

In current fresh-cut processing, harvested produce is generally cut and then washed to remove "organic exudate" (such as juices and/or a more viscous pulpy matter) that has leaked from freshly-cut surfaces. This organic exudate reacts immediately and continuously with chlorine and other sanitizers, and consequently reduces the level of free chlorine or other sanitizers in the washing solution. Free chlorine and other sanitizers can be replenished through the "make-up" addition of chemicals, but the continuing accumulation of organic material in the wash solution requires addition of ever-larger amounts of sanitizer chemicals in order to maintain an adequate concentration of active sanitizer for sanitizing produce and preventing microbial cross-contamination.

When adequate sanitizer concentration is not maintained above a critical level, not only is the efficacy of microbial reduction diminished, but also microbial survival in wash water is enhanced, which allows microbial contamination of otherwise clean produce. This then results in significant food safety and food quality problems. Thus, it is important to remove the organic exudate early in the process. In this research, our project team members developed a technology that effectively removes the organic exudate early in the washing process without damaging plant tissues. Taking organic materials from the wash system earlier in the process ensures the maintenance of free chlorine and/or other sanitizer needed for pathogen inactivation.