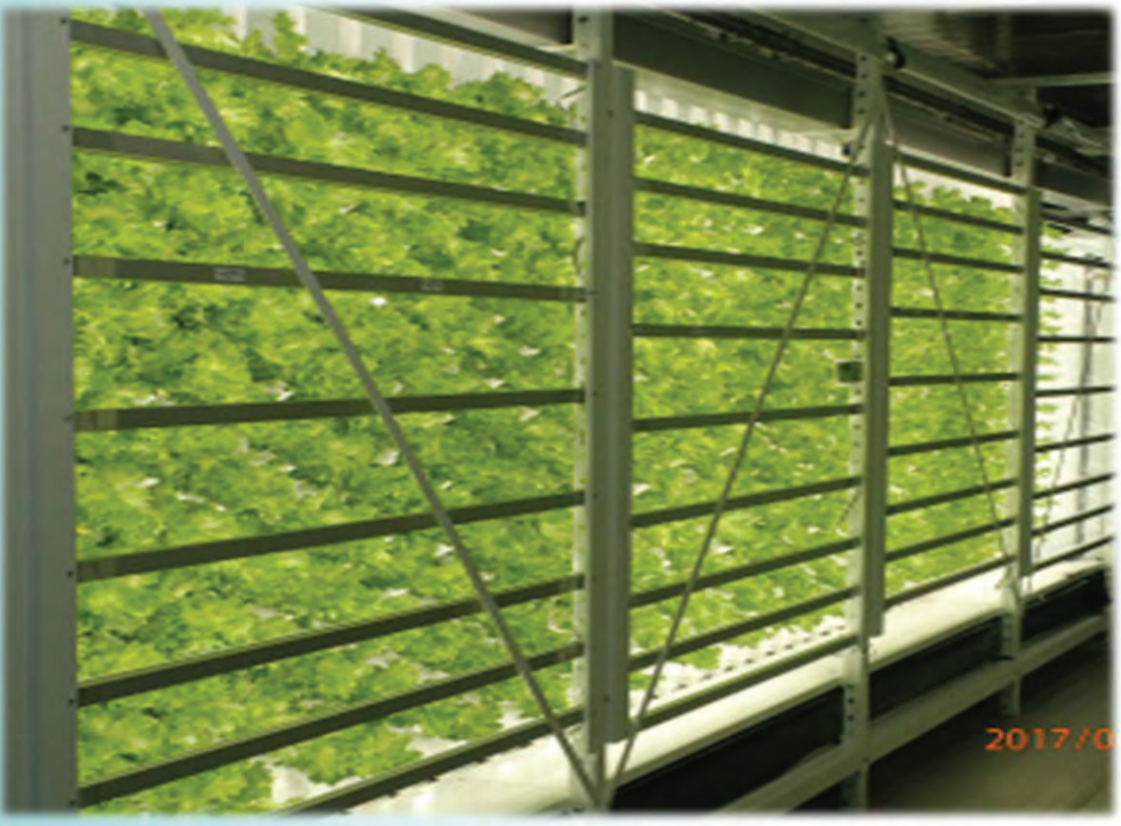
【Document 2】
Aug. 27th,2020

Introduction of
Next generation “indoor farming”



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TK WORKS

START!
the Future

Prologue - Foods

Why you should eat foods?

We can`t live without eating.

Food can be nourished, and it plays a vital role in human life. For example, it can be the source of the body, it can be used as the raw material for the energy that moves the body, or the body can be conditioned. In other words, it is a so-called balanced diet to balance the foods that fulfill these roles. A well-balanced diet is said to help maintain health, promote health and prevent lifestyle-related diseases, and prevent severe disease.

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Prologue - Vegetables

Why you should eat vegetables?

It`s good for our health.

Vegetables contain Vitamins, minerals and a lot of dietary fiber.
Potassium, dietary fiber and antioxidant vitamins have been proved to work effectively for the prevention of cancer called lifestyle-related diseases, heart diseases and stroke., This is because vegetables contain many of these components.
Vegetables contain functional ingredients that help boost immunity and antioxidant power, and they are low in calories.

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Overview of Toyo Seikan Group

The Toyo Seikan Group is the biggest Japanese packaging manufacturer.

Toyo Seikan Group

TOYO SEIKAN GROUP

Since its foundation in 1917, Toyo Seikan Group Has been striving to offer top quality and highly functional products in a “safe, affordable and Speedy” manner by leveraging the properties of materials such as metals, plastics, paper and glass.

The Group as the largest packaging manufacture has large social mission and responsibility to “contribute to the happiness and prosperity of mankind through **packaging Technology**. “

To fill this mission and responsibility, we will enhance the corporate value of the Group with “people” and “technology” at the core of our business by accelerating further collaboration within the Group.

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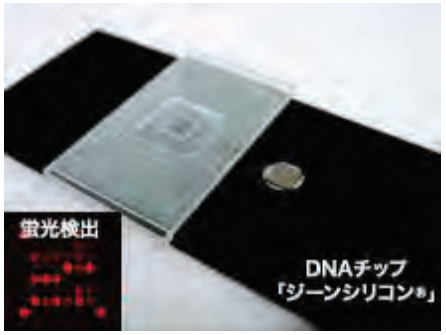
Our all products



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Agriculture related business

Indoor farming

Indoor Unit for Trial Hydroponic Culture

A small scale Indoor farming
Utilizing 40ft container

NEW!

Fertilizer

Carton Case

Agricultural PO film

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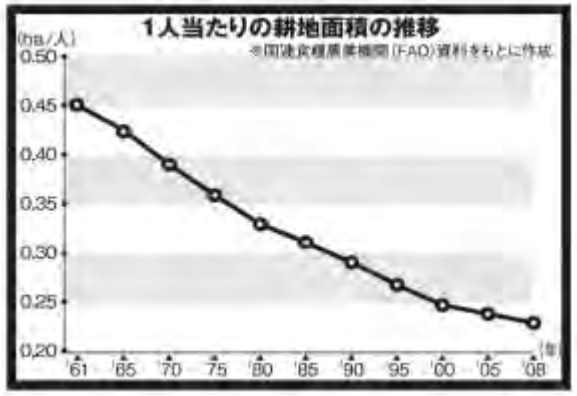
Food crisis

•The world`s population will total 9 billion people in 2050, more than 6 billion people will gather in urban areas of the world and global warming phenomenon also adds to serious problems in terms of food and energy supply. (「OECD environmental observation2050」)

•FAO (the United Nations Food and Agriculture Organization) said that it is necessary to increase food production by 60% by `50 in order to cope with the increase in the world population, but it will be difficult to increase the production.

•The area of cultivated land per capita has declined (see the graph), and the globalization of the economy has led the agricultural land to switch to a site for agricultural production for export, not for local people`s food production.

⇒ 「Supply Limit」



Transition of arable land area per capita

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Food crisis

- Weather irregularity

  but is this condition normal?
- Water shortage, Drought
- Land shortage in urban areas
- Declining agricultural population
- Pesticide spraying

How do we inherit to the next generation?

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Solution

- Effective utilization of land

  approximately 70% of people live in urban area.

- Stable production of crops not affected by climate
- Production of safe, secure crops
- Production of highly productive crops with good workability.

Cultivation in Indoor farming

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So what kind of crops do we cultivate?

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~~Root crops~~

Production of <u>leafy vegetables</u> is suitable for indoor farming.

~~Fruit vegetables~~

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Vegetables

The intake of vegetables is very important, and it is necessary to eat a certain amount of vegetables on a single day.

A lot of nutrients necessary for making a healthy body such as vitamins and potassium are included. Lipid is less prevention of lifestyle diseases causing major diseases such as three major diseases.

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Efficacy of vegetables




	Nutrients	Efficacy
Parsley	Many Vitamins, Mineral	Improve and protect stomach pain, Prevention of halitosis, cancer and arteriosclerosis
Mitsuba	Potassium, Beta Carotene	Prevention of high blood pressure, Eliminate swelling, Cold prevention, Stress relief, Improvement in sleep
Mizuna	Vitamin C, Beta Carotene, Dietary fiber, Calcium	Antibacterial action, Prevention of thrombosis, Skin beauty effect, The effect of strengthening teeth and bones
Spinach	Mineral, Many Vitamins	Anemia prevention, Rejuvenation effect by antioxidant action, Nutrition necessary for pregnant women
Basil	Beta Carotene(which is top class among vegetables), Calcium, Vitamin K,	Antioxidant effect, Prevention of osteoporosis, Relaxing effect
Lettuce	Folic acid, Vitamins	Eliminate swelling, Prevention of arteriosclerosis, Insomnia improvement
Shit	Beta Carotene, Calcium	Immunity improvement, Improvement of allergy constitution, Prevention of arteriosclerosis
Kale	Beta Carotene, Calcium	Improve blood sugar level, Improvement of hypercholesterolemia, Prevention of arteriosclerosis




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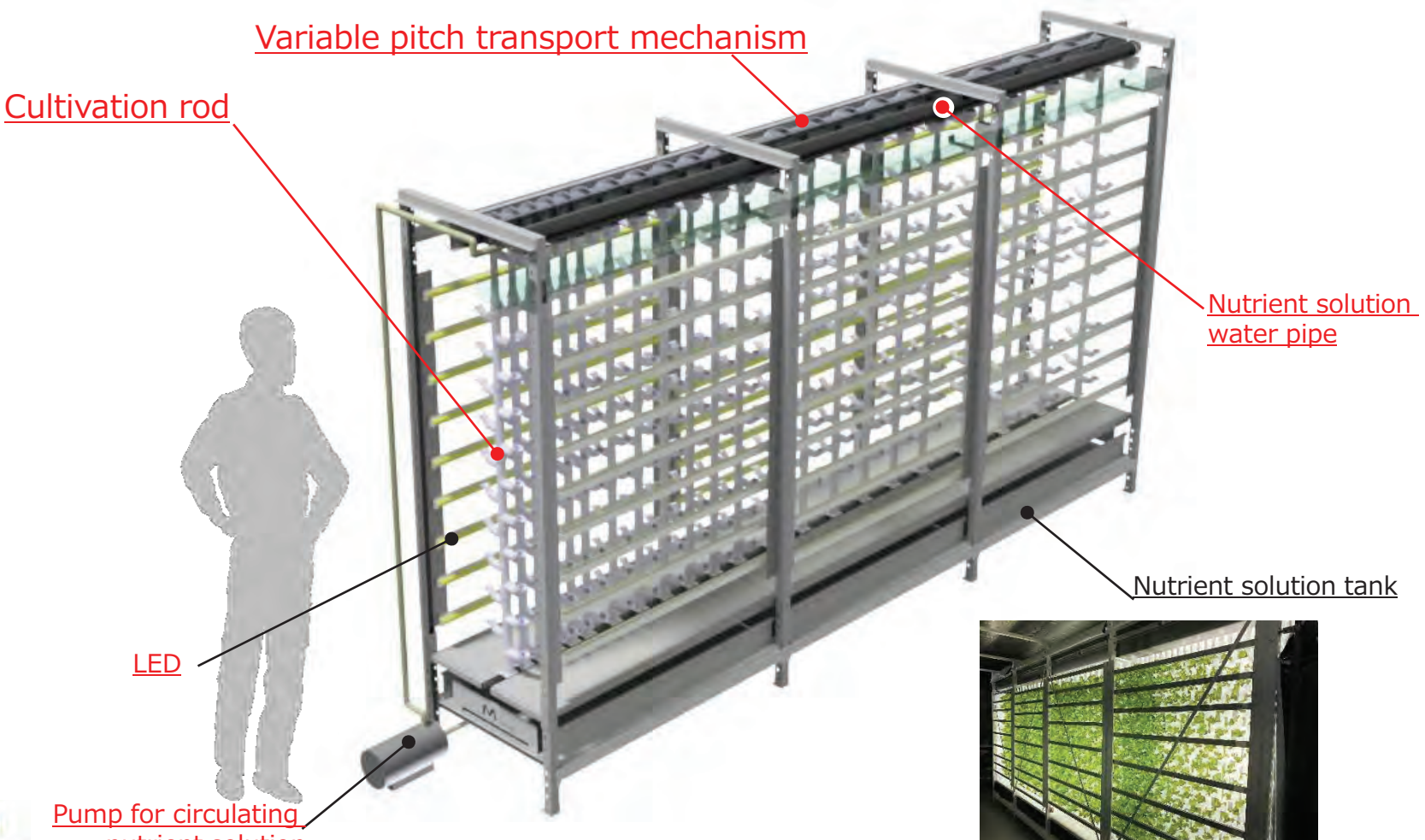
High density Vertical Hydroponics system

It is a new cultivation system that can obtain a lot of harvests even in a small space by cultivating with high density using vertical rods. (1.5 to 2 times more than multi-stage plant factory) Frame is made of steel.



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System Features

1 Original cultivation rod

2 Variable pitch transportation mechanism

Narrow space

Wide space

Conveyor screw

Pitch spreads as the vegetables grow

3 Harvesting work burden reduction

Easy harvest without work at height

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Cultivation Flow

Sowing → Nursery → Planting → Cultivation → Harvest → Adjust ment

Seed the urethane

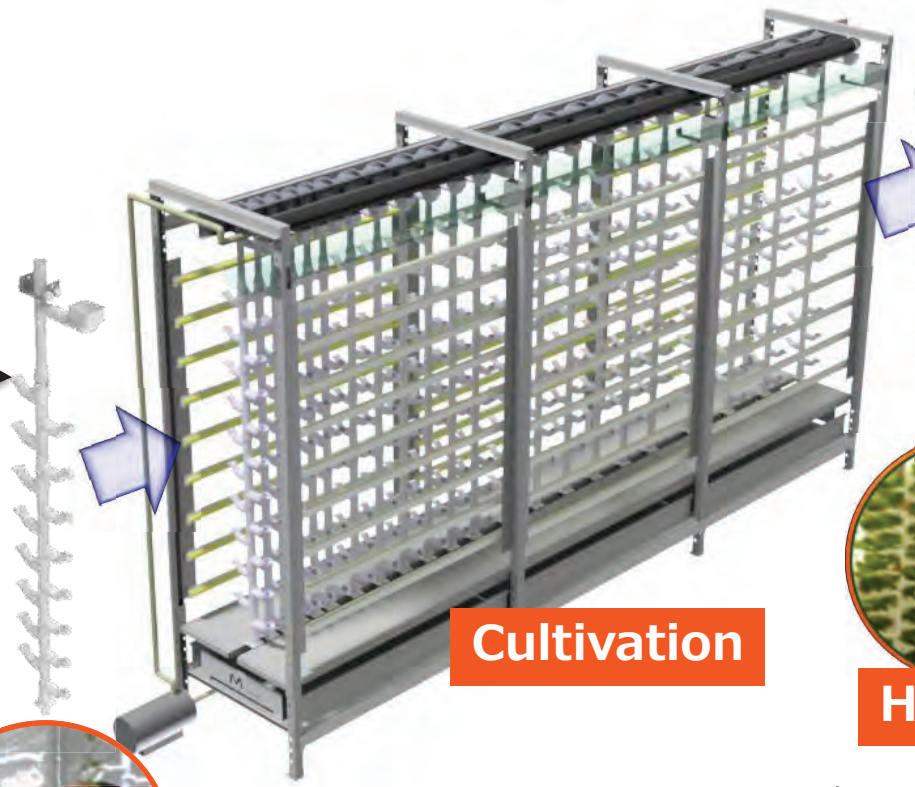
Sowing

Nursery

Grow seedlings

Planting

Transfer seedlings to vertical cultivation rods and put them into cultivation system



Cultivation

Harvest

Take out the cultivation rod from the cultivation system and harvest

Adjustment

Trim the roots of lettuce after harvest

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System Features

Adjustment ~Packing~ shipment

The roots of the harvested leafy vegetables and the outer leaves with some aging are trimmed, packed, and then shipped

Tidying up

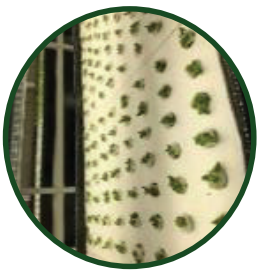
Wash used nursery panels, growing rods and nursery boxes

Harvest

Take out the leafy vegetables grown to the harvest weight from the cultivation rod

Planting

After planting the grown seedlings on the cultivation rod, put the cultivation rod into the cultivation lane



Nursery

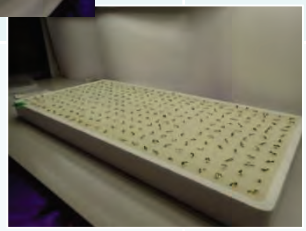
Transfer germinated seedlings to nursery panel

Sowing

Seed the urethane

Cultivation Schedule

Schedule	1st week	2nd week	3rd week	4th week	5th week	6th week
Sowing	2days					
Greening		7days				
Nursery			14days			
Plating				16days		
Harvest						



Weight of seedling after raising=10g

Lettuce weight at harvest =80~100g

Harvest time

Difference of each system

How difference between existing multistage type and vertical type?

The overwhelming difference in crop yield over the same area by 1.5-2 times.

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