Introduction of food waste recycling from business activities in Kitakyushu city

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1. Food waste recycling in Japan

(1) Food waste in Japan

Food self-sufficiency rate • • • • • • 39%

Livestock feed self efficiency rate • • 26%

Food waste • • • • • • • • • • 17,000,000ton/Yr

(Worldwide 1,300,000,000ton/Yr)

including food that can be eaten
(Dead stock, Expired, Leftover etc.)

• • • • • • • • • • 6,420,000ton/Yr

Food wastes of a business establishment

• • • • • • • • • • 6,410,000ton/Yr

The recycling rate • • • • • • 48%

Home food wastes • • • • • • • • 10,720,000ton/Yr

The recycling rate • • • • • • 6%
1. Food waste recycling in Japan

(2) Law of food wastes recycling

Act for Establishing a Recycling-Oriented Society
(Waste, recycling) AD. 2000

(a) Law of food wastes recycling (2000)
(b) Law of effective utilization promotion of resources
(c) Law of container wrapping recycling
(d) Law of recycling of home electrical appliances
(e) Law of construction waste recycling
(f) Law of car recycling
(g) Law of environment consideration product purchase
1. Food waste recycling in Japan

(3) the future of food recycling policy

from website of the Ministry of Environment

● promote activities and achieve a generation control target of determined **26 categories** of business
● reduce food waste in cooperation between public sector and private sector
● promote activities through acquiring cooperation from local authorities
  • set an adequate target on **general waste management plan set by cities, towns and villages**
  • submit a regular **report by prefecture**
● priority of recycling method
  recycling into feed, fertilization, energy reduction such as methanation
● promote activities related to **school lunch**, etc.
● promote dietary and environmental education forward
● promoting generation control and reuse of food wastes can contribute to revitalization of local community, reuse of biomass, improvement of food / livestock feed self-sufficiency rate, promotion of organic agriculture, environmental and dietary education, etc.
2. Food waste recycling from business activities in Kitakyushu City

(1) Technology of compost

Effect
@ Improvement of the reduced rate
@ The temperature rises.
@ Water decreases.

Effect
@ The quantity of crop increases.

24th Grand Prize for The Global Environment Award (2015) Award from the Minister of Agriculture, Forestry and Fisheries
2. food waste recycling from business activities

(1) Technology of compost (1st compost) [1Week]
Microorganisms resolute food waste into water and CO2 and reduce its quantity at 40°C.
2. food waste recycling from business activities

(1) Technology of compost (2nd 3rd compost)

[2 Months]

Microorganisms ferment food waste thirdly at 80-40°C.
2. food waste recycling from business activities

(2) **On-site processing**

first fermentation at the place food waste generates

Vegetables → Restaurant, Hospital, Food factory, etc. → Compost Machine → 1st compost

The farmer → Food waste Recycling center → compost

Compost Recycling center
2. food waste recycling from business activities

(3) Off-site processing

food waste is carried to a recycling center, and, the first fermentation

Vegetables → Restaurant, Hospital, Food factory, etc. → Food waste Recycling center → Compost Machine → compost

The farmer
2. **food waste recycling from business activities**

(3) **Off-site processing**

**Food waste Recycling center in Kitakyushu ECO-Town**

- **Wholesale market of municipal management**
- **Vegetable farmland**
- **Municipal hospital**
- **Restaurant**

**Food waste Recycling center**

- **Crush**
  - **1st compost, and Reduced**
  - **2nd compost**
  - **3rd compost**

- **Max 4.5ton/Day**
- **1,300ton/Yr**

- **20t**
  - **facilities for the handicapped**
  - **Liquor production**

- **40t**
  - **The Farmer**

- **20t**
  - **Farming association corporation “UTSUI 3-cyo Seisan Kumiai”**

- **80 ton/Yr**

**Compost**

- **Vegetables**
- **Sweet potato Liquor**

- **Max 4.5ton/Day**
- **10**
2. **food waste recycling from business activities**

(3) **Off-site processing**

*Food waste Recycling center in Kitakyushu ECO-Town*
2. Food waste recycling from business activities

(3) Off-site processing
   Food waste Recycling center in Kitakyushu ECO-Town

Please see the movie.
Recycling loop (Restraint)

“BUDOU-NO-KI” group

Restaurant

- the quantity of food waste is reduced at on-side quickly

Vegetables

“Hokkori Farm”

- dietary learning class
- Agricultural experience

Compost making experience

- fermented compost 2\textsuperscript{nd} and 3\textsuperscript{rd}

Recycling loop (Restrainment)

first fermented product is carried.
Recycling loop (Supermarket) 
“Tanoshii-sancyoku Ichiba” market

- Carnival (HONJYO store)
- Carnival (HIBIKINO store)
- Staff of “Tanoshii-syokuba” company
- Vegetables
- “Tanoshii-sancyoku Ichiba”
- The farmer (20 groups)
- compost
- Food waste Recycling center

First fermented product is carried.
High value-added rice
Farming association corporation “UTSUI 3-cyo Seisan Kumiai” makes “ECO 50” certified by Yamaguchi Prefecture.
Agricultural chemicals and Chemical fertilizer are reduced 50% and more than an ordinary rice field.

Recycling loop (The Farm)
Recycling loop (Restaurant and The farmer)

Restaurant and “UTSUI 3-cyo Seisan Kumiai”

“Unagi” Restaurant “Chikurin-Tei”

Rice is delivered twice a week. (15ton/Yr)

“UTSUI 3-cyo Seisan Kumiai”

1st compost

Food waste Recycling center

Compost

Used disposable bamboo chopsticks

Recycled bamboo charcoal

Charcoal maker

“Azami-en”

Recycling loop (Restaurant and The farmer)
Recycling loop (Home for the aged and The farmer)

Home for the aged and “UTSUI 3-cyo Seisan Kumiai”

“First Life” Corporation
★Lafine ★ITOZU-no-mori ★minami-oji sakura-kan

-delivered with brown rice-

Rice is polished every day.

A food waste disposer is installed in the facilities. The first composted processing is done at the place.

-“UTSUI 3-cyo Seisan Kumiai”
Agricultural chemicals and Chemical fertilizer are reduced 50%

Sweet potato is grown without agricultural chemicals by plowing a field with adding compost at welfare facilities, etc. Sweet potato shochu is made at Akashi sake brewing.

Circulation sweet potato “shochu” Liquor “Meigetsu-Goryou” Completion-celebrating ceremony souvenir

Rice is polished every day.

Food waste Recycling center

1st compost

compost

compost
Project built with the distilled spirits in which I cooperated with a welfare facility

the harmony of "environment" and "economy" and "welfare"

Welfare facility
The farm
Sweet potato “Kogane-Sengan”
Recycling compost
Recycling bamboo charcoal

Sweet potato 7.9 tons

Akashi SAKE Factory
「明月五良」
"Meigetsu-goryou"

The Merry Corp.
Messy’s JAPAN Corp.
Recycling compost production
Recycling bamboo charcoal

“5hou-yoshi” project

The store which participates in MERRY’s system

1st compost
Used disposable bamboo chopsticks

7,200ℓ (900mℓ 8,000 bottles)

@ To a customer, offer of distilled spirits
@ Install food waste disposer
@ Cooperate in recycling disposable bamboo chopsticks.

＜5hou-yoshi＞
It’s good for a consumer.
It’s good for a producer.
It’s good for society.
It’s good in the earth.
It’s good for offspring’s.
May/2014 The farm (Sweet Potato)

★NPO “Imomushi”  
Training center for independence of persons with disabilities

★”Nanairo-no-kaze”  
Welfare service center for persons with disabilities

★”Azami-en”  
Welfare service center for persons with disabilities

★NPO”KOUBOU Hazuki”  
Job assistance center for persons with disabilities

★OGURE Farm

★HIROKAWA Farm
Efforts at an elementary school

“shokuiku” class at an elementary school and a nursery school (Calpis company and our company “shokuiku” delivering class)
3. Business development in Japan

(1) Image of regional circulation deployment model in cooperation with an incineration facility

The expected effect

① reduce the quantity of waste
② reduce the cost by more than 30% compared to the incineration cost
③ reduce CO2 emissions by 40% compared to incineration
④ promote agriculture
⑤ create additional value by a recycling loop
3. Business development in Japan

(2) what to be considered regarding efforts to recycle food and create multi-faceted usability and value such as waste reduction, formation of recycling society, agriculture development, and value creation by a loop

Results at Kitakyushu City’s approaches

(1) package service of construction, facility, technology, fund and operation to municipality
(2) low-cost and less CO2 emissions recycling
(3) Formation of a loop by a safe microorganism and a good compost
(4) Offer of farm produce of high added value and an artifact
4. **Introduction of a project in Fraser's Hill, Malaysia**

**Compost Area**

- walls
- shutters
- windows were constructed.
4. Introduction of a project in Fraser's Hill, Malaysia

Food waste 17,711kg / 10 Months (12/2015~9/2016)
## Component of compost

**Good condition**

*Sampling date: 23th July 2016*

<table>
<thead>
<tr>
<th>Item</th>
<th>value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 C/N</td>
<td>25</td>
</tr>
<tr>
<td>2 Total carbon (全炭素)</td>
<td>25%</td>
</tr>
<tr>
<td>3 Total Nitrogen (全窒素)</td>
<td>0.99%</td>
</tr>
<tr>
<td>4 Total Phosphoric acid (全リン酸)</td>
<td>0.43%</td>
</tr>
<tr>
<td>5 Total potassium (全カリウム)</td>
<td>0.27%</td>
</tr>
<tr>
<td>6 Moisture (水分)</td>
<td>41%</td>
</tr>
<tr>
<td>7 Chloride (塩化物)</td>
<td>0.16%</td>
</tr>
<tr>
<td>8 Oil (油分)</td>
<td>0.44%</td>
</tr>
</tbody>
</table>
Thank you very much.