

## **Is Quaternary ammonium effective against norovirus? What is the recommended procedure in disinfecting against norovirus?**

Quaternary Ammonium and ethanol alcohol are lipophilic sanitizers and therefore not very effective against single-stranded, non-enveloped RNA viruses, such as norovirus, since they lack a lipid envelope to attack. Barker, et al., 2004, did a disinfection study using norovirus, and found that when an area is contaminated with fecal material, the area must first be wiped clean with detergent and water, and then followed by disinfection with exposure 5000 ppm hypochlorite solution for at least 5 min., in order to completely eliminate norovirus. This would be equivalent to about ¼ cup of chlorine bleach in 1 gallon of water. However, this concentration is much higher than recommended for sanitizing food contact surfaces in the Food Code, and may damage many materials, so great care must be taken in using this disinfection procedure, and if the area is a food contact area, this disinfection procedure must be followed by a second step.

If the contaminated area consists of food contact surfaces, then the disinfection must be followed by a clear-water rinse, and a final wipe down with a sanitizing bleach solution, consisting of 200 ppm chlorine bleach. There are other disinfectants that have been found to be effective against the feline calicivirus, which is genetically similar to the norovirus, but there is no assurance that the feline calicivirus is similar in biocide resistance characteristics to norovirus. For example, EPA has registered a 0.5% hydrogen peroxide solution against the feline calicivirus.

Environmental disinfection recommendations in the literature include the need to disinfect all heavy hand contact surfaces such as food preparation surfaces, self-service utensil handles, faucets, tables, chairs, counters, door handles, push plates, railings, elevator buttons, telephones, keyboards, vending machine keyboards, pens, pencils, casino chips, cards, slot machines, sports equipment, etc. Public restroom surfaces, including: faucet handles, soap dispensers, stall doors and latches, toilet seats and handles, and towel dispensers are also important heavy fecal contamination areas that require disinfection. When norovirus contamination is suspected, cleaning procedures that increase the aerosolization of norovirus should not be utilized, such as vacuuming carpets or buffing hard surface floors. Contaminated carpeting should be disinfected with a chemical disinfectant if possible, and the steam cleaned for a minimum 5-minute contact time at a minimum temperature of 170 degrees F.

When a food worker or patron vomits in a public area or food preparation area, the vomit should be treated as potentially infectious material and should be immediately covered with a disposable cloth, and doused with a disinfectant to reduce the potential airborne contamination. All individuals in the immediate area of the vomiting incident should be cleared from the area before the vomit is cleaned-up. Cleaning staff should use disposable face masks, gloves, and aprons when cleaning up after a vomiting incident. Paper toweling or other toweling used to clean-up liquid vomit should be immediately disposed of in a sealed trash bag and properly disposed of.