

# Researchers develop low tech method for environmental sampling of campylobacter

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A team of researchers from the United Kingdom has developed a novel method for assessing human/pathogen interactions in the natural environment, using citizen scientists wearing boot socks over their shoes during walks in the countryside. In the process, they found that slightly less than half of the socks were positive for the gastrointestinal pathogen, *Campylobacter*. The research is published in *Applied and Environmental Microbiology*, a journal of the American Society for Microbiology.

In the study, groups of volunteer walkers wearing boot socks on one foot took regular four kilometer (two and a half mile) walks on each of six pathways in the countryside, over a 16 month period. The pathways are located in two regions of the UK, the livestock-dominated North West, and East Anglia, much of which is devoted to cropland, said coauthor Natalia Jones, PhD, Senior Research Associate, University of East Anglia.

Following the walks, the walkers mailed the socks to the lab, where coauthors used microbial culture and PCR methods to determine the presence, and species of *Campylobacter*.

As measured on boot socks, *Campylobacter* was more prevalent in livestock-dominated North West than in East Anglia (55.8% of socks, vs 38.6%). *Campylobacter* peaked during winter in both regions, and peaked again in spring in North West. Precipitation was associated with greater *Campylobacter*, and higher temperatures with less. The results "are consistent with our understanding of *Campylobacter* survival and

the probability of material adhering to boot socks," according to the report.

*C. jejuni* was the most commonly found species, with *C. coli* largely restricted to the livestock dominated North West, according to the report. Source attribution analysis suggested that the major source of *C. jejuni* was sheep in North West, and wild birds in East Anglia.

The motivation for the study was the desire to develop an efficient sampling method to explore the potential for transfer of *Campylobacter* from the environment to humans through visits to the countryside, and to determine whether any such risk varied seasonally, said Jones.

*Campylobacter* is the most common bacterial cause of diarrheal disease in the developed world. "It is known that food is often a source of *Campylobacter* infections in humans, but we also know that exposure through food cannot explain all the cases seen in the human population," said Jones. "Exploring other potential routes was a key motivation."

Conventional sampling is based on sampling from a single point, called spot sampling, and does not sample human-pathogen interactions.

"Ultimately, this research could lead to interventions to reduce the risk to humans," said Jones.

Provided by American Society for Microbiology

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