

Finding Solutions to *Campylobacter* in Poultry Production

Sometimes a solution to a problem can be both easy and difficult, particularly when dealing with foodborne disease. When food is properly cooked and handled, bacterial contamination is not usually an issue. But mistakes can be made, and contaminated foods may accidentally be consumed.

One foodborne pathogen of particular interest is *Campylobacter*, which may cause mild to severe diarrhea and fever in humans and possibly result in a secondary, neurological condition known as Guillain-Barré Syndrome. *Campylobacter* is commonly found in the intestinal tracts of swine, cattle, and poultry. It may be deposited onto trucks, trailers, and coops when the animals are transported to processing plants.

“For poultry, washing transport cages with water and disinfectant can certainly reduce the level of *Campylobacter*, but it isn’t very reliable and doesn’t completely eliminate the microbe,” says microbiologist Mark Berrang, who is in the Bacterial Epidemiology and Antimicrobial Resistance Research Unit in Athens, Georgia. He and food technologist Julie Northcutt, of the Poultry Processing Research Unit, evaluated the role of transport coops and carcass defeathering as critical points in *Campylobacter* contamination of broilers and broiler carcasses.

Berrang, Northcutt, and their colleagues found that feces from a *Campylobacter*-positive flock can contaminate feathers and skin of a *Campylobacter*-negative flock if the birds are later placed into the same soiled transport coop.

“We put *Campylobacter*-free birds in a commercial transport cage that had previously held positive birds,” says Northcutt. “The second flock of chickens was held in the transport coop for the same length of time that a commercial processing company would hold them. We tested the second flock after they had been processed

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Broiler carcasses exiting an automated feather-picking machine in the pilot poultry processing facility at the Russell Research Center.

through scalding and feather removal and found that they were positive for the pathogen.”

Further studies show that storing transport cages for 48 hours between uses lowers numbers of *Campylobacter*. “Allowing the cages to dry for 48 hours essentially turns chicken feces to dust, dramatically lowering numbers of *Campylobacter*,” says Berrang. “But it’s economically and logistically impractical to leave cages dormant for that long. Redesigning the cage to make it easier to clean would be more practical, and we have some experiments planned to test that.”

Studies by Berrang and Northcutt revealed that, overall, broiler processing decreases *Campylobacter* numbers on carcasses, but feather removal (one of the first steps) increases them. Processors then have to work against this jump in numbers through the rest of the process to control the microbe. Berrang, Northcutt, and colleagues determined that the increase is caused by escape of highly contaminated fecal matter from the cloaca (lower gut) during feather removal.

“Manipulation of the carcass by the feather-picking machine causes leakage of fecal matter, which contaminates the carcass,” says Berrang. He and others are investigating methods to minimize this source of contamination, including flushing or plugging the cloaca before defeathering. —By **Sharon Durham, ARS.**

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Microbiologist Mark Berrang (left), student Xavier Howell (center), and technician Mark Freeman collect a sponge sample from the floor of a transport coop.