

**Title** Occurrence of bacteria in dishcloths used in restaurants and survival of respiratory viruses on produce

**Author** Maria Yepiz, Charles P. Gerba, Ian L. Pepper, Kelly A. Reynolds and Kelly R. Bright

**Citation** Thesis, Doctor of Philosophy (Microbiology), The University of Arizona. 116 pages. 2009.

**Keywords** Dishcloths; Disinfection, Produce, Respiratory viruses, Restaurants, Survival

### Abstract

The first study was designed to determine the occurrence of bacteria in dishcloths used in restaurants and bars. Coliforms were isolated from 89% of dishcloths and 70% of tabletops. *Escherichia coli* was isolated from 54% of dishcloths and 20% of tabletops. The numbers of heterotrophic bacteria (HPC) and coliforms were higher in bars than in restaurants. The levels of HPC found in dishcloths were 25-fold and coliforms were 60-to 120-fold lower than the levels found in dishcloths in previous home studies. The most commonly isolated genera from dishcloths in restaurants and bars differed from those in homes. The numbers of HPC on restaurant tabletops were 45-fold greater after cleaning than prior to cleaning. The mandatory use of sanitizers in restaurants and bars may therefore have reduced contamination levels and caused a shift in the microbial populations present in food service establishments.

The second study was designed to determine the recovery efficiency and the survival of two respiratory viruses on produce and was compared to the survival of the enteric poliovirus 1. Adenovirus was recovered with an efficiency of 56%, 32% and 35% from lettuce, strawberries and raspberries, respectively. Coronavirus was recovered from lettuce with an efficiency of 19.6%, but could not be recovered from strawberries. Poliovirus was recovered from lettuce with an efficiency of 76.6% and 0.06% from strawberries. The survival of the viruses was observed for up to eight days. Adenovirus survived the longest on raspberries, with a  $\log_{10}$  reduction of 0.61, followed by 1.68- and 1.75- $\log_{10}$  reductions on strawberries and lettuce, respectively. Coronavirus declined by 0.41- $\log_{10}$  after two days and  $>1.34 \log_{10}$  by day 4 on lettuce. The enteric poliovirus 1 survived longer on produce, decreasing by only 0.37- $\log_{10}$  on lettuce and 1.30- $\log_{10}$  on strawberries.

A microbial risk assessment was performed to assess the risk of infection from ingesting 1, 10, and 100 particles of adenovirus on lettuce. The estimated risk of infection by ingesting these numbers were 1:2000, 1:200, and 1:20, respectively and increased in a proportional way as the number of servings was increased from one to ten and 365 servings of lettuce.