

Title Current status of the fresh-cut produce industry and sanitizing technologies in Japan
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Abstract

Fresh-cut products have been popular in Japan over the past decade. In a commercial produce plant, product washing is an important step to reduce microbial population during the processing operations, because microbiological control and safety are of major concern in preparation of fresh-cut produce. Some chemical disinfectants and natural antimicrobial agents from plant and animal are effective without causing deterioration of fresh-cut vegetables. Electrolyzed water (pH 2.7 or 6.5, 20 to 60 ppm available chlorine) and ozonated water (1 to 10 ppm ozone) are disinfectants approved as food additives by Ministry of Health, Labor, and Welfare of Japan. The treatments with electrolyzed water reduced total microbial counts of fresh-cut cucumber, carrots, and spinach by 1 to 3 logs CFU/g relative to non-treated samples without quality loss. Ozonated water (5 and 10 ppm) also reduced the microbial counts by 1 log and was a better disinfectant of fresh-cut cabbage than of lettuce. The ozonated water increased the rate of electrolyte leakage from tissue slices and polyphenol content and accelerated brown discoloration of fresh-cut lettuce, but not of fresh-cut cabbage. Among the natural antimicrobial preservatives, a 0.5% ferulic acid agent (2% of ferulic acid) or 1% fumaric acid agent (20% of fumaric acid) applied on fresh-cut lettuce, 0.1% mustard and hop extract agent (10% of allyl isothiocyanate and 7% of β -acid) on fresh-cut cabbage, and 0.05% calcined calcium agent (91% of calcium) on fresh-cut cucumber reduced the microbial counts by 0.3 to 1.5 logs as compared to water-dipped control. The fumaric acid agent followed by electrolyzed water treatment was the most effective in reducing microbial counts with fresh-cut lettuce and cucumber. Since the microbicidal effectiveness of disinfectants and agents was dependent on type of fresh-cut vegetables, it is important to understand which disinfectant and agent are best for each fresh-cut vegetable.