

**Freshness keeping device with  
cutting-edge high-voltage technology**

 **INAZUMA** 

**Company Name** SURIYA Co., Ltd.  
**Address** Kanda Misaki-cho 2-4-13 Chiyoda-Ku  
107-0062 TOKYO JAPAN  
**CEO** Koichi Ishiguro  
**Established** April 1 2015  
**Capital Amount** yen 10,000,000  
**Fiscal Year** From January 1 to December 31  
**Employees** 6 person  
**Main Business** Development and sale of clean energy products

- Development and sales of storage batteries
- Development and sales of LED lighting fixtures
- Ultra high voltage generator
- Production/sale of activated carbon
- Biomass production
- System development
- Production/sale of virus buster water

**Company History**

**April 1 2015**  
Established J-Beacon Co., Ltd. in Kumamoto City, Kumamoto Prefecture

**December 1 2017**  
Changed the company name to SURIYA Co.,Ltd and moved the head office to Chiyoda-ku, Tokyo.  
Sivasuntaran Suharnan appointed CEO

**Agust 1 2018**  
Biomass business Was adopted for Trade and Industry 4th Jump Out Japan! by Ministry of Economy

**February 3 2020**  
“Susanoo® cultivation, processing, and quality control system and demonstration/commercialization project” was adopted  
2019 2nd SME / SDGs Business Support Project

**July 1 2020**  
Myox Virus Buster Water was adopted for the "New Coronavirus Infectious Disease Emergency Response Capital Investment Support Project".

There are many challenges that need to be addressed in the future world, such as clean energy and food loss. At SURIYA, we are committed to tackling these challenges head-on and focusing on a future Earth.

## Energy Sector

We develop and sell products that contribute to the spread of clean energy in society, such as the development of solar systems and storage battery systems.

### ENAJU



We manufacture and sell emergency installation type battery ENAJU.

### Carry Case Battery Tank



This is an emergency portable battery. It can be easily used in case of emergency and is also used as a power source for outdoor activities such as camping

## Hygiene-related Sector

### MIOX Virus Buster Water



We manufacture and sell MIOX Virus Buster Water, a skin-friendly disinfectant. We also manufacture and sell MIOX GATE, a device installed at entrances for full-body disinfection.

## Food Sector

### Coconut palm farm management

In northern Sri Lanka, which was devastated by civil war, we operate a coconut plantation with the aim of restoring land and employment.



### Cultivation of Seaweed SUSANOO

We are cultivating Ocean Keerai, which is rich in nutrients, along the coast of Sri Lanka. We will import it to Japan as a material for agar and sell it domestically.



## Research and Development

### Biomass Production

We will reuse discarded coconut shells in Sri Lanka to manufacture activated carbon. The activated carbon made from coconut shells has many small pores and is highly effective in odor removal and water purification. Currently, the factory is under development

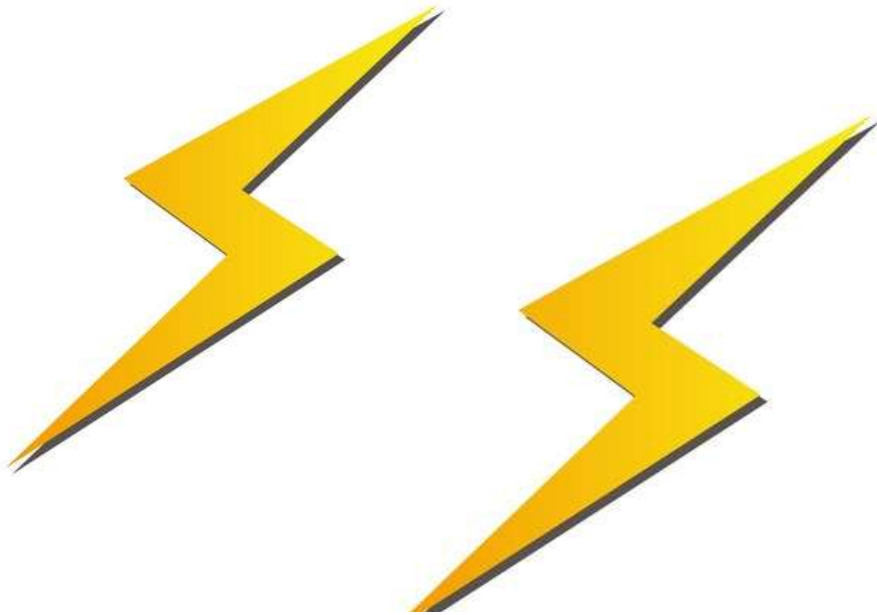


### Activated carbon production

We will reuse discarded coconut shells in Sri Lanka to produce biomass. Currently, the factory is under development.

# INAZUMA System Origin of the name

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Inazuma means thunder in Japanese. It has long been said that a year with a lot of thunderstorms brings a good harvest. A recent study found that lightning-induced phenomena improve food quality. Based on this knowledge, we researched and developed a device that preserves food while preserving its freshness, and named it "INAZUMA."

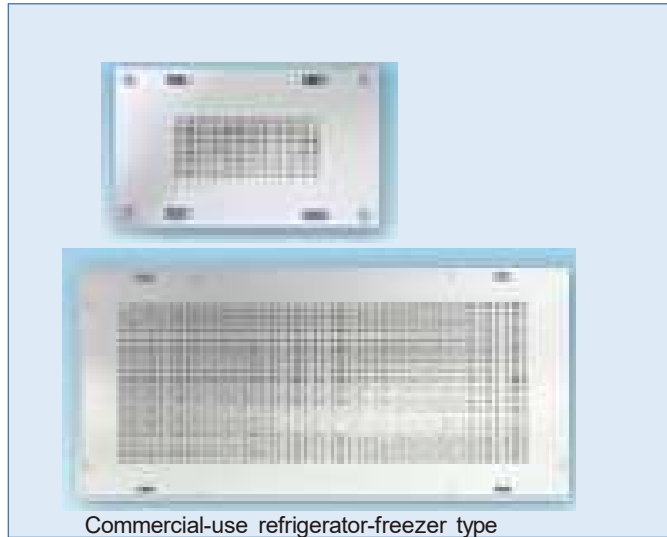


# INAZUMA System

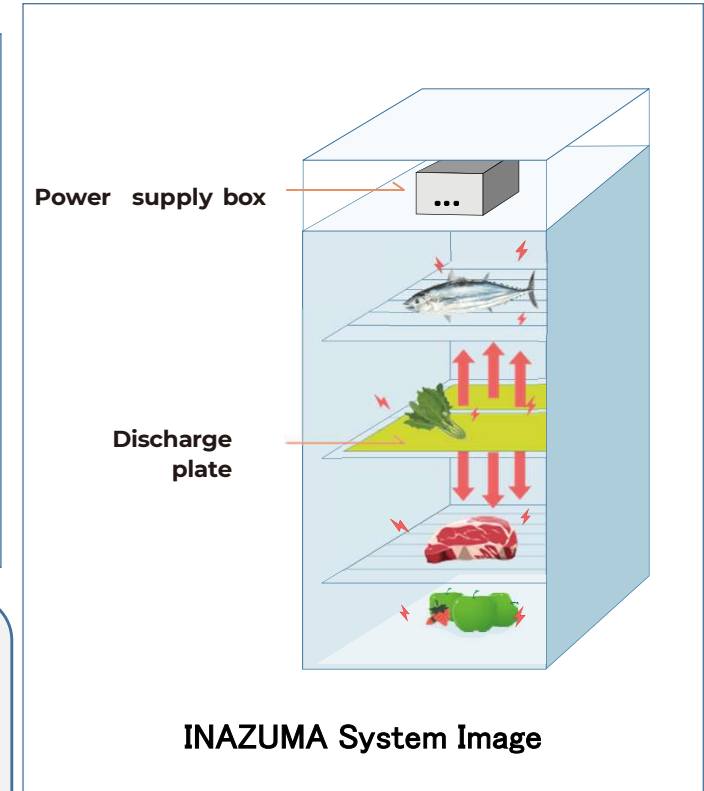
# Electric field generation device for Freshness Maintenance

## INAZUMA DEVICES

## Pair of Supply box and Discharge Plate



Commercial-use refrigerator-freezer type



INAZUMA System Image

**Power supply box** This computer-controlled machine has a built-in safety device and automatically stops when an abnormality is detected in the plate. In addition, it is possible to change the voltage from 100V to 380V, and it corresponds to voltage all over the world. **PATENTED TECHNOLOGY : NO.7213605**

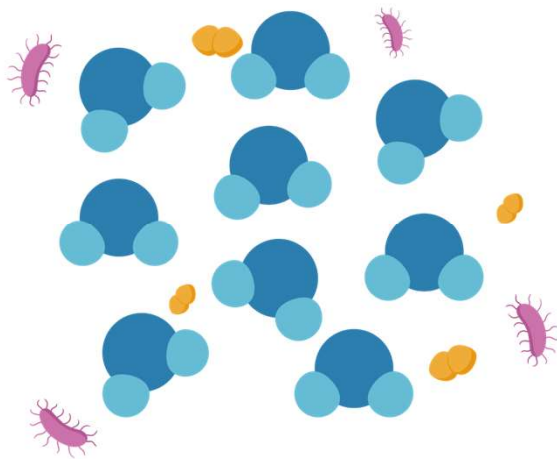
**Discharge plate** By installing this plate, it is possible to efficiently create a high-potential electric field. It generates an electric field space with a wave frequency of 48 Hz to 1000 Hz and an intensity of 0.3 kV/m to 2,000 V/m or more within a radius of 3 meters. **PATENTED TECHNOLOGY : NO.076089**

body	INAZUMA 100V (5mA)
size	W200mm×H135mm×D300mm
power supply	AC100V / 50/60Hz ± 50VA
output current	2.5mA, 5mA (Overcurrent limit switching)
power consumption	20W (per hour)
weight	5.4 kg

# INAZUMA System INAZUMA supercooling image

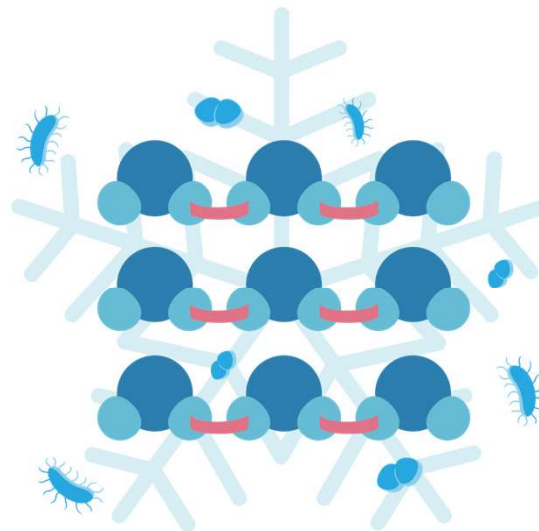
## INAZUMA technology can be applied to all living things

Our technology, which was launched in Japan in 2017, has unlimited potential to revolutionize global logistics. It enables transportation to the other side of the world without compromising the quality of food and plants, contributing to the reduction of food loss. This technology eliminates freezing damage to perishables and enables long-term frozen storage while keeping quality.



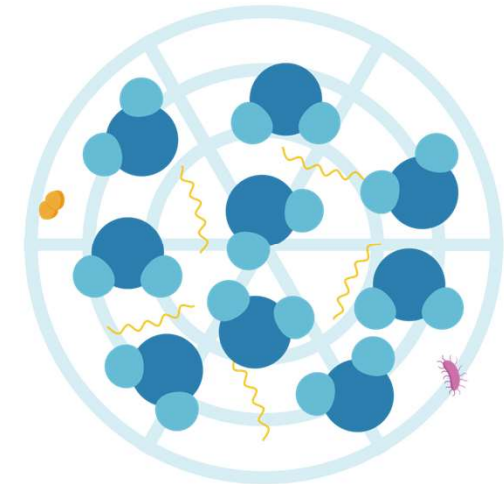
### Normal water status

Water molecules do not combine at room temperature. Bacteria carried by food proliferate.



### Ice status

Water molecules combine to form a frozen state that damages the food's cells. Bacteria carried by food proliferate.



### Water status in INAZUMA

suppresses binding of water molecules. It creates a state in which water does not freeze even if it drops below zero where it should freeze. Bacteria do not grow.

# Five effects of installing Inazuma System

## High Quality [Freezing]

It enables high freshness preserving freezing in existing freezers (-18 to -25 degrees Celsius). Ice crystals can be frozen without damaging cell membranes. With this technology high-quality freezing is possible without using of quick freezers (-50 to -6 degrees Celsius)!

## Maintain freshness [Refrigeration]

When exposed to an electric field cell activation increases to 3-5 times the normal level!  
By applying electric field to the food, the water molecules are activated and does not freeze even when temperature drops below freezing.  
Thins condition allows food to be stored for a long time without freezing.

## Drip Cut [Defrosting]

No food leakage when thawing. This eliminates the risk of loss ingredients such as umami and protein contained in foods. It also has an antioxidant effect properties ,which eliminates discoloration and deterioration of food and reduces that occur during thawing.

**Freshness preserve device  
“inazuma”**

## Increase Flavor [Aging]

Proteins are broken down into amino acids, which increases the flavor and sugar content! Meat becomes tender as muscle tissue is broken down.

## Cost reduction [Heating]

By installing the Inazuma Plate inside the fryer, it is difficult for water to come out of the food and the oil is less likely to get dirty, greatly reducing the time and effort required to change the oil. Also the food keeps juicy because it does not lose its moisture, and the batter remains crispy for a long time.

# INAZUMA System Uniqueness ①

**An overwhelming array of patented technologies!**

## 【 List of Published Patents 】

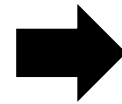
- power supply BOX → PATENTED TECHNOLOGY NO.2022-049615
- Automatic recovery method and apparatus for battery management systems  
→ PATENTED TECHNOLOGY NO. 2022-050149
- High voltage transformer → PATENTED TECHNOLOGY NO. 2022-054076
- High-voltage panel to form an electric field inside a cold storage cabinet  
→ PATENTED TECHNOLOGY NO. 2022-076089
- **【NEW!】** Refrigerated storage and its electric field formation method  
→ PATENTED TECHNOLOGY NO. 7213605  
( Detailed explanation on the next page )



Succeeded in realizing a significant reduction in purchase cost!

【Competitors' products】

Up to two panels per transformer



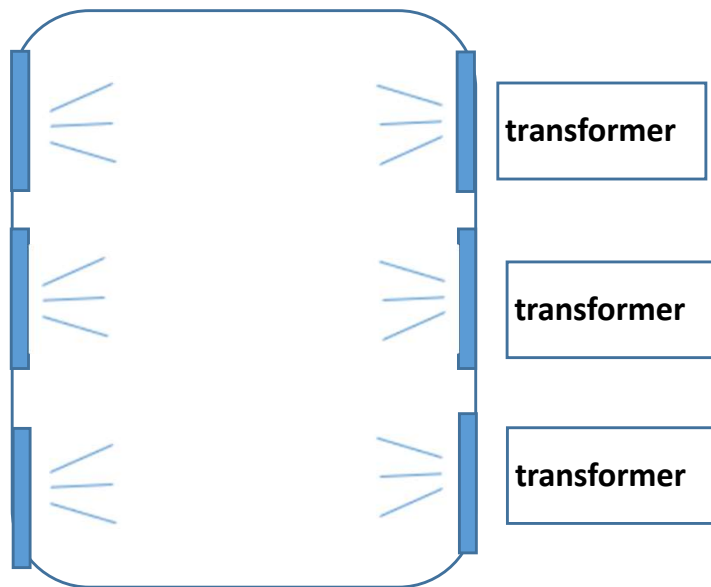
【New INAZUMA】

A single transformer can discharge from six or more panels

Relay type port (patented) can generate an electric field over an area up to 6 times larger!

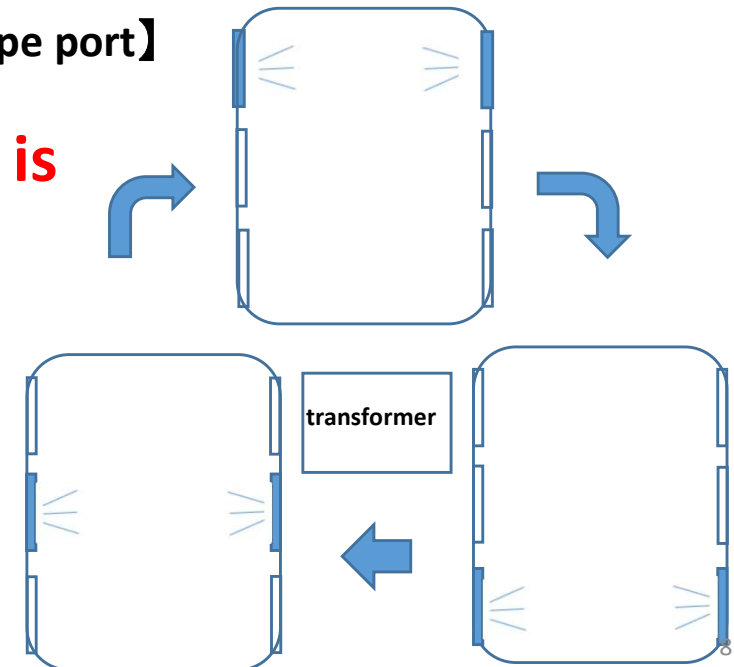
※ A single transformer can efficiently generate an electric field over a large area.

【Multiple transformers required】



【Relay type port】

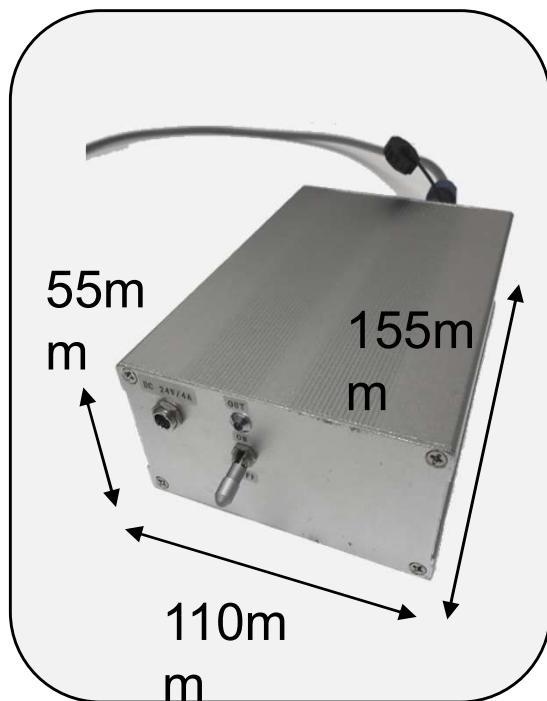
Installation cost is Less than a quarter!



More attractive products are on the way!

~ AC transformer (AC) to DC24 (DC) ~

Succeeded in miniaturization to less than 1/4 the size! Now available for home use!



【 left 】 Large 【 right 】 small



【 Upper 】 large 【 Lower 】 small



High voltage freshness preservation pallet for logistics!

The pallets can be stacked two-high & folded!

After transportation, the product can be brought to the customer's destination while maintaining its freshness.



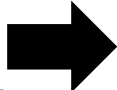
Important!

Adopted by the Ministry of Agriculture, Forestry and Fisheries (MAFF) for the 2021 Emergency Project for Reconstruction of Overseas Food Value Chains!

## Upgrade the panel to a mesh type!

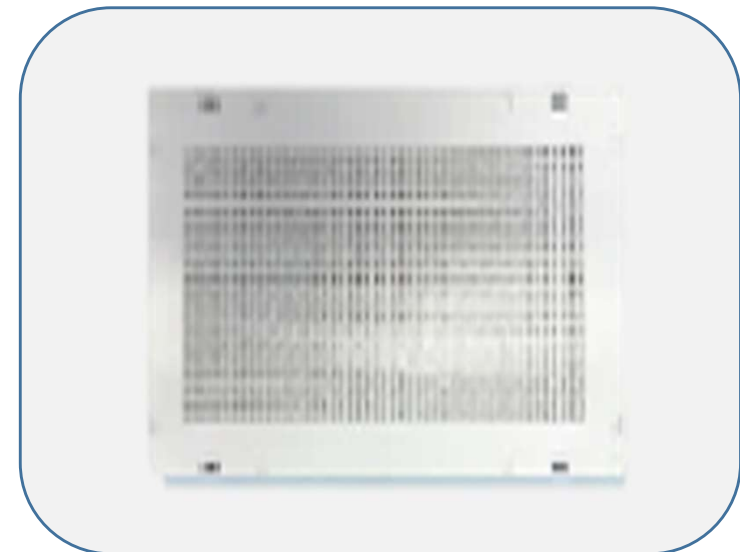
【Competitors' products】

【 New INAZUMA】

Heavy and inefficient panels  **light and efficient mesh system.**  
Improved efficiency in transportation and construction! Furthermore, the efficiency of the electric field has been dramatically improved!



Body	Icing free sheet
Size	H1000mm×W1000mm×D5mm
Weight	4kg



Body	InaZUMA sheet B01
Size	H1000mm×W1000mm×D5mm
Weight	2 kg

# The cause of loss of freshness depends on the ingredients!

## 【 Vegetables & Fruits 】



### 【 Continue respiration after harvesting 】

→ Decompose nutrients such as sugar and vitamin C

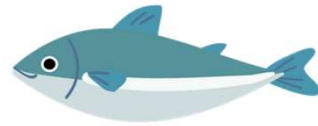
### 【 Due to evaporation of moisture 】

→Vegetables are 90% water, so water evaporates as they breathe.

### 【 Produce ethylene 】

→Ethylene is a hormone found in plants. It promotes respiration and accelerates plant growth (aging). Fruits produce more and vegetables less, but most vegetables and fruits are affected by ethylene gas produced by surrounding vegetables and fruits.

## 【 seafood 】



- 【Because of the high water content of the fish's body, it is vulnerable to heat. 】
- 【Due to the weak flesh of the fish】】
- 【Due to the greater action of autodigestive enzymes】
- 【Because of its viscera and gills, it is prone to decomposition】
- 【Because】 the postmortem changes are so great】

## 【 meat 】



【For bacteria to multiply.】

→ Airborne bacteria and fungi attach to the surface of meat and multiply.  
The conditions that cause this alteration are related to temperature.

【Because it oxidizes. 】

→Oxidation of fat and protein in meat causes discoloration and loss of flavor.  
Drying the surface of the meat also causes the loss of volatile aromatic compounds and further diminishes the flavor.

**→ There are many factors that can cause food to lose its freshness!**

## INAZUMA



Freshness preservation device [INAZUMA] Patented! It creates a supercooled state that does not freeze even when the temperature drops below freezing. It enables long-term preservation in a "refrigerated state" while keeping microorganisms active at sub-zero temperatures! When exposed to an electric field, the amount of C12H22O11 (sucrose) necessary for cell activation increases 5 times the normal level!

## MIOX Mixed Oxidant Virus Buster Water



Pentagon patented [Virus Buster Water] A powerful oxidant obtained by electrolyzing diluted salt water mixed with salt and water! Safe, secure, and friendly to people, facilities, and the environment ⇒ Contributes to the United Nations Sustainable Development Goals (SDGs) Compared to chlorine, the sterilizing power is 7 to 10 times stronger and the speed of sterilization is 3,500 times faster!

# Suriya's freshness preservation system



A functional plastic film with a 3-layer structure that is insect-proof and moisture-proof, with 7 to 10 times the sterilization power and 3,500 times the sterilization speed of ordinary bags. It also has a UV cut and deodorizing effect.

\*International patent acquired in 2011



**April 2023 Ethylene gas adsorption type  
PROGUARD new ! !**



## Ultra-low temperature quick freezer Rock Frozen

### Steam-heated cooker



batch style



Conveyor type



### - 60°C Ultra-low temperature quick freezer



batch style



Conveyor type

#### ■ Steam-heated cooker

- Available for vegetables with high water content (leafy greens, etc.), which were difficult to freeze.  
→It is also useful during the harvest season and as a countermeasure against market price hikes.
- Oysters with shells do not shrink even when defrosted and reheated due to steam-heated cooking.
- Sterilized and sterilized by steam-heated cooking, making the ingredients safe and secure →Noro-Free and safe
- Steam-heated cooking breaks down the scum and bitterness. →No scum is produced even in a hot pot of fish.
- Steam-heated cooking enables cooking while retaining nutrients. →Frozen foods that contain more nutrients than those cooked normally can be developed.

#### ■ -60°C Ultra-low temperature quick freezer

- -The ultra-low freezing temperature of over 60°C does not destroy cell membranes, and reproducibility during thawing is high. Also, productivity is high.
- Because it is frozen in powder form, a knife can be used even when frozen (chewable).→Can be cooked without thawing. Possible to produce melt-in-your-mouth fruits. Almost no water remains when thawed, so it does not become watery.
- IQF (bulk) freezing allows you to thaw and use only what you need.

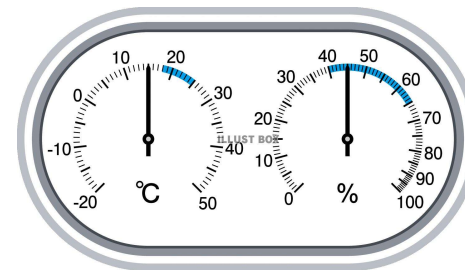
## 【 carbon dioxide filling system 】

Fruits and vegetables are still breathing after harvest, and their quality deteriorates as they use their own sugar and respire. By keeping the air composition in the storage room in a high carbon dioxide state, we suppress the respiration of fruits and vegetables and create a state of hibernation.



## 【 Environmental Management System 】

The temperature and humidity are set to the optimum level for each food item. If the temperature falls below the standard, the system automatically detects it and notifies the user with a sensor.



**As a freshness preservation equipment manufacturer → solution provider, we will propose the best system combination for each food product you want to keep fresh!**

## Case Studies

Adopted as an emergency project for restructuring overseas food value chains by the Ministry of Agriculture, Forestry and Fisheries of Japan in FY2021! Scheduled to open a distribution center using the INAZUMA system → Contributing to the expansion of Japanese agricultural exports



経済  
**海の幸 鮮度保ち海外へ 「スーリヤ」 伏木富山港で実証実験**  
 2022.11.23 00:03



電気製品開発・製造のスーリヤ（東京）は、同社が特許を持つ鮮度維持装置を使い、生鮮食品を伏木富山港から海外に船便で送る実証実験を始めた。22日に物流管理会社のTED（富山市大場）でシンガポール便の出発式を開いた。

# Nov. 2022- Start of joint research with Iwate University (Yuan Laboratory, Department of Food Production and Environment) Experimental subject (tuna)

2022年(令和4年)12月14日(水曜日) (26)

## マグロ鮮度保つ新技術

岩手大農学部の実験紅准教授(水産食品加工学)と、生鮮品の鮮度保持装置の技術開発を手がけるスリーヤ(東京)は、同装置でマグロを長期保存する共同実験を行っている。

### 岩手大とスリーヤ(東京)共同実験

「1ナズマ」と呼ばれる高圧の「過冷却」状態にマグロを保管する装置が、水分子同士の結合を抑制し、水が凍る温度の0度以下でも凍りつかず、「過冷却状態」を生み出すことで、食品の鮮度を長く保つ。既に商品化された。

鮮度保持装置で1カ月間冷蔵したマグロ(右)と一般的な冷凍マグロで保存したマグロ。一般的な保存ではマグロ、一般的に保存できないと見られる。

### 高電圧で「過冷却」に

物流会社や飲食店などで導入が進んでいる。13日は盛岡市本町通の試験会を開き、一般的な食品を冷蔵したり、一般的な食品

### 冷凍より食味良くなる

鮮度保持装置を使い冷蔵したマグロの成分分析を共同で行う佐藤和恵取締役(右)と袁春紅准教授

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2022年(令和4年)12月16日(金曜日) (6)

## 1カ月保存しても新鮮

### 鮮度保持システム「1NAZUMA」

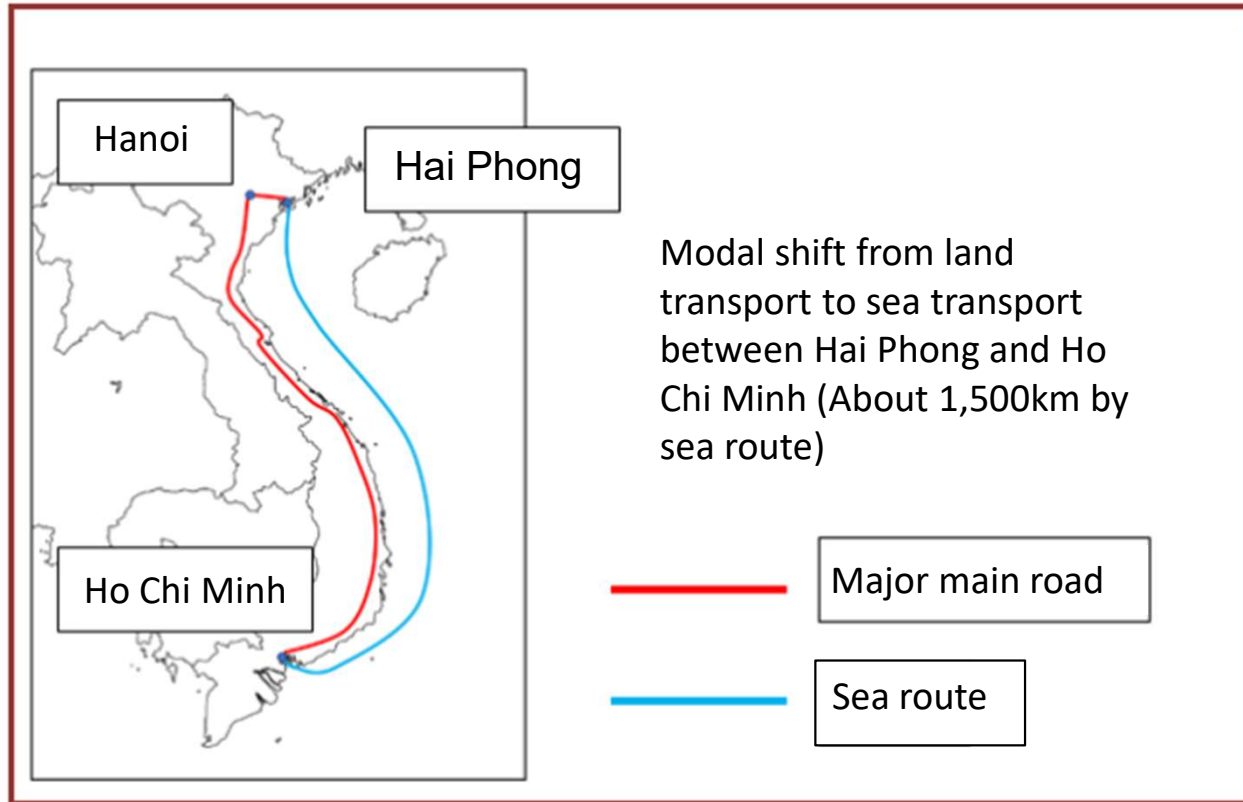
岩手大とスリーヤが共同開発 盛岡市内で業者「驚いた」

鮮度保持システム「1NAZUMA」で1カ月間冷蔵したマグロの成分分析を共同で行う佐藤和恵取締役(右)と袁春紅准教授

鮮度保持システム「1NAZUMA」で1カ月間冷蔵したマグロの成分分析を共同で行う佐藤和恵取締役(右)と袁春紅准教授

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# Technology provision case



Provision of technology to containers that have been adopted and granted subsidies for carbon dioxide emission control projects for fiscal years 2018 through 2020 (financial support program for equipment under the Japan Credit Mechanism (JCM) Model)



The Global Environment Centre (GEC), has decided to grant a subsidy for the project "Modal Shift from Land to Sea Using Reefer Containers with Freshness Retention Function" in Vietnam, under the scheme of "Bilateral Credit System Funding Support Project" aimed at reducing greenhouse gas emissions in developing countries by utilizing excellent low-carbon technologies, etc. and obtaining credits based on the Joint Crediting Mechanism (JCM).

# Nihon Crant Co. Ltd (Ibaraki prefecture)



Already installed in 70 units 40ft container for overseas

Used for overseas transportation from Japan and transportation from overseas to Japan.



# Private management restaurant



It can be used in a small two-door refrigerator.

Longer-lasting freshness of vegetables, meat, and fish reduces inventory loss and ordering frequency, and enables bulk purchases of ingredients, which increased profit margins.



# Inazuma System

## Recommended installation example



Producers → Storage Containers



Shop Storage → Prefabricated warehouse  
Commercial refrigerators



Land Transportation → Trucks for fresh products  
Railroad freight for fresh products



Sea Transportation → Reefer Containers for fresh products

**Commercial refrigerators/ Prefabricated warehouse less than 150m<sup>2</sup>/ Household refrigerators/ Electric Trucks/ Containers/ Refrigerated warehouse larger than 150m<sup>2</sup>**

- It is possible to install the Inazuma panel additionally to refrigerators, warehouses, storages, and containers
- It is possible to build-to-order manufacturing of refrigerators, warehouses, storages, and containers
- It is possible to build-to-order manufacturing reefer containers

# Others Products with which we can cooperate



## 【 Other products we can offer 】

Shiitake mushrooms produced in Toyama

Prefecture Hydrogen water produced in Toyama  
(For Humans & Animals)

Sri Lanka Kirin Rhino

Sri Lankan MCT coconut oil can also be proposed!



We would be happy to have another meeting with you  
to discuss any products that may be of interest to you.





Thank you for watching until the end.

For inquiries, please contact  
Kazue Sato, Director, Surya Co.  
Email Address : [sato@suriya-ltd.com](mailto:sato@suriya-ltd.com)

