

**Title** Development of technologies for safe fresh and fresh-cut produce in Japan

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### **Abstract**

Fresh and fresh-cut produce can become contaminated with microorganisms and can be the vehicle for foodborne pathogens. Microbial count was basically higher on vegetables than on fruits, and approximately 80% of the total isolates were bacteria in vegetables and molds in fruits. Most of the bacteria and molds isolated from produce are phytopathogenic and soilborne organisms. Our research showed that on farm sources of microbial contamination are from soil, fertilizer, agricultural water, pesticide solution, and humans at the preharvest level and soil, agricultural and rinse waters. Packing shed equipment, and humans at the postharvest level. We also reported that major sources of in-plant contamination are from the equipment and machinery used in preparing fresh-cut produce. An on-farm food safety program such as Good Agricultural Practices (GAP) and an in-plant food safety program such as Hazard Analysis and Critical Control Point (HACCP) have been recommended to minimize microbial food safety hazards of fresh and fresh-cut produce. However, more intensive and extensive research studies are needed to better understand the interaction of field and plant conditions and treatments in reducing and regulating spoilage and human pathogens in Japan. We have researched preharvest treatments including chlorination of agricultural water and ethyl alcohol spraying on packing shed equipment and postharvest treatments including chemical disinfectants such as electrolyzed water and ozonated water and physical treatments such as hot water and high-pressure of fresh-cut produce to safe food. These technologies will be effective in establishing a scientific baseline for designing and improving food safety guidelines that will control microbial quality and assure safety of fresh-cut produce.