

Importance of Skeletal Muscle for Supporting Healthy Longevity and the Effects of Food Ingredients

SHINJI MIURA, Ph.D.

Professor

School of Food and Nutritional Sciences

University of Shizuoka

<Summary>

As a health problem specific to super aging societies, "Locomotive Syndrome (LOCOMO)" which attenuates skeletal muscle function has been attracting attention. Since both muscle endurance improvement and muscle mass increase are necessary for muscle function maintenance, exercise training and proper nutrient intake have long been considered important. However, treatment methods currently recommended to counter muscle function decline are often insufficient in effect, execution is often impossible, and since there is no drug based therapy available, prevention of muscle function decline has not yet been achieved. Food ingredients that improve skeletal muscle function are expected to become widely available and accepted for health maintenance, but there are not many products currently on the market for LOCOMO. The authors are conducting a survey of compounds and food ingredients useful for maintenance and promotion of skeletal muscle function based on research on the effects on skeletal muscle of exercise training vs inactivity and the underlying molecular mechanisms. In this article, we introduce ingredients that are currently on the market for LOCOMO and explain the novel ingredients that are regarded as promising against LOCOMO, an area which has been drawing attention in recently. In addition, we will also introduce our research and future prospects. With the Tokyo Olympic Games in two years, Japanese food has gained attention in foreign markets. Opportunities to appeal food ingredients effective against LOCOMO as healthy longevity products from Japan will undoubtedly grow.

Improvement of Arterial Stiffness by Exercise and Nutrition

MOTOYUKI IEMITSU
Faculty of Sport and HealthScience,
Ritsumeikan University

<Summary>

Cardiovascular diseases (heart and cerebrovascular diseases) are among the leading causes of death around the world. Prevention and improvement of cardiovascular diseases are important medical topics because arterial stiffness increases with advanced age. It is well known that regular aerobic exercise (jogging and bicycling) enhances and improves arterial function, leading to reduced arterial stiffness. In addition to the effects of aerobic training, higher daily physical activity reduces arterial stiffness. Furthermore, in recent years, the possibility of reducing arterial stiffness by stretching exercises has been shown. Vasodilators secreted from endothelial cells are involved in mechanisms resulting in reduced arterial stiffness following exercise. Additionally, in recent years, the combined effect of exercise and tailored nutrition show greater reductions in arterial stiffness, in which the effects of lactotripeptide, curcumin, chlorella, etc. have been shown. Thus, it is reasonable to expect future scientific evidence and studies to clarify the beneficial effects of exercise and nutrition on preventing or reducing arterial stiffness.

Oils and Gut Bacteria for the Control of Wellness and Diseases

KOJI HOSOMI¹ and JUN KUNISAWA¹⁻⁴

1 Laboratory of Vaccine Materials, Center for Vaccine and Adjuvant Research and Laboratory of Gut Environmental System, National Institutes of Biomedical Innovation, Health and Nutrition (NIBIOHN)

2 International Research and Development Center for Mucosal Vaccines, The Institute of Medical Science, The University of Tokyo

3 Graduate School of Medicine, Graduate School of Pharmaceutical Sciences, Graduate School of Dentistry, Osaka University

4 Department of Microbiology and Immunology, Kobe University Graduate School of Medicine

<Summary>

Intestinal immunity has a specialized immune system in which the active immune responses to eliminate pathogenic microorganisms and the immunological tolerance to such as food components and commensal microorganisms coexist. Collapse of the balance of active and regulatory immune responses increases a risk of infectious diseases and immunological diseases such as allergy and enteritis. Therefore, the maintenance of the immunological homeostasis is important in intestine to maintain the health. It is known that intestinal immunity is functionally affected by food components and intestinal bacteria. We focus on lipids that are ingested from a diet and examine the effects of fatty acids in the dietary oils on intestinal immunity and diseases. We found that linseed oil, which contains a lot of an omega 3 α -linolenic acid, could inhibit the onset of diarrhea caused by food allergy.

Metabolome analysis revealed that, among metabolites derived from of α -linolenic acid, 17,18-EpETE, an epoxidated EPA, is an execution molecule that could inhibit intestinal allergy. In addition to food allergy, administration of synthetic 17,18-EpETE inhibited contact hypersensitivity. These findings suggest that 17,18-EpETE can be applied to drug discovery. As another example, palmitic acid, which is contained in palm oil, and its metabolites, sphingolipids, enhanced the production of IgA antibodies in the intestine. Thus, fatty acids and their metabolites play an important role in the regulation of immunosurveillance in the intestine. Recently, it has been shown that dietary fatty acids are converted to biologically active metabolites by not only endogenous enzymes but also gut microbiota. In the future, studies for the mechanism for regulation of intestinal immunity by food components together with the effects of gut microbiota will advance the comprehensive understanding of relations among foods, gut microbiota, and host, leading to the application to prevent disease and promote our health.

Diet for Extending Healthy Life Expectancy

KAYO KUROTANI, Ph.D.

*Department of Nutritional Epidemiology and Shokuiku
National Institute of Health and Nutrition
National Institutes of Biomedical Innovation, Health
and Nutrition*

<Summary>

The evidence has shown that diet plays an important role in extending healthy life expectancy. The Global Burden of Disease Study 2013 showed that dietary factors including low intakes of vegetables, fruits, and whole grains and extreme intakes of red meat, sodium, and sugar-sweetened beverages result in a 21% higher risk of mortality in the world. In order to maintain or enhance health, each country has dietary guidelines. In Japan, the “Japanese Food Guide Spinning Top” was formulated based on “Dietary Guidelines for Japanese”. The Japanese Food Guide is a chart designed for the general public that indicates the recommended daily servings for some food groups with illustrations featuring examples of foods and dishes to meet these recommendations. Recently, several studies have supported the usefulness of the Japanese Food Guide. For example, closer adherence to the Food Guide was associated with lower risk of mortality, as well as lower probability of metabolic risk factors and depressive symptoms. Similarly, meta-analyses have shown that the Healthy Eating Index (HEI), the Alternative Healthy Eating Index (AHEI), and Dietary Approaches to Stop Hypertension (DASH), as well as the Mediterranean diet were associated with a lower risk of mortality. Thus, there are likely many diets which lead to extension of healthy life expectancy, not be one. Firstly, we need to clarify what health means for each target population. We will examine the association between the “health” and diet so that we can clarify what diet might lead to longer healthy life expectancy. In pursuit of a healthy diet suited to Japanese people, more research on the definition of “Japanese food” and its relation to health is necessary.

Why Do We “Still” Need Animal Experiments for the Assurance of the Safety of Food and the Other Chemicals?

DAI NAKAE, M.D., D.M.Sc.

Professor

Laboratory of Food Safety Assessment Science

Department of Nutritional Science and Food

Safety Faculty of Applied Biosciences Tokyo

University of Agriculture

<Summary>

The first stage of the risk analysis of food and the other chemicals is to elucidate what their adverse effects are, and how they occur. This is the risk assessment, in which toxicity tests, especially in vivo tests using living animals, play major parts. Recently, however, there is a growing trend to be opposed to conduct animal experiments. The action of EU on the risk assessment of chemicals in the field of cosmetics made a big impact on those of the other fields, and efforts have started to seek a way to assess risks of chemicals without using animal experiments also in the field of foods. Nevertheless, it is currently impossible and unrealistic to exclude animal experiments from the risk assessment of chemicals. In this context, the present article describes why we “still ” need animal experiments for the assurance of the safety of food and the other chemicals.

I< Research Institute of ILSI Japan Members >

The Research and Development of the Yamazaki Baking Group:
Leading the Food Market in the 21st Century and Challenging
Cultural Creation

SHIGETAKA INOUE, Ph.D.
Assistant General Manager
Applied Technology Development Section,
Management Section
Central Laboratory
Yamazaki Baking Co., Ltd.

<Summary>

In the Central Laboratory of Yamazaki Baking Group, according to the spirit of the Yamazaki “Making an appeal to consumer the products and the services with high quality, reasonable price and customer-oriented spirit ” , we are working on research and development activities in order to sow the seeds lead to create a new value and a new demand, and subsequently, to drive the force of the group's further growth and development.

A couple of years ago, the Central Laboratory moved the space, where the Yamazaki was established in 1948, in Ichikawa City, Chiba Prefecture from Tokyo downtown area by the reason of both the diversification and the advancement of research contents.

In the new Central Laboratory, as a new section, the functional food technology development and research section was established for the purpose of strengthening not only the development of the functional foods but the nursing care and the hospital food for aging. And also, the applied microbiology laboratory, which belonged to the other departments so far, was integrated for strengthening the research related to food technology. As mentioned above, we have installed a research system including the technological development leading to further the improvement of product quality as well as the analysis investigation to cope quickly with the problems and troubles accompanied by food safety and security. Additionally, for the Group companies, we have installed the facilities and the equipment to conduct the research and the development such as confectionery, rice snack, cooked rice and noodles. The staff room is provided in a large room system there is no partition for communication among researchers. We are working to establish the basic technologies of the group in cooperation with the production departments and the related department.

Report on the Symposium “Integrated Achievement of Functional Food Science and Its New Breath ” Organized by the ILSI Japan- Endowed Chair of Functional Food Genomics

SHINJI OKADA, Ph.D.

Associate Professor

*ILSI Japan-Endowed Chair of Functional Food Science and Nutrigenomics,
Graduate School of Agricultural and Life Sciences, The University of Tokyo*

<Summary>

The symposium “Integrated achievement of functional food science and its new breath ” was held at the University of Tokyo Yayoi Auditorium on September 18, 2018. In this symposium, the activities and achievements of the ILSI Japan-Endowed Chair of Functional Food Science and Nutrigenomics in the University of Tokyo for 15 years were presented. The future outlooks about the researches on functional foods were also presented.

The symposium focused on the importance of the past activities and accomplishments of the ILSI Japan-endowed chair. The future expansions of functional foods researches were also discussed.

< Friends in ILSI >

Report of the 10th BeSeTo Meeting, Taipei

KEISUKE NAMEKAWA

*Manager,
Regulatory Affairs Unit,
Hayashibara Co., Ltd.*

NATSUKI MATSUYAMA

*Life & Healthcare Products Department
Global Regulatory & Pharmaceutical Affairs Office
NAGASE&CO.,LTD.*

<Summary>

The 10th ILSI BeSeTo Meeting, was held on September 13th - 14th, 2018 at Howard Plaza Hotel Taipei. Past 9 years, ILSI Focal Point in China, ILSI Korea and ILSI Japan hosted the meetings in a sequence, this time ILSI Taiwan kindly hosted this 10th special meeting. In addition to those four entities, participants include staffs and member representatives of ILSI Global, ILSI Southeast Asia Region, and officials from Food and Drug Administration, MOHW, Taiwan.

Before the meeting, a half-day Mini-Symposium on Practical Implementation of Food Microbiological Criteria by Regulatory Authorities was organized by ILSI Taiwan. The meeting includes the sessions about food safety issues, regulation updates, and ILSI member collaboration. All the participants appreciated the well-organized venue and schedule, and warm hospitality ILSI Taiwan provided.