

Nutrition Japan Public Private Platform (NJPPP) member organizations and businesses
(In chronological order)

Japan International Cooperation Agency (JICA), Japan External Trade Organization (JETRO), National Institutes of Biomedical Innovation, Health and Nutrition (NIBIOHN), The Japan Dietetic Association (JDA), Japan Food Industry Association (JFIA), Ajinomoto Co., Inc., Kikkoman Corporation, Sakata Seed Corporation, World Vision Japan (NPO), RESULTS Japan (NPO), Save the Children Japan, Meiji Co., Ltd., NISSIN FOODS HOLDINGS CO., LTD., RDB Consulting, International Life Sciences Institute Japan (ILSI Japan) (NPO), Japan International Research Center for Agricultural Sciences (JIRCAS), MORINAGA & CO., LTD., Otsuka Pharmaceutical Co., Ltd., NTC International Co., Ltd., Kumamoto Flour Milling Co., Ltd., The Japanese Society of Nutrition And Dietetics (NPO), Vitae Co., Ltd., Bioversity International, IC Net Limited, Hasegawa Farm Co., Ltd., FUJI OIL HOLDINGS INC., Yakult Honsha Co., Ltd., DSM Japan K.K., HOUSE FOODS GROUP INC., Social Compass, Price waterhouse Coopers Sustainability LLC, Kagome Co., Ltd., Japan Platform (NPO), MORINAGA MILK INDUSTRY CO., LTD., Izuhara Solutions, Uzushio Shokuhin, Seibu Nosan Vietnam Co., Ltd., Japan Association for International Collaboration of Agriculture and Forestry (JAICAF), Kaihatsu Management Consulting, Inc., Yuki Manufacturing, WELY Inc., Taiyo Kagaku, TWF Japan, Kao Corporation, Japan Health Food and Nutrition Food Association (JHNFA), NH Foods Ltd., Foundation for International Development Relief (FIDR), entomo protein Inc., BSR Japan, The Ajinomoto Foundation, SGS Japan Inc., Alliance Forum Foundation, SHARE (NGO), Bubblestar inc., MIYAKOKYUSHOKU Co., Ltd., Dentsu Inc., Sun Smile, Nichirei Corporation, Sasakawa Africa Association, World Industry Co., Ltd., Yukashikado Inc., Koei Research & Consulting Inc., BugMo Inc., Oriental Consultants Global Co., Ltd., Deloitte Touche Tohmatsu, Toyo Foods Co., Ltd., Ridgelinez Limited, MEGMILK SNOW BRAND Co., Ltd., MiL Inc., Sanyu Consultants Inc, Shinmei Co., Ltd., AMDA Multisectoral & Integrated Development Services, Tottori Resource Recycling, Inc., UN World Food Programme (WFP) Japan Relations Office, International Support and Partnership for Health (ISAPH), KENKO Mayonnaise Co., Ltd., Asahi Group Foods, Ltd., International FURIKAKE Association, SHIDAX CORPORATION, Ezaki Glico Co., Ltd., Food and Agriculture Organization of the United Nations (FAO), Liaison Office in Japan, Nikkeisha, Inc., NTT DATA INSTITUTE OF MANAGEMENT CONSULTING, Inc., UMITRON K. K., ecologie Inc., Hayashibara Co., Ltd., Obayashi Corporation, TOKYO8 GLOBAL, Inc., Taiyo Yuka Co., Ltd., Assentia Holdings, Inc., Foundation of Advanced Studies on International Development, Happy & Life88, Innocent Co., Kyoto Grain System Co., LTD., Nestlé Japan Ltd., Freeb Co. (fis for Personal Gym & Pilates), Japan Asian Association & Asian Friendship Society, International Child Nutrition Japan, Famleaf Co., Ltd., Personal Gym STREAM, Toyo Dental Office, NES Co., Ltd.

As of end of January 2024

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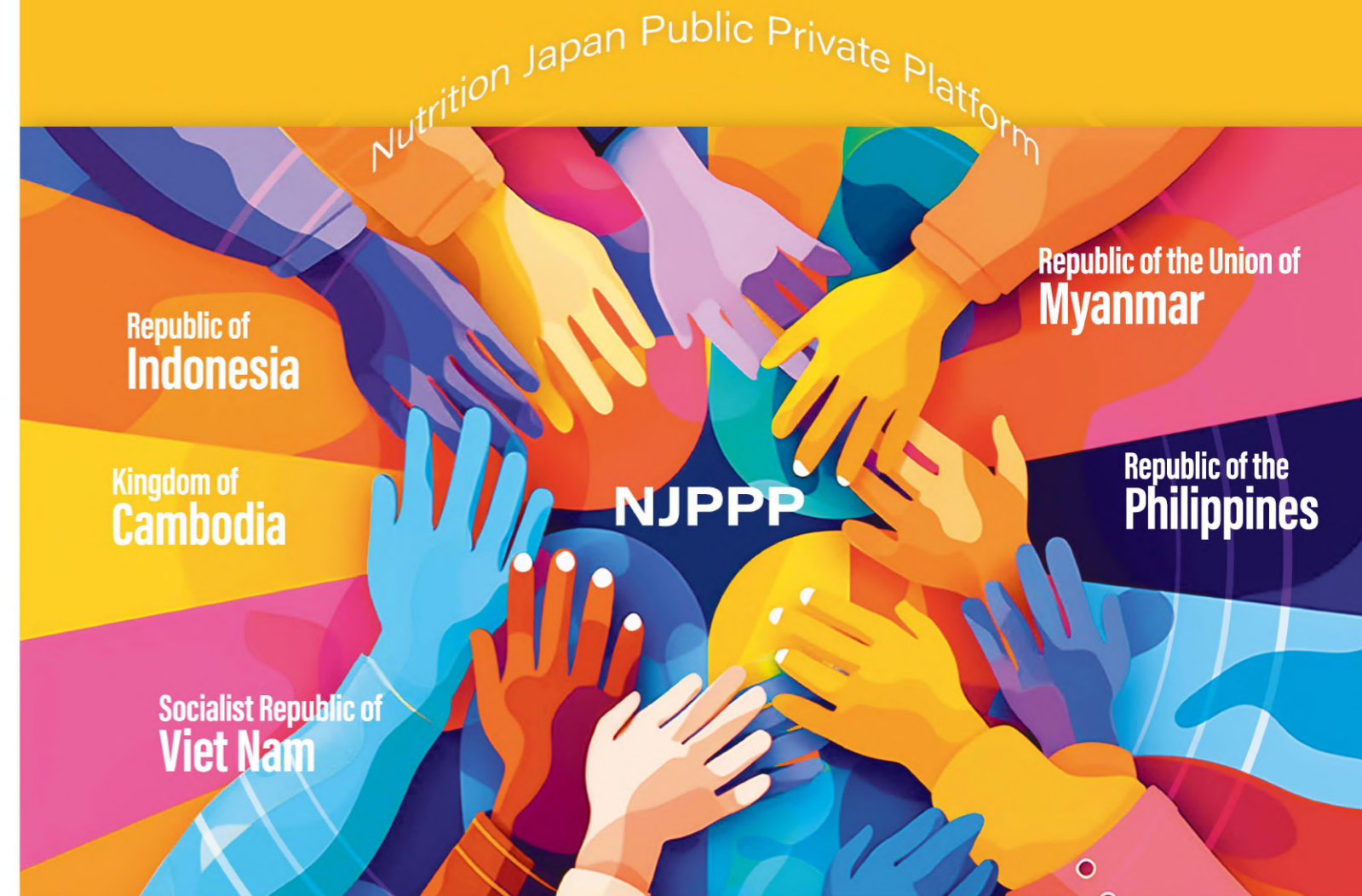
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Nutrition improvement in developing and emerging countries



Nutrition Japan Public Private Platform



Tokyo Nutrition for Growth (N4G) Summit 2021

The Tokyo Nutrition for Growth (N4G) Summit 2021 was held on December 7 and 8, 2021, hosted by the Government of Japan. This summit is an assembly of international initiatives to tackle nutrition improvement, which met for the third time since beginning with the London Olympics & Paralympics. Government and ministerial-level members from over 60 countries participated in this hybrid assembly, with overseas participants joining online. Representatives from the private sector, civil society, and academia, and heads of international organizations all gathered in heated discussion about efforts to improve nutrition.



High-level session from the Tokyo Nutrition for Growth Summit 2021

Results Overview of the Tokyo Nutrition for Growth (N4G) Summit and NJPPP's efforts

- At the summit, in addition to taking up the topic of the Double Burden of Malnutrition (undernutrition and overnutrition) for the first time, discussions focused on the five thematic areas of: (1) Health, (2) Food, (3) Resilience, (4) Accountability, and (5) Financing, with consideration for the worsened global nutrition situation due to COVID-19.
- The results of the discussions were published in the Tokyo Compact on Global Nutrition for Growth, thanks to the endorsement of 215 stakeholders comprised of 65 countries, 11 international organizations, 60 private sector companies, and 58 civil society members. It demonstrates the direction the global community needs to take in its efforts to affect nutrition improvement. NJPPP called out to member companies and organizations for endorsement for the compact.
- Further, 181 stakeholders including the governments of 66 countries, 26 private sector companies, and 51 civil society members delivered on 396 commitments (declarations of a variety of political and financial intentions), resulting in the announcement of over US\$27 billion in funding donated for nutrition related efforts. By promoting concrete actions from a large variety of stakeholders, we were able to give the global nutrition improvement initiative a significant lead. 13 companies and groups from NJPPP affiliates have pledged commitments.

SDGs in the last decade

There are many programs and initiatives underway all around the world designed to achieve the 2030 objectives of the United Nations Sustainable Development Goals (SDGs). The 17 SDGs include Zero Hunger (Goal 2) and Good Health and Well-being (Goal 3), and laid out 169 specific targets for achieving these objectives. Nutrition improvement programs are contributing toward at least 12 goals including, most importantly, Zero Hunger. The N4G Summit 2021 will facilitate and accelerate these efforts.

Tackling social issues while providing support for industry in developing and emerging countries

In years past, Japan experienced a period of malnutrition. We were able to overcome this through a combination of school lunch programs and nutrition awareness education campaigns, together with food development initiatives in private industry. Today, there are many countries and regions of the world that suffer from nutrition deficiencies or malnutrition, and this constitutes an urgent and pressing problem. NJPPP was launched in 2016 in response to healthcare policy to promote the overseas expansion of nutrition improvement projects via public-private partnerships.

Activities of the NJPPP

- Seminars, symposiums and discussion groups
- Field surveys and fact-finding studies in developing and emerging countries
- Project planning and implementation
- Collaboration with private industry, international organizations and academic and research institutes
- NJPPP website (including reports, updates and event information)
- Project consulting

Project background— workplace canteens as the start point

Overview

1 in 3 people worldwide suffer from some type of malnutrition (undernutrition, inadequate vitamins or minerals, overweight, obesity, and resulting diet-related-noncommunicable diseases).

The State of Food Security and Nutrition in the World 2023 estimates that in the current scenario, 600 million people will be chronically undernourished in 2030. On the other hand, according to WHO's "Fact Sheets", 39 million children under the age of 5, over 340 million people ages 5-19, and 1.9 billion people over age 18 are overweight or obese. The Nutrition Improvement In Workforce Nutrition has been shown to deliver substantial benefits to employers by improving the nutritional health and well-being of employees. Yet it has not been embraced at the global level.



Working with Japanese companies

The NJPPP began by working directly with Japanese companies in Asia on The Nutrition Improvement In Workforce Nutrition. Japanese companies traditionally take a keen interest in employee health and well-being. Accreditation of health management practices is becoming increasingly common in Japan, as a direct reflection of public expectations. So now is an ideal time for companies to consider ways to improve workplace meals. Several companies have already reported that meal programs have led to better relations with their employees, and have been asked to take part in research to validate their findings. NJPPP has identified a number of case studies in Southeast Asia and hopes to use the results to demonstrate effective approaches for improving nutrition levels.

Sustainable corporate activity

In addition to healthier employees, nutrition improvement programs offer benefits to employers such as reduced absenteeism and higher productivity levels. Provided that the benefits of higher productivity are seen to outweigh the cost of providing nutritional meals to employees, then this initiative should be enthusiastically adopted.

As well as delivering direct nutrition improvements in the workplace, the project has the added benefit of identifying fundamental obstacles to nutrition improvement that need to be addressed at the whole-of-population level. NJPPP works with private and public sector bodies to develop national strategies for tackling obstacles to nutrition improvement in developing countries, in order to maximize the benefits.



Recent NJPPP projects in Southeast Asia are described on the following pages.



Nutrition improvement through better workplace menus

Target group

Factory workers in Karawang International Industrial City (KIIC)

Background

Nutritional deficiencies have long been an issue in Indonesia. Excessive consumption of foods with a poor nutritional balance has led to a sharp increase in lifestyle diseases such as obesity and diabetes, in what is dubbed "the double burden of malnutrition" (see below). The Indonesian government, sensing the urgency of the problem, is committed to education and awareness programs centered around nutrition to encourage people (particularly in younger age groups) to adopt better dietary habits. Workplaces such as factories are seen as good starting points for programs designed to promote behavior change.

Methodology

- A comprehensive study of meals provided to workers at Japanese factories in Karawang International Industrial City was used as the basis for designing more nutritionally balanced offerings and planning workplace nutrition awareness and education campaigns.

Results

Several factories were keen to provide their workers with healthy, nutritionally balanced meals that would appeal to them, but only if it could be done for the same cost. Some of the catering companies that service the factories also expressed an interest in supplying healthy meals. Thus, it is important that both sides work together to this end.



Typical employee meals

The healthy meal on the left has plenty of vegetables, while the standard meal on the right has a lot of fried foods in it. Most workers apparently prefer the standard meal.

Double burden of malnutrition (DBM)

The double burden of malnutrition (DBM) refers to the existence of both undernutrition and overnutrition within the same country, place or organization. Sometimes these two states can even afflict the same individual at different points in their life. Many countries in Southeast Asia are now grappling with this problem following strong economic growth in recent years.

Nutrition improvement through workplace meals

Project partners

MIYAKOKYUSHOKU Co., Ltd., International Life Sciences Institute Japan (ILSI Japan) (NPO), IPB (Institut Pertanian Bogor) University

Target group

Workers at Japanese companies in Kota Deltamas industrial township

Background

Selected factories were inspected in November 2018. The inspections revealed that meals provided to workers were not nutritionally balanced, and also identified key health issues such as excessive weight levels and high blood pressure.

Methodology

- Nutritional meal offerings were designed in consultation with IPB University. Nutrition and diet training was also provided. The previous meals had a low vegetable content with many fried foods. The menu was redesigned to provide a more appropriate balance of fats, proteins and energy. Vegetable content was increased, with an emphasis on vegetables high in dietary fiber, while fried foods were limited to one serving per meal. A nine-point checklist for menu design was introduced.
- Educational measures were used to encourage workers to change their dietary habits. These included an easy-to-use checklist* for daily eating, designed to encourage diversity in food choices, as well as a smartphone app that provides important nutritional information.

* Indonesian version of the Take 10! Diet Checklist (see Page 8)

Timing

Since February 2019

Pilot project results and next stage

It would appear that the combination of healthier meal options and dietary education programs can be successful in influencing the dietary habits of workers, particularly with respect to diversity of food intake. The next stage involves collecting data to demonstrate that providing more healthy meal options and improving worker health and well-being can boost overall productivity.



Before (typical Indonesian food)



After (new healthy menu): wider variety of food types, more vegetables and dietary fiber, limit of one fried food per meal, introduction of dairy products



Workers enjoying their new healthy meals



Survey on the promotion of vegetable consumption and the popularization of healthy eating

Project partners

Obayashi Corporation, International Life Sciences Institute Japan (ILSI Japan) (NPO)
Meros Consulting, IPB(Institut Pertanian Bogor) University (Project 1)
PT. Equator Bumi Energi (Project 2)

Background

The low average consumption of vegetables is recognized as a challenge in Indonesia. (It is said that 95% of the population do not consume enough vegetables). The policy of the government of Indonesia is to improve the nutritional balance of children, young people and the working generation on whom economic growth depends, and to encourage the consumption of fruits and vegetables.

Project 1 Consumer survey on the promotion of vegetable consumption

Survey Objectives

The purpose of the survey was to examine and identify the situation with regard to the consumption of vegetables, the relationship between vegetable consumption and health, and the factors impeding an increase in the consumption of vegetables; to understand how vegetables/tomatoes are regarded in the diets of those in the high-income bracket and to learn what image this group has with regard to vegetables/tomatoes.

Target group

Ten women from the high-income bracket living in the three cities of Jakarta, Bandung and Surabaya with a relatively high level of health awareness, who purchase vegetables at least twice a week. (household expenditure in excess of 2.5 million IDR)

Methodology

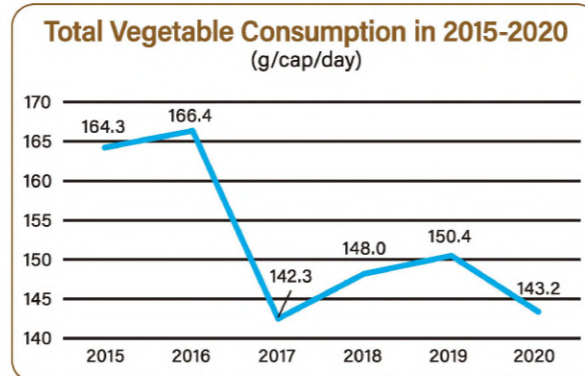
Interviews with the ten participants

Timing

February 11th to 16th, 2022

Findings of documentary research

The documentary research indicated that there is a need for nutritional education for mothers, nutritional literacy and menu proposals in schools; also, that support is needed for the establishment of an environment and methodologies enabling stable and regular access to vegetables, as well as support for the promotion of the consumption of nutritious foods.



Source: food Security Agency(MoA, 2021)



Results of Interviews

- (1) Most participants consumed vegetables once or twice a day.
- (2) Vegetables commonly consumed: greens, legumes, leafy vegetables, carrots, broccoli, potatoes, pumpkin, corn, tomatoes, cucumbers, etc.
- (3) The most common way to cook vegetables is in a stir-fry; water spinach stir-fry and *cap cai* (Indonesian vegetable stir-fry) are dishes that are most often eaten.
- (4) Raw vegetables account for 20% to 40% of all vegetables consumed. (Mainly cucumber, tomato, lettuce, etc.)
- (5) Most tomatoes consumed are large-size tomatoes. In the home they are processed into tomato juice or used to make *sambal* (a kind of sauce).
- (6) When buying vegetables, freshness takes precedence over taste. Value is placed on good color and appearance, and on organic vegetables.
- (7) Vegetables were an essential part of any meal, and participants considered that they were consuming enough.
- (8) Washing and peeling the vegetables before cooking them is considered time-consuming and bothersome.
- (9) There was a strong interest in new types of vegetable, cooking methods and recipes; information on the health merits, cooking kits, etc., provide motivation for vegetable consumption.

Project 2 Survey on popularization of healthy eating

Survey Objectives

In the 'Consumer survey on the promotion of vegetable consumption', it was suggested that nutritional improvement in Indonesia could be achieved through nutritional education for mothers and proposals for new menus and ways of cooking a variety of foodstuffs. While there is no psychological barrier to the consumption of vegetables among those who consume vegetables regularly, it became apparent that there was a desire to reduce the amount of time and effort needed and to have more satisfying recipes. On the basis of these findings, we looked into whether the provision of nutritionally balanced meal kits together with a nutrition education service would lead to an improvement in vegetable consumption, meal quality and nutritional balance.

Target group

Unmarried or married women aged between 25 and 35, living in Jakarta or Bandung

Methodology

- (1) Fact-finding survey on vegetable consumption, 470 participants : questionnaire survey
- (2) Identification of behavior change in 100 people
Details of implementation : Together with the meal kit product a nutrition education service was provided (Webinars providing knowledge on nutrition, consultations with a nutritionist, etc.); measurements of BMI and body fat were taken, changes in health awareness / types of foodstuffs consumed and the stages in behavior change were investigated and a survey was made of product preferences / preferred purchase price / convenience.
- (3) Manufacture and sales: identification of issues relating to the production and operating systems

Timing

November, 2022 - March, 2023



Meal kit sales website

Results

- (1) The facts with regard to vegetable consumption
 - It became apparent that of the approximately ¥11,450 weekly expenditure of each household, spending on fruits and vegetables amounted to no more than 17% (roughly ¥2,000).
 - The frequency of vegetable consumption was 2 or 3 times a week, consumption at one sitting being no more than one small bowl.
- (2) Behavior change
 - It was observed that there is a trend towards more frequent consumption of vegetables, and a trend for people to eat a wider variety of foods.
 - Body composition measurement showed that roughly half the participants were obese; but while they considered themselves to be in good health according to their self-perception, more than half wanted to lose weight.
 - After the service came to an end, people's perceptions had changed in that they were aware of the need to improve their eating habits; more people were trying to start a healthy diet, and there was a trend towards the improvement of irregular eating habits. After using the meal kits, meal variety scores went up and the nutritional balance of participants were improved.
- (3) Manufacture and sales
 - The meal kits received a high rating for palatability (roughly 93% of respondents said they liked the kits).
 - Although the kits were sold at a price that matched participants' preferred purchase price, there were many who decided not to buy after hearing what the price was.
 - It was found that a shelf life of three days was considered too short; the stable procurement of quality ingredients was a problem, and there were also problems with the packaging.



Example of Meal Kit



Cooking example: Meal Kit



Nutrition improvement at workplaces through micronutrient-fortified rice

Project partners

International Life Sciences Institute Japan (ILSI Japan) (NPO), RACHA (Reproductive and Child Health Alliance)

Target group

Female factory workers of child-bearing age(18 – 45)

Background

Low levels of folic acid in women of child-bearing age have been found to increase the risk of neural tube defects (NTDs) in newborn children. The Cambodian diet typically lacks diversity, with rice as the staple food, leading to low levels of key micronutrients in the general population. Nutritional awareness was observed to be quite poor, and regular health check-ups were uncommon. Significant numbers of workers were either overweight or underweight, which presumably is reflected in absenteeism rates and productivity levels.



Typical lunchtime meals



Fortified rice project reporting team

Methodology

- One group of workers in the dining hall was given rice fortified with micronutrients, while another group was given the standard type of rice. A nutrition analysis found higher levels of micronutrients (folic acid, zinc and Vitamin B1) in the fortified rice group.
- Both groups attended dietary awareness sessions on good dietary habits and healthy food choices. Dietary diversity was monitored using the ILSI Take 10!® checklist.

Timing

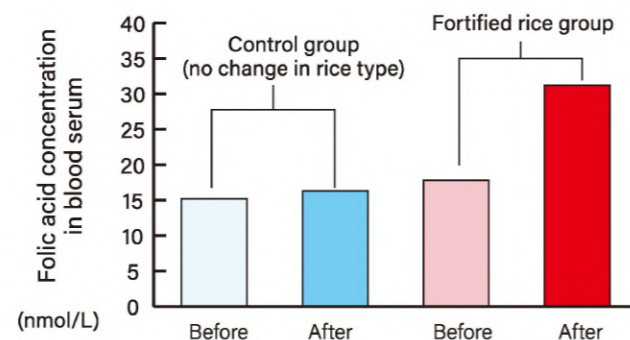
12-week period between November 2018 and February 2019

Results

Folic acid concentrations in the blood showed a statistically significant increase in the fortified rice group, with the increase proportional to the number of meals consumed. This result suggests that the introduction of fortified rice is a viable solution for combating folic acid deficiency. Workers in the fortified rice group also demonstrated higher levels of motivation as reflected in improved presenteeism* rates.

* See Page 15

Impact of fortified rice on folic acid concentration in blood serum



Using blockchain to educate workers about nutrition and improve nutrition levels

Project partners

Ridgelinez Ltd., International Life Sciences Institute Japan (ILSI Japan) (NPO), RACHA (Reproductive and Child Health Alliance)

Target group

Factory workers

Background

In the previous project, the nutrition education sessions did not deliver the anticipated benefits. It was decided that in order to raise awareness of the importance of good nutrition and motivate people to change their behavior and steer them toward more nutritionally balanced foods, the education component would need to be modified by introducing a gameplay element. This project seeks to evaluate the chosen gameplay element, a token economy using blockchain technology developed by Ridgelinez Ltd. In the token economy, participants are rewarded for desired behaviors with remuneration in the form of tokens that have value within a defined marketplace.

Methodology

- Workers were encouraged to use a smartphone app to track their food consumption. The app also provides nutritional information and advice and dispenses tokens to incentivize good behaviors.

Timing

From December 2019

Next stage

It is hoped that the gameplay element of the app will help to raise awareness of healthy eating principles and motivate workers to get into the habit of monitoring their nutritional intake. The app will need to be rolled out at a larger scale, so that this can be scientifically validated. Given the benefits in terms of worker productivity, the next stage will involve rolling out the app to other workplaces.

How the app works

1 Log in

Record details of all foods consumed at home and at work.



Login screen



The home screen shows the food groups listed in Take 10!® (see below).

Home screen

2 Canteen menu

The app is pre-loaded with details of the canteen menu.



3 Collect stamps

Stamps are awarded in accordance with meal choices from the menu.



Stamp card

4 Earn coins

Collect six stamps in one day and answer a healthy eating quiz question correctly to receive a coin token.



Quiz question

5 Exchange for prizes

Use the app to exchange coins for prizes such as fresh fruit and product coupons.



TAKE10!®

Take 10!® was developed by ILSI as part of a campaign encouraging people to take ten minutes off for exercise at least twice a day and eat from the ten food groups every day. Each piece of food consumed from one of the ten food groups (including meat, fish, eggs, and green and yellow vegetables, excluding staples such as rice and bread) earns a point. The aim is to get to ten points per day.



Educational QoL Health Check and nutrition improvement project

Project partners

Kao Corporation, Hirosaki University COI (Center of Healthy Aging Innovation), vridge Co., Ltd.

Target group

Workers at Japanese companies in Hai Phong

Background

Hai Phong has experienced rapid economic growth and urbanization in recent years. With this has come significant lifestyle changes that have caused an increase in lifestyle diseases such as obesity, high blood pressure and diabetes. The local government of Kagawa Prefecture in Japan has been working closely with the city of Hai Phong to tackle these health issues. In FY2015, Kagawa launched a three-year project based around health check-ups, exercise instruction and information sessions at schools in Hai Phong. The project was a natural extension of an initiative set up by Kagawa Prefecture that combines the Educational QoL Health Check program developed by the Hirosaki University COI with a general nutrition improvement program. The program will initially be introduced on a trial basis at workplaces and worksites and the outcomes will be monitored. If shown to be successful, it will ultimately be rolled out as a permanent ongoing preventative measure run by local authorities.

Topics

In December 2019, the Educational QoL Health Check program was trialed at two Japanese companies operating in Hai Phong. The aim was to identify implementation issues and evaluate acceptance of the program and understanding of the key messages among the target group.

The trial group consisted of 61 Vietnamese workers across both worksites. Nine observation categories were recorded: height, blood pressure, body composition, grip strength, two-step, rise time, visceral fat, vegetable intake and saliva test results. Participants were informed of their results and the health implications of the results, then provided with health advice and suggestions for improvement. The senior managers in attendance were most impressed, as was a delegation from the Hai Phong Provincial Center of Preventive Medicine. The participants displayed a good level of understanding and were highly receptive to the program.

As Table 2 shows, averages for the ten observation categories showed higher values for girth, visceral fat and blood pressure compared to similar workers in Aomori Prefecture in Japan, despite the Vietnamese workers being on average almost ten years younger (Table 1). These are highly significant findings because they point to the possibility of a rapid increase in lifestyle diseases in the near future.

Next stage

- In July 2020, the Japan International Cooperation Agency (JICA) launched a grassroots technology cooperation project* that involves bringing Vietnamese delegates to Japan for training and assistance with the Educational QoL Health Check program and associated follow-up procedures.
- In parallel with the above, JICA will evaluate outcomes from the Educational QoL Health Check program and will work together with the Hai Phong Provincial Center of Preventive Medicine to expand the program from worksites to schools and communities. JICA will also work with local bodies such as the National Institute of Nutrition (NIN) on other dietary and nutrition improvement programs. This includes joint collaborations with local food suppliers to design healthy menus made from locally sourced ingredients.

* FY2019 First Grassroots Technology Cooperation Project (support model): Title: Training for Hai Phong Education and Health Check Program



Educational QoL Health Check

The Educational QoL Health Check initiative aims to combine the three stages of health checkup, analysis of results, and health consultation and advice all on the same day. Instant feedback is important for identifying and preventing disease and illness and also in boosting awareness of health and well-being. The initiative was developed using Big Data from a longitudinal study of more than 20,000 residents in the Iwaki district of Hirosaki in Aomori Prefecture that involved detailed health surveys over a period of 15 years.



Educational Health Check session at Nichias Vietnam—explanation of findings and general health advice



Health check—two-step



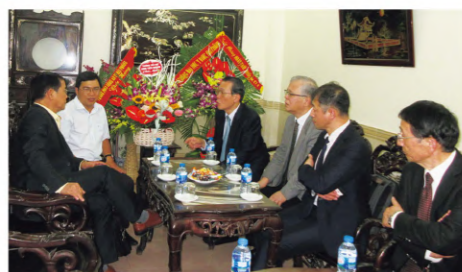
Health check—body composition



Health check—visceral fat



At the National Institute of Nutrition



At the Hai Phong Provincial Center of Preventive Medicine

Table 1 FY2019 Educational QoL Health Check program in Viet Nam

	Company I (Viet Nam)	Company N (Viet Nam)	Company M (Aomori)
Date	14 December	17 December	May 28/29/30
Participants	20	40	191
Male	10	29	129
Female	10	11	62
Mean age	33.8	36.9	45.8
Standard deviation	7.2	8.8	10.1
Observations*	9*	9*	9*
Time required (min)**	90	100	-
Staff required***	10	10	14

* Height (self-reported), body composition, saliva test, blood pressure, grip strength, rise time, two-step, visceral fat, vegetable check
 ** Iiyama Seiki used multiple venues so it took longer
 *** Excluding interpreters deployed at testing stations

Table 2 Results

Company	Height	Weight	BMI	Girth	Visceral fat	Systolic blood pressure	Diastolic blood pressure	Grip strength	Two-step	Vegetables
Company I (Viet Nam)	163.5 8.6	59.3 12.5	22.1 3.2	81.1 9.6	73.4 46.4	120.0 12.4	79.8 10.0	34.7 9.3	1.6 0.1	5.8 1.2
Male	170.1 4.8	67.5 9.1	23.3 2.9	86.1 8.3	101.1 47.9	125.0 9.0	83.2 10.8	42.7 4.0	1.7 0.2	5.2 1.1
Female	156.9 6.2	51.1 9.7	20.6 2.9	76.2 8.0	45.6 21.9	114.9 13.3	76.4 7.7	26.6 5.3	1.6 0.0	6.4 0.9
Company N (Viet Nam)	165.1 6.8	69.7 10.2	25.5 3.0	89.6 8.6	106.7 45.9	132.2 20.8	87.1 13.8	39.3 9.6	1.6 0.1	5.4 1.2
Male	168.1 5.4	72.0 9.5	25.4 2.7	90.6 7.7	116.2 44.7	138.7 19.7	91.2 13.3	43.8 7.2	1.6 0.1	5.1 1.1
Female	157.2 2.3	63.6 9.2	25.7 3.7	86.7 10.5	79.3 37.7	115.2 12.6	76.1 7.6	27.6 3.6	1.4 0.1	6.0 1.2
Company M (Aomori)	168.3 8.1	67.3 11.8	23.7 3.5	85.7 9.8	93.4 49.5	117.9 13.2	77.6 10.1	35.4 9.3	1.6 0.1	5.3 1.2
Male	172.4 6.1	72.0 13.2	24.2 3.1	88.5 8.2	110.4 46.0	121.3 12.8	79.7 9.4	40.5 6.2	1.6 0.1	5.0 1.0
Female	159.8 3.9	57.7 10.1	22.7 4.0	79.6 10.3	57.6 35.6	110.8 11.1	73.5 10.2	24.8 4.0	1.4 0.1	6.0 1.3

Upper figure in each cell is mean value, lower figure is standard deviation
 Figures in red exceed standard value

Subjects Company I (Viet Nam) : Males =10, females =10
 Company N (Viet Nam) : Males =29, females =11
 Company M (Aomori) : Males =129, females =62



Study of nutrition improvement in the workplace through canteen meals

Project partners

World Industry Co., Ltd., International Life Sciences Institute Japan (ILSI Japan) (NPO), Nakamura Gakuen University

Target group

Thilawa Special Economic Zone and Mingaladon Industrial Park in Yangon

Background

The Myanmar diet is said to be a classic example of the double burden of malnutrition: lacking in proteins and micronutrients and over-represented with fats, salt, carbohydrate and other elements that cause obesity, diabetes and high blood pressure. Although World Industry delivers around 1,000 meals per day from its industrial kitchen adjacent to the Thilawa Special Economic Zone, worker health is poor due to a lack of understanding and awareness around the importance of nutritional balance.

Key issues

Local surveys conducted in January and March 2020 identified potential conditions for the double burden of malnutrition as described above. They also found evidence that workers may be skipping breakfast altogether and/or eating a light dinner, so that the workplace meal becomes the main meal of the day. This makes it particularly important to ensure that workplace meals are healthy and nutritious. The Myanmar government is encouraging the use of fortified rice in school lunches and at maternal child health centers. A trial study in Cambodia found that introducing fortified rice into workplace meals was an effective way to improve nutrition levels without encountering resistance.



Canteen meals supplied by World Industry Co., Ltd.

However, consistency of food sources for meals may be impacted by issues at the production and distribution stages. Further research will be necessary in order to identify and address systematic problems with stability of the food supply.

Timing

From December 2019



World Industry Co., Ltd. industrial kitchen

Next stage

Collaboration framework

- Design canteen meals that are both nutritionally balanced and appealing to workers in Myanmar, then provide diet and nutrition training to three Japanese companies operating in the Thilawa Special Economic Zone and Mingaladon Industrial Park on the outskirts of Yangon, which have a combined total of 1,080 employees.
- Work with counterparts in Myanmar—the Ministry of Health and Sports and the National Nutrition Center (NNC)—and JICA in Japan to evaluate the benefits of nutrition improvement.
- Promote the use of fortified rice in conjunction with Gold Power and Excel International Trading, local suppliers of fortified rice and fortified kernels.

The project is being keenly monitored by a range of stakeholders including the Ministry of Agriculture, Livestock and Irrigation, the World Food Programme (WFP), the Scaling Up Nutrition (SUN) Business Network and local universities. The ultimate aim is to develop a fully sustainable nutrition improvement program to improve worker nutrition standards that would involve a combination of environmental strategies (switching to fortified rice and phasing in nutritionally balanced meal options) and education strategies (boosting awareness around diet and encouraging behavior change). Such a program can be expected to deliver the following benefits.

- Many workers are women in the 18-29 age bracket, so the benefits of nutrition improvement will have a ripple effect extending to their immediate families and children.
- Nutrition improvement will contribute to worker health and well-being, in turn boosting productivity by reducing absenteeism and improving retention rates.
- Local meal producers will benefit from consistent ongoing demand, promoting the development of the farming and food production industries. This will serve as a template for healthy meal supply services in other sectors.



Mealtime at a Myanmar factory



Typical factory canteen in Myanmar



With Dr. Lwin (NNC)



Preliminary study of canteen meals



Rice Nutrient Fortification Project

Project partners

International Life Sciences Institute Japan (ILSI Japan) (NPO), DMS Japan K.K.
World Food Programme Philippines (Project 1)
Food and Nutrition Research Institute (Project 2)

Background

The Philippines was the first country in the world to enact legislation on the fortification of rice; the fortification of rice with iron is mandatory. Iron deficiency anaemia is regarded as an important public health problem in the Philippines; it is expected that the prevalence of anaemia will be reduced through the use of fortified rice, but even after it was made mandatory, only a small amount of iron-fortified rice is produced, and nutritionally fortified rice is not widely available.

Project 1 "Survey on the Popularization of Iron-fortified Rice"

Methodology

In order to understand the reasons for the lack of widespread use of fortified rice, and specifically, with the aim of identifying issues in the supply chain, advocacy and campaigns for the use of iron fortified rice, we conducted interviews with key stakeholders in iron-fortified rice (government agencies, manufacturers of iron-fortified rice, machine manufacturers, local farmers' cooperatives, etc.) and held discussions at public elementary schools where iron-fortified rice is used in school lunches. We also compiled recommendations for the development of policies to promote the use of iron-fortified rice.

In addition, there is a strong possibility that many people in the Philippines have a deficiency in many micronutrients, not only iron, and fortifying rice, a staple food, with multiple micronutrients could help solve the problem of micronutrient deficiencies.

Mandatorily fortified foodstuffs

Flour	Vitamin A, Iron
Refined Sugar	Vitamin A
Cooking oil	Vitamin A
Milled rice	Iron
Salt	Iodine

The Philippines enacted Republic Act (RA) 8976, An Act Establishing the Philippine Food Fortification Program and Other Purposes in 2000, with full implementation of mandatory fortification by 2004. The table shows the mandated foodstuffs and the nutrients with which they are to be fortified.



Results

Issues that came to light were:

- (1) An imbalance between demand and supply
 - (2) Vulnerabilities in supply chain planning and logistics and in procurement
 - (3) An imbalance between the cost of nutritionally fortified rice and the perceived value to the consumer
 - (4) The lack of awareness raising programs in the country.
- Our general proposals are;
- (1) Increase demand
 - (2) Step up production in those regions where production bases are lacking
 - (3) Review production costs
 - (4) Education to raise perceived value
 - (5) Expand to other regions based on lessons learned from successes
 - (6) Stronger approaches to individual local governments

Project 2 "Study on the Challenges of Commercializing Multiple Micro-Nutrient (MMN) Fortified Rice in the Philippines"

Methodology

The Food and Nutrition Research Institute (FNRI) of the Philippines developed Multiple Micro-Nutrient (MMN) Fortified Rice that has added iron, zinc, vitamins A, B1, B2 and folic acid. We carried out a survey to clarify the feasibility and necessity of introducing this fortified rice, the legal and legislative procedures required for its introduction and the measures required for its expansion.

Results

We learned that a variety of government agencies are involved in the nutritional fortification of rice in the Philippines. The Philippine Food Fortification Act of 2000 is an initiative of the Department of Health, and the Executive Office of the Sub-Technical Working Group on Mandatory Food Fortification (TWG-MFF) was coordinated by the National Nutrition Council (NNC). It is the task of the TWG-MFF, together with member organizations including the Department of Education (DepED), Department of Social Welfare and Development (DSWD), Department of Agriculture (DA), Department of Local and Interior Government (DILG), Department of Science and Technology (DOST), Department of Trade and Industry (DTI), National Economic and Development Authority (NEDA), Department of Labor and Employment (DOLE), Non-Government Agencies and Representatives of the Industry, to ensure the implementation of collective efforts to scale up the use of fortified rice, to support and cooperate with the National Food Authority (NFA) in its compliance with the fortification of rice as set out in the law, and to develop and implement advocacy and communication activities to promote the sale and consumption of iron-fortified rice.

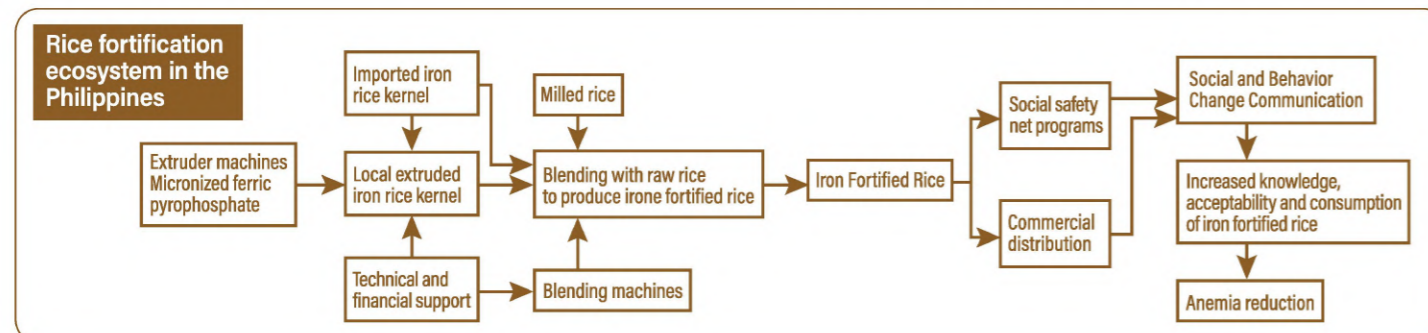
What is needed to obtain legal and regulatory approval for MMN fortified rice also became clear. It has also been shown that fortifying rice, a staple food, with multiple nutrients can be expected to be effective over a wide range of age groups, and has the merit of there being no great increase in cost. Based on experiences in activities to promote iron-enriched rice, the timing is right to begin activities to raise awareness of the need for MMN fortified rice.

These results suggest that the introduction of MMN fortified rice can be an effective means of solving the problem of micronutrient deficiency faced by the majority of the population of the Philippines.

Iron-fortified Rice



Iron-fortified rice is mixed in with ordinary rice (the grains that have a slightly different shape and color are the iron-fortified rice). This means that it looks almost no different from ordinary rice



Key project outcomes

Diversity of nutritional status

Nutrition issues and dietary habits

- In Indonesia, there remains a common group of nutritional deficiencies. At the same time, Indonesian cuisine involves a great deal of frying in palm oil, which boosts the calorie intake, leading to a high incidence of obesity and overweight issues. This is the classic double burden of malnutrition. An almost complete lack of vegetables compounds the problem.
- In Cambodia, a preliminary survey of women of reproductive age revealed deficiencies of folic acid, zinc and key vitamins. Such micronutrient deficiencies can potentially lead to serious health problems for mothers and children.
- Myanmar has one of the highest levels of rice consumption in the world. While specific data on nutrient deficiencies are not available, an analysis of the Myanmar diet revealed a high oil content and heavy use of salt and pepper (the resulting salty oil liquid condiment is typically poured over a huge bowl of rice as a meal).

Dietary environment

The diversity of meal menu is poor, most notably the low intake of vegetables. This is attributable to a general lack of infrastructure in the food industry, particularly with respect to distribution and storage. After the vegetables are harvested and sent to markets, any that are unsold will be discarded. This creates a vicious circle that forces up vegetable prices and puts them further out of reach for many.

Defined outcomes

Nutrition improvement

The obvious outcome of a nutrition improvement project is the fortification and intake of missing key nutrients. In Cambodia, the introduction of nutrition fortified rice was shown to boost the blood level of folic acid. Ideally, employers will achieve results such as increased productivity and improved absenteeism rate; the reality, however, has been that the direct outcomes of nutrition improvement projects are not so readily identifiable.

The Ministry of Health in Indonesia has expressed an interest in evaluating behavior change in relation to dietary diversification (particularly vegetable consumption) as a key outcome. The Take 10!® checklist from ILSI Japan CHP has a specific focus on dietary diversification and, as such, serves as a tangible indicator of success.

Presenteeism

Presenteeism refers to the condition of workers who while present at work are considered unmotivated or underperforming due to physical or mental health problems. The Health and Work Performance Questionnaire from the World Health Organization (WHO-HPQ)* quantifies this phenomenon by asking workers to answer a series of questions both before and after an intervention study. In the "Health promotion by micro-nutrient fortified rice in Cambodia" project, it was found that presenteeism rates among participants improved.

* For more information about the WHO-HPQ go to <<https://www.hcp.med.harvard.edu/hpq/info.php>>.

Future challenges

The challenge of changing dietary habits

- **Low motivation to "healthy diet"**
 1. Resistance to a new diet is to be expected. It is difficult to accept a nutritionally well-balanced diet as a countermeasure to dietary habits guided by eating experience from an early age.
 2. Even if it is initially accepted, it is difficult to maintain interest over the long term.
 3. In fact, many low-paid workers living in poor conditions rely on the canteen lunch as their main meal of the day. Satisfying with a restricted diet as a measure against overweight is quite reluctant.

Thus, it is necessary to have a thorough understanding of health and nutrition.

- **Sticking to traditional dietary habits (Food culture, religion or other reasons)**

Dietary habits are generally born out of many years of food culture and religion-based eating experiences. It can be extremely difficult and challenging to switch to a whole new meal, "healthy diet." A better approach is to introduce dietary diversity by making small, incremental changes to the canteen menu. Where certain food types are unavailable locally or are considered unpalatable, it may be necessary to find alternative ways to provide the required level of nutrition.





Aiming for greater benefits



Performance indicators

■ Nutrition improvement

Fortification and overnutrition measures

A pilot study of nutrition improvement using fortified rice found an increase in blood levels of insufficient nutrients. In the future, there are plans to conduct validation testing on a larger scale. It is hoped that outcomes such as improved nutrition education will translate into better health checkup results and fewer frequency of use in the medical office.

Furthermore, in order to reach productivity improvement, the understanding of the introducing factory members is essential. Employees need to understand the importance of improving nutrition through a healthy diet, and employers need to understand the cost increases associated with project promotion. A sustainable project can only be achieved with mutual agreement.

Projects for overnutrition involve dietary (calorie) restriction. The challenge therefore is to ensure that the food is still adequately satisfying. The key is to design meals that use new and different ingredients. At the same time, it may be necessary to compensate for the decrease in satisfaction and to raise personalized motivations by “visualizing” the state of health.

■ Proof of benefits to industry

Increased productivity and corporate loyalty

All ongoing projects are at the pilot testing stage and no direct evidence has been found to improve productivity. It is important to be able to provide empirical data to demonstrate the positive impacts of health and nutrition improvements on productivity.

Sound development of catering business as a food system

■ Hygiene management

Hygiene management is critical from the perspective of being directly linked to health outcomes. If hygiene is poor, nutritional education cannot be expected to achieve the desired health outcomes. Helping to introduce techniques to improve hygiene should lead to great credibility.

■ Nutrition management

In Japan, the presence of many nutritionists enables adequate nutrition management. But it can be said that it is difficult to entrust nutrition management overseas because many countries do not have qualifications for nutritionists. To this end, support by dispatch of specialists is also an important aspect of improving nutrition.

Direct intervention— nutritional fortification and reduction of excessive intake

Introducing non-invasive devices into the evaluation method of the fortified rice project will reduce the burden on participants. At the same time, we will “visualize” the results more easily. With respect to promoting vegetable intake in particular, we should adopt strategies that help to promote the use of measuring equipment used in validation testing.

Indirect intervention Nudging and nutritional literacy improvement for independence development

Improving nutritional literacy is fundamental to nutrition improvement. Even if you participate in the nutrition improvement project without understanding nutritional literacy, you cannot expect continuous participation.

In order to motivate people to alter their behavior, we employ nudge theory*, a concept in behavioral economics. People need to be educated about health and nutrition so they understand the concepts involved, then they need to be provided with detailed nutritional information at the decision point where they are making a food choice or choosing a meal option.

NJPPP projects start with a preliminary survey conducted in the target country by utilizing the prior knowledge. The next step is to design an optimized nutrition intervention strategy, followed by a pilot study and evaluation. The findings from the pilot study can then be used as the basis for a larger validation study. The final stage involves rolling out the project at scale. In order to validate the efficacy of this approach we need clear empirical data and evidence.

* Nudge is a technique that guides people to voluntarily choose more desirable behaviors by means of ingenuity and mechanisms based on the knowledge of behavioral science rather than economic incentives.

Behavior change

In the Indonesian project, we are promoting “visualization” of health status by introducing non-invasive devices. By visualizing your health status, you will be able to independently select a well-balanced healthy diet.

Suppression of Presenteeism

It can be said that it takes some time for nutrition improvement projects to lead to direct productivity improvement data (quantification). As a preliminary step, the quantification of presenteeism by WHO-HPQ is considered to be significant as “visualization” of evaluation.

Improving corporate loyalty

Health and productivity management (HPM)—the idea that employee health and well-being is linked to productivity—is being promoted in Japan. The aim is to disseminate the HPM concept to NJPPP project partner countries and show how nutrition improvement programs for workers can enhance enterprise value.

Evaluation of dietary habit Improvement

Positioning the first step in improving dietary habits as “diversifying ingredients and improving cooking methods”, I plan to review the menu. First of all, eating a lot of ingredients and trying various cooking techniques is the key to improve dietary habits.