Bio-Cide INTERNATIONAL

A KEMIN COMPANY

KEEPER™ SERIES

Your Essential Food-grade, Broad-spectrum Antimicrobial Solutions.

Designed to control microbial and enzymatic activity without impacting flavor or safety of food while extending shelf life.

KEEPER™ SERIES

Food-grade antimicrobial solutions for direct food contact.

KEEPER™ Series is an antimicrobial agent that is used to **eliminate pathogens, extend shelf life, and improve the quality of meat, seafood, poultry, and post-harvest fruits and vegetables.**

Our products have **demonstrated broad spectrum efficacy** against bacteria, fungi, algae, viruses, and parasitic microorganisms.

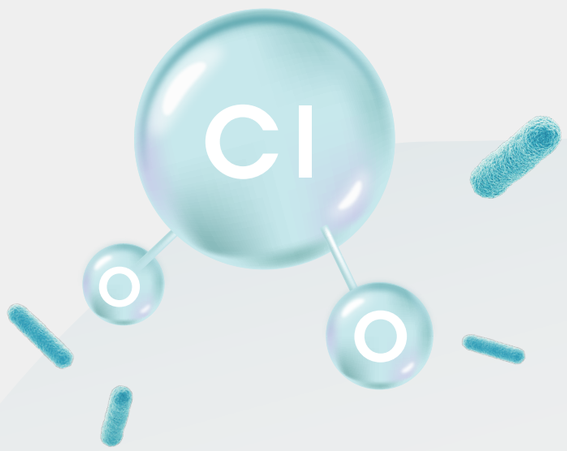
- KEEPER™ Series solutions are high-quality precursors supported by our proprietary delivery system.
- Broad-spectrum antimicrobial activity to eliminate and prevent formation of biofilm.
- Meet the required efficacy without impacting the nutritional quality and organoleptic properties of products.
- Effective in removing odor.
- Effective over a broad pH range.
- Suitable for various application such as dip or spray.
- Non residual and no trihalomethanes (THM) formation.

KEEPER™ Series is internationally-accredited and recognized for use in the food industry.

EPA	USDA	FDA	OMRI-USDA	NSF International
Environmental Protection Agency	United States Department of Agriculture	Food and Drug Administration	Organic Farming Material Association	National Sanitation Foundation International

Food Safety Should Not Be Taken Lightly

Food safety can only be achieved through stringent procedures and strict routines. Foodborne illnesses that arise from the negligence of food processing plants can result in far-reaching and devastating consequences.



Breaking Down Biofilm at a Molecular Level

KEEPER™ penetrates biofilms to effectively control biofilm formation by killing in-situ bacteria and eliminating the ability of the microbes to spread.

FOR THE MEAT & POULTRY INDUSTRY

From slaughterhouse to packaging.

Approved as Acidified Sodium Chlorite (ASC) for the processing of poultry carcasses, parts and organs, KEEPER™ Series is used to eliminate pathogens, extend shelf life and improve the quality of poultry products such as processed, comminuted, and/or formed meats. Use KEEPER™ Series as a component of a spray or dip; at concentrations up to 1200 ppm, and at or near a neutral pH.

FOR THE SEAFOOD PROCESSING INDUSTRY

From ship to processing.

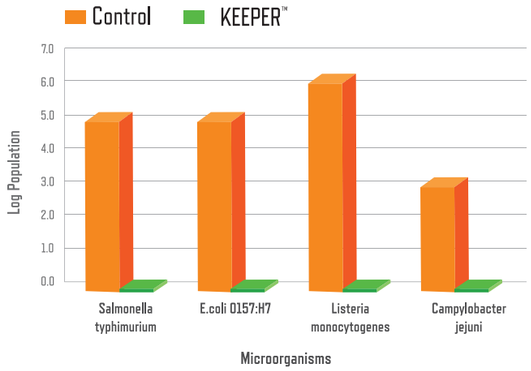
Overcome challenges in eliminating pathogens, extending shelf life, and improving quality in seafood with KEEPER™ Series, approved for use in water and ice that are used to rinse, wash, thaw, transport, and store seafood.

FOR THE POST-HARVEST PROCESSING INDUSTRY

From farm to storage.

Eliminate pathogens and extend the shelf life of post-harvest fruits and vegetables with KEEPER™ Series - approved for use in water and ice for rinsing, washing, transporting, and storing fruits and vegetables at concentrations below 500 ppm (typically between 5-50 ppm).

Invitro Antimicrobial Efficacy of KEEPER™



No Residues on Direct Food Contact

Evaluation of Chlorite and Chlorate Ion Residues on Raw Beef Cuts and Frankfurters Following Treatment with KEEPER™

Treatments

Beef Flank Cuts
Untreated
Treated with activated KEEPER™ at 1200 ppm

Frankfurters
Untreated
Treated with activated KEEPER™ at 1200 ppm

Sample Preparation and Analyzes

Samples were treated by complete immersion in 1200 ppm of activated KEEPER™ for 30 seconds.

After dipping, each sample was held at a refrigerated temperature of 40°F for approximately 2 hours, and then ground. The ground sample was then stomached for 1 minute with equal quantity of distilled water by weight. Slurry was centrifuged and the supernatant analyzed for chlorite and chlorate ions using procedures specified in EPA Method 300.1. The limit of detection for chlorite and chlorate ions using this assay is approximately 0.1 ppm.

Sample Rep.	Beef Flank Cuts			
	Untreated		Treated	
	(Chlorite ppm)	(Chlorate ppm)	(Chlorite ppm)	(Chlorate ppm)
1	<0.1	<0.1	<0.1	<0.1
2			<0.1	<0.1

Table 1

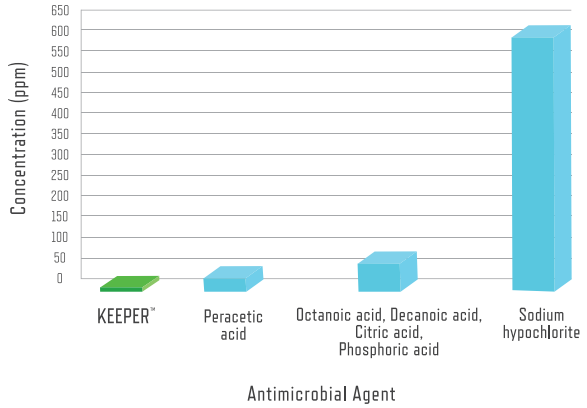
Sample Rep.	Frankfurters			
	Untreated		Treated	
	(Chlorite ppm)	(Chlorate ppm)	(Chlorite ppm)	(Chlorate ppm)
1	<0.1	<0.1	<0.1	<0.1
2			<0.1	<0.1

Table 2

Results

As presented in Table 1 and Table 2, no chlorite or chlorate ion residues were detected on any treated beef flank or frankfurter samples.

Concentration of Antimicrobial Agents Required
to achieve >5log reduction of E.coli O157:H7 in 60 seconds



DID YOU KNOW?

Keeper™ is proven to be more effective than other conventional antimicrobial agents including Peracetic acid, Octanoic acid, Decanoic acid, Citric acid, Phosporic acid, and Sodium hypochlorite (chlorine).

Made Possible with Kemin's Proprietary Technology & Systems

KEEPER™ Series is a highly refined blend of oxychloro species containing purified sodium chlorite - activated at the time of use to produce chlorine dioxide.

The activation of KEEPER™ Series solutions involves lowering the pH of the concentrate with any Generally Recognized as Safe (GRAS) acid. Kemin's patented engineered activation and application system is designed to help users **achieve a consistent activated yield of chlorine dioxide.**

AANE™ | Automated Activation Non Electric

Automated activation system designed to reduce human intervention for safety and ease of application.

OLAS™ | Online Activation System

Water powered on-demand activator engineered for controlled dispensing and to eliminate wastage.

TITAN™ | Chlorine Dioxide Generation Injection System

State-of-the art system, targeted for high-volume activation with variable outlet. Comes with a digital panel to support a diversity of concentration needs and various applications.

Assuring Food Safety and Quality with Industry-trusted Antimicrobial Solutions

Find out how Kemin can help you effectively meet food processing safety and hygiene standards.

Scan for more info

kemin.com/disinfection

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