

“Food Safety and Reliability Project”

(Assessment of Food Functions and Safety by Nutrigenomics, i.e., Comprehensive analysis of a series of genomes induced by food ingestion and food allergy)



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Investigation period: 2008-2011.

KAST and Kanagawa Prefectural Government are working together to meet regional challenges by providing financial assistance, transferring environmental protection technologies and engaging in joint projects and other cooperative efforts.

Currently, food producers' and consumers' interests in food are increasing. It is quite obvious that nutrigenomics requirements for “Food Safety and Reliability” have been growing steadily. However, its evaluation by producers themselves has not been well developed yet. There are some cases where scientific uncertainty remains. Thus it is strongly hoped that a fully reliable assessment system with scientific support would be established in a short time.

Concurrently, there has been a recent rise in food allergies that requires nutrigenomics to identify the symptoms and how they can be treated.

In order to meet these needs, we started this project under the science and technology policy of Kanagawa Pref. Government, which has pledged to contribute to ~~for~~ our life, society and safety dietary habits in science.

This project has two main objectives. One is assessment of food functionality and safety evaluation, and another is analysis and prevention of food allergies. To establish an evaluation system for food functionality and reliability, nutrigenomics will develop a database based on scientific evidence that can be accessed by industries in Kanagawa Prefecture. In addition, we would like to continue contributing to this project “Food Safety and Reliability” for promoting the development for agricultural crops and food which are distinctive in Kanagawa.

Research Content

Subject 1: Assessment of Food Functions and Safety by Nutrigenomics

Nutrigenomics is coined from nutrition and genomics, which is the study of the comprehensive analysis of variability of gene cluster occurring by food ingestion.

This study aims to formulate the procedure for assessment of food functions based on nutrigenomics. Specifically, we are aiming to explore certain biomarkers evaluating various kinds of food material functionalities and their consumption effects (effects by excess or deficiency of ingestion). Based on this result, we would establish rating a system based on bioinformatics using transcriptomics (genetic level mapping). Using this process of study, we would like to conduct the rating evaluation by proteomics (protein level mapping). At this phase, observational studies by nutrigenomics will be conducted by some blood samples from rats and mice. These results ensure our success to be able to create the assessment method of nutrigenomics by blood from human.

Subject 2: Analysis and Prevention of Food Allergies

Food allergy has various responses caused by an allergen during food consumption. Although food allergy symptoms vary from person to person, there are special cases where proper medical attention is required.

In this study, utilizing the food allergen as a useful marker, we can aim at establishing an assessment for evaluation system and a method of consistent food allergen controlling system in a distribution channel. Specifically, we will try to establish a creation of systematic method, a cultivating method that is able to control and deduct food allergens, a technology with extra-sensitive detection system for food allergens that can be used for evaluation and analysis and a food allergen assessment system utilizing proteome. Moreover, to expand those creations to prophylaxis and medical treatment, we aim to deducte allergens of farm and marine products and make good use of those technologies to develop an effective medical treatment.