

**Title** Sustainable sanitation techniques for keeping quality and safety of fresh-cut plant commodities

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### **Abstract**

The minimal processing industry for fruit and vegetables needs appropriate selection of raw materials and operation of improved sustainable strategies for reducing losses and providing high quality and safe commodities. The most important target for keeping overall quality of these commodities is a decrease in microbial spoilage flora as these cause both decay and safety problems. Every step in the production chain will influence microbial load and the implementation of an accurate disinfection program should be the main concern of commercial processing. The only step that reduces microbial load throughout the production chain is washing disinfection, and the keys are proper handling and optimizing existing techniques or a combination of them. Chlorine is a common efficient sanitation agent but there is the risk of undesirable by-products upon reaction with organic matter and this may lead to new regulatory restrictions in the future. Moreover, its efficacy is poor for some products. Consequently the minimal processing industry wants safer alternatives. Several antimicrobial washing solutions, O<sub>3</sub>, UV-C radiation, intense light pulses, super high O<sub>2</sub>, N<sub>2</sub>O and noble gases, alone or in combination, are presently considered promising treatments. However, change from use of conventional to innovative sanitizers requires knowledge of the benefits and restrictions as well as a practical outlook. This review addresses some recent results obtained with these eco-innovative sanitizers on fresh-cut plant commodities.