Making *Campylobacter* Easier To Count

Imagine trying to count the raindrops on your car's windshield after a light rain. That's what it can be like for a researcher to count *Campylobacter* colonies growing in round petri dishes.

Historically, the medium, called agar, used to grow *Campylobacter* contains blood components or charcoal, giving the agar a dark color. Unfortunately, *Campylobacter* colonies are clear, often appearing like water droplets on the agar.

Now, Agricultural Research Service food technologist J. Eric Line has found a way to make the task of counting them a whole lot easier.

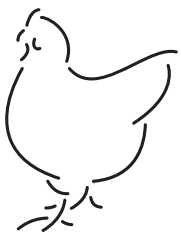
Scientists typically use a technique called direct plating to isolate and count microscopic organisms. "Direct plating can be used to grow and count *Campylobacter* from a variety of sample types. But distinguishing *Campylobacter* from non-*Campylobacter* contaminants that often grow on many existing agars is difficult," says Line.

Line has determined that exposing *Campylobacter* to low levels of the chemical triphenyltetrazolium chloride does not harm growth, yet stains the colonies deep red to magenta. New agars used for *Campylobacter* growth are translucent, resulting in a contrast of dark colonies on the translucent background. Line explains, "This greatly facilitates *Campylobacter* isolation and makes counting them on light boxes or by electronic means possible."

But contamination by other organisms can still happen. In this instance, even if contaminant colonies show up as red, most of them are easily distinguished from *Campylobacter* by differences in shape and structure.

Campylobacter is a foodborne pathogen found in several raw or mishandled foods, including poultry. More than 10,000 cases of human campylobacteriosis are reported to the Centers for Disease Control and Prevention each year, though many more cases go undiagnosed or unreported. This illness is characterized by diarrhea, cramping, abdominal pain, and fever. (See related articles on pages 2 and 4.)

The new technique, available for licensing, can be used in laboratories to conduct diagnostic testing.—By **Sharon Durham,** ARS.



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A New Way for Chicken To Come Clean

Former Agricultural Research Service (ARS) agricultural engineer Andra Dickens and microbiologist Arthur Hinton, Jr., tested a new chemical solution that reduces enteric pathogen counts in poultry.

The scientists, from the Richard B. Russell Agricultural Research Center in Athens, Georgia, tested the chemical, known as $Safe_2O$ Poultry Wash, for its inventor, Mionix Corp., a biotechnology company based in California. Dickens recently retired from the lab.

When used as a prechill application, $Safe_2O$ reduced numbers of *Salmonella*, *Campylobacter, E. coli,* and *Listeria*. Used as a postchill treatment, it increased the shelf life of wings by 3 days.

$Safe_2O$ is a low-pH, calcium sulfate-based solution composed of Generally Recognized As Safe chemicals. It has been approved by both the U.S. Food and Drug Administration (FDA) and USDA's Food Safety and Inspection Service (FSIS) for use as a prechill treatment for broilers. FDA has also approved it as a postchill treatment, and FSIS is currently reviewing it for that use. Tests have revealed that $Safe_2O$ is more effective as a postchill treatment.

Dickens and Hinton have also tested the solution for a Texas-based poultry producer, Pilgrim's Pride. $Safe_2O$ was sprayed both prechill, with an inside/outside washer, and postchill. Not only were pathogens reduced, especially *Salmonella, Campylobacter,* and *Listeria,* but the number of spoilage microorganisms was also decreased. Shelf life of wings was extended to 9 days when the meat was sprayed postchill.

Since the chemical could be used prechill with an inside/outside washer, processors would not have to retool any of their current machinery or procedures.

$Safe_2O^{TM}$ can be used with less water than another common pathogen reducer, trisodium phosphate (TSP), and poses fewer environmental concerns.

"Some processing plants spray carcasses with an 8- to 12-percent TSP solution to remove fecal material and associated microorganisms before chilling," says Dickens. "The higher pH produced by TSP requires the chiller water to be treated with acid to bring the water back to a pH level at which bactericidal activity of the chlorine in the water can be effective. But then the phosphates from the overflow water must be removed before entering the sewer system in most municipalities.

"$Safe_2O$ could be a viable alternative to TSP without the problems associated with phosphate disposal and reacidification of the chiller water."—By **Sharon Durham,** ARS.

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