

# Eco-Lyte Introduction

April 2011



**ECA** technologies africa

# AGENDA

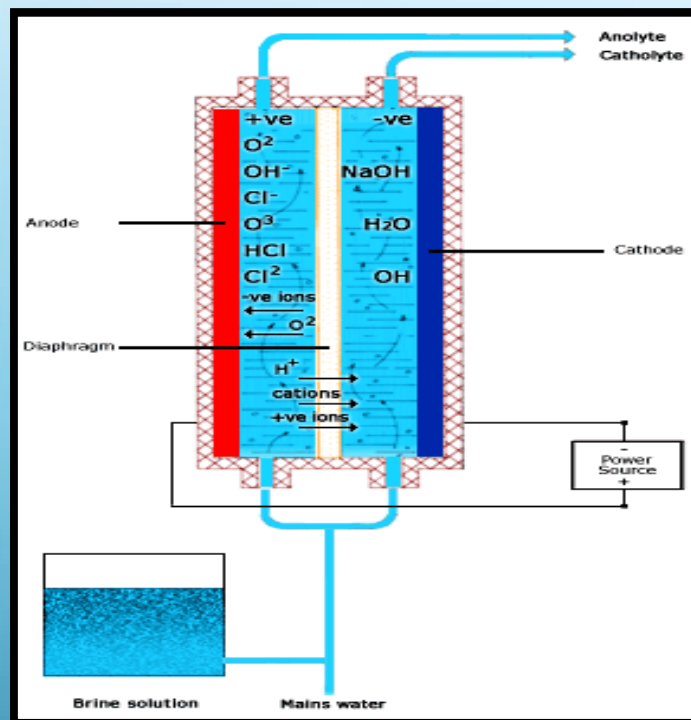
- What is ECA Technology?
  - Eco-Lyte (Anolyte / Catholyte)
- Accreditation
- Applications
- Compelling proposition



# What is ECA ?

## ➤ What is Electro Chemical Activation (ECA)?

The process of passing a diluted saline (brine) solution and ordinary tap water through a patented electrical process. 2 cleaning solutions are produced namely: **Anolyte** and **Catholyte** (Brand name: **Eco-Lyte**)



# The products

## ➤ What is Eco-Lyte (NTL) or Anolyte ?

**Eco-Lyte (NTL)** - is the worlds most effective **NON CHEMICAL** cleaning solution available and is used to eliminate all types of bacteria, micro-bacteria, viruses, fungi, spores and microbial toxins. It is used wherever pH is important and corrosion is a concern.

| Active substances                          | CAS-No                    | EINICS-No                   | Wt/vol % | Symbols          |
|--------------------------------------------|---------------------------|-----------------------------|----------|------------------|
| Sodium Chloride                            | 7647-14-5                 | 231-598-3                   | 0.26%    | NaCl             |
| Hypochlorous acid<br>+<br>Hypochlorite ion | 90-92-3<br>+<br>7681-52-9 | 231-959-5<br>+<br>231-668-3 | 0.05%    | HClO<br>+<br>OCl |
| Water                                      | 7732-18-5                 | 231-791-2                   | 99.69%   | H <sub>2</sub> O |



| Regime         | active chlorine mg/l | pH       | ORP mV (redo-potential) | Type of ECA Tech generator                                                           |
|----------------|----------------------|----------|-------------------------|--------------------------------------------------------------------------------------|
| Eco-Lyte (NTL) | ~500-700             | ~5.5-8.5 | ~700-900                | Any ECA Tech Africa EL or ELA unit designed and set for generating of Eco-Lyte (NTL) |

# The products

## ➤ What is Eco-Lyte (DG) or Catholyte?

**Eco-Lyte (DG)** - has a pH between 11 and 13 and can be used for flocculation (e.g. of heavy metals), coagulation, washing, extraction and de-greasing.



Regime

active chlorine mg/l

pH

ORP mV (redox-potential)

Type of ECA Tech generator

Eco-Lyte (DG)

0

11-13

~-800-900

Any ECA Tech Africa EL or ELA unit

# The process



## ➤ How does it work ?

- Pathogens such as bacteria and viruses are killed by breaking the chemical bonds in their molecules
- Disinfectants consist of active compounds which can exchange atoms with other compounds
- When enzymes come in contact with chlorine, one or more of the hydrogen atoms in the molecule are replaced by chlorine
- This causes the entire molecule to change shape or fall apart and die

# The process

## ➤ How does it work ?

- hypochlorous acid ( $\text{HOCl}$ , which is electrically neutral) and hypochlorite ions ( $\text{OCl}^-$ , electrically negative) will form free chlorine
- hypochlorous acid is split into hydrochloric acid ( $\text{HCl}$ ) and atomic oxygen ( $\text{O}$ ). The oxygen atom is a powerful disinfectant
- The disinfecting properties of Anolyte is based on the oxidising power of the free oxygen atoms and on chlorine substitution reactions

## The process

### ➤ How does it work ?

- The cell wall of pathogenic microorganisms is negatively charged by nature. As such, it can be penetrated by the neutral hypochlorous acid, rather than by the negatively charged hypochlorite ion.
- hypochlorous acid can penetrate slime layers, cell walls and protective layers of microorganisms and effectively kills pathogens as a result.

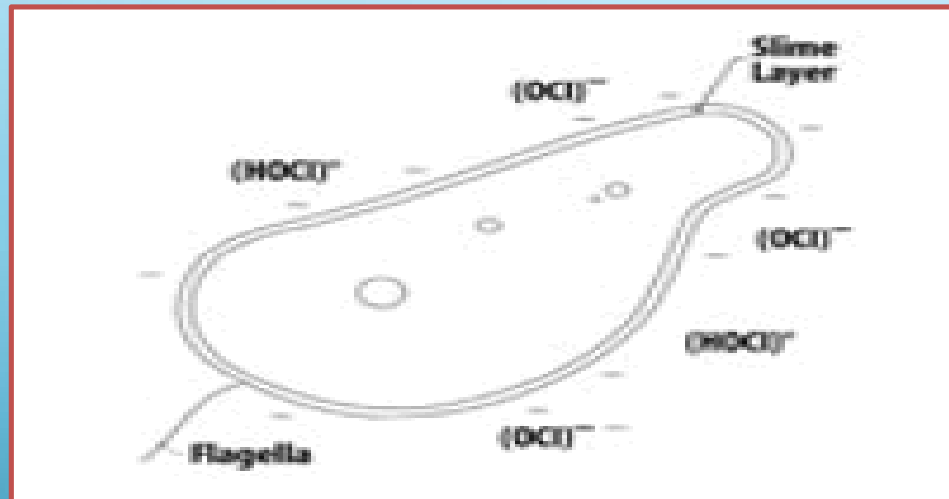


**Figure :** the neutral hypochlorous acid can better penetrate cell walls of pathogenic microorganisms than the negatively charged hypochlorite ion

# Accreditation

**ECA Technologies are now widely accepted solutions across Europe, The United States, Australia and Asia. The following are just a few accreditations that are currently in place worldwide:**

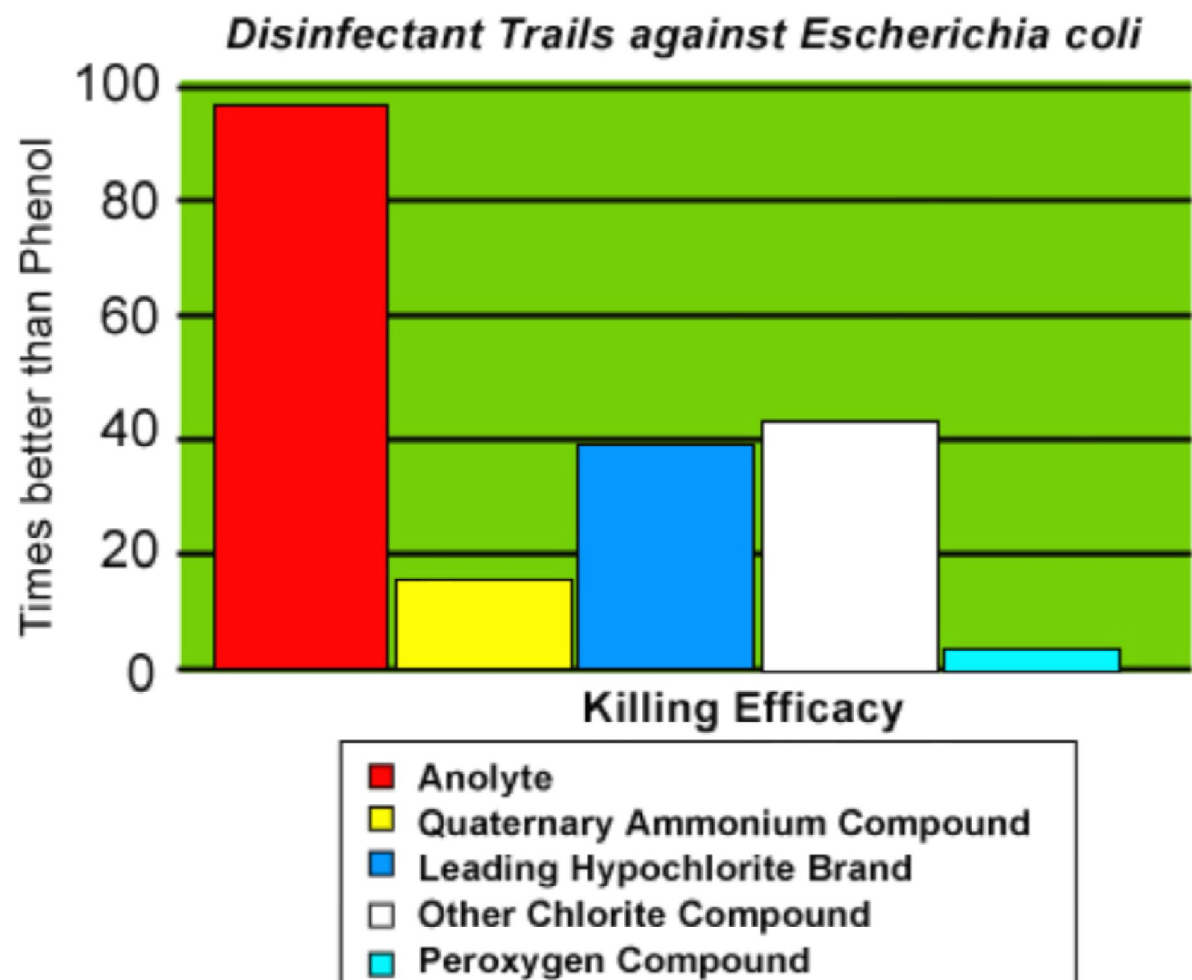
- Moyne Institute University of Dublin – Department of Microbiology Trinity College – Dr RJ Russell
- Roinn Cumarsaide Mars Agnus Acmhainni Nadurtha (Dpmt Communications , Marine and Natural Resources Ireland) – Council Directive 91/493/EEC
- AFFSA – France 28th June 2004
- SABS Approval attained by competition for ECA Solutions – South Africa
  - South African Department of Health – solutions have been approved for the treatment of foodstuffs for human consumption.
  - South African Department of Agriculture – solutions are approved for use in red meat export abattoirs.
  - SABS 241:2005: a dilution of the Anolyte solution complies with the requirements for potable/ drinking water standards.
  - SABS 1827 & 1828 – Both Anolyte and Catholyte meet the requirements for use in food processing facilities.
  - SGS South Africa (Pty) Ltd – Complies with the requirements of a safe organic disinfectant with no harmful residues.
  - Kosher & Halaal approved.
- CE Certified – Conforms with European Union manufacturing standards (2008)
- Department of Microbiology and Plant Pathology, University of Pretoria, South Africa
- FDA Approval – Center for Food Safety And Applied Nutrition United States of America (August 18th 1997)
- FDA approval for use in food processing facilities
- USDA Approval - Food Safety Inspection Service (February 18th 1998).

# Results and Testing



southern scientific  
services ltd.

Dr Marie Kerr  
Phenol Co-efficient Challenge Report



# Results and Testing



Proff. Eugene Cloete  
Department of Microbiology and Plant Pathology

**Table 1: Percentage kill of bacteria strains at different anolyte concentrations**  
(produced using 3% NaCl)

| Bacterial strain                   | Gram strain | Anolyte concentration |      |      |
|------------------------------------|-------------|-----------------------|------|------|
|                                    |             | 100%                  | 1:10 | 1:20 |
| <i>Bacillus subtilis</i>           | +           | 100                   | 100  | 78   |
| <i>Pseudomonas aeruginosa</i>      | —           | 100                   | 100  | 87   |
| <i>Acinetobacter calcoaceticus</i> | —           | 100                   | 100  | 100  |
| <i>Lactobacillus brevis</i>        | +           | 100                   | 100  | 100  |
| <i>Micrococcus luteus</i>          | +           | 100                   | 100  | 100  |
| <i>Streptococcus faecalis</i>      | +           | 100                   | 100  | 31   |
| <i>Pseudomonas fluorescens</i>     | —           | 100                   | 100  | 66   |
| <i>Staphylococcus aureus</i>       | +           | 100                   | 100  | 100  |
| <i>Pseudomonas alcaligenes</i>     | —           | 100                   | 100  | 52   |
| <i>Pseudomonas medocina</i>        | —           | 100                   | 100  | 88   |
| <i>Pseudomonas putida</i>          | —           | 100                   | 100  | 90   |
| <i>Bacillus cereus</i>             | +           | 100                   | 100  | 92   |
| <i>Micrococcus roseus</i>          | +           | 100                   | 100  | 100  |
| <i>Pseudomonas stutzeri</i>        | —           | 100                   | 100  | 57   |
| <i>Pseudomonas syringae</i>        | —           | 100                   | 100  | 87   |

# Who uses it ?

A dynamic splash of water, captured in a high-speed photograph, showing droplets and ripples. The water is white and frothy at the top, transitioning into a clear blue as it spreads across the upper portion of the slide.

## ➤ Major industry players:

- Food and drink production
- Bottling companies
- Farming and dairy (livestock, chicken and fisheries)
- General cleaning contracts (offices, shopping centres, airports)
- Hotel and restaurant groups
- Shipping companies
- Retail stores
- Municipality (potable water and effluent)
- Mining (dust suppression)
- Healthcare (hospitals, doctors rooms, nursing)

# Drink and food production

## ➤ Key areas for this industry:

- Raw material disinfection
- Process water treatment
- CIP (clean in place)
- Bottle and cork disinfection
- Shelf life improvement



## • Institute of Food Science and Engineering – University Arkansas:

*Reduction of microbial contamination of fresh vegetables:*

- *99.9% reduction of Listeria, Salmonella and E.coli*
- *95.0% reduction was best achieved by competition (Ozone, chlorine dioxide or chlorine)*

# Hotels, Restaurants, Schools and Offices

## ➤ Case Study: **Pilot Phase of two prominent restaurant groups**

- **Areas of usage:**

- Food preservation and transportation
- CIP (cleaning in place)
  - Kitchens and food prep areas
  - Equipment
  - Waste areas

- **Key results:**

|                            | <u><b>TMA count:</b></u> | <u>Before</u> | <u>After</u> |
|----------------------------|--------------------------|---------------|--------------|
| Meat prep board (Chemical) |                          | 3 200         | 1 140        |
| Meat prep board (Eco-Lyte) |                          | 14 400        | No growth    |
| Kitchen surface (Chemical) |                          | 1 580         | No growth    |
| Kitchen surface (Eco-Lyte) |                          | 960           | No growth    |
| Waste bins (Eco-Lyte)      |                          | 5 120 000     | 520          |
| Sink area (Eco-Lyte)       |                          | 1 360         | No growth    |

# Fishing Industry

## ➤ Key areas for this industry:

- Disinfecting the produce as a whole
- Disinfecting the filleted product
- Ice for packing and transport is made with Eco-Lyte
- CIP (cleaning in place)

## **Kilic Fish Processing Factory in Turkey (Sea Bass and Bream)**

- *4 Hatcheries and 2 adaptation facilities*
- *Highest production capacity in the world (250 million p/year)*
- *Increased shelf life*
- *Fresher produce (higher quality)*
- *Substantial cost saving (between 20% and 30% on the bottom line)*



# Fishing Industry

## ➤ Shrimp Farming:

- Daily disinfection of the hatchery water
- Treatment of shrimp feed
- CIP (cleaning in place)

## Shrimp Farming Industry in Malaysia

- *Survival rate of shrimp raising increased to over 90%*
- *Growth cycle shortened from average 140 to below 110*
- *Harvest increased from less than 1.5 tons to 3 / 4 tons p/hectre*
- *No use of chemicals or antibiotics*
- *Larger individual shrimp sizes*



# Livestock: Chickens

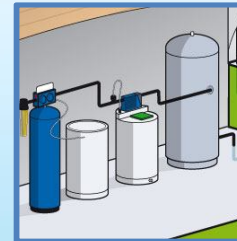
## ➤ CIP (Clean In Place)

- Facility sanitation (Broilers)
- Personnel cleanliness
- Machinery decontamination (change in production runs)
- Odour control



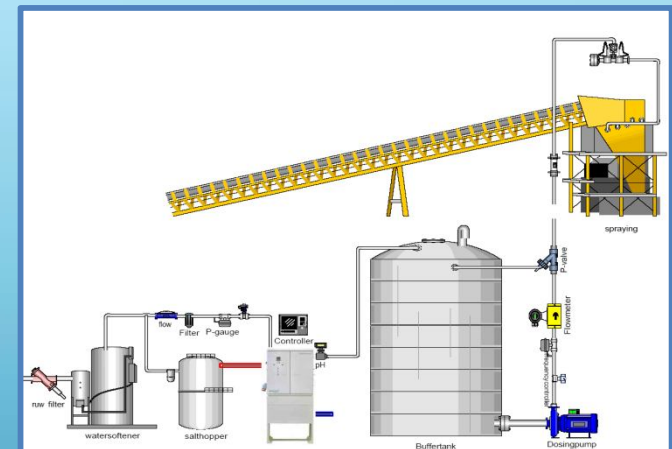
## ➤ Livestock

- Drinking water
- Maize sprayed with Eco-Lyte
- Cleaned when fogging takes place



## ➤ Key results:

- Egg production rate 6% higher
- Egg mass 5 to 6 grams heavier
- Chicken mortality down by up to 30%
- Feed conversion rate: 100grams last chicken

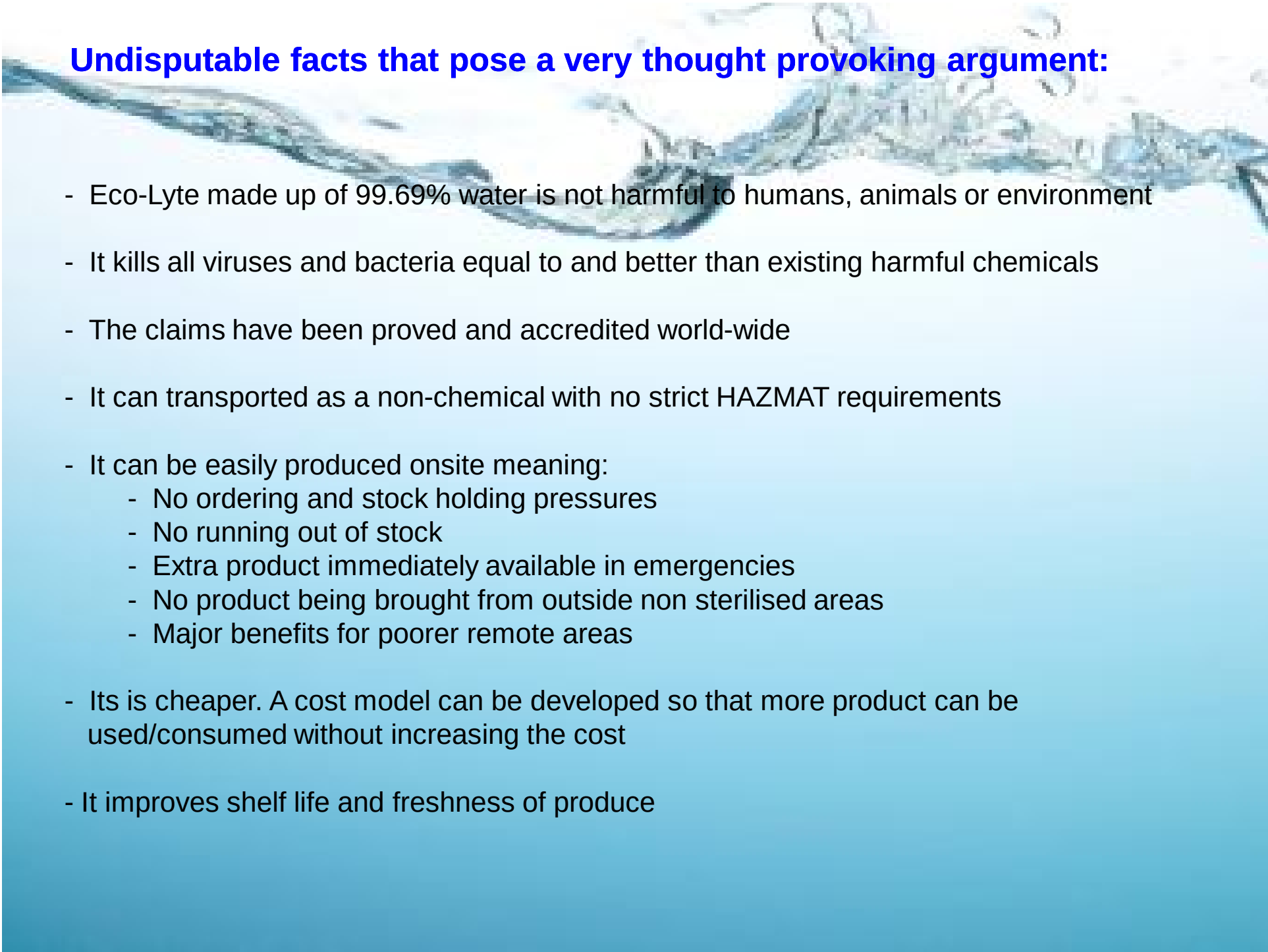


# Competitive Advantage

## ➤ Produce product from sea water:

- Envirolyte seawater units are manufactured with output capacity ranging from **40 LPH up to 4000 LPH** of ANK- neutral anolyte;
- Envirolyte seawater units are assembled in our traditional [polycarbonate](#), stainless steel or [steel finished with powered technology](#), [reinforced polyester](#) or [chromate aluminium](#) enclosures;
- Power consumption depends on the model and may vary from 740 W/H to 10,5 KWT/H;
- Feed water - seawater with the salinity ranging from **5-7 PSU up to 33-35 PSU**;





## Undisputable facts that pose a very thought provoking argument:

- Eco-Lyte made up of 99.69% water is not harmful to humans, animals or environment
- It kills all viruses and bacteria equal to and better than existing harmful chemicals
- The claims have been proved and accredited world-wide
- It can transported as a non-chemical with no strict HAZMAT requirements
- It can be easily produced onsite meaning:
  - No ordering and stock holding pressures
  - No running out of stock
  - Extra product immediately available in emergencies
  - No product being brought from outside non sterilised areas
  - Major benefits for poorer remote areas
- Its is cheaper. A cost model can be developed so that more product can be used/consumed without increasing the cost
- It improves shelf life and freshness of produce



Thank You.....

