

Japan-EU Economic Partnership Agreement: Sanitary and Phytosanitary Measures and Food Safety Aspects

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<Summary>

This article is based on a presentation given during IFIA 2018 exhibition on 17 May 2018 in Tokyo. While the focus of the presentation was on the food safety issues pertaining to the EU-Japan Economic and Partnership Agreement ('EPA') signed by the EU and Japan on 17 July 2018 and effective since 1 February 2019, this article outlines the scope of sanitary and phytosanitary ('SPS') measures foreseen in the EPA, of which food safety represents one important component.

Action of Fatty Acid Esters on Thermophilic Anaerobic Spore-forming Bacteria *Moorella thermoacetica* Spores

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<Summary>

Spores of thermophilic anaerobic spore-forming bacteria are highly heat resistant. They are causal bacteria in low-acid beverages, warmed and sold, such as canned milk coffee. Among these, *Moorella thermoacetica* spores are extremely highly heat resistant. Therefore it is difficult to control them only by heat treatment. Fatty acid esters are effective in preventing the growth of this bacterium. At present, there is a very low risk of spoilage by this bacterium. The mechanism of action of fatty acid esters on this bacterial spore is unknown. In this report, the results of research by the authors on the mechanism are explained along with the course of research.

Fatty acid esters did not affect dormant spores and did not affect germination of the spores. Transmission electron microscopy observation revealed that they acted on spores after germination, causing defects in a part of the spore inner membrane, resulting in leaked core contents. Analysis by fluorescence microscopy and flow cytometry using fluorescence labeled fatty acid esters revealed that fatty acid esters bound to the inner membrane of germinated spores. Binding in a certain amount of fatty acid esters damaged the membrane and killed the spores. Death of the spores did not result when fatty acid esters were present at the time of heat treatment. Heat damaged spores displayed delayed onset of growth. The coat and cortex of the spores were deformed and damaged.

Evidence of Physical Activity Guideline (Active Guide) for Health Promotion

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<Summary>

The Ministry of Health, Labor and Welfare had started the "National Health Promotion Movement in the 21st Century 2nd edition" which is called "Health Japan 21 (2nd edition)" from April 2013. In the "Physical activity and exercise" section in Health Japan 21 (2nd edition), there are 3 targets such as increasing daily steps, increasing the number of people who have an exercise habit, and increasing municipalities which engage in community development and environmental improvement to make it easy to do physical activity. Moreover, the Ministry of Health, Labor and Welfare had presented the "Physical Activity Reference 2013 for health promotion" and the "Physical Activity Guideline (Active Guide)" in order to assist Health 21 (2nd edition) in March 2013.

The Active Guide based on "physical activity reference 2013" introduced "+10 (Plus Ten)" as a catchword for encouraging daily physical activity. Plus Ten involves 10 minutes of increasing daily physical activity, especially walking. Several epidemiological studies scientifically supported the words of "+10 (Plus Ten)" for prevention of non-communicable diseases. Moreover, the Active Guide recommended over 60 minutes of moderate physical activity, such as walking every day and vigorous exercise 60 minutes per week for people aged 18 to 64. Furthermore, it recommended 40 minutes of light physical activity, such as standing, walking, or housework every day for people over 65 years of age.

We hope these evidence-based physical activity guidelines will contribute to increasing healthy life expectancy.

Physical Activity and Diet for Brain Function

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<Summary>

including dementia and depression. To understand the underlying mechanisms of exercise-induced improvement in brain function, most of the studies so far have focused on the aspects of neuronal plasticity; however, we highlight the fact that exercise can improve cerebrovascular plasticity as well. This point of view would be important to further understand the mechanisms how diet improves brain function, and to examine whether exercise and diet confer synergistic effect and their interaction. In the latter parts, we refer to the difference between exercise and physical activity, then, underscore physical inactivity as a risk factor for brain function. As for future perspective, because diet can affect physical activity of rodents, we propose a new hypothesis that diet affects brain function through changes in the amount of physical activity.

Knowledge of Gut Microbiota for a Healthy Lifestyle

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<Summary>

It has been reported that interactions between host and gut microbiota can strongly influence human health and various diseases. Here, this review aims to summarize the relationship between the several diseases, including lifestyle diseases, and the gut microbiota, and then discuss the point of contact between lifestyle (exercise, nutrition and stress) and gut microbiota. The ratio of Firmicutes to Bacteroidetes (F/B ratio) might be associated with obesity. Both type 2 diabetes and hypertension may be shown to be regulated by the inflammation of the intestinal tract and gut microbiota-induced short chain fatty acids. Also, it seems that trimethylamine (TMA)-producing microbiota are involved in arteriosclerotic cardiovascular disease. The same might be true for the influence of gut microbiota on several cancers and psychiatric disorders. Relationships between lifestyle (such as exercise, nutrition, stress) and gut microbiota are becoming clear more and more.

Ectopic Fat and Insulin Resistance

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<Summary>

Insulin resistance plays an important role in the pathogenesis of metabolic syndrome and type 2 diabetes. Recent data suggest that ectopic fat accumulation in muscle and liver induces insulin resistance in these organs, independent of obesity. For example, 3 days high fat diet increased intramyocellular lipid (IMCL) level and impaired insulin sensitivity. In contrast, 2 weeks exercise therapy decreased IMCL and improved insulin sensitivity in type 2 diabetes. Interestingly, IMCL level in endurance runners is elevated despite their insulin sensitivity is high. This phenomenon is so called “athlete paradox”. We found that difference in fatty acid transporter in skeletal muscle is associated with this phenomenon. Finally, I addressed the association between fatty liver and insulin resistance in muscle.

Development of Microbiological Quality Control Methods in Unpasteurized Beer Production

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<Summary>

Unpasteurized beer is the dominant market segment in Japan. This situation is in sharp contrast to that of other countries where most beer products are pasteurized. The stable production of unpasteurized beer is difficult because the strict microbiological control is required in breweries. In particular, beer spoilage microorganisms are hard to detect by conventional microbiological quality control (QC) tests adopted by the brewing industry. It is therefore essentially important to develop comprehensive and reliable QC tests to eliminate beer spoilage microorganisms latent in breweries. The Japanese brewers have strived to develop microbiological QC media and discriminative methods for beer spoilage ability of detected microorganisms. In this paper, the Japanese technologies that allow the stable production of unpasteurized beer will be explained.

Organ-on-a-chip Microdevices for Drug Efficacy and Toxicity Testing

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<Summary>

There is a large gap between conventional 2D cell cultures and inside the body where cells reside in 3D microenvironments that are dynamically fed by blood vessels and are comprised of a complex set of cellular, chemical, and physical cues. This physiological gap raises various challenges in basic cell biology, drug testing, and cellular therapeutics because cells in traditional dish cultures respond very differently than in the body. Recent advances in microsystems technology and tissue engineering have led to the development of biomimetic microdevices to model key functional units of organs, known as organ-on-a-chip. By mimicking natural tissue architecture and microenvironmental chemical and physical signals within microfluidic devices, this technology realizes organ-level functionality in vitro that cannot be recapitulated with conventional culture methods. Since the physiological microenvironments in living systems are mostly microfluidic in nature, microfluidic systems facilitate engineering of cellular microenvironments. Microfluidic systems allow for control of local chemical gradients and dynamic mechanical forces, which play important roles in organ development and function. This organ-on-a-chip technology has great potential to facilitate drug discovery and development, to model human physiology and disease, to model pharmacokinetics and pharmacodynamics, and to replace animal models for efficacy and toxicity testing. Here, I describe an overview of the organ-on-a-chip technology to recapitulate cellular microenvironments and especially focus on engineering of bone marrow-on-a-chip to recapitulate a functional hematopoietic niche as well as hematopoietic function as a novel type of approach to develop organ-on-a-chip.

< Research Institute of ILSI Japan Members >
Meiji Co., Ltd. “Meiji Innovation Center”

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R&D Total Oversight Department
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<Summary>

In November 2017, Meiji consolidated two research laboratories and integrated all R&D activities such as Product Development, Food Science Research, Production Technology Research and Food Quality Research to establish the “Meiji Innovation Center ” in Hachioji, Tokyo.

This innovation center will bring innovations and new value to customers, by developing new products with health benefits in the same way as the current probiotic yogurts and “Meiji Chocolate Kouka ” , in order to achieve further growth. At the Meiji Innovation Center, researchers with many different specialties work closely together to combine their unique expertise and transcend organizational boundaries. Meiji will fulfill its mission by continuing to create innovative products that are uniquely Meiji. In addition, Meiji Innovation Center will be a core for open innovation to accelerate R&D activities. Meiji will create a network with leading companies and research institutes at home and abroad including the Pasteur Institute in France. With Meiji ’s strength in “Dairy ” , “Lactic acid bacteria ” , “Cocoa ” and “Nutrition ” , this network will enhance their value creation and contribute to customers ’ healthy dietary lifestyle.

Report on the Symposium Committee on Nutrition and Foods for Special Dietary Uses

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<Summary>

The 40th Codex Committee on Nutrition and Foods for Special Dietary Use (CCNFSDU) was held in Berlin, Germany from 26 to 30 November 2018. The Committee agreed to the following matters.

(1) Matters for CAC42 adoption (step 5)

- Review of the Standard for Follow-up Formula (Agenda Item 4b)

The committee agreed to advance Scope, Product definition and Labelling of Section A (follow up formula for older infants) to Step 5 for adoption by CAC42.

(2) Matters of each agenda items (step 2/3/4)

- Review of the Standard for Follow-up Formula (Agenda Item 4a, 4b)

The committee agreed to:

i) Send the labelling provisions for Section A to CCFL45 for endorsement.

ii) Discuss product definition and labelling of Section B and the structure and preambles of the Standard(s) at CCNFSDU41.

iii) Re-establish the EWG to address the issue of sweetness of carbohydrates and to complete the remaining sections.

- Proposed Draft Guideline for Ready-to-Use Therapeutic Foods (Agenda Item 5)

The Committee agreed to re-establish an EWG to develop the section of Food additives and Proteins. The rest of the text was held at Step 4 for the consideration at CCNFSDU41.

- Proposed Draft Definition for Biofortification (Agenda Item 6)

The Committee agreed to hold this work at Step 4 and request CCFL to consider if the definition would meet their intended needs and to clarify the codex text which this definition would be best placed in.

- Discussion Paper on Claim for “Free ” of Trans Fatty Acids (Agenda Item 8)

The Committee agreed to suspend the discussion on the claim for “free ” of TFA, and the chair of EWG prepare a discussion paper about other possibilities for risk reduction of TFA for consideration at CCNFSDU41.

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(3) Others on the handling of the agenda

- Proposed Draft NRV-NCD for EPA and DHA Long Chain Omega-3 Fatty Acids (Agenda Item 7)

The Committee agreed to discontinue the work and inform CCEXEC77 and CAC42 accordingly.

- NRV-R for Older Infants and Young Children (Agenda Item 9)

The Committee agreed to re-establishing EWG to consider remaining recommendations, prioritization of nutrients and codex texts in which NRVs-R should be placed.

- Food Additives – Mechanism / Framework for Considering Technological Justification and Other Matters (Agenda Item 10)

The Committee agreed to establish PWG prior to CCNFSDU41 to consider the remaining matters about the Framework and to evaluate the technological need of xanthan gum, pectin and gellan gum.

- Discussion Paper on Harmonized Probiotic Guidelines for Use in Foods and Dietary Supplements (Agenda Item 11)

The Committee agreed to consider this item at its next session. Argentina will redraft the discussion paper.

- Discussion Paper on General Guidelines to Establish Nutritional Profiles (Agenda Item 12)

The Committee agreed that Costa Rica and Paraguay would research the different nutrient profile models which are already built or published, and develop the discussion paper for consideration by CCNFSDU41.

- Other Business and Future Work (Agenda Item 13)

i) Methods of analysis for provisions in the Standard for Infant Formula and Formulas for Special Medical Purposes Intended for Infants

The Committee agreed to submit the methods to CCMAS for review and endorsement, and request CCMAS to re-type or revoke the related existing methods.

ii) Prioritization mechanism to better manage the work of the Committee

The Committee agreed that the host country would prepare a paper summarizing already finished, ongoing and not going forward works as well as emerging new proposals of this committee for prioritization and long-term management of overall works.