

# Miracle Everyday's Solution Against EtO (Ethylene Oxide)



Presentation by



[www.miracleeveryday.com](http://www.miracleeveryday.com)

[sales@miracleeveryday.com](mailto:sales@miracleeveryday.com)

## Recent Incident :

- MDH and Everest masalas can be found in the grocery baskets of most Indian consumers. The spice manufacturing companies, started in 1919 and 1967 respectively, that promise to enhance the flavour in your food dishes have become a household name among Indian families. However, they find themselves in a spot now.
- MDH and Everest, two very popular firms in India, world's largest consumer of spices, have been banned in Singapore and Hong Kong for allegedly containing pesticide 'ethylene oxide' beyond permissible limits.
- Hong Kong has withdrawn four spice blends—MDH Madras Curry Powder, Sambhar Masala Powder and Curry Powder and Everest Group's Fish Curry Masala, while Singapore has withdrawn Everest's Fish Curry Masala so far.

## What is Ethylene Oxide (EtO)?

- fossil fuel byproduct, has multiple industrial uses, including fumigation of spices.
- It is a highly reactive compound that has not only been found to be carcinogenic but can also be mutagenic if inhaled.
- The International Agency for Research on Cancer (IARC) has declared it a Group 1 carcinogen, while the European Union has declared it a category 1B carcinogen and 1B mutagen.

## Use of ethylene oxide (EtO) in food industry :

- Ethylene oxide is a food fumigant that prevents microbial contamination, including bacteria, viruses, and fungi.
- The spice industry uses EtO to arrest the growth of disease-causing microbes such as Salmonella and E coli. The same DNA-damaging property of Ethylene Oxide helps sterilize foods.
- When used within permissible limits, it can aid in preventing the spread of foodborne illnesses and give dried foods a longer shelf life.

## Why is Ethylene Oxide a concern?

- Whenever Ethylene oxide is used for sterilizing food products and food contact surfaces or pharmaceuticals or medical purposes or fumigants, it leaves its residues.
- Harmful effects of ethylene oxide on human health :
- Acute Effects:
  - Nausea, vomiting
  - Irritated the skin and eyes in humans.
  - Chronic Effects (Noncancer):
    - Neurological disorders, pulmonary edema, and emphysema.
    - Cancer Risk:
      - EtO is reportedly carcinogenic (e.g., lymphoma and leukemia).
      - Lymphoid cancer and tumors of the brain, lung, connective tissue, and uterus.

## Why is there a problem of residual Ethylene oxide in spices?

- Spices must be processed for the control of microbes for safe consumption.
- Processing of herbs and spices includes fumigation with ethylene oxide before use in food systems to protect food quality and safety.
- However, when the aeration step foreseen for spices after fumigation with ethylene oxide is not properly carried out, residues of Ethylene Oxide and its derivative ethylene chlorohydrin (ECH) are produced by reaction with chloride ions always present in the matrix.

## What are the food safety regulations surrounding EtO use?

- In the United States, EtO use in foods is allowed, but regulated.
- In the EU, the use of ethylene oxide as a food fumigant has been banned since 1991, the EtO is registered as a pesticide used to sterilize spices.
- In the India, Spice board set the maximum pesticide residue level of Ethylene oxide (sum of ethylene oxide and 2-chloro-ethanol expressed as ethylene oxide mg/kg) is 0.1mg/kg.

## Alternative for chemical fumigants : Miracle everyday L-44F

- In recent developments, organic fumigants have emerged as a promising alternative to chemical fumigants, offering a solution that avoids harmful effects on both consumers and the environment.
- Miracle Everyday L-44 F is a 100% ORGANIC product based on a BIOFLAVONOID extracted from bitter orange peel, made from food grade ingredients and FSSAI approved Shelf Life Enhancer product.
- Miracle Everyday L-44 F has potent :
  - Anti-microbial properties – Eliminate all harmful pathogens
  - Anti-oxidant properties - Prevents oxidation
  - Anti-inflammatory properties – Reduces inflammation



## Composition of L-44 F

100 % ORGANIC CERTIFIED

INGREDIENTS	LISTING IN FSSAI REGULATIONS	CAS NO
<ul style="list-style-type: none"> <li>● Citrus Aurantium Extract</li> </ul>	<p>Listed in FSSAI's <u>Nutraceutical ingredient list.</u></p>	<p>928-587-7</p>
<ul style="list-style-type: none"> <li>● Lactic Acid</li> </ul>	<p>Listed in FSSAI's Processing Aids as <u>Flocculating Agent.</u></p>	<p>50-21-5</p>
<ul style="list-style-type: none"> <li>● Octanoic Acid</li> </ul>	<p>Listed in FSSAI's Processing Aids as <u>Microbial Control Agent</u></p>	<p>124-07-2</p>
<ul style="list-style-type: none"> <li>● Glycerine</li> </ul>	<p>Listed in FSSAI's Processing Aids as <u>Lubricant, Antistick Agent.</u></p>	<p>56-81-5</p>
<ul style="list-style-type: none"> <li>● Purified Water</li> </ul>		

NOTE :- All the ingredients in L-44 are 100% organic and are naturally derived.

## Application of L-44 F

- Application of L-44 F with a certain concentration for specific contact period, results in inhibiting the microbial contamination upto 99.999 % efficacy.
- It kills the bacteria like *Staphylococcus aureus*, *Escherichia coli*, *Proteus vulgaris*, *Methicillin-resistant Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Legionella pneumophila*, *Salmonella spp.*, *Lysteria monocytogens*, *Food spoilage bacteria*
- Fungi like *Aspergillus niger*, *Aspergillus brasiliensis*, *Brettanomyces*, *Candida albicans*, *Food spoilage fungi*

## Dry Chilli and Coriander Seeds Application by Spraying



Image: Represents the 50 g of spice samples stored in plastic punches for trials. Control sample (on the left side) and two treated samples (middle and right side) with L44-F by spraying with certain concentration. After spraying L44-F the samples were allowed to air dry before packing and then kept for further studies.

## Dry Chilli and Coriander Seeds: Microbial Observations

Sample	Concentration ml/litre	TVC	<i>E. coli</i>	<i>Staphylococcus</i>	Yeast and Moulds
Red Chilli	Control	TNTC*10 <sup>5</sup>	NG	3*10 <sup>2</sup>	TNTC*10 <sup>3</sup>
	1	TNTC*10 <sup>5</sup>	NG	NG	TNTC*10 <sup>3</sup>
	1.5	TNTC*10 <sup>5</sup>	NG	NG	85*10 <sup>3</sup>
	3	21*10 <sup>5</sup>	NG	NG	TNTC*10 <sup>3</sup>
	5	NG	NG	NG	36*10 <sup>3</sup>
Coriander seeds	Control	TNTC*10 <sup>5</sup>	NG	TNTC*10 <sup>2</sup>	TNTC*10 <sup>3</sup>
	1	172*10 <sup>5</sup>	NG	1*10 <sup>2</sup>	TNTC*10 <sup>3</sup>
	1.5	108*10 <sup>5</sup>	NG	NG	TNTC*10 <sup>3</sup>
	3	39*10 <sup>5</sup>	4*10 <sup>3</sup>	1*10 <sup>2</sup>	TNTC*10 <sup>3</sup>
	5	NG	NG	NG	132*10 <sup>3</sup>

Table: Microbial load in the samples checked after treatment on day 0; TVC: Total Viable Count, NG: No Growth, TNTC: Too Numerous To Count

## Miracle everyday L44 FG - Ultimate Fumigation

- AYUSH certified 100% organic product
- Plant based, non - toxic, Chemical and pesticide residue free solution as a fumigant
- Offers >9 log reduction against airborne moulds spores certified by NABL accredited lab ROSS LIFESCIENCE, Pune
- Delivers effective fumigation within one hour

# Thank You

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