Life Sciences

●Basic Stage

(Fiscal Year 2002-2004)

Kagoshima City Area

Function Verification of Local Agriculture and Livestock Products and its Application to Safe and Healthy Food

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Core Research Organization

Kagoshima University

Major Participating Research Organizations

Industry…NIHON STARCH CO.,LTD., BioMedical Technology Hybrid, Ltd., Satsuma Shuzo Co., Ltd., SHIN NIPPON BIOMEDICAL LABORATORIES, LTD., SNOW BRAND MILK PRODUCTS CO., LTD
Academia…Kagoshima University
Government…Kagoshima Prefectural Institute of Industrial Technology

Typical result of City Area Program

1. Development of functional food that secures safety of human life

1,5-Anhydrofructose (1,5-AF), produced by the action of algal enzyme on starch, was effective to inhibit the growth of several food-poisoning germs that pose food-safety hazard and threaten human health. Many promising anti-bacterial peptides of plants origin were identified. Some of them were successfully produced by certain microorganisms through genetic engineering. The researches have clarified that a number of oligosaccharides and peptides, that were prepared in this project, act as antimicrobial agent. Therefore, the use of these materials in a certain combination are proposed as alternative antibiotics, which valuable for the safety of our foods and livestock fodder.

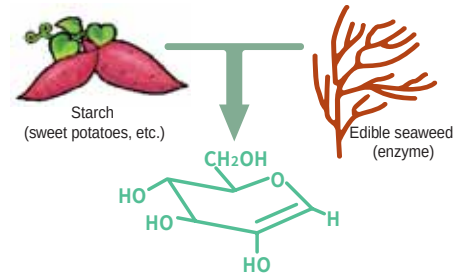
2. Development functional food that aims at control of lifestyle diseases.

1,5-AF was found to promote insulin secretion, lower the level of blood sugar in human and rat, and inhibit the aggregation of platelet. Thus it was perceived to be effective to control the lifestyle disease. Ascopyrone P (APP), a novel derivative of 1,5-AF, was found to have a new physiological activity on the control of cell cycle and an antitumor activity.

3. Development of industrial process for 1,5-AF production.

The industrial processes for the production of 1,5-AF (40-90% purity) and for the powdering of 1,5-AF solution were established. APP was extracted from 1,5-AF by heating and processed to attain 90% purity. The partially purified APP was found to be a material of high functionality because it was antioxidative effective as vitamin C and act as an antimicrobial agent.

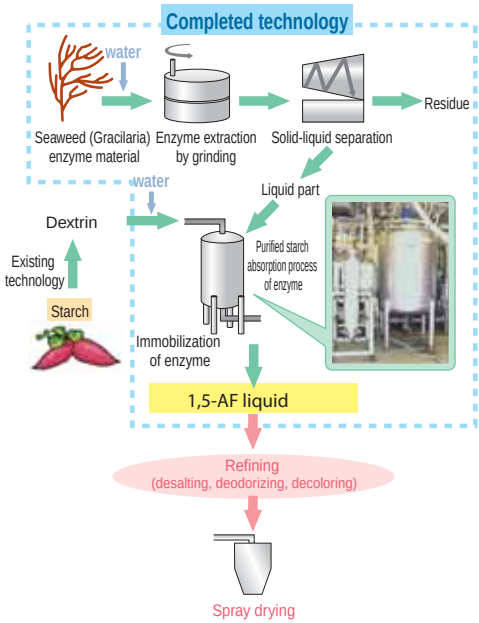
Overview of 1,5-anhydrofructose



1,5-anhydrofructose (1,5-AF)

Multi-functional materials
antibacterial, antioxidative, health promotion effect

Development of production technology



About the approach after the project

Production of a safe and secure anti-bacterial agent.

Since the proposal for the production 1,5-AF as a safe and secure anti-bacterial agent was adopted as one of the Regional Consortium Research and Development Project by the Ministry of Economy, Trade and Industry, the research of those researches continues. The production of 1,5-AF has been practically industrialized and the sugar has been proven to be applicable to many area of food industry so that an efficient process for APP production by heating has been developed. The researchers will continue to work on application of 1,5-AF and APP for the specified health food and medicine in order to make the best use of its functionality.

To commercialize 1,5-AF