



Food safety research at VSU in the US

Chyer Kim^{1,*}, Rehab Almuqati², Abeer Fatani², Rahemi Alireza¹, Paul Kaseloo², Crystal Wynn³, Theresa Nartea⁴, Eunice Ndegwa¹ and Laban Rutto¹

¹Agricultural Research Station, Virginia State University, Petersburg, Virginia 23806, USA;

²Department of Biology;

³Department of Family and Consumer Sciences;

⁴Cooperative Extension, Virginia State University, Petersburg, Virginia 23806, USA

Abstract

As farmers' markets have increased in size, scope and complexity, so have the food-safety challenges and implications. Most products sold at farmers' markets receive minimal to no treatment, which increase their potential microbial risks. The aim of this study was to assess the prevalence and characterization of foodborne pathogens on select fresh produce procured from farmers' markets in Central Virginia. A total of 138 samples produced by 15 farms and sold at 9 registered farmers' markets were obtained between March and November 2017. The highest level of coliforms was found in cilantro with 5.8 log MPN/g. Prevalence of *Campylobacter*, *E. coli*, and *Listeria* were observed. A total of 46 bacterial isolates consisted of *Campylobacter*, *E. coli*, and *Listeria* were tested for their susceptibility to 12 antimicrobials. Ampicillin showed the highest frequency of resistance among *Campylobacter* (100%) and *E. coli* (47.8%) isolates while nalidixic acid showed the highest resistance in *Listeria* isolates (72.7%). At least 17% of each *Campylobacter*, *E. coli*, and *Listeria* isolates exhibited resistance to three or more categories of antimicrobials, meeting criteria for multidrug resistance (MDR). No isolates had matching pulsed-field gel electrophoresis (PFGE) profiles demonstrating that the isolated pathogens had a high degree of genomic diversity. This study demonstrated a potential health hazard arising from farmers' market-acquired fresh produce and emphasizes the importance of good agricultural and handling practices to prevent foodborne illness. Continued research is needed to determine and intervene the cause(s) of the observed prevalence and to support the healthy development of food products sold at farmers' markets.

Biography

Dr. Chyer Kim is an Assistant Professor of Food Safety and Microbiology Program at the Agricultural Research Station of Virginia State University. He has worked as a researcher and teacher in various capacities at the University of Georgia, North Carolina A&T State University, and Virginia State University. His research has three focus areas: 1) food safety and quality in conjunction with the effective use of technologies to limit deleterious microbiological and nutritional impacts on food products, 2) assessment of antimicrobial resistance in bacteria acquired from food samples, and 3) subtyping microorganisms utilizing cutting-edge methods such as ELISA, API, and PFGE. He has contributed to 41 publications in peer-reviewed journals. He has been awarded with 17 grants over \$3.1M as either PI or Co-PI. Besides, he has trained and mentored more than 100 students serving as an editorial board member on 5 international journals.

Publications

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2. Kim, C., Alrefaei, R., Bushlaibi, M., Ndegwa, E., Kaseloo, P., and Wynn, C. 2019. Influence of growth temperature on thermal tolerance of leading foodborne pathogens. *Food Science and Nutrition*. <https://doi.org/10.1002/fsn3.1268>.
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5. Kim, C., Fulke, M., Rahemi, A., Taghavi, T., Asmare, A., Kaseloo, P., Ndegwa, E. and Sismour, E. 2018. Antimicrobial resistance in *E. coli* isolated from residential water wells in south central Virginia. *EC Nutrition*. 13(2):45-5