

Title A field study of the microbiological quality of fresh produce of domestic and Mexican origin
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Abstract

Produce is responsible for an increasingly larger proportion of foodborne disease outbreaks. In particular, the globalization of the food supply may introduce new food safety risks and allow widespread distribution of contaminated food, particularly produce. The objectives of this study were to: (i) compare the overall quality of domestic and Mexican produce throughout the packing process; (ii) examine changes in microbiological quality of both domestic and Mexican produce at each stage of production and processing; and (iii) evaluate the prevalence of select pathogens on fresh produce, including leafy green, herbs, melons, and vegetables. Furthermore, we also sought to characterize the antibiotic resistance profiles of *Enterococcus faecium* and *Enterococcus faecalis* strains isolated from fresh produce. A total of 466 produce and matching environmental swab samples was collected from various locations in packing sheds in the southern US from November 2002 through December 2003. These samples were assayed by enumerative tests for total aerobic bacteria (APC), total coliforms, total *Enterococcus*, and *E. coli*. Produce samples were also analyzed for the presence of *Salmonella*, *Listeria monocytogenes*, *Shigella*, and *E. coli* O157:H7. A total of 112 *E. faecium* and *E. faecalis* isolates were further screened for antibiotic resistance using a panel of seventeen antibiotics. Overall, the microbiological quality of fresh produce ranged from 4.0 to 7.9 log₁₀ CFU/g (APC); less than 1.0 log₁₀ to 4.5 log₁₀ CFU/g (coliforms); less than 1.0 log₁₀ to 4.0 log₁₀ CFU/g (*E. coli*); and less than 1.0 log₁₀ to 5.4 log₁₀ CFU/g (*Enterococcus*). No *Salmonella*, *Shigella*, or *E. coli* O157:H7 were detected from the 466 25-g produce samples tested. However, three domestic cabbage samples were found to be positive for *L. monocytogenes*. Of the *Enterococcus* isolates, *E. faecium* had a higher degree of resistance to antibiotics in general, while *Enterococcus* spp. isolated from Mexican produce had a higher degree of antibiotic resistance when compared to strains isolated from produce samples of domestic origin. Despite increased attention to the role of imported produce in foodborne disease, this study does not support the assumption that domestic produce is of higher microbial quality than Mexican produce.