Pro-health Water Technologies

Engineering Plus Water

Drinking Water Minerals and Mineral Balance

Smart Monitoring Water Purification & Mineralization Dispensing System

Engineering Water Mineral Content

Ca^{2+} + Mg^{2+}

Pro-health Water Technologies

Pain Point

NOW: 95% of food imported overseas

Singapore

Year 2030 : 30% of food to be produced locally

Too much sodium

Too much calcium

Too much potassium & magnesium

Rusty pipes

THE RISE OF PLASTIC WALLED CITIES

Applications

Agriculture

Sports

Food & Beverage

Aquaculture

Re-Mineralization water technology

$0.02

Unique Value Proposition

x38

$2.00

Highest ROI from drinking water for human consumption because of massive transformative disruption.

Current

Mineral bottle water

Future

Mountain spring water

Precise control Of Individual Content of Water

Ca^{2+} + Mg^{2+}

Pro-health Water Technologies

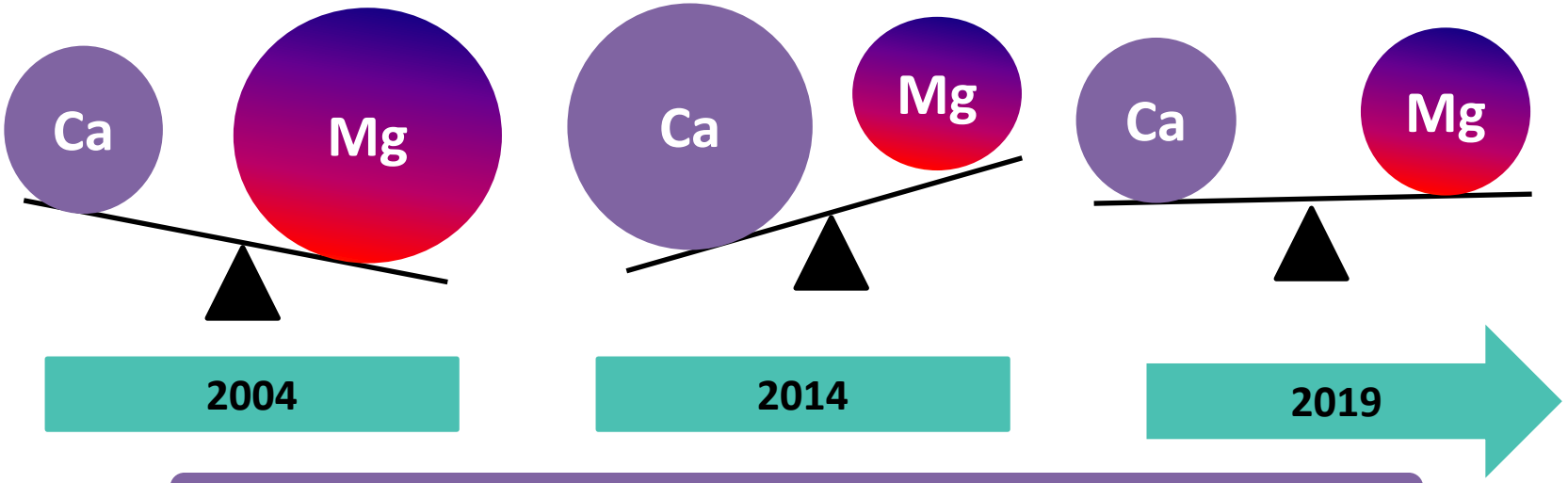
Smart Water - Customizable Water per gender, industry, sector, age etc.

Nutrient Unit Mg/L		Commercial Mineral Waters Quality Range	Pro-health Water Mineral Water Quality Range
Total Dissolved Solids (TDS)		250 – 110	130
pH value		5 – 8	7
Calcium (Ca)		4 – 215	21.0
Magnesium (Mg)		2 – 50	11.6
Potassium (K)		1 – 14	3.10
Sodium (Na)		1 – 170	1.15
Sulphate (SO4)		5 – 460	26.1
Bicarbonate		75 – 445	80.4
Chloride		3 – 200	26.1

Nutritional mindset changes over time

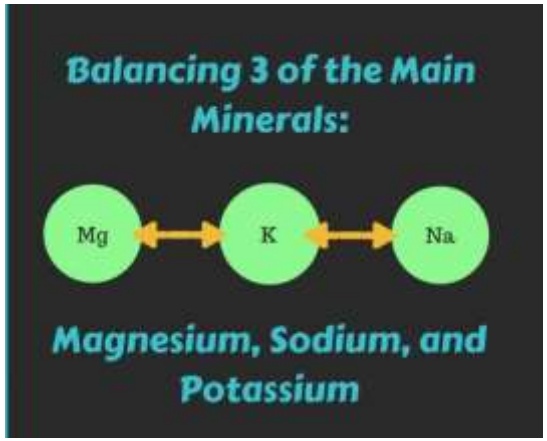
Ca^{2+} + Mg^{2+}

Pro-health Water Technologies



Beyond Ca & Mg, combining all 5 minerals

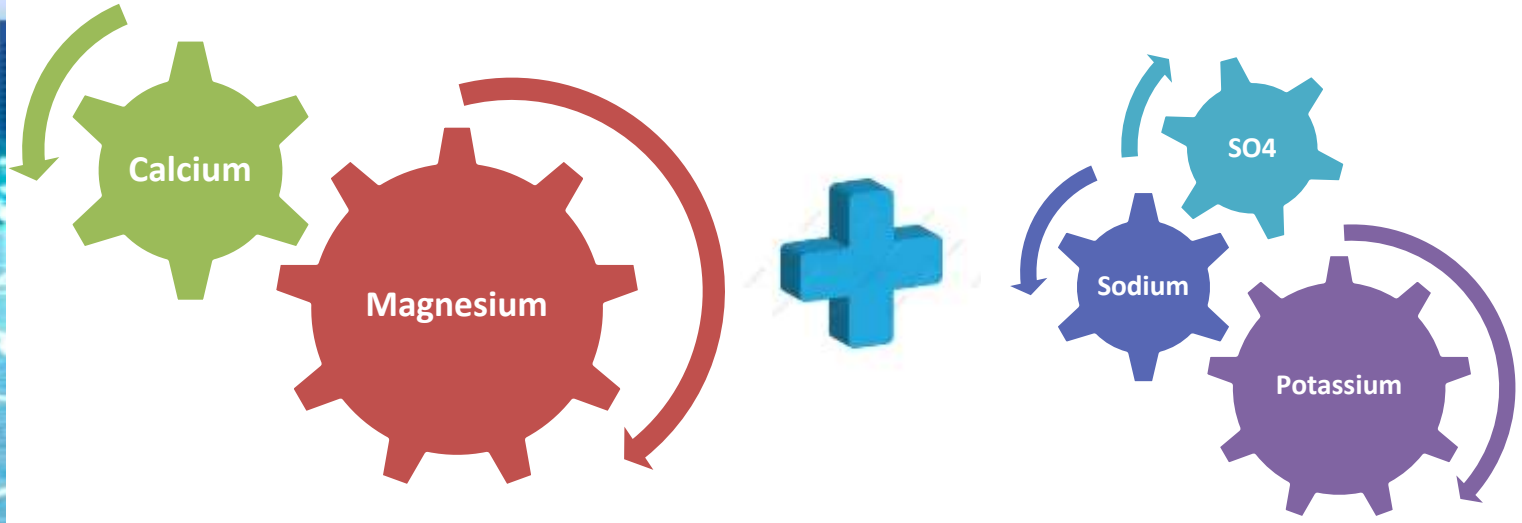
Ratio Balance as assigned by World Health Organization (WHO)



Precise control Of Individual Content of Water

Ca^{2+} + Mg^{2+}

Pro-health Water Technologies



Alkalinity

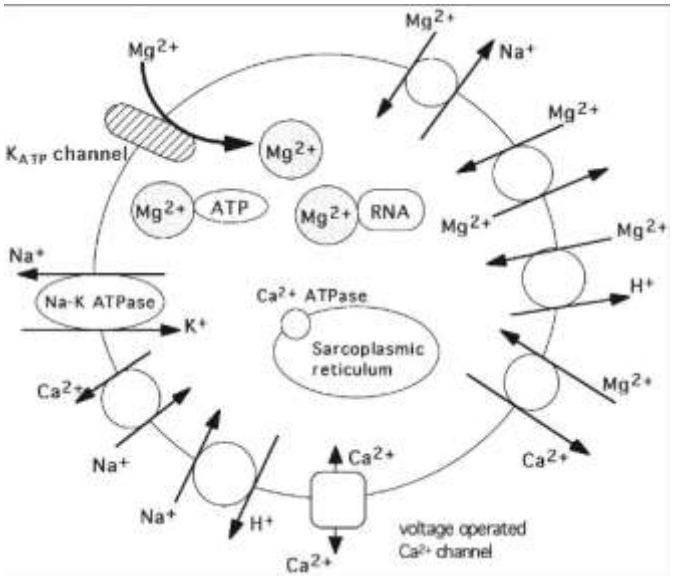
Salinity

Mineral Ions Channel

Ca^{2+} + Mg^{2+}

Pro-health Water Technologies

- Beyond Ca & Mg, combining all 5 minerals for ratio balance.
- Too much calcium prevents the uptake of magnesium and hence the optimal balance of these two minerals in water is vital to our health.
- Conductivity gives a idea of the amount of dissolved ions in water.
- Minerals in drinking water are important for the human and animal health, since they appear in ionic form and are generally more easily absorbed in intestines.



A Natural Mineral Water

✓ **Remineralization Technology**

Balanced Levels of carbonation

✓ **$CaCO_3$** ✓ **H_2O** ✓**Carbonated CO_2**

Minerality of Water is determined by the minerals in contain. Calcium and Magnesium Carbonate ($MgCO_3$ and $CaCO_3$) are the best choice. They give texture but does not overpower minerals like potassium, sodium, sulfate, chloride, bicarbonate ion minerals that the human body needs. **Lead** and **Copper** are removed by **Pro-health Water Technologies** media in all contents and concentrations.

Without changing its Orientation (pH)

pH of the water is most important factor in all "Drinking waters". The **pH** (for **p**otential **H**ydrogen) if acidic or alkaline is not recommended for drinking or making whatsoever drinks. Natural waters (pH 7.0) is best for human consumption. They tastes neither sour nor bitter but best for human tongue.

Structured Water

Definition: When water is unadulterated means only structured as follows

$$Ca(HCO_3)_2 \rightarrow CaCO_3 + H_2O + CO_2$$

Nothing added or subtracted and 100% natural.

This in turn means this H_2O (water molecule) has its outer electron shell intact, i.e. in equilibrium and without a charge. This is a structural water, a water without the change in pH, without adding high sodium content, a water that you will feel and see can penetrate the body"s cells with ease and therefore cleanse your cells and re-hydrate your body"s cells much more easily. It is this cleansing of your cells that give you a better, healthier and happier life.

TDS as a function of cell hydration property

The optimal **TDS** (Minerals) the greater the cell hydrating properties of the water. All healthy cells are surrounded by ("structural water"). And all natural waters are naturally carbonated those are treated with **Pro-health Water Technologies**. All mineral waters with its unique mineral composition those are reputed to have beneficial properties for health.

Nucleation Assisted Crystallization

• Nucleation Assisted Crystallization (**NAC)** Is different from other crystallization process of water crystallization. A solid **heterogeneous catalyst** that reacts with a water and gaseous/solutions.

• The reaction occurs on the **mineral** surface which is a surface coated on Calcium and beads. The reactants are absorbed onto the catalyst **Pro-health Water Technologies** surface at the “active sites” cracked surface. These reactants are physically & weakly adsorbed. When the high concentrations of the reactants are very close to each other and weakening the original molecular bonds within the reactants ions are separated in seconds with a great success of “fruitful” collision.

Hydrogen Carbonate Ion (HCO_3^-)

The hydrogen carbonate ion as HCO_3

Pro-health Water Technologies

$$Ca(HCO_3)_2 \longrightarrow CaCO_3 + H_2O + CO_2$$

insoluble calcium carbonate, Pure Water and CO_2 as gas and on surface of **Pro-health Water Technologies** the carbonate ions CO_3 acting as a base, gains protons to form

$$H_2O + CO_2 + Ca^{2+}$$

these are separated on the surface of **Pro-health Water Technologies**, CO_2 in this formula is acting as supersaturated CO_2 and the Ca starts Nucleation process and becomes crystals.

Hydrogen Carbonate Ion (HCO_3^-)

Incidentally, H_2O is a neutral oxide because its pH is 7. Logistically the oxonium/hydrated proton ion concentration equals to the hydroxide ion concentration.

$$2H_2O \leftrightarrow (H_3O^+) + (OH^-)$$
(And this is a scientific fact)

The strength of adsorption is very important to have a very smooth surface.

WATER $\longleftrightarrow$ Oxonium / Hydrogen ion + Hydroxide ion

But, in this reaction, water acts as but both ACID and BASE i.e, one water molecule acid donates a proton to another water molecule which becomes an oxonium ion (hydrated proton) and another water molecule (base) simultaneously accepts a proton!

Therefore, water is an amphoteric oxide: That is it reacts as both a proton acceptor and a proton donator.

Hydrogen Carbonate Ion (HCO_3^-)

Now the hydrogen carbonate ion HCO_3^- Can act as a carbonate ion both as ACID with a Base or act as a base with an acid, such behavior is described as amphoteric

HCO_3^- acting as a base, accepting a proton from an acid.

$$HCO_3^- + OH^- \longrightarrow H_2O + CO_2$$

HCO_3^- acting as an acid donating a proton to the hydroxide ion base

MORE SIMPLE: the reactant $Ca(HCO_3)_2$ bounding to the **Pro-health Water Technologies** catalyst surface (chemisorptions/ adsorption) must be very strong to apart reactant ions as fast as possible but enough to handle all ions and the products to escape from the **Pro-health Water Technologies** surface its called (desorption process).

Nucleation → Adsorption

Assisted → Desorption

Crystallization → in one process

Independent Reputable Laboratory Test Reports and COI's Validation

Test Reports from Tap water → to RO

SETSCO

TEST REPORT

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18 Tuban Gardens Crescent
Singapore 608925
Tel: (65) 6566 7777
Fax: (65) 6566 7778
www.setsco.com

Your Ref : -
Our Ref : EN85000090720/LWW/1

Date : 30/12/2019
Page 1 of 1

Subject : Analysis of water samples submitted by **Ngee Ann Polytechnic** on **20/12/2019** and testing commenced on **20/12/2019**.

Tested For : **Ngee Ann Polytechnic**
Block 39-01-06
535 Clementi Road
Singapore 599489
Attn : Mr. Gerald Tee Meng Seng

Sample Reference : One (01) water sample was received.

Results :

Test Parameter	Unit	Test Method	Sample UF (17/12/19)
Bicarbonate as HCO_3	mg/L	APHA : Pt 4500-CO_2 (D)	19.4
Chloride as Cl	mg/L	APHA : Pt 4110B	19.3
Sulphate as SO_4	mg/L	APHA : Pt 4110B	15.0
Calcium as Ca	mg/L	APHA : Pt 3120B	16.2
Magnesium as Mg	mg/L	APHA : Pt 3120B	1.50
Sodium as Na	mg/L	APHA : Pt 3120B	4.63
Potassium as K	mg/L	APHA : Pt 3120B	7.45

Remarks:
1. APHA is a Standard Method for the Determination of Water and Waste Water (APHA 23rd Edition : 2017).
2. The tested result applies only to the sample as received by the laboratory.

MARIVIE VIANA GAPUD
EXECUTIVE CHEMIST

LEE WEI WAH
ASSISTANT MANAGER

BIOLOGICAL AND CHEMICAL TECHNOLOGY DIVISION

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Your Ref : -
Our Ref : EN85000090720/LWW/2

Date : 30/12/2019
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Tested For : **Ngee Ann Polytechnic**
Block 39-01-06
535 Clementi Road
Singapore 599489
Attn : Mr. Gerald Tee Meng Seng

Sample Reference : One (01) water sample was received.

Results :

Test Parameter	Unit	Test Method	Sample RO (17/12/19)
Bicarbonate as HCO_3	mg/L	APHA : Pt 4500-CO_2 (D)	<2†
Chloride as Cl	mg/L	APHA : Pt 4110B	1.74
Sulphate as SO_4	mg/L	APHA : Pt 4110B	<1†
Calcium as Ca	mg/L	APHA : Pt 3120B	0.36
Magnesium as Mg	mg/L	APHA : Pt 3120B	0.036
Sodium as Na	mg/L	APHA : Pt 3120B	1.14
Potassium as K	mg/L	APHA : Pt 3120B	1.37

Remarks:
1. APHA is a Standard Method for the Determination of Water and Waste Water (APHA 23rd Edition : 2017).
2. The tested result applies only to the sample as received by the laboratory.
3. † = Not Detectable (The reported values are less than (<) the detection limits of the test methods).

MARIVIE VIANA GAPUD
EXECUTIVE CHEMIST

LEE WEI WAH
ASSISTANT MANAGER

BIOLOGICAL AND CHEMICAL TECHNOLOGY DIVISION

Independent Reputable Laboratory Test Reports and COI's Validation

Test Reports from RO to Pro-health Water

TEST REPORT

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Your Ref : -
Our Ref : EN85000907201LWW/4

Date : 30/12/2019
Page 1 of 1

Subject : Analysis of water samples submitted by **Ngee Ann Polytechnic** on **20/12/2019** and testing commenced on **20/12/2019**.

Tested For : **Ngee Ann Polytechnic**
Block 39-01-06
535 Clementi Road
Singapore 599489
Attn : Mr. Gerald Tee Meng Seng

Sample Reference : One (01) water sample was received.

Results :

Test Parameter	Unit	Test Method	Sample MRO-3 (19/12/19)
Bicarbonate as HCO_3	mg/L	APHA : Pt 4500-CO_2 (D)	80.4
Chloride as Cl	mg/L	APHA : Pt 4110B	26.1
Sulphate as SO_4	mg/L	APHA : Pt 4110B	<1†
Calcium as Ca	mg/L	APHA : Pt 3120B	23.0
Magnesium as Mg	mg/L	APHA : Pt 3120B	11.6
Sodium as Na	mg/L	APHA : Pt 3120B	1.15
Potassium as K	mg/L	APHA : Pt 3120B	3.10

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BIOLOGICAL AND CHEMICAL TECHNOLOGY DIVISION

Patent Filed

Ca^{2+} + Mg^{2+}

Pro-health Water Technologies

IP²SG
An e-services portal by IPOS

Request for Grant of Patent/Statement of Inventorship and of Right to Grant of Patent (PF1/PF8)

Pre-requisites:

Among other requirements, a Date of Filing will be issued only if a description of the invention is filed or if a complete and valid statement is made under Part 9 of this form.

Estimated Time:

This form may take approximately 15-20 minutes to complete.

E-File Reference No. : E2019092900050

Specific Notes:

* denotes required field

PF1 Video Tutorial

Form Selection | **Form Filling** | Payment | Acknowledgement

PART 1

Claiming the Filing Date of an Earlier Singapore Application

- A divisional of an earlier Singapore Application
- An application filed in response to an order by the Registrar after determination of a question regarding the entitlement of earlier Singapore application

PART 2

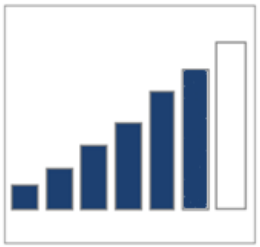
Applicant/ Agent Reference: Chew Soo Yan

PART 3

Title of Invention* (Max. length 1000 characters.): Design and Development of a prototype smart monitoring water purification and mineralization dispensing system.

Trade Secrets:

- A proprietary ratio of calcium and magnesium in drinking water was determined.
- IP ValueLab, a member of the Intellectual Property office of Singapore (IPO) Family points out that Pro-health Water Technology's intangible ssets are gnerally well procted.
- The agency gives a high rating of 6 out of 7.



High Quality Mineral Water is Expensive

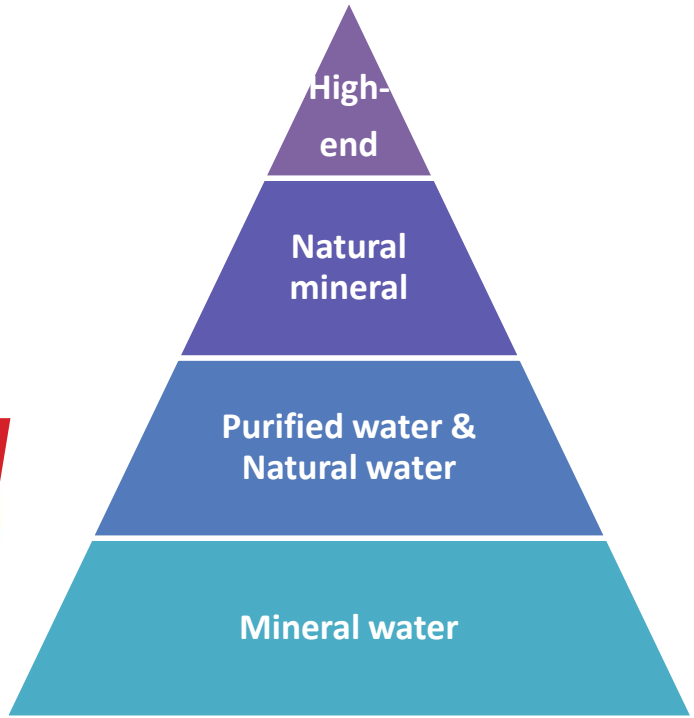
Ca^{2+} + Mg^{2+}

Pro-health Water Technologies

MINERAL WATER COMPARISON

Units: Mg	Evian	Fiji	San Pellegrino	Safe to drink Lower than	Tap water PUB#	Enhanced mineral water
Calcium	80	17	179	200	22	21
Magnesium	26	13	52	50	1.45	11.6
Potassium	1	0	0	na	not avail	6.2
Sodium	6	18	33	350	6.5	2.3
Sulphate	12	0	445	167	37	26.1

#: https://www.pub.gov.sg/Documents/Singapore_Drinking_Water_Quality.pdf



Traction: KPI metrics and Forecast from 2019/2020

Pro-health Water Technologies	2019	2020	2021	2022
Revenue	60,000	1,600,000	2,500,000	3,060,000
COGS	33,063	700,000	800,000	900,000
Gross Revenue	26,937	900,000	1,700,000	2,160,000
(Gross Margin %)	45%	56%	68%	71%
SG&A	6,000	420,000	520,000	648,800
EBITDA	20,937	480,000	1,180,000	1,511,200
(Operating Margin %)	35%	30%	47%	49%
Net Income	18,000	400,000	500,000	612,000
(Net Margin %)	30%	25%	20%	20%

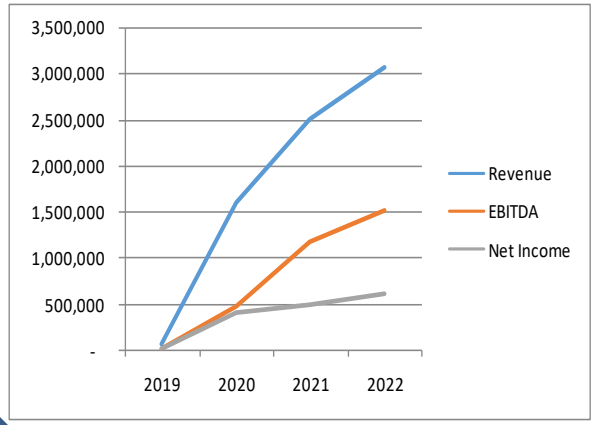
The drinking water market

China is world's largest market for bottled water

Bottled water sales in China

US$1 billion (yr 2000)

US$24 billion (yr 2019)



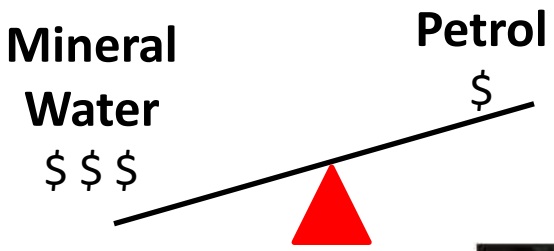
20% to 30%

Water: Our Most Precious Resource

Ca^{2+} + Mg^{2+}

Pro-health Water Technologies

- Real Mineral Water are more expensive than petrol.



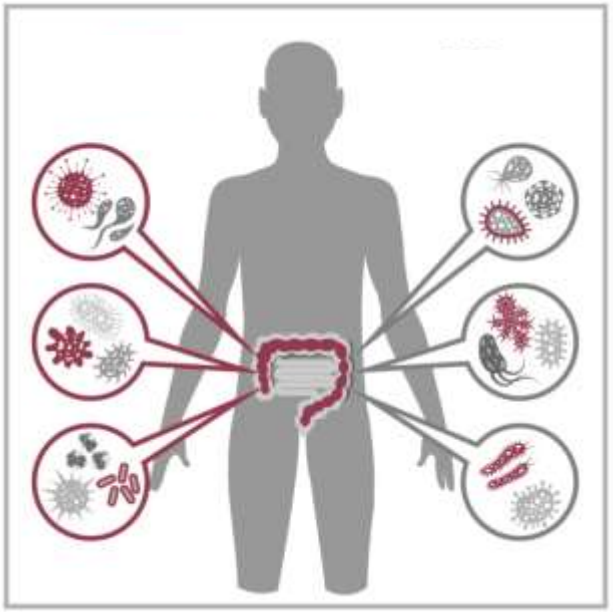
Kashin-Beck Disease

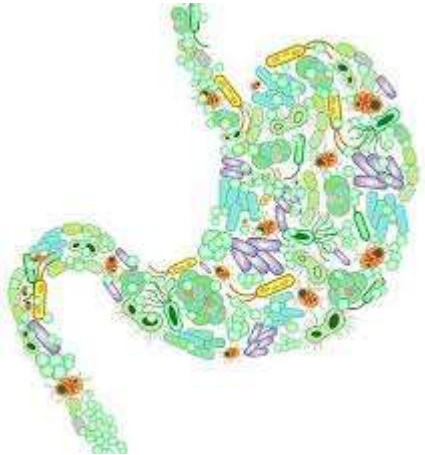
How Magnesium in water helps gut health

Ca^{2+} + Mg^{2+}

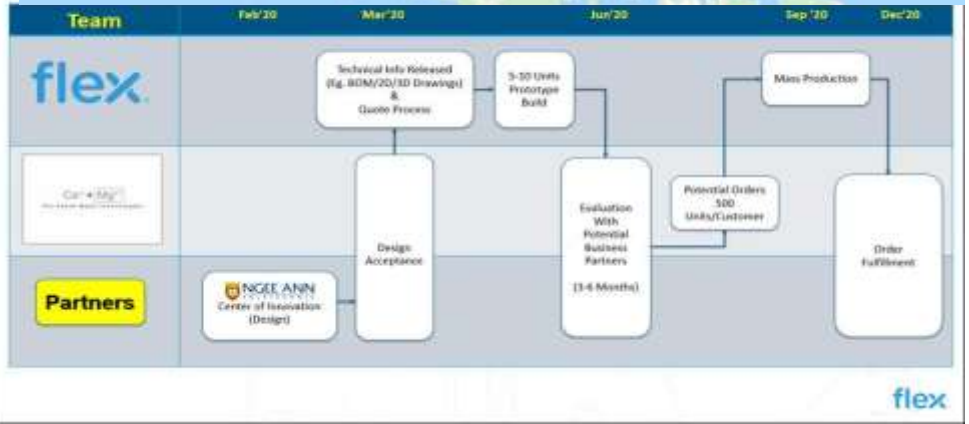
Pro-health Water Technologies

- Magnesium encourages digestive tract to relax.
- Magnesium help to balance stomach acid levels.





Business and Collabora Model



NGEE ANN POLYTECHNIC

- Product Distribution
- Technology Licence (Licencing to startups from Ngee Ann, SIM & SUSS)
- Overseas Joint Venture
- Product Assembly

Go-to-Market Strategy

Target upper or middle class

Willing to pay additional price for health products

Program-led

火凤凰云空间 EGOWORK.COM

3 Go-to-Market Channels to enter Wuhan market

Ego Coffee in Wuhan:

Competitor Analysis

First in the World Second to none

Competing Technologies

OHYA

LENNTECH

- No precise control
- Control two nutrients
- Prolonged / cumbersome process
- Expensive treatments

Our Technologies

Ca^{2+} + Mg^{2+}

Pro-health Water Technologies

- Precise control
- Control four or more nutrients
- Single step process
- Cost effective treatments

Diverse Range of Contents in Water

Nutrients/L	 Evian	 Fiji	 San Pellegrino
Calcium	80mg	17mg	164mg
Magnesium	26mg	13mg	49mg
Potassium	1mg	0mg	0mg
Sodium	6mg	18mg	31mg
Sulphate	14mg	0mg	403mg

Smart Water

- Customizable Water per gender, industry, sector, age etc.

Ca^{2+} + Mg^{2+}

Pro-health Water Technologies


Children


Women


Elderly


Athletics


Working Adults

9 billion tonnes of plastic have been made

US$20 billion smart water market

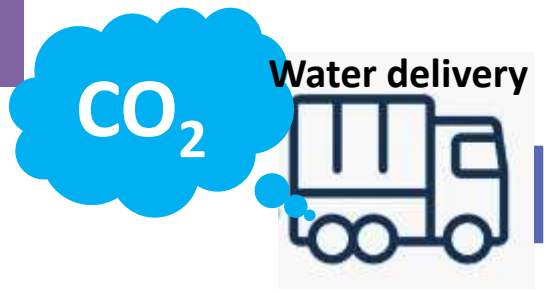
Reduce Carbon Footprint

Ca^{2+} + Mg^{2+}

Pro-health Water Technologies

Current

Malaysia



Singapore

Future

Singapore

Singapore

Pro-health Water Reduce Plastic Bottles

San Francisco airport to ban sale of plastic bottles

Benefit Humanity: Optimal Growth

Ca^{2+} + Mg^{2+}

Pro-health Water Technologies

Fish*

- pH : 6.6-8.5
- Total Dissolved Solids (TDS): 0.13 mg/L
- Hardness : 50-100 mg/L

Prawn^

- pH : 5.8-8.5
- Total Dissolved Solids (TDS) : 100-260 mg/L

Rice~

- pH : 6.5-8.5
- Dissolved oxygen: 7 mg/L
- Total Dissolved Solids (TDS) : 250-500 mg/L

Singapore sets 30% goal for home-grown food by 2030

Ca^{2+} + Mg^{2+}

Pro-health Water Technologies

THE STRAITS TIMES

Imported food from over **90%** ⬇ **70%**

URBAN farmer

Urban Farmers

Singapore is like a ship

Validation

Ca^{2+} + Mg^{2+}

Pro-health Water Technologies

Validated by Enterprise Singapore with funding support

IPOS international

Enterprise Singapore

EWT COI

NGEE ANN POLYTECHNIC

$4,900

CDG Capability Development Grant

IPI SINGAPORE

EUREKA innovation across borders

Market Readiness Assistance

Your first step to the world

Enterprise Development Grant EDG

$43,780

Milestones & Team

Ca^{2+} + Mg^{2+}

Pro-health Water Technologies

2001-2017
- Research and Development of Water Technologies
- Incorporation of Company

2018
- Intangible Asset Audit
- Invitation for Talent Program in Wuhan

2019
- Joint Development with Ngee Ann Polytechnic Centre of Innovation (EWTCOI) on enhanced prototype

Pro-health Water Technologies History

2001-2019

Chew Soo Yan, NTU, Computer Eng, 1997.

- **Pivoted into Water Technologies for 15 years.**
- Succeeded in producing high-end conditioned water mass production in an overseas water plant.
- Produced richest potable mineralized water with minimal environmental impact

Lynn Wong, Masters of Business, Curtin University of Technology, 1998

- 15 years of experience overseeing Finance, Marketing, Public Relations in three listed companies.

Our Contact

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Whatsapp: 8777-9237
Email: chewsooyan@gmail.com

Lynn Wong, Manager
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Email: lynnwongbd@gmail.com

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THANK YOU