Graduate Research Assistant, Department of Food Science and Technology, Virginia Tech; Rachel Cheng, Assistant Professor, Department of Food Science and Technology, Virginia Tech; and Lester Schonberger, Associate Extension Specialist, Department of Food Science and Technology, Virginia Tech

What you will learn

- *Campylobacter jejuni* is a major cause of foodborne illness.
- Symptoms usually begin 1–3 days after infection and usually include diarrhea, stomach pain, nausea, and fever.
- Cooking meat properly, avoiding raw milk, testing private water sources, preventing cross-contamination, and washing hands all help reduce the risk of infection.

Campylobacter jejuni (*C. jejuni*) is a leading cause of foodborne illness in humans worldwide and is the most common pathogen for causing diarrhea (CDC, 2025). *C. jejuni* is a curved or spiral-shaped bacterium that can move freely by swimming or gliding in their own environment (Figure 1).

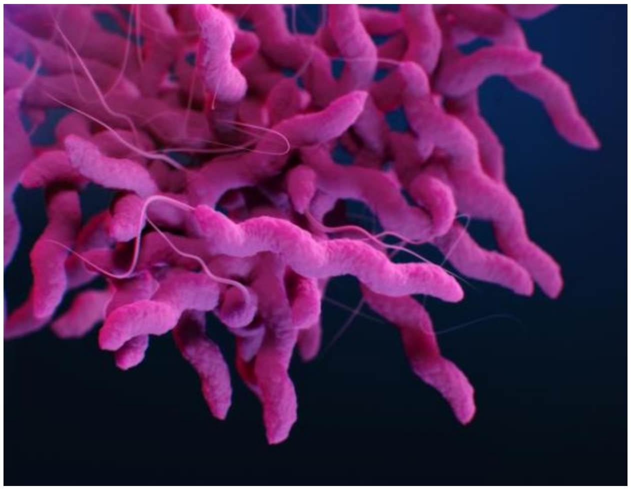

Figure 1. An illustration of *Campylobacter spp.*

Why do we care?

The illness caused by *C. jejuni* is known as campylobacteriosis, experienced by an estimated 1.5 million people annually (CDC, 2024). The onset of symptoms may be observed 1-3 days after the bacterial infection and can last for 10 days (WHO, 2020). The short-term symptoms include diarrhea, abdominal pain, nausea, vomiting, headache, and fever (Figure 2). Though the infections are generally not serious, some can be life-threatening.

The long-term effects have been associated with Guillain-Barré syndrome, a severe neurological dysfunction that causes some forms of paralysis, joint inflammation (arthritis), and the development of other notable gastrointestinal diseases such as inflammatory bowel disease or colorectal cancer (Kaakoush *et al*., 2015). Twenty percent of patients need hospitalization (Shah et al., 2024), and around 124 deaths occur each year (CDC, 2024).

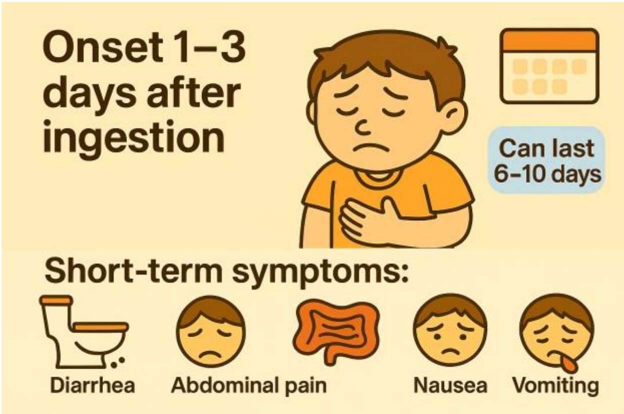

Figure 2: Primary symptoms caused by *C. jejuni* infection (Created by ChatGPT)

Where does it come from?

C. jejuni is zoonotic, meaning it spreads mostly from animals to humans (Table 1). Birds are a major host of *C. jejuni,* and can also be found in cattle, pigs, and pets (puppies and cats).

Table 1: Some major outbreaks by *C. jejuni* over the last decade in the U.S. (Jansen et al., 2021; CDC, 2024)

Year	No. of cases	Source	Multi-state
2021	64	Non-centralized water	No
2019	30	Puppies	Yes
2018	113	Puppies	Yes
2014	99	Raw milk	No
2012	6	Poultry	Yes

C. jejuni grows best between a temperature range of 98.6°F - 107.6°F (37°C - 42°C), so it thrives in an animal's gastrointestinal tract. However, it can survive at refrigeration temperatures (Haddad et al., 2009).

The disease is transmitted to humans through food, mostly by eating

- Undercooked meat
- Raw meat
- Unpasteurized milk
- Contaminated water or ice (especially when water is untreated)

Who is at greater risk?

Infants and children under 5 years old, older adults (>65 years old), and individuals with weakened immune systems are more likely to become sick with campylobacteriosis and to require hospitalization due to more severe illness (CDC, 2025).

How can I control it?

There are some easy ways that you can reduce the risk of becoming sick with campylobacteriosis:

- Cook foods to their recommended, safe temperature.
- Avoid consuming raw milk or foods that contain raw milk
- If consuming water from a private well or open water source, regular testing and treatment are important
- Keep raw meat and poultry separate from ready-to-eat foods, for example, by placing raw meat and poultry at the bottom of the refrigerator and fresh produce above it
- When handling raw meat, be sure to wash your hands regularly and use separate utensils and cutting boards
- Wash your hands after touching animals

Additional Resources

Schonberger, H.L. and R. Boyer. 2024. Is it Safe? Use a Food Thermometer to be Sure. (FST-28NP-A (FST-493NP-A)). https://www.pubs.ext.vt.edu/FST/FST-28/FST-28NP-A/FST-28NP-A.html

References

Centers for Disease Control and Prevention (CDC). 2025. Clinical Overview of *Campylobacter* https://www.cdc.gov/campylobacter/hcp/clinical-overview/index.html.

Centers for Disease Control and Prevention (CDC). 2025. Outbreaks of *Campylobacter* Infections. Centers for Disease Control and Prevention. https://www.cdc.gov/campylobacter/outbreaks/index.html.

Centers for Disease Control and Prevention (CDC). 2024. About *Campylobacter* Infection. https://www.cdc.gov/campylobacter/about/index.html.

Food Safety and Inspection Service (FSIS). 2025. Food Safety and Inspection Service. *Campylobacter*. https://www.fsis.usda.gov/food-safety/foodborne-illness-and-disease/illnesses-and-pathogens/campylobacter#:~:text=Cook%20all%20raw%20beef%2C%20pork,is%20above%2090%20degrees%20F.

Haddad, N., Burns, C. M., Bolla, J. M., Prévost, H., Fédérighi, M., Drider, D., & Cappelier, J. M. (2009). Long-term survival of *Campylobacter jejuni* at low temperatures is dependent on polynucleotide phosphorylase activity. *Applied and environmental microbiology*, *75*(23), 7310–7318. https://doi.org/10.1128/AEM.01366-09

Jansen, L., Birn, R., Koirala, S., Oppegard, S., Loeck, B., Hamik, J., Wyckoff, E., Spindola, D., Dempsey, S., Bartling, A., Roundtree, A., Kahler, A., Lane, C., Hogan, N., Strockbine, N., McKeel, H., Yoder, J., Mattioli, M., Donahue, M., & Buss, B. (2024). Campylobacteriosis Outbreak Linked to Municipal Water, Nebraska, USA, 2021[1]. *Emerging infectious diseases*, *30*(10), 1998–2005. https://doi.org/10.3201/eid3010.231509

Kaakoush, N. O., Castaño-Rodríguez, N., Mitchell, H. M., & Man, S. M. (2015). Global Epidemiology of Campylobacter Infection. *Clinical microbiology reviews*, *28*(3), 687–720. https://doi.org/10.1128/CMR.00006-15

Lopes, Graciela; Volz, Tassiana; Ramires, Natalie; Rauber Kleinubing, Letícia; Klein Scheik, Ângela Maria; Fiorentini, and Wladimir Padilha da Silva. "Virulence Factors of Foodborne Pathogen *Campylobacter Jejuni*." *Microbial Pathogenesis* 161 (December 2021): 105265. https://doi.org/10.1016/j.micpath.2021.105265.

Shah, H. J., Jervis, R. H., & Wymore, K. (2024). Reported Incidence of Infections Caused by Pathogens Transmitted Commonly Through Food: Impact of Increased Use of Culture-Independent Diagnostic Tests — Foodborne Diseases Active Surveillance Network, 1996–2023. Morbidity and Mortality Weekly Report 73:584–593. http://dx.doi.org/10.15585/mmwr.mm7326a1

World Health Organization (WHO). 2020. *Campylobacter*. https://www.who.int/news-room/fact-sheets/detail/campylobacter.

Visit Virginia Cooperative Extension: ext.vt.edu

2026 FST-517NP