**Infectious Diseases** 

## Norovirus Surfaces in Prepackaged Deli Meats

BY HEIDI SPLETE
Senior Writer

ATLANTA — Just when you thought that prepackaged deli meat was safe, a gastroenteritis outbreak among river rafters in Colorado was traced to norovirus in prepackaged chicken and beef, Dr. Ezra J. Barzilay said at the International Conference on Emerging Infectious Diseases.

On September 18, 2005, the National Park Service contacted the Centers for Disease Control and Prevention to report an outbreak of 136 cases of gastroenteritis in 3 weeks among rafters who participated in group trips on the Colorado River, said Dr. Barzilay, an epidemiologist at the CDC.

"Norovirus accounts for about 50% of all foodborne outbreaks in the US." he noted.

The cases occurred among participants in 12 of 90 trips conducted by 16 rafting companies during the 3-week period.

Most rafting trips last from 2-14 days.

Perishable food is carried in cold storage containers on each raft. Typical rafts carry six to eight people as well as a guide, and each raft carries a portable excrement storage container known as an "ammo can."

Dr. Barzilay and his colleagues interviewed rafters who went on trips on which people became ill. An "ill rafter" was defined as a rafter or guide who suffered vomiting or diarrhea while on a rafting trip between August 19 and September 12, 2005. An "ill trip" was defined as a trip

with three or more ill rafters. "Cases" were individuals who became ill within the first 48 hours of a trip, and controls were individuals who were not ill within 72 hours of the start of the trip or who were never ill.

"The mean incubation for norovirus is about 33 hours, so we looked at possible exposure to the virus on the launch date of any given trip," Dr. Barzilay said. A review of 57 cases and 96 controls showed that cases were 7.3 times more likely than controls to have consumed deli meat. Deli meat was served for either lunch or dinner on the first day of each of the trips on which people became ill.

Ultimately, three of five composite stool samples from the "ammo cans" on trips sponsored by two rafting companies tested positive for norovirus, as did two of four individual stool samples from ill

Food involved in disease outbreaks may have been contaminated at the point of processing, rather than at the point of service.

rafters; all positive norovirus samples were of the same genetic sequence.

The rafters came from different geographic locations, and the ill trips did not use the same raft guides or equipment. All ill trips were launched by 5 of

16 rafting companies, and these 5 companies shared three food suppliers. Both chicken and beef from a single plant that supplied meats to five rafting companies tested positive for norovirus, despite the fact that the meat was vacuum-packed and frozen at  $-10^{\circ}$  F for 7-28 days before shipping.

While visiting the plant where the contamination was thought to originate, the CDC investigators learned that a food handler had become ill around the time that the deli meat for the rafting companies was processed. "He was most likely still shedding virus when he returned to work, and he cross-contaminated that meat," Dr. Barzilay said.

The food handler became ill on August 13, but he was working at the plant on August 15 and 16; the deli meat was shipped on August 18, and the first case of illness was reported on August 19. "This is the first report of food product contaminated at the point of processing in a government-inspected plant," Dr. Barzilay noted.

Physicians who see patients with foodborne illnesses should consider that food involved in disease outbreaks may have been contaminated at the point of processing, rather than the point of service.

"Although we think of norovirus contamination occurring at point of service, we suspect that contamination can also occur at point of processing for prepackaged and ready-to-eat foods," Dr. Barzilay said. Norovirus is highly resilient and can survive on surfaces for extended periods of time, he noted, adding that food handlers who become ill should stay home from work for 24 hours after their symptoms resolve.

