

Only US FDA approved Food sanitizer

Introducing,

1<sup>st</sup> Time In India

# EatSafe™

Peracetic Acid > 500 ppm

Globally approved in U.S, Europe , Australia

Proven Efficacy<sup>1</sup>

- Rapid Killing- High oxidizing potential of 1.8 eV with 5 log reduction
- Faster action (within 5 minutes)

Proven Safety<sup>3</sup>

- Eco friendly- Non chlorinated by product
- Non-carcinogenic

Convenient to use<sup>2</sup>

- Rinsing not required
- Alcohol free
- Better spread- In spray form

For further information, please contact-

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Ensure It's Safe...

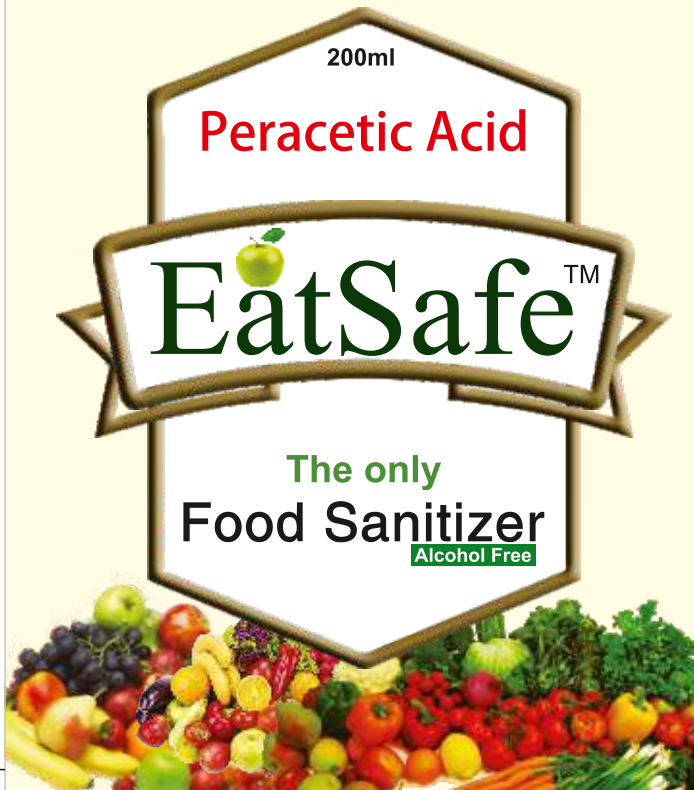
# EatSafe™

Peracetic Acid > 500 ppm



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- ◆ Proven Efficacy
- ◆ Proven Safety
- ◆ Convenient to use



- Non chlorinated by products and non-carcinogenic – safe for human use
- Long shelf life of 6 months- Ease to store.
- PET bottle containing sprayer ensures ease of application.
- Does not spoil vegetables/fruits/non vegetarian products after application.
- Ready to use, no dilution required, ensures compliance.
- No rinsing required- convenient to use.
- EatSafe can be used in wide range of temperature and pH.
- 200 ml pack, ensures economy and fulfil need for a family.
- Small bottle ensures convenience

**References:**

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3. <https://www.foodsafetymagazine.com/enewsletter/the-covid-19-pandemic-food-safety-an-eyewitness-to-the-global-war-against-the-invisible-enemy/>
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6. [www.federalregister.gov/articles/2000/12/01/00-30679/peroxyacetic-acid-exemption-from-the-requirement-of-a-tolerance](http://www.federalregister.gov/articles/2000/12/01/00-30679/peroxyacetic-acid-exemption-from-the-requirement-of-a-tolerance)
7. USDA National Organic Program, certified organic (7CFR 205.601).
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9. Federal Register/Vol.65, No.232/Friday, Dec 1, 2000/ Rules and Regulations.
10. Rev Sci .tech. off .int .Epiz, 1995, 14(1), 81-94
11. Postharvest Disinfection of Fruits and Vegetables, Elsevier, ISBN 978-0-12-812698-1, P-58

### 3.1 Composition of EatSafe :

Peracetic Acid > 500ppm  
Hydrogen Peroxide Q.S.  
Purified Water.

### 3.2 Usage Recommendation :

It can be used on any food like fruits, vegetables, meat, fish etc.  
It can also be used to sanitize packed food and packaging of any food. EatSafe can be used on any utensils and any surface.

### 3.3 Sanitation Recommendations :

- 10-20 sprays sufficient to sanitize 1 kg of fruits and vegetables
- 2-5 sprays sufficient to sanitize 1 kg of any packed food like Biscuits, chips etc

### 3.4 Presentation :

200 ml aqueous solution in a sprayer containing PET bottle.

### 3.5 EatSafe as Food Sanitizer :

- FDA approved PAA as food sanitizer for direct food contact with fruits/ Vegetables/meat/poultry and sea foods
- Eat Safe can be used on ready to eat food like cut fruits as food sanitizer<sup>11</sup>
- PAA in EatSafe does not pose dietary risk in infants and children<sup>9</sup>
- Rapid killing of microbes with high oxidizing potential
- Broad Spectrum microbicidal activity- Kills 99.99% microbes
- Proven virucidal activity
- EatSafe does not affect taste characteristics of fruits
- Faster action (5 minutes) than chlorine or quaternary amines (hours)

### 1.1 Introduction :

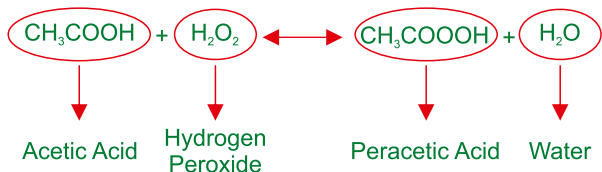
Peracetic acid is a bleaching agent for food starch. Peracetic acid (also known as peroxyacetic acid, or PAA), is an organic compound with the formula  $\text{CH}_3\text{COOOH}$ . This organic peroxide is a colorless liquid with a characteristic acrid odor reminiscent of acetic acid.

Peracetic acid can be used as a bleaching agent. It is used at weakly acidic pH and relatively low temperature. It is a relative efficient and selective bleaching agent, and it is often used as an alternative to chlorine dioxide and elemental chlorine in totally chlorine free bleaching sequences (TCF).

Peracetic acid is a much weaker acid than the parent acetic acid, with a pKa of 8.2. Peracetic acid is an ideal antimicrobial agent due to its high oxidizing potential. It is broadly effective against microorganisms and is not deactivated by catalase and peroxidase, the enzymes that break down hydrogen peroxide. It also breaks down in food to safe and environmentally friendly residues (acetic acid and hydrogen peroxide), and therefore can be used in non-rinse applications. It can be used over a wide temperature range (0-40°C), wide pH range (3.0-7.5), in clean-in-place (CIP) processes, in hard water conditions, and is not affected by protein residues.<sup>1</sup>

### 1.2 Safety :

Peracetic Acid is a highly biocidal oxidizer that maintains its efficacy in the presence of organic load. Peracetic Acid removes surface contaminations and function by denaturing proteins, disrupting cell wall permeability and oxidizing sulfhydryl and sulfur bonds in proteins, enzymes and other metabolites.



It is a product resulting from a reaction between acetic acid and hydrogen peroxide that is maintained in equilibrium in water. Peracetic Acid used as a concentration of 0.17 PPM<sup>(6)</sup> has no harmful effects on living beings. It has been highly acclaimed as a high level surface disinfectant by both CDC<sup>(2)</sup> (centers for disease control and prevention), USA and the EPA<sup>(3)</sup> (environment protection agency), USA.

A special advantage of Peracetic Acid is its lack of harmful decomposition products, ie. It quickly breaks down in carbon dioxide, oxygen and water. It is a high – level disinfectant having a broad spectrum of antimicrobial activity which does not linger on surfaces and are completely biodegradable.

Peracetic Acid has a very high oxidation due to an eV value of 1.81 which ensures that electrons are transferred faster to microorganisms and in turn they are inactivated or killed rapidly. It enhances removal of organic material.

Peracetic Acid is sporicidal even at a lower temperature and more potent than chlorine dioxide and sodium hypochlorite.<sup>1</sup>

### 1.3 Mode of Action :

It is thought to function as an oxidizing agent, ie. it denatures protein, disrupts cell wall permeability and oxidizes sulphydryl and sulfur bonds in proteins, enzymes and other metabolites.

## 2.4 EatSafe is better than chlorine based sanitizers

Sl No	Peracetic Acid	Sodium Hypochlorite
1	It is NON-CARCINOGENIC	It is CARCINOGENIC
2	Does not cause Disinfection By-products which are Environmental Pollutants	Tends to form persistent chlorinated organic compounds (CARCINOGENIC), absorbed by organisms and enters the food chain
3	Does not cause Disinfection By-products which are Environmental Pollutants	It has tendency to form persistent chlorinated organic compounds (CARCINOGENIC), absorbed by organisms and enters the food chain
4	Corrosive Nature is Negligible	It is a Dangerous and Corrosive substance
5	Causes mild Skin Irritation	Causes Severe Skin Burn and Eye Damage when used in Concentration form
6	No need of Rinsing with water	Dichlorination is mandatory through rinsing with water
7	No Degradation by UV ray	Degradation by UV ray becomes Half by 45 mints
8	Aquatic Toxicity is Negligible	Aquatic Toxicity is Very High
9	Better Efficacy in Plastic, Nylon, Rubber, Wood surfaces	Lesser Efficacy compared to Peracetic Acid
10	Long Shelf Life of 6 months	Starts Degrading substantially within 10 weeks

### 2.3 Peracetic Acid is approved by EPA, USFDA and US Dept of agriculture for using directly to food<sup>6</sup>

Environmental Protection Agency (EPA) regulations exempt peracetic acid residues from tolerances in food products treated up to 100 ppm per application on with solutions of less than 500 ppm applied to equipment

- ✓ Fruits
- ✓ Vegetables
- ✓ Tree nuts
- ✓ Cereal grains
- ✓ Herbs
- ✓ Spice

- ✓ U.S. Department of Agriculture regulations provide that peracetic acid may be **directly applied to foods** that are NOT certified as organic.<sup>7</sup>
- ✓ Peracetic acid blends have been approved by the U.S. Food and Drug Administration (FDA) approved as sanitizer on food contact surfaces and for direct food contact with **fruits, vegetables, meat, poultry and seafood** <sup>8</sup>

Peracetic Acid will inactivate gram positive and gram negative bacteria, fungi and yeasts in < 5 minutes at < 100 PPM. In the presence of organic matter, 200 – 500 PPM is required for viruses, the dosage range is wide (12 – 2250 PPM), with Poliovirus inactivated in yeast extract in 15 minutes with 1500 to 2250 PPM. Bacterial spores in suspension are inactivated in 15 seconds to 30 minutes with 500 to 10,000 PPM (0.05 to 1%).

### 1.4 Proven Efficacy of PAA Against Microorganisms<sup>10</sup>

Type <sup>1</sup>	Bacteria	Mycobacteria	Viruses	Bacterial Spores	Yeasts	Moulds	Toxicity	Carcinogenic	Rinsing
Peracetic acid	++	++	++	++	++	++	Low	No	No
Chlorine	++	++	++	+	++	++	Medium	Yes	Yes
Formaldehyde	+	+	+	+	+	+	High	Yes	Yes
Phenolics	+	+	-	-	+	+	High	Yes	Yes
Quaternary Ammonium compounds	-	-	-	-	++	+	Low	Yes	Yes
Hydrogen peroxide	++	+	+	-	+	+	Low	Yes	Yes
Iodophors	++	++	++	+	+	+	Medium	Yes	Yes
Sodium Hydroxide	+	+	+	+	+	+	High	Yes	Yes

### 1.5 Proven Virucidal Activity of EatSafe<sup>2</sup>

Virucidal Action	Time	Source
Activity against encapsulated viruses (EN14476-Vaccinia)	1 min	Rabenau 2010
Limited spectrum virucidal activity (EN14476-Adenovirus and murine norovirus)	5 min	Becker 2017
General virucidal activity (EN14476-Polio virus, adeno virus and murine norovirus)	5 min	Becker 2017
Decontamination of SARS-CoV-2 on surfaces	1 min	Spanish Ministry of health, 2020
Activity against human coronavirus (HCoV-229E)	1 min	Kampf 2020

### 1.6 Peracetic Acid has Strong Oxidation Potential :

Peracetic Acid is more potent than Chlorine dioxide and Sodium hypochlorite. The primary mode of action is oxidation. The mechanism of oxidation is transferring of electrons, therefore the stronger the oxidizer, the faster electrons are transferred to the microorganism & the faster the microorganism is inactivated or killed.

Disinfectant	eV (electron volts)
Ozone	2.08
Peracetic acid	1.81
Chlorine dioxide	1.57
Sodium hypochlorite	1.36

### 2.1 Food Safety During Covid19 Pandemic-<sup>3</sup>

Recent studies concluded that the COVID-19 virus can survive (remain viable) on different surfaces for up to 3 days, under specific conditions such as temperature, relative humidity, and light. The transmission of COVID-19 virus can also happen through contact with contaminated surfaces when people touch these contaminated surfaces and then touch their nose, mouth, or eyes. Thus, theoretically, **COVID-19 virus can be transmitted by touching contaminated food or food contact surfaces (including packaging materials) when a healthy person touches these contaminated food or food contact surfaces, and then shortly afterward, touches eyes, mouth, or nose.**

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However, food safety can be significantly compromised in the following scenarios: a) increases in food production or processing line speeds to meet the unexpected need during the pandemic, making it harder to control significant food safety hazards; b) transport restrictions, quarantines, and trade disruptions could impose food safety issues, especially with highly perishable and nutritious food such as milk, meat, fish, and fresh produce; c) the absence of inspection or audits; d) infected food workers; e) shortage of labor/workers who run food safety programs, and f) increases in home food delivery/takeout, which can present unprecedented food safety risks and challenges if not properly monitored.

### 2.2 The food industry, during this time of pandemic, has the primary responsibility to ensure that the foods they produce are safe.<sup>4</sup>

Everyone should a) adopt public health measures (as listed above), especially during food shopping; b) properly wash fresh fruits and vegetables under running tap water; c) not eat raw or undercooked food of animal origin; d) properly wash and/or sanitize hands before and after touching food or food packaging; **e) properly clean and sanitize food contact surface before and after use;** f) follow the four key steps of food safety (clean, separate, cook, and chill); g) clean lids of canned food before opening; h) refrigerate or freeze perishable food within 2 hours of purchasing; i) properly clean and sanitize kitchen counters; and j) handle raw animal products with care to avoid cross-contamination.

The big issue in the food industry today is food safety; and microbial contamination is the number one enemy of the food supply. **Chemical treatments with compounds such as peracetic acid are among the most effective methods for control of microbial contamination.**<sup>5</sup>

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