

●Starting Stage

(Fiscal Year 2005–2007)

Kanto Plain Saitama Area

Establishment of Infrastructure for Developing an Environmental Industry Cluster Led by a Safe and Secure "Resource Recycling Factory"

- **Major Participating Industry**...9 members from "Sainokuni Resource Recycling Factory," environment-related businesses
- **Research Organizations Academia**...Waseda University, Saitama University, and others
- **Government**...Center for Environment Science in Saitama, Saitama Prefectural Agriculture and Forestry Research Center, and others



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Core Research Organizations
Waseda University, Saitama University

Overview of Project

1. Research-Exchange Initiatives

Theme-specific seminars and feasibility tests regarding the environment or resource recycling were conducted as part of industry-government-academia collaborations. The "Study Group for Regional Biomass Utilization" was established as a joint project with private companies to promote the commercialization of biofuel. These initiatives have enhanced industry-government-academia attempts to address relevant issues and needs in terms of biofuel. At the same time, we have established a "Recycling Value Chain" strategy with the aim of commercializing biofuel.

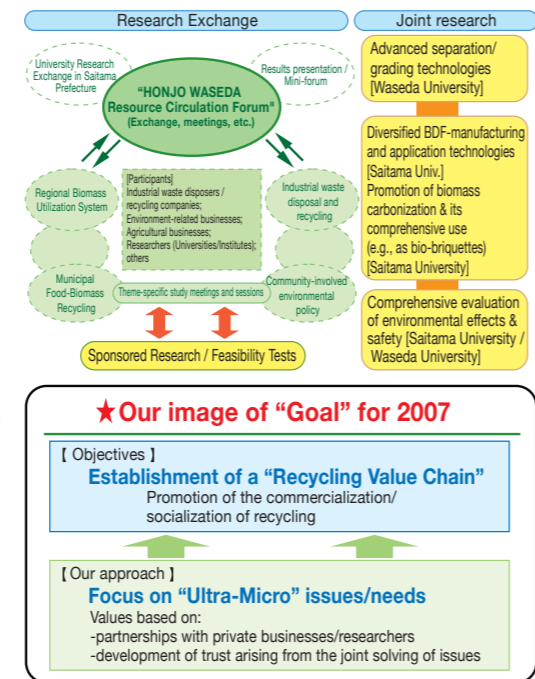
2. Joint research

With the aim of the efficient reuse of municipal waste biomass, joint research was conducted by Saitama University and Waseda University, yielding promising results. We have developed innovative technology for BDF (*1) production (patent pending, see "Major Deliverables" below) and various technologies for BDF pre-processing [e.g., the removal of CCA(*2) from treated wood].

*1: BDF = biodiesel fuel

*2: CCA = chromated copper arsenate, a chemical wood preservative containing chromium, copper, and arsenic

Establishment of a Collaboration Platform for the Kanto Plain Saitama Area



From the "Presentation of Final Results" document

Main Results of City Area Program

1. Improved efficiency of BDF processing and enhanced support system for its commercialization

- We successfully developed BDF processing that utilizes ultrasonic treatment to preprocess waste edible-oil (patent pending). This technology is expected to improve the reaction rate by 20% and enhance refinery efficiency, as it facilitates glycerin separation.
- A comprehensive support system has been established for the promotion of BDF commercialization. Of particular success has been a security evaluation of BDF combustible gas, and an environmental evaluation for regional manufacturing/utilization.

2. Advancement of resinification technology for coffee grounds and aluminum-coated beverage containers, and promotion of its commercialization

- Feasibility tests have contributed to advancing the technology required to convert coffee grounds and aluminum-coated beverage containers used in vending machines into a hybrid resin (patent pending).
- The commercialization of a continuous utilization system, including coffee grounds and the collection of used aluminum containers, has made significant progress under the cooperative efforts of various groups, including vending-machine operators, beverage companies, and user companies.
- A demonstration plant has been constructed by a local waste-disposal company, and has entered operation (mass-production trials etc.).

●Starting Stage

(Fiscal Year 2005–2007)

Miyazaki Prefecture Northern Coastal Area

Development and Application of Marine Biomass Technology to Enhance QOL in the Elderly

- **Major Participating Industry**...Yoshitama Surface Finishing Co., Ltd., Nippon Pure food Inc., Fuji Silysia Chemical Ltd., and others
- **Research Organizations Academia**...Kyushu University of Health and Welfare, University of Miyazaki
- **Government**...Miyazaki Prefectural Fisheries Experimental Station, Miyazaki Prefectural Food Research and Development Center



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Core Research Organizations
Kyushu University of Health and Welfare, University of Miyazaki

Overview of Project

This project aimed to identify an effective and functional material in preventing disease in the elderly, primarily using a screening technique for oceanic biomass developed by the School of Pharmaceutical Sciences, Kyushu University of Health and Welfare. Based on Miyazaki University's seed projects, we also developed a technology to recover and utilize functional materials in biomass at high efficiency and low cost.

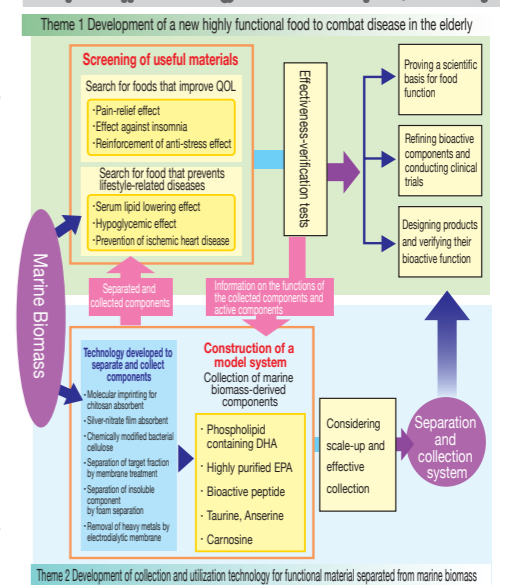
1. Development of new functional foods to prevent disease in the elderly

Target samples with physiological activity were found by establishing a screening system to search for functional materials, and by screening regional biomass such as oceanic biomass. The target group shows potential in combating ischemic heart failure, stress, pain, sleeping disorders, arteriosclerosis, diabetes, high blood pressure, and dementia.

2. Development of retrieval and application technology for functional material derived from oceanic biomass

We developed the component technology required to screen the active ingredients of known functional ingredients in oceanic biomass, and technology that is highly effective in separating and purifying plutonium. Moreover, we developed a revolutionary production process to prepare novel phosphatidylserine molecules containing DHA.

Development of Application Technology for Marine Biomass to Improve QOL in the Elderly



Theme 2 Development of collection and utilization technology for functional material separated from marine biomass

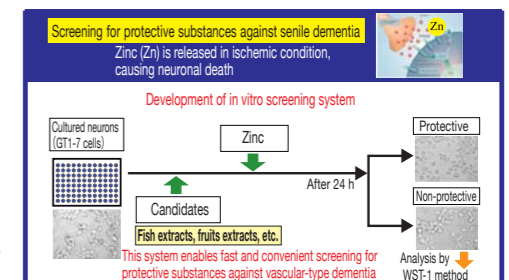
Main Results of City Area Program

1. Development of new functional foods for disease prevention in the elderly

- We established a primary evaluation system concerning seven areas of physiological activity. We established a system that extended from the collection of various fish and shellfish resources to the preparation and supply of samples for primary evaluation.
- The first screening revealed that seven fish-stock samples were active.
- Carnosine was found to be an active component in the search process of material that contributes to combating dementia, piercing pain, and insomnia.

2. Development of the technology required to recover and apply functional materials derived from oceanic biomass

- We developed a method of preparing chelating resin by immobilizing transition metal ions for the selective collection of carnosine in highly saline solutions.
- Fatty acids such as DHA in the culture of Chlorella were incorporated into the cellular phospholipids fraction. The phospholipids in Euglena cells were converted to phosphatidylserine by phospholipase D, enabling control of the acylmoieties of phosphatidylserine molecules.



Preparation of chelating resin by immobilizing transition metal ions