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MANIPURA  
AYURVEDA

Precious Art of Nature

# Vegetables & Fruits Sanitizer

## Conclusion



You probably knew how important it is to sanitize fruits and vegetables even before the spread of COVID-19. But the corona virus has meant getting more serious about sanitizing the items we bring into our home—fresh produce included. And whereas a quick rinse in water might have once seemed enough, today's rules around food safety at home suggest that you're better off doing more than less when it comes to the sanitization of your fruits and veggies.

Q. Why we need Vegetable Sanitizer?

Ans: It is especially important to note that we should wash vegetable and fruits before eating. Even when veggies and fruits are pre-washed, that does not mean they are clean.

- Many people touch them as fruit picker, mediator, seller, buyer etc it is not conforming that they are neat and clean.



- Many insects sit on them, bite it sometimes, some may excrete on them etc.
- Vegetables can become contaminated with human pathogens, if they have been exposing to raw sewage or animal manure in the field, to dirty irrigation water or from unhygienic handling.

Moreover, in covid-19 pandemic this vegetable sanitizer not only kills the corona virus also kills pathogenic microorganisms such as viruses, bacteria, molds, fungus and even spores.

Q. Does it really work?

Ans: YES, it works and in colony test (after spray the 'vegetable sanitizer' on agar-agar solution, no colony found till 5days incubation), does not grow any colony in incubation.

Q. Does it preserve vegetables & fruits?

Ans. NO, it just sanitizes fruits and veggies, but keeping in mind that after sanitization we do not take that veggies instantly, so we added a mild type food preservative(recommended by FDA)to keep those vegetables fresh for longtime. After certain period there have putrefaction too, we ensure you the veggies can be stored freshly more than normally you keep.

Q. Is it safe to use on vegetables?

Ans. This product outcome from our tremendous effort of research & development to maintain the balanced daily life. We follow the guide lines of WHO, According to WHO guidelines released on 19th March,2020 "water sanitation hygiene and waste management for the Covid-19 virus" we introduced this product that ensure the construction of new health-care settings is of acceptable quality.

Q. Can I eat just after spray and without wash it again?

Ans. Yes, you can. Please follow the direction of use. After spray Keep it for 20 minutes to eliminate the germs.



Q. According to WHO is there any mentioned formulation or guidelines of sanitizer regarding fruits and vegetables?

Ans: There are many guidelines, and have formulations too, but sanitization is a vast area, WHO only guided some specific fields which are primary in the sense, like Hand Hygiene Practices, Sanitation and Plumbing, Toilets and the Handling of Faeces, Emptying Latrines and Holding Tanks and Transporting Excreta off-site, Cleaning Practices etc.. For details go through the link below.

<https://www.who.int/publications-detail/water-sanitation-hygiene-and-waste-management-for-covid-19>

There have mentioned many disinfectant and chemical agents that for killing microbes in this pandemic. Among these WHO guided chemicals, we have been able to find through our research works on types of ingredients are able to stop microbial action on veggies.

Q. How do you say that the ingredients in the 'vegetable & fruit sanitizer' are effective?

Ans: There are many disinfectants and sanitizing agent that guided by WHO. Please go through the link, and follow the page number: 29,31,44.

[https://www.who.int/gpsc/5may/tools/who\\_guidelines-handhygiene\\_summary.pdf](https://www.who.int/gpsc/5may/tools/who_guidelines-handhygiene_summary.pdf)

or

<https://www.who.int/publications-detail/who-guidelines-on-hand-hygiene-in-health-care>

Among them some specific are there those are effective to kills the microbes that grows in vegetables is given below:



<b>Pathogen</b>	<b>Product</b>
<i>Aeromonas</i>	alfalfa sprouts, asparagus, broccoli, cauliflower, celery, lettuce, pepper, spinach
<i>Bacillus cereus</i>	alfalfa sprouts, cress sprouts, cucumbers, mustard sprouts, soybean sprouts
<i>Campylobacter jejuni</i>	green onions, lettuce, mushroom, potato, parsley, pepper, spinach
<i>Clostridium botulinum</i>	cabbage, mushrooms, pepper
<i>E. coli</i> O157:H7	alfalfa sprouts, apple juice, cabbage, celery, cilantro, coriander, cress sprouts, lettuce
<i>Listeria monocytogenes</i>	bean sprouts, cabbage, chicory, cucumber, eggplant, lettuce, mushrooms, potatoes, radish, salad vegetables, tomato
<i>Salmonella</i>	alfalfa sprouts, artichokes, beet leaves, celery, cabbage, cantaloupe, cauliflower, chili, cilantro, eggplant, endive, fennel, green onions, lettuce, moonbeansprouts, mustard cress, orange juice, parsley, pepper, salad greens, spinach, strawberries, tomato, watermelon
<i>Shigella</i>	celery, cantaloupe, lettuce, parsley, scallions
<i>Staphylococcus</i>	alfalfa sprouts, carrot, lettuce, onions sprouts, parsley, radish
<i>Vibrio cholerae</i>	cabbage, coconut milk, lettuce

Our effort to find out those agents that kills these microbes even spores in a specific way. Keeping in mind, the vegetables or fruits should be hygienic too and safe to eat.



## Ingredients wise Description:



### Active Ingredients:

Hydroxyethane, 2-Propanol, Sodium Ethanoate, Sodium Benzoate, Ethyl Hexadecyl Dimethyl Ammonium Ethyl Sulphate & Potassium Iodate.

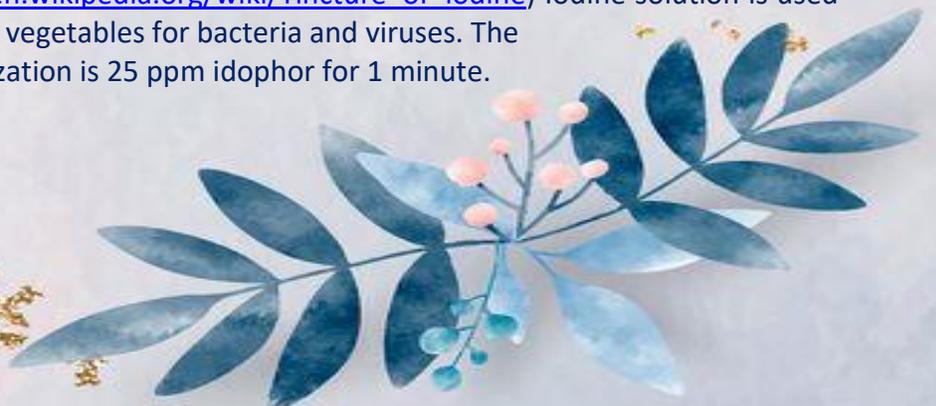
**HYDROXY ETHANE:** Ethanol kills microorganisms by dissolving their membrane lipid bilayer and denaturing their proteins, and is effective against most bacteria and fungi and viruses. However, it is ineffective against bacterial spores. 70% ethanol is the most effective concentration, particularly because of osmotic pressure. Absolute ethanol may inactivate microbes without destroying them because the alcohol is unable to fully permeate the microbe's membrane. Ethanol can also be used as a disinfectant and antiseptic because it causes cell dehydration by disrupting the osmotic balance across cell membrane, so water leaves the cell leading to cell death.

**2-PROPANOL:** Effective concentration for killing the tissue phase of *Cryptococcus neoformans*, *Blastomyces dermatitidis*, *Coccidioides immitis*, and *Histoplasma capsulatum* and the culture phases onto various surfaces including vegetables. The culture phase was more resistant to the action of ethyl alcohol and required about 20 minutes to disinfect the contaminated surface. Isopropyl alcohol (20%) is effective in killing the cysts of *Acanthamoeba culbertsoni*. According to WHO released guide lines alcohols are effective to break the outer layer of corona virus.

**SODIUM ETHANOATE:** As the conjugate base of acetic acid, a solution of sodium acetate and acetic acid can act as a buffer to keep a relatively constant pH level. This is useful especially in maintaining a mildly acidic range (pH 4–6), to keep the fruits fresh.

**SODIUM BENZOATE:** Sodium benzoate is a food preservative. Keeping in mind after sanitization the vegetables should be intact a fresh for long time because it is not necessary after sanitization, we eat them instantly, so a mild based preservation is required. Its usage as follows by FDA.

**POTASSIUM IODATE:** For Oxidizing Agent. Including Iodate, Potassium Iodide(KI) also added here according to Wikipedia, ([https://en.wikipedia.org/wiki/Tincture\\_of\\_iodine](https://en.wikipedia.org/wiki/Tincture_of_iodine)) Iodine solution is used to sanitize the surface of fruit and vegetables for bacteria and viruses. The common concentration for sanitization is 25 ppm idophor for 1 minute.



**ETHYL HEXADECYL DIMETHYL AMMONIUM ETHYL SULPHATE:** Whenever sprayed in closed bucket (airtight) to sanitize the veggies, with alcohol used as other ingredients it kills the viruses, bacteria, and other microorganisms present in that closed air. 20 minutes time is recommended to eliminate the maximum microbes that grows in the vegetables and the atmosphere. There is mentioned in WHO guidelines about use of quaternary ammonium compound, point 11.8, page 35. Link given below:

[https://apps.who.int/iris/bitstream/handle/10665/44102/9789241597906\\_eng.pdf?sequence=1&isAllowed=y](https://apps.who.int/iris/bitstream/handle/10665/44102/9789241597906_eng.pdf?sequence=1&isAllowed=y)

QACs are primarily bacteriostatic and fungistatic, although they are microbicidal against some organisms at high concentrations. They are more active against Gram-positive bacteria than against Gram-negative bacilli. QACs have relatively weak activity against mycobacteria and fungi and have greater activity against lipophilic viruses.

## Conclusion

Essential environmental health standards in health care contains guidelines for setting standards of safety conditions to provide adequate health care. This document also recommends measures for minimizing the risk of health care-associated diseases for patients, staff and carers.

We used to:

- develop specific national standards that are relevant to various health-care settings indifferent contexts.
- support the application of national standards and set specific targets in health-care settings.
- assess the situation regarding environmental health and pre and post effect on environment impact.
- plan and carry out the improvements that are required conditions are achieved and maintained.



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