Project examines norovirus survival and transmission in water on produce

Human norovirus may not grab the headlines that bacterial illnesses tied to produce do, but the virus likely is responsible for up to 40 percent of all foodborne outbreaks. As part of a two-year study, Dr. Melissa K. Jones, a research assistant professor with the University of Florida, Gainesville, is looking at characteristics of irrigation water and how they relate to norovirus survival in the water, on produce and transmission to a host.

"We're kind of on the leading edge of it," said Jones, who will present her findings during the CPS Produce Research Symposium, June 23 - 24, in Atlanta. "One of the things we're learning about norovirus is they have a really high presence in the environment. And we've known for a long time that they are very, very stable and can survive for years in the water and the soil."

Joining her in the project are experts in food safety, foodborne disease and noroviruses. Jones credited Dr. Keith Schneider, a University of Florida professor specializing in produce food safety, for helping develop the research protocols as well as securing the produce for the study.

Part of the multi-faceted project will look at what physiochemical and biological conditions reduce or increase norovirus in irrigation water and its eventual transmission to a host. By identifying those factors, the produce industry may be able to develop risk assessment models and management programs to help minimize the chances of an outbreak. One of the challenges with studying human norovirus is, until recently, it couldn't even be cultured in the laboratory for study. This virus appears to be extremely host specific and typically can't replicate outside the host.

Although Jones has helped develop a lab method to culture the human norovirus, it still needs refining. Instead, she is working with murine norovirus, commonly known as mouse norovirus, as a model. Part of the research will try to narrow how much norovirus must be present to cause infection and how those levels change along the food supply chain from irrigation water, to produce, to host. "Just because the virus can replicate in tissue culture doesn't necessarily mean it will cause disease in the natural host," she said.

Another unique aspect of norovirus is it seems to decrease as populations of enteric, or gut-dwelling, bacteria decline. Jones cited studies where antibiotics were used to wipe out much of the intestinal flora before exposure to norovirus, and in those subjects, norovirus numbers are reduced. Jones and her team will examine several groups of bacteria that occur naturally in fields -- Pseudomonas; enteric bacteria such as *E. coli*; and *Citrobacter* --to see how they interact with norovirus.

"One of our thoughts is the presence of bacteria, in general, actually may increase the stability of the virus," Jones said. If that proves true, then "the next step could be looking at treatments that reduce bacterial numbers to see if they will also help reduce the virus."

View the research abstract proposal: "Effect of physiochemical and biological parameters on survival, persistence and transmission of norovirus in water and on produce"

Melissa Jones, Ph.D. from the University of Florida, Gainesville will present her findings at the Center for Produce Safety Symposium, June 23-24, in Atlanta.

CPS Contact:
Bonnie Fernandez-Fenaroli, Executive Director
Phone (530) 554-9706
Email bonnie@centerforproducesafety.org