Are oxidizing Sanitizers Safe for Use on Fruits and Vegetables?

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Fruits and vegetables change several hands while passing from the farm to the table. The produce is exposed to potential microbial contamination at every step including cultivation, harvesting, transporting, packaging, storage and selling to the final consumers. Microbial spoilage and contaminating pathogens pose a serious problem of food safety.

The oxidizing chemicals such as chlorine, hyppochlorite, chlorine dioxide, peracetic acid, hydrogen peroxide and ozone has been routinely used to reduce microbial contamination on fruits and vegetables. The oxidizing chemicals by definition oxidize organic molecules on fruits and vegetables as well as on contaminating microorganisms. Thus oxidizing process kills microorganisms. The mass of organic molecules present on the surface of fruits and vegetables is infinitely large as compared to that present on the contaminating microorganisms. The preponderance of the organic molecules on produce consumes practically all of the oxidizing sanitizing chemical. A tiny fraction is used in the sanitizing process. Because these commodity-oxidizing chemicals are available at a very low cost the economic impact of this wastage is either ignored or not noticed.

However there are potentially long term health issues that arise from the use of oxidizing sanitizers on produce. The oxidizing chemicals alter organic molecules to unknown entities by covalent chemical reactions. Because of the complexity of newly formed organic materials, it is difficult to begin to comprehend the long-term health effects of consumption of treated produce. The studies on byproduct of hypochlorite treatment reveal the danger posed by the use of oxidizing chemicals.

The use of hypochlorite for disinfection of raw food results in various chemical reactions that produce harmful organochlorine compounds (Fukayama et al. 1986.). Reaction with carbohydrates is generally oxidative, however, low levels of volatile chlorinated compounds are produced. Hypochlorite reacts with double bonds in fatty acids and other lipids to form chlorinated products. Amino acids in proteins react with hypochlorite to form N-chloro derivatives. Reaction with aromatic amino acids proceeds via heterocyclic ring. Chloroform, N-chloro compounds, chlorinated purine and pyrimidines, chlorophenols, chlorobenzenes are some of the carcinogenic and toxic resulting from chlorination of food products and water **(**Cheng-I et al. 1985). Even minute quantities of lipophilic chlorinated compounds can accumulate in adipose tissue during lifetime to levels that can be carcinogenic. Soy bean sprouts and cabbages treated with solutions of sodium hypochlorite showed increased formation of chloroform and residual chlorine with increased concentration of hypochlorite and with increasing temperature treatment (Hidaka et al. 1992).

Microcide, Inc. has developed a line of EPA registered non-oxidizing sanitizing products (PRO-SAN) that can be used to wash fruits and vegetables without any covalent chemical reactions. These products display comparative sanitizing activity to the oxidizing chemicals but are almost inert to precious organic nutrients on fruits and vegetables and therefore are not consumed. PRO-SAN products contain USDA and FDA approved ingredients for washing fruits and vegetables. PRO-SAN products have very long shelf life and have broad spectrum of activity against microorganisms. Contact: Dr. John Lopes at 248-526-9663 e-mail: info@microcideinc.com and website: www.microcideinc.com.

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