●Basic Stage

(Fiscal Year 2007–2009)

Akita Prefecture Central Area

Support for both the mind and body of the middle-aged and elderly
Development of rice-based foods and formation of a food industry cluster

The Akita Center To Implement Vigorous Enterprises (ACTIVE)
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Life Sciences

IT

Environment

Nanotech Materials

Others

Framework for Project Promotion

Project Director·················Takashi Aoyagi
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Science and Technology Coordinator···Takashi Aoyagi
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Core Research Organizations

Akita Research Institute for Food and Brewing
Research Institute for Brain and Blood Vessels Akita
Faculty of Medicine, Akita University
Faculty of Engineering and Resource Science, Akita University
Faculty of Bioresource Sciences, Akita Prefectural University
Graduate School of Agricultural Science, Faculty of Agriculture,
Tohoku University

Major Participating Research Organizations

Industry···AWAJI Seihun Co., Ltd., Akita Jujo Chemicals Co., Ltd., AKITA New Bio Farm Co., Ltd.,
SAKAMOTO. BIO Co., Ltd.,SHIKISAI Co., Ltd., my way (Ando's GOLDEN FOODS JAPAN)
YAMADA FOODS Co., Ltd., R I N K A I Food Cooperation Union,
AKITA SHURUI SEIZOH Co., Ltd., AKITA SEISYU Co., Ltd., AKITA MEIJOU Co., Ltd.,
KODAMA JOZO Co., Ltd., HINOMARU JOZO Co., Ltd.,
Akita Headquarters National Federation of Agricultural Co-operative Associations,
FUJI CHEMICAL INDUSTRY Co., Ltd., Akita KONNO Co., Ltd.,
KURIKOMA FOODS Co., Ltd., LOTTE Co., Ltd. MIYAGI HOKEN KIKAKU Co., Ltd.

Academia···Akita Prefectural University, TOHOKU University
Akita Municipal College of Arts and Crafts

Government···Akita Research Institute of Food and Brewing
Research Institute for Brain and Blood Vessels Akita
Akita Research Center for Public Health and Environment

Aims of Project

In this project, we aim to utilize abundant farm products (mainly rice) in food production (e.g., the brewing industry and fermented foods) and to promote and stimulate the food industry in the Central Area of Akita Prefecture, which has a long tradition of food production and significant accumulated technical know-how.
Moreover, we aim to develop a food industry cluster, and develop model rice-based foods for a long-living society—foods that support the physical and mental health of the elderly, and that will be distributed throughout the entire country.
With aging, humans generally experience a loss of "digestive abilities via absorption," "deglutition-related mastication ability," "sense of taste," and "sense of smell." Therefore, the contents of everyday meals become unbalanced, resulting in impaired health due to a lack of essential nutrients.
In this project, we seek to establish a health-related industry by developing food designed such that "nourishment," a "feeling of chewing," and "physiology" contribute to the health of the elderly. As a result, we will contribute to the realization of a healthy and long-living society, which will benefit citizens within Akita Prefecture.

Contents of Project

1. Development of new evaluation methods for foods by real-time electroencephalogram measurements and research into the activation of brain function by chewing
   In this project, we intend to measure electroencephalograms from the moment foods are eaten to evaluate the feeling of chewing or taste of foods for elderly people from the consumer's viewpoint.
   We will also develop a new evaluation method for foods that can objectively assess the satisfaction or feeling of healing that occurs when food is consumed.
   Research will also target the chewing action in terms of the activation of brain functioning, with the aim of developing foods effective in the prevention of dementia.

2. Development of foods and alcoholic beverages effective in maintaining the physical and mental health of the middle-aged and elderly
   It is an important challenge for both individuals and the wider society to prevent lifestyle-related disease in the elderly generation.
   We aim to develop foods and alcoholic beverages that complement the nourishment provided by food and that are appropriate for the chewing abilities of the middle-aged and elderly. Such foods and alcoholic beverages will also have physiological functions that might contribute to good health.

3. Development of grain-based foods for specific health uses
   We shall search for food with a composition that acts against corpulence, and assess the positive effects of such food. We will investigate the ability of ingredients within fermented soybeans to normalize blood pressure, and identify related ingredients. We will also search for physiological synergism between various food ingredients, and investigate their functions. Based on these results, we aim to acquire official authorization to market the foods for specific health uses.

Main Results

1. Development of new evaluation methods for foods by real-time electroencephalogram measurements and research into the activation of brain function by chewing
   We developed methods of measuring brain waves and brain blood flow in humans. We confirmed that brain wave data (termed "event-related potential") are effective in evaluating the appearance of food. We observed and recorded blood flow changes at the brain surface in response to chewing action. We introduced a multi-point sensing method to quantify the sense detected by an oral cavity during chewing.

2. Development of foods and alcoholic beverages effective in maintaining the mental and physical health of the middle-aged and elderly
   We developed fermented soybeans rich in GABA and developed a system of meeting customized tofu orders, making it possible to service rest homes.
   We designed foods for elderly people based on rice, flour, and sailfin sandfish, and undertook trial production.
   We developed a brightly colored sweetening material that enables us to use colored rice was a raw material.
   We also investigated the physiology of secondary materials generated during the production of alcoholic beverages.

3. Development of grain-based foods for specific health uses
   In our wide-ranging search for products with physiological functions, we found the effects of anti-oxidation activation in Kabanoanatake (a type of mushroom) and anti-corpulence in Yamabushitake (a type of mushroom).
   Based on animal experiments, we confirmed the effects of Yamabushitake in weight reduction, reduced fat around internal organs, and reduced blood cholesterol.
   We identified the ingredients in soy beans effective against high blood pressure, and analyzed the chemical structure of related ingredients.

Approaches in Akita Prefecture Central Area (Fiscal Year 2007～2009)

The formation Foods industry cluster which regards rice as the core

The Akita Center To Implement Vigorous Enterprises

Industry
Food-related companies
Bio-related companies
Akita Headquarters National Federation of Agricultural Co-operative Associations

Academia
Akita University
Akita Prefecutural University
TOHOKU University,and more

Government
Akita Research Institute of Food and Brewing
Research Institute for Brain and Blood Vessels Akita

Research themes▼

Development of new valuation-methods for foods by measurement of Brain waves

Development of foods and alcoholic beverages to support the health of both mind and body of the middle-elderly people

Development of foods for specified health use with grains as the base

Realization of the health and the long lived society by foods