Title	Effectiveness of Gaseous Chlorine Dioxide in Killing Salmonella, Escherichia coli 0157:H7, Listeria
	monocytogenes, and Yeasts and Molds on Fresh and Fresh-cut Fruits and Vegetables
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Abstract

An increased frequency in outbreaks of illness associated with the consumption of fresh produce in recent years has raised interest in developing more effective sanitization methods. Among the sanitizers of interest is gaseous chlorine dioxide (CIO₂). We previously observed that treatment of blueberries, strawberries, and raspberries with gaseous CIO₂ was effective in killing large numbers of *Salmonella* without compromising shelf life. We expanded these studies to evaluate the efficacy of gaseous CIO₂ in killing *Salmonella*, *Escherichia coli* 0157:H7, and *Listeria monocytogenes* inoculated onto the surface of fresh-cut cabbage, carrot, and lettuce as well as fresh whole apples, peaches, onions, and tomatoes. Sachets containing reactant chemicals were formulaed o produce gaseous CIO₂ at concentrations of 1.4, 2.7, and 4.1 mg/L of air in a sealed cabinet within 5.4 to 10.5, 10.5 to 20.5, and 20.5 to 30.8 min, respectively, at 22°C and high relative humidity (62 to 98%). Treatment with 1.4 mg/L CIO₂ significantly (P \leq 0.05) reduced populations of pathogens on all produce. Significant reductions in yeasts and molds on apples and peaches but not on tomatoes and onions were achieved by treatment with CIO₂. With the exceptions of apples, tomatoes, and onions, treatment of produce with gaseous CIO₂ at concentrations causing reductions in pathogens similar to those achieved using 100 to 200 µg/ml chlorine adversely affected the sensory quality during subsequent storage. The effect of a more rapid release of CIO₂ into the atmosphere surrounding produce on inactivation of pathogens and on sensory quality should be further studied.