

**Title** Impact of ozonation on the pesticide residues degradation and shelf-life of fruits

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### **Abstract**

Pesticide residues in foods (fruits) have been an important food safety issue. Traditional chlorination often leaves the hazardous residues in the food products. There are great needs to develop a more effective, more environmental friendly, and safer method for removing or reducing the levels of pesticide residues in foods. This study was aimed to evaluate the effect of ozone treatment on fruits compared with traditional chlorine treatment. Specific objectives include study of the effectiveness of ozonation on pesticide residues degradation on/in fruits as well as its impact on the shelf-life, and nutrient and visual quality of fruits. An aqueous model system was developed to optimize ozonation process by studying the effects of three pH values (4.6, 7.0 and 10.7) and two temperatures (0 °C and room temperature) on pesticides degradation over a 30 min period. The optimal ozonation condition was employed in the fruit sample treatments. To study the effects of ozonation on the fruits shelf-life over time and different pHs, ozonated water, chlorinated water, and tap water were used to wash fruit samples for 5 min, 15 min and 30 min under acidic, neutral, and alkaline conditions, respectively. Vitamin C, a critical nutrient in fruits, was determined in fruit samples after ozone and chlorine treatments to evaluate the impact of ozone treatment on the fruits nutrients. Pesticide residues (malathion) were effectively degraded by ozonation compared with chlorination. The shelf-life of fruits samples treated by ozonation process was extended compared with the tap water wash. The effect of ozonation treatment on vitamin C content of fruit was not significant. The results indicated that ozonation is an effective method in pesticide residues degradation and shelf-life extension of fruits without changing the important nutrients.