

## SAFETY &amp; SANITATION DISINFECTING &amp; SANITIZING

# Ozone as an Added Protection in Food Processing Chain

Ozone technology used in day-to-day food safety protocols for sterilization of bacterial, fungal, viral, and prion contaminants  
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**E**very step from farm to fork is fraught with the danger of contamination. Although more is known about the risks of contamination in the food chain from production to plating than ever before, food safety practices have struggled to keep up.

The fact is that chlorine-based chemical sterilization procedures cannot protect food products from all risks, as emerging pathogens demonstrate increasing resistance to customary concentrations of chlorine-based food safety systems.

## Ozonated Water to the Rescue

America's largest farm operations, food animal processors, restaurants, grocery stores, wineries, and breweries are all utilizing ozone technology in their day-to-day food safety protocols, achieving almost complete sterilization of bacterial, fungal, viral, and even prion contaminants. Aqueous ozone achieves between 99.99 percent to 99.9999 percent sterilization of food products contaminated by disease causing pathogens, essentially, on contact.

When swimmers in Malibu became ill because of waterborne pathogens from septic tank effluent, ozone helped solve the bacterial contamination problem. When a pharmaceutical facility had to shut down because of tenacious biofilm

contamination, ozonated water was the solution. Ozonated water technology has solved many other pathogenic and chemical pesticide contamination issues in various industries. Interestingly, disinfection of food products at every stage of the farm-to-fork process presents greater challenges than the problems presented by contamination in these controlled industrial environments as there are simply more food safety variables at play.

## Real-World Users

Familiar brand names, such as Whole Foods, The Cheesecake Factory, Kanaloa Seafood, Frank Family Vineyards, Coca-Cola, Sierra Nevada Brewing Co., Halpern's Meats and Seafood, and Fresh Direct,

## For Further Reading

The book "Ozone in Food Processing" brings together essential information on the application of ozone. This reference includes topics on current trends, regulatory and legislative issues, and specific food applications. The book also discusses operational systems and provides technical studies to confirm the efficacy of ozone. For more information on book, go to <http://ow.ly/IKCV3odpm1q>.

are successfully utilizing aqueous ozone technology to accomplish high levels of food safety.

Companies turn to ozonated water to assure protection of their valuable brands. The Cheesecake Factory has stated in its 2016 annual report "We utilize ozone cleaning systems for certain ingredients in approximately one-half of our prep kitchens, and plan to further roll out this program in order to provide an effective 'green' sanitizing method that is consistent with our sustainability goals."

Dr. Al Baroudi, PhD, CFS, VP, QA, and The Cheesecake Factory's food safety guru, reports, "By killing bacteria on contact, ozonated water disinfection provides the extra needed protection against a cross-contamination event or a deadly *E. coli* outbreak."

Bruno Serato, award-winning chef, and owner of the Anaheim Whitehouse restaurant, installed an ozonated water system in his kitchen and catering facilities. Chef Bruno says, "My ozonated water system is my added insurance policy. Every year there are millions of cases of foodborne illness hospitalizations and deaths due to foodborne bacteria. Ozonated water should be mandatory equipment on food service."

Whole Foods has also endorsed the use of ozonated water going forward, as it has been utilizing the technology in its stores since 2006.

## The Benefits

Ozonated water is a cold-water disinfection agent. Currently, chlorine chemical cleaning processes require expensive hot water, and consumes valuable storage space for the chemicals and rinsing solutions. Use of chlorine-based sanitizing systems require frequent deliveries, dedicated storage space, and the training and tasking of employees on how to measure and mix proper proportions of chemical cleaning agents. Chlorine-based systems also require substantial rinsing. Inadequate rinsing can result in the addition of unpleasant bleach flavor to food products.

Conversely, there is no hot water or storage of chemicals needed with ozonated water. Training of food handlers in the use of ozonated water is a one-step process: Immerse the food in ozonated water for at least 30 seconds. The benefits of ozo-

nated water systems don't stop there: They only require inspection and maintenance once a year, on average; they are environmentally safe as the ozone molecules naturally revert to oxygen within 20 minutes; they don't require dedicated disposal procedures, like chlorine-based products; and they don't leave behind harmful residues.

Tri-atomic oxygen is infused into ozonated water to produce an all-natural sanitizing agent that can be 50 percent stronger than chlorine. It prevents decay and thus extends shelf life by eliminating decomposition agents such as bacteria, yeast, and molds, and enhances food safety by reducing populations of foodborne pathogens, including *E. coli*, *Salmonella*, *Listeria*, and *Shigella*.

Ozone can work about 3,000 times faster than chlorine, and requires fewer parts per million to achieve its desired results. It can achieve 4 to 6 log reductions in a short period of time without the by-products of chlorine. For example, a 5-log reduction of *E. coli* population can be accomplished by exposure to aqueous ozone for only 30 seconds. Aqueous ozone is effective against *E. coli* populations whether they are found on the surface of food stuffs, or on the hands of food handlers, who can immerse their hands in ozonated water rinses during food preparation.

Ozone has been approved as a disinfection/sanitizing agent for more than 16 years when the FDA granted GRAS status approval in 2001. Ozone is approved for organics, and is approved by FDA as a food additive. Ozonated water also relieves food operations from burdensome recordkeeping as the EPA does not require reporting in connection with the use of ozonated water.

New advanced ozonated water systems have been designed to integrate into existing food production, processing, and handling facilities. They are scaled from small operations to large industrial operations; that is, something as simple as a sink that dispenses ozonated water from its faucet to larger ozone generators used in the creation of large quantities of ozonated water that can disinfect/sanitize large scale food production processes.

Ozonated water in the wash environment can enhance food safety by killing waterborne and surface pathogens on food products, processing equipment, and

contact points of food handlers. Ozonated water systems meet Hazard Analysis and Critical Control Points, or HACCP, requirements by providing automated verification and reporting of control over water usage and disposal. Oxidation-Reduction Potential probes monitor the strength and data logs the readings of the ozone systems while assuring operational status.

Ozonated water breaks down into water and oxygen molecules, leaving no resi-

due. Unlike chlorine sterilizing processes, there is no need for facilities to receive, store, or dispose of ozone.

If you spill ozonated water, get a mop. If you spill chlorine, well, that's a problem you don't need. Ozonated water is the modern, economical, and environmentally benign solution to an ancient problem.

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products that REALLY work.

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SG-WDS/ICE

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- Kills Biofilm, Slime, Salmonella, *E. coli*, Legionella, Norovirus, Listeria
- Eliminates or reduces manual cleaning
- Leaves no chemical residues behind
- No change in taste or colour of your ice
- The SG-WDS/ICE generates pure, safe ozonated water that is a disinfectant that is 3,000 times faster than chlorine and safer.
- FDA and USDA approved
- Ensures best quality hygiene 24/7

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