

## **Microfluidic mixer allows determination of pathogen inactivation by chlorine in less than 1 second**

Preventing pathogen survival and cross-contamination during produce washing requires specific information about how exposure time and free chlorine affect pathogen inactivation. The FDA and the produce industry need data exposure-dose data on time scales of 1 sec or less to develop science- and risk-based food safety regulations and practices to support implementation of the Food Safety Modernization Act. Because conventional approaches are unable to provide data on this time scale, scientists at the USDA-ARS designed, fabricated, and demonstrated a novel microfluidic micromixer to determine pathogen inactivation kinetics on time scales as short as 0.1 second. The resulting data fills a critical data gap and has substantially aided development of industry standards for wash water sanitization of fresh-cut produce. Results of this research have been shared with the FDA, the fresh produce industry, and the CDC, and are being incorporated into an Interagency-Industry cooperative report on produce wash water sanitation validation. More broadly, this patent-pending technology provides a valuable tool for researchers to determine pathogen inactivation kinetics on sub-second time scales, providing an alternative to the much more expensive approach of stopped-flow kinetic studies. The technology has been directly shared with the University of Maryland and CDC, and is expected to provide additional critical data and insight on the kinetics of bacterial inactivation for a broad range of sanitizers and produce wash operational conditions, thus facilitating development and implementation of science-based food safety regulations and practices for improving food safety.