Program

Day 1: Tuesday, November 26, 2019

07:30 – 08:45  Registration

08:45 – 09:00  Opening and Welcome
National Institute of Nutrition (NIN), Vietnam
Mr. Geoffrey Smith, President, ILSI SEA Region, Singapore

Session 1: Issues and Strategies of Fortification
Chairperson: Mr. Geoffrey Smith
President, ILSI SEA Region, Singapore

09:00 – 09:40  Revisiting Food Fortification Agenda in an Evolving Micronutrient Landscape of ASEAN
Dr. Regina Moench-Pfanner, IIBN360, Singapore

09:40 – 10:05  Multi-Criteria Mapping of Stakeholders’ Views on Strategies to Reduce Micronutrient Deficiencies among Women and Children in SEA: The SMILING Project
Assoc. Prof. Pattanee Winichagoon, Institute of Nutrition, Mahidol University (INMU), Thailand

10:05 – 10:15  Q&A

10:15 – 10:35  Morning Break
Seminar on Food Fortification in Southeast Asia: Current Challenges, Strategies for the Future
November 26-27, 2019, Hanoi, Vietnam

<table>
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| 10:35 – 11:10| *Key Considerations in Micronutrient Fortification: From Design to Implementation*
|              | Ms. Dora Panagidas, Landell Mills, Myanmar                                 |
| 11:10 – 11:35| *The Global Fortification Data Exchange: An Analysis and Visualization Tool for Industrial Fortification*
|              | Ms. Becky Tsang, Global Fortification Data Exchange, USA (via Video Presentation) |
| 11:35 – 12:00| *Unlocking the Potential and Synergy of Biofortification with Micronutrient Interventions*
|              | Mr. Steve Qn, HarvestPlus, Vietnam                                         |
| 12:00 – 12:15| *SEA Country Experiences: Current Challenges and Future Priorities for Fortification*
|              | Dr. Siti Muslimatun, ILSI SEA Region Indonesia Country Committee, Indonesia |
| 12:15 – 12:35| Q&A                                                                      |
| 12:35 – 13:45| Lunch Break                                                              |

**SESSION 2: Regulations of Fortification**

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| 13:45 – 14:05| *Updates of Vietnam Regulatory Status of Micronutrient Fortification*
|              | Ms. Bui Hoang Anh, Vietnam Food Administration, Vietnam                   |
| 14:05 – 14:40| *Updates of SEA Regulatory Status of Micronutrient Fortification*
|              | Ms. Pauline Chan, ILSI SEA Region, Singapore                               |
| 14:40 – 14:50| Q&A                                                                      |

**SESSION 3: Experiences and Perspective of Fortification**

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| 14:50 – 15:15| *Vietnam’s Experience: Current Challenges and Future Priorities for Fortification*
|              | Dr. Tran Thuy Nga, NIN, Vietnam                                            |
| 15:15 – 15:45| *Beyond the ’Big Five’: Micronutrients of Emerging Interest for Public Health and Strategic Considerations*
|              | Mr. Geoffrey Smith, Essential Micronutrients Foundation, Singapore         |
| 15:45 – 16:10| *Industry Perspective: Opportunities and Challenges in Fortification*
|              | Ms. Nguyen Thi Phuong Trang, Unilever Vietnam                             |
|              | Ms. Wei Tang, Unilever China                                               |
| 16:10 – 16:25| Q&A                                                                      |
| 16:25         | End of Day 1                                                              |
| 16:25         | Afternoon Tea                                                             |
Seminar on Food Fortification in Southeast Asia: Current Challenges, Strategies for the Future
November 26-27, 2019, Hanoi, Vietnam

## DAY 2: Wednesday, November 27, 2019

### SESSION 4: Case Studies on Micronutrient Fortification

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<tr>
<td>08:30 – 08:55</td>
<td>Iodine Deficiency: Epidemiology, Consequences and Reduction Strategies</td>
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<td>Dr. Fabian Rohner, Groundwork, Switzerland</td>
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<tr>
<td>08:55 – 09:20</td>
<td>Iodine Fortification in Thailand</td>
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<td>Prof. Visith Chavasti, Institute of Nutrition, Mahidol University, Thailand</td>
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<td>09:20 – 09:45</td>
<td>Thiamine and Riboflavin as Key Candidates for Fortification in</td>
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<td>Southeast Asia: A Case from Cambodia</td>
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<td>Dr. Kyly Whitfield, Mount Saint Vincent University, Canada</td>
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<td>09:45 – 10:10</td>
<td>Introduction of Fortified Rice into the Canteen for Cambodian Female</td>
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<td>Dr. Yukiko Nakatsuki, ILSI Japan Center for Health Promotion, Japan</td>
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<td>10:10 – 10:35</td>
<td>Flour and Rice Fortification in Indonesia</td>
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<td>Dr. Yuni Zahraini, Ministry of Health, Indonesia</td>
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<td>10:35 – 10:55</td>
<td>Q&amp;A</td>
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### ROUNDTABLE DISCUSSION

**Chairperson:** Dr. Regina Moench-Pfanner  
*Founder & CEO, Icn360, Singapore*

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<td>10:55 – 11:10</td>
<td>Briefing</td>
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<td>11:10 – 12:15</td>
<td>Morning Tea Break &amp; Discussion</td>
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<td>Topic: Future Strategies to Achieve Effective and Sustainable Fortification Programs in SEA</td>
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<td>12:15 – 12:55</td>
<td>Group Presentations</td>
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<td>Final Discussion &amp; Q&amp;A</td>
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<td>12:55 – 13:10</td>
<td>Summary &amp; Closing Remarks</td>
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<td>13:10</td>
<td>End of Seminar &amp; Lunch</td>
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*The Program is subjected to changes by the Organizers*
Seminar Information

OFFICIAL LANGUAGE
The official language of the seminar is English.

NAME TAGS
Registered delegates are to wear their name tags at all times during the seminar for identification and security purposes. Admission to the seminar is based on name tags.

SPEAKERS’ PRESENTATION SLIDES
The speakers’ presentation slides are available for viewing online. Please use the QR code or the URL link below to access them:
https://ilsisea-region.org/event/foodfortification2019/

LUNCH
Lunch will be served at La Cheminée restaurant, Level 1.

TEA BREAKS
Morning and afternoon refreshments shall be served at the Foyer, Van Mieu 1 & 2, Grand Ballroom, Level 1.

ELECTRONIC DEVICES
As a courtesy to all delegates and speakers, cellular phones and other electronic devices must be operated in silent/vibrated mode throughout the seminar sessions. No telephone conversations are permitted during the seminar.

PARKING
Free parking and subject to availability.

CERTIFICATE OF ATTENDANCE
E-Certificate of Attendance will be sent to registered delegates upon receiving the completed evaluation form of the seminar online. Please use the link here to access the evaluation form:
http://tiny.cc/EF_FF2019

CONSENT FOR PHOTOGRAPHY, AUDIO/VIDEO RECORDING
Please note that photography and video/audio recording may occur and are to be used for our communication and marketing purposes, including on our website, or for any purpose(s) that the Organizers deem fit to use. By participating at the seminar, you are fully informed of the above disclaimer and have given consent to the Organizers to carry out photography and video/audio recording for the above purpose(s).

LIABILITY
The Organizers and co-organizer will not assume any responsibility for accidents, losses or damages, as well as delays or modifications of the seminar programme.
About the Organizers

International Life Sciences Institute (ILSI) Southeast Asia Region & ILSI Southeast Asia Region Vietnam Country Committee

The International Life Sciences Institute (ILSI) is a non-profit, worldwide foundation based in Washington, DC, USA established in 1978 to advance the understanding of scientific issues relating to nutrition, food safety, toxicology, risk assessment and the environment. ILSI accomplishes its work through its branches and the ILSI Research Foundation.

Established in 1993, ILSI Southeast Asia Region facilitates and coordinates scientific programs, research and information dissemination in ASEAN, Australia, New Zealand and the Pacific Islands. Based in Singapore, ILSI Southeast Asia Region also oversees Country Offices and Committees in Australia, Indonesia, Malaysia, Philippines, Thailand, and Vietnam.

By bringing together scientists from government, industry, academia and the public sector, ILSI seeks a balanced approach to solving problems of common concerns for the health and well-being of the general public. ILSI receives financial support from the industry, government, and foundations.
About the Co-Organizer

National Institute of Nutrition, Vietnam

The National Institute of Nutrition (NIN) under the Ministry of Health was established in 1980 by the Government of Vietnam. NIN is the leading institute responsible for research, training and implementation activities in the field of nutrition, food science and clinical nutrition in Vietnam.

NIN conducts research on nutritional requirements and dietary intake of Vietnamese people in relation to physiological status and socio-economic conditions of the country; food hygiene and food safety conditions; nutritive value of Vietnamese foods and other nutritional-related health problems. NIN has been responsible for food and nutrition surveillance, measures for improving nutritional status, and the development of Dietary Allowances and Food-based Dietary Guidelines.

NIN has set up co-operative relationships with such international agencies as UNICEF, FAO, WHO, ILSI, ADB, WB, GAIN, the Netherlands Government as well as many NGOs and other research institutes including Wageningen University (the Netherlands), INMU (Thailand), Universities of Japan, University of Los-Banos (The Philippines), Queensland University (Australia) and IRD, and GRET (France).

The National Institute of Nutrition has been appointed as the WHO national participating Institution for Food Contamination Monitoring (1995); as the SEAMEO - TROPMED Collaboration Center in Community Nutrition (1994) and as the National Focal Point for Nutrition (1995-2000) and the National Nutrition Strategy (2001-2010 and 2011-2020).
SESSION 1

Issues and Strategies of Fortification

Chairperson:  
Mr. Geoffry Smith  
ILSI SEA Region  
Singapore
Chairperson’s Biography

Mr. Geoffry Smith is President of ILSI Southeast Asia Region based in Singapore, and a Member of the Executive Committee of the global ILSI Board. In addition, he is the Chairman of the Essential Micronutrients Foundation, a non-profit organization which addresses micronutrient deficiencies globally as a public health issue. He is also Director of Nutrition Strategies International which deals with food and nutrition issues in developing countries. In addition, he serves as a Member of the editorial board of the journal, Food and Nutrition Bulletin. Prior to his current positions, Mr. Smith was the Global Director, Health Chelates for Akzo Nobel Functional Chemicals, and directed the global business for these compounds in food and nutrition as well as pharmaceutical applications. He was responsible for the global project within Akzo Nobel addressing iron deficiency anemia. In addition, Mr. Smith directed the Asia Pacific activities for Akzo Nobel’s Innovation Unit. He is a thirty-year veteran of the chemical industry in the Asia Pacific and has resided in Singapore for more than 20 years. He is a Member of the Nutrition Society of the UK, the American Society of Nutrition and the American Chemical Society.
**Biography**

Dr. Regina Moench-Pfanner is Founder and CEO of ibn360, Singapore, a consulting firm specializing in food, nutrition and health. She has 30 years’ experience leading development and nutrition programs in emerging markets. She began her career with the International Federation of the Red Cross and Red Crescent, leading major relief operations in Africa and Eastern Europe before moving into development to improve nutrition through public-private-civic initiatives focusing on large scale food fortification while working at the Global Alliance for Improved Nutrition (GAIN). Dr. Moench-Pfanner has published and co-authored over 60 peer-reviewed papers and has dedicated her career to bringing nutritious foods to those in need, specifically to the lower-income consumers who have to survive on small budgets. She is a widely recognized thought leader in the complex field of nutrition and the linkages between agriculture and nutrition. She also delivers key presentations and moderates at international conferences. Dr. Moench-Pfanner is a Fulbright Scholar who holds an M.Sc. in International Nutrition, Michigan State University, USA and a Doctorate from the University of Bonn, Germany.

**Abstract**

Despite significant economic growth and reduction in poverty, ASEAN countries still face the issue of the double burden of malnutrition, which is the co-existence of under- and overweight coupled with micronutrient deficiencies. For example, Indonesia, the most populated country in ASEAN, has the same number of underweight children as overweight children coupled with high levels of iron deficiency, zinc and other micronutrients. Other ASEAN countries have similar sub-optimal health and nutrition statistics, in particular, high levels of stunting is a reflection of long-term inadequate dietary intake. Food fortification has been accepted as an efficient complementary strategy to bring nutrient-dense food to those in need; among others, staple food fortification has been taken up by governments to complement their efforts to provide micronutrients when the local diet is inadequate or a diversified nutrient-dense diet is not affordable. Dr. Moench-Pfanner will talk about the nutrition landscape in ASEAN and its pressing challenges and provide insight into how food fortification has been employed to help to reduce micronutrient deficiency.
Biohraphy

Assoc. Prof. Pattanee Winichagoon is Senior Advisor to the Institute of Nutrition, Mahidol University (INMU), Thailand. Her work in the area of maternal and child micronutrient status, micronutrient intervention and community-based nutrition are well-regarded and she has provided advice and consultation to various agencies, such as WFP, UNICEF-EAPRO and AUSAID projects, to name a few. She has also published numerous peer-reviewed articles and monographs. Assoc. Prof. Winichagoon was the Vice-Chair of the Scientific Committee for the 19th International Congress of Nutrition held in Bangkok in 2009; co-chair of Local Organizing Committee of the forthcoming 5th Micronutrient Forum Global conference to be held in Bangkok, March 2020. She obtained her M.Sc. in Nutrition from University of Hawaii and Ph.D. in International Nutrition from Cornell University, USA.

Abstract

Several nutrition-specific and sensitive interventions have been recommended to alleviate micronutrient deficiencies in women and children. Food fortification, e.g., iron fortification of breakfast cereals has been a successful program in developed countries; and several micronutrient fortifications were shown to be efficacious in women and children in developing countries. However, its implementation may encounter several challenges. This paper presents how food fortification was perceived by various stakeholders if it is to be implemented as a large scale program to reduce micronutrient deficiencies in women and children in five Southeast Asian countries, namely, Cambodia, Indonesia, Laos, Thailand and Vietnam. About twenty interventions derived from landscape analysis of the situations and potential interventions (ranging from supplementation, food fortification and dietary diversity/nutrition education) were listed in each country for consideration. A qualitative approach using the multi-criteria mapping (MCM) was used to collect and analyze data on the viewpoints of various stakeholders. Stakeholders (about 20 persons per country) consisted of policy or program planners, civil society and academics, private sector, non-government organization and international agencies, depended on the availability and consent to participate in the study. All stakeholders received the list of interventions with explanations prior to the interview. The criteria for ranking and relative weight of performance of each intervention were not predetermined but elicited from stakeholders during the interview. Each interview lasted 2-3 hours. The results showed that overall, interventions that already exist or are familiar (e.g., supplementation program) are preferred to new and innovative interventions (e.g., food fortification, delayed cord clamping). The interviewed stakeholders considered feasibility, impact, effectiveness and sustainability as important criteria for judging performance of interventions. Food fortification is not favored in
most countries, except Indonesia where most of the food fortification programs were mandatory and implemented widely. Other countries ranked it low and there was a wide range in weighting scores of relative performance (worst to best). Mandatory and universal salt iodization were ranked third among the interventions, but voluntary fortification of other foods received a low ranking in Thailand, Cambodia, Laos and Vietnam. Concerns on implementing food fortification included price, regulations and product acceptability. Limitation of the study: recruitment of stakeholders is not proportionally the same for all countries due to time constraints. In conclusion, while food fortification is listed as a potential intervention to alleviate micronutrient deficiencies in all five countries studied, the relative ranking as preferred intervention and performance differed, especially for voluntary food fortification.
Key Considerations in Micronutrient Fortification Process: From Design to Implementation

Biography

Ms. Dora Panagides is Team Leader for the EC-funded Food Fortification Advisory Services (2FAS), implemented in partnership between Landell Mills and the Global Alliance for Improved Nutrition (GAIN). Dora has over 25 years’ experience in international nutrition. Before joining 2FAS, Dora served as Food Fortification Advisor at the World Food Programme headquarters and as Senior Food Fortification Manager at GAIN in Geneva. Before joining GAIN, she worked extensively in Asia and Africa where she served as Deputy Regional Director for Helen Keller International and was their Country Director in Bangladesh, Cambodia and Zimbabwe. She holds an M.Sc. in Health Science from the Johns Hopkins Bloomberg School of Public Health, USA.

Abstract

Food fortification is widely implemented in the ASEAN region. Various food vehicles are being fortified, whether voluntarily, or mandated by law. These include staples such as rice, oil, and wheat flour; and condiments such as fish sauce, soy sauce and salt.

The overall goal of food fortification is to achieve a public health impact, by ensuring that the target population is consuming sufficient nutrients.

Ensuring that programs are designed to make a difference requires a good understanding of the situation. Data on population groups affected by deficiencies, consumption patterns, and industry capacity are important for program design.

Moving to implementation requires a strong commitment by various stakeholders including government departments (e.g. food control and industry) and food producers.

This presentation will discuss some of the key factors in the design and implementation of food fortification programs and share some examples.
GFDx: An Analysis and Visualization Tool for Data on Food Fortification

Biography

Ms. Becky Tsang is Project Manager for the Global Food Fortification Data Exchange (GFDx) Secretariat, USA. She has dual roles at the Food Fortification Initiative (FFI) as the Technical Officer in the Asia Pacific Region and global focal point for rice fortification and also consults with the Iodine Global Network (IGN) as the program manager of the Double Fortified Salt consultation. Ms. Tsang’s experience in fortification includes landscape analyses to identify opportunities for fortification and providing technical support to governments and partners in Asia planning, implementing, and evaluating cereal grain fortification.

Prior to her roles with the GFDx, FFI, and IGN, Ms. Tsang was a fellow at the US Center for Disease Control and Prevention’s National Center for Birth Defects and Developmental Disabilities. Her work focused on translating evidence into recommendations and policy to eliminate folic acid preventable birth defects. She holds a Bachelor of Arts in Mass Communications and a Master of Public Health with a focus in global public nutrition.

Abstract

The Global Fortification Data Exchange (GFDx) is an open-access database and website with information for up to 196 countries on the fortification of maize flour, oil, rice, salt and wheat flour. Data are provided by country partners or are extracted from publicly available documentation. Available in English (FortificationData.org) and Spanish (FortificacionDatos.org), the website presents programmatic information in maps, figures and tables, and it provides downloadable raw data for further analysis.

The GFDx makes fortification information readily available for decision-makers. For example, with the GFDx, decision-makers can:

1. use data on food intake/availability and the proportion of food that is industrially processed to identify which fortifiable foods will be consumed by the most people;
2. collect information on legislation, standards and monitoring protocols in a country for a particular food to determine if they have data to support fortification implementation and monitoring;
3. determine if fortification is likely to benefit the population by analyzing information on the proportion of food that is fortified according to country specifications (i.e. compliance), proportion of individuals consuming the fortified food (i.e. coverage), the amount of nutrient requirements potentially contributed by fortification, alignment of fortification specifications with international guidelines and/or presence of impact studies carried out in the country.

The presentation will highlight how GFDx data can and has been used for decision making at country, regional and global levels.
Unlocking the Potential and Synergy of Biofortification with Micronutrient Interventions

Biography

Mr. Steve Orr is Partnership Coordinator at HarvestPlus based in Hanoi, Vietnam. He manages the Partnership for Biofortification between HarvestPlus and the Global Alliance for Improved Nutrition (GAIN), working to commercialize 9 biofortified staple crops in 6 countries across Asia and Africa. He is also an International Development Industry Thought Leader, Program Manager and Consultant with over 25 years of experience work in Africa, the Middle East, and Asia championing global initiatives that address food security issues impacting the world’s most vulnerable populations. Prior to that, he served as team leader for the UK AID funded FoodTrade for Eastern and Southern Africa programme facilitating improved trade in staple foods in 9 African countries. Mr. Orr is also a former USAID Foreign Service Officer serving as a Director for Agriculture in two USAID Missions. He is passionate about improving the availability and access of nutritious foods through better collaboration between development industry donors/practitioners and the Private Sector.

Abstract

Two billion people, nearly one-quarter of the world’s population is affected by vitamin and mineral deficiency. This micronutrient deficiency, or “hidden hunger,” is particularly prevalent in rural populations in low- and middle-income countries whose diets are dominated by staple food crops that are deficient in vitamin A, iron, and zinc. Micronutrient deficiency is not just limited to developing countries, every country on earth is facing a serious issue with malnutrition.

Biofortification aims to increase micronutrient levels in crops during plant growth through conventional plant breeding; this differs from fortification, which involves the use of micronutrient additives during the processing of crops into food products. HarvestPlus improves nutrition and public health by developing and promoting biofortified crops and foods and providing global leadership on biofortification evidence and technology. Biofortification presents a way to reach populations where supplementation and conventional fortification activities may be difficult to implement, or where fortified foods are not readily available.

Staple food crops such as wheat, maize, rice, cassava, sweet potato, beans, and pearl millet are primary targets for biofortification because they are consumed widely as a part of everyday diets in lower middle-income countries (LMICs) but tend to provide low levels of bioavailable micronutrients. Biofortification is sustainable; once a farming family has made the switch to more-nutritious crops, the intervention is sustained for seasons and generations to follow.

HarvestPlus was launched 16 years ago, emerging from an idea by its founder, Howarth Bouis. The crops were developed with CGIAR center partners and the benefit to human health was
demonstrated through extensive human intervention studies in several countries. Now is the time to scale up and sustainably embed biofortification into the global food system, in partnership with the food industry, which is showing quantifiable demand for the use of naturally nutritious crops that provide clean label foods without genetic modification.

Together with supplementation, dietary diversity, and fortification, we can work in partnership to end global hunger.
Biography

Dr. Siti Muslimatun is the Faculty of Food Science Study Program at the Indonesia International Institute for Life Sciences (i3L), Indonesia. Prior to her current role, Dr. Muslimatun was the Head of Department, Food Science study program at i3L between January 2015 and August 2018. Her previous work was as the Acting Chief Operating Officer of SEAMEO RECFON and the Program Director of the centre’s South East Asian Nutrition Leadership Program (SEA-NLP) from 2002 to 2008. Her current areas of expertise and interest include food science, community nutrition, food security and public health nutrition. Dr. Muslimatun has authored several articles published in peer-reviewed journals, and she has also participated in several research projects as well as community nutrition projects. She was a Member of the Cost of the Diet Study in Indonesia commenced by the World Food Program. She was the Principal Investigator for the Food and Nutrition Survey in Timor Leste, and the SEAMEO RECFON coordinator in the Sustainable Micronutrient Interventions to Control Deficiencies and Improve Nutritional Status and General Health in Asia (SMILING) project. Dr. Muslimatun received her B.Sc. in Engineering in Agricultural Technology from Gadjah Mada University, Indonesia. She received her M.Sc. in Nutrition from the University of Indonesia, Indonesia, and her Ph.D. in Nutrition, Food Technology and Biotechnology from Wageningen University, the Netherlands.
SESSION 2

Regulations of Fortification

Chairperson:
Emeritus Prof. Corazon Barba
University of the Philippines Los Baños
Philippines
Emeritus Prof. Corazon Barba is Professor Emeritus of the Institute of Human Nutrition and Food of the College of Human Ecology, University of the Philippines Los Baños, Philippines. She is also a visiting faculty of the SEAMEO Regional Center for Food and Nutrition, University of Indonesia. She currently serves as a Nutrition Consultant of the World Food Programme Philippines, and was the Resident Advisor of A2Z Philippines, the USAID Micronutrient Project, from 2006 to 2011. Prof. Barba was the Director of the Food and Nutrition Research Institute of the Department of Science and Technology, Philippines from 1998 to 2004. She was also past President of the Nutritionists-Dietitians’ Association of the Philippines, and the Philippine Association of Nutrition. Prof. Barba presently sits on a number of important food, nutrition and health committees in the Philippines. She is also an IUNS Fellow and a recipient of the Asia-Pacific Clinical Nutrition Society Award in 2006. Prof. Barba received the Presentacion Perez Award, the highest nutrition-dietetics award in the Philippines, in 2011.
Biography

Ms. Bui Hoang Anh is Official of the Regulatory Affairs and Inspection Division, Vietnam Food Administration under the Ministry of Health, Vietnam. Ms. Bui is currently responsible for developing legislative documents such as Food Safety Law, decree for elaboration of food safety law, decree on food fortification, good labels and circulars. She has also conducted inspection activities on food safety and hygiene at the national level. At the international level, she is currently involved as a member of the ASEAN working group on Food Safety-Cluster 4, of Product Working Group on Prepared Foodstuff (PFPWG). She received her degree in biotechnology and food technology from Hanoi University of Technology and an M.Sc. in Biotechnology from the same university in 2004.

Abstract

Based on the summary of research reports and assessments of micronutrient deficiency of Vietnamese population, the 9 years-implementation of Decree No.163/2005/ND-CP of the Government dated December 29, 2005 on the production and supply of iodized salt for human consumption and experimental studies on fortification of iron and zinc in wheat flour, Vitamin A in cooking oil, iron in soy sauce was reviewed and the Vietnamese Government had issued Decree No.09/2016/ND-CP of January 28, 2016 stipulating the compulsory provisions on food fortification with specific micronutrients, including iodine in salt, iron and zinc in flour, and Vitamin A in vegetable oil, and ensuring the use of iodized salt, flour fortified with iron and zinc in food processing. Fortified foods with micronutrients must meet relevant national technical regulations and in compliance with food safety legislation. Decree No.09 is also in line with international recommendations for a highly effective and low-cost strategy to help in the prevention and control of micronutrient deficiencies, as well as to demonstrate the Government’s commitment to improving public health. This is also an important measure to achieve the goal of the Government’s project on “Improving the stature of Vietnamese people” stated in the National Strategy on Nutrition approved by the Prime Minister for the period 2010-2020 and vision to 2030. It also contributes to the implementation of the Resolution No.20/NQ-TW of the Party Central Committee on strengthening care and protection of people’s health.
Trên cơ sở Tổng hợp các báo cáo nghiên cứu, đánh giá về tình trạng thiếu hụt vi chất dinh dưỡng của người dân Việt Nam, Tổng kết 09 năm thi hành Nghị định số 163/2005/ND-CP ngày 29/12/2005 của Chính phủ về sản xuất và cung ứng muối l-o-t cho người ăn và các nghiên cứu thực nghiệm tăng cường sắt, kem vào bột my, vitamin A vào dầu ăn, sát vào xi dầu (nuộc tương), ngày 28/01/2016, Chính phủ Việt Nam đã ban hành Nghị định số 09/2016/ND-CP quy định bắt buộc tăng cường l-o-t vào muối, sát, kem vào bột my và vitamin A vào dầu thực vật, đảm bảo sử dụng muối l-o-t và bột mi đã được bổ sung sắt, kem trong chế biến thực phẩm. Thực phẩm tăng cường vi chất dinh dưỡng được quy định này phải đáp ứng quy chuẩn kỹ thuật quốc gia tương ứng hoặc phải phù hợp với quy định của pháp luật về an toàn thực phẩm. Nghị định 09 cũng phù hợp với các khuyến nghị quốc tế về một chiến lược có hiệu quả cao với chi phí thấp giúp phòng ngừa và kiểm soát thiếu hụt vi chất dinh dưỡng, cũng như cho thấy cam kết của Chính phủ trong lĩnh vực cải thiện sức khỏe nhân dân. Đây cũng là biện pháp quan trọng để đạt được mục tiêu của đề án “nâng cao tầm vóc người Việt Nam” của Chính phủ được nêu tại Chiến lược Quốc gia về Đinh dưỡng l discarded Thị trường Chính phủ phê duyệt cho giai đoạn 2010-2020 và tầm nhìn đến năm 2030, đồng thời giúp thực hiện Nghị quyết 20/NQ-TW của Ban Chấp hành Trung ương Đảng về tăng cường chăm sóc và bảo vệ sức khỏe nhân dân.
Updates of SEA Regulatory Status of Micronutrient Fortification

Biography

Ms. Pauline Chan is the Director of Scientific Programs for the Southeast Asian branch of the International Life Sciences Institute (ILSI), a global non-profit organization that seeks to improve public health through the advancement of science in the areas of nutrition and food safety. ILSI SEA Region is headquartered in Singapore and covers the 10 ASEAN countries, Australia and New Zealand. Ms. Chan has extensive experience in developing scientific programs and facilitating dialogue between scientists, government regulators, and industry to address regional and international issues in nutrition, food safety and health. She is a registered dietitian (RD) with the Academy of Nutrition and Dietetics. Ms. Chan received her M.Sc. in Nutrition and Dietetics from New York University, USA, and her B.Sc. in Chemistry from the Chinese University of Hong Kong.
SESSION 3

Experiences and Perspective of Fortification

Chairperson:
Emeritus Prof. Corazon Barba
University of the Philippines Los Baños
Philippines
Vietnam’s Experience: Current Challenges and Future Priorities for Fortification

Biography

Dr. Tran Thuy Nga is Head of Department of Micronutrients, National Institute of Nutrition, Hanoi, Vietnam. She has studied on intervention solutions for malnutrition in mothers and children, specializing in micronutrient deficiencies, notably vitamin A, iron and zinc and focused on applications of nutrition and food sciences in supporting nutrition-related diseases and community health care. Dr. Nga has been the principle investigator for various projects to test the efficacy and effectiveness of interventions to improve the nutritional status of pregnant women, infants and school children. She has published 95 articles on National and International scientific journals. She graduated from Hanoi Medical University as a medical doctor and obtained her Ph.D. in Nutrition at Institute of Nutrition, Mahidol University, Bangkok, Thailand with the scholarship from the International Nutrition Foundation and Ellison Medical Foundation in 2008. Dr. Nga has been working as a researcher at the National Institute of Nutrition and as a visiting lecturer for Hanoi Medical University.

Abstract

Vietnam has achieved remarkable reduction with regards to the prevalence of anemia, iodine and Vitamin A deficiencies. However, micronutrient deficiencies and anemia remain a public health problem. Reduction of iodine deficiency is unstable. On the other hand, zinc deficiency is severe in all vulnerable groups and micronutrient interventions to improve nutritional status are unsustainable. A large percentage of the population have inadequate knowledge and practice on micronutrient deficiency prevention. In this context, programs to improve micronutrient status for Vietnamese people should be more comprehensive with the involvements of all related partners including government, enterprises, research institutions and communities. The approval of mandatory decree for food fortification showed the government determination in solving the problems of iodine, iron, zinc and vitamin A deficiencies. However, there is a requirement for strong and continuous commitment from both the government and the community to effectively implement this decree. Platforms for collaboration between the government and food processing enterprises as well as organizations responsible for intervention programs should be developed and strengthened. Increasing communications on micronutrient deficiencies, raising awareness on the importance of micronutrients, changing behaviors, and increasing consumers’ demand for fortified foods are essential. Prevention activities for other micronutrient deficiencies such as vitamin D, calcium, and folate also need to be future focal points if the results from General Nutrition Survey shows relevant evidences.
Biography

Mr. Geoffry Smith is President of ILSI Southeast Asia Region based in Singapore, and a Member of the Executive Committee of the global ILSI Board. In addition, he is the Chairman of the Essential Micronutrients Foundation, a non-profit organization which addresses micronutrient deficiencies globally as a public health issue. He is also Director of Nutrition Strategies International which deals with food and nutrition issues in developing countries. In addition, he serves as a Member of the editorial board of the journal, Food and Nutrition Bulletin. Prior to his current positions, Mr. Smith was the Global Director, Health Chelates for Akzo Nobel Functional Chemicals, and directed the global business for these compounds in food and nutrition as well as pharmaceutical applications. He was responsible for the global project within Akzo Nobel addressing iron deficiency anemia. In addition, Mr. Smith directed the Asia Pacific activities for Akzo Nobel’s Innovation Unit. He is a thirty-year veteran of the chemical industry in the Asia Pacific and has resided in Singapore for more than 20 years. He is a Member of the Nutrition Society of the UK, the American Society of Nutrition and the American Chemical Society.

Abstract

It has been more than 100 years since the “discovery” of vitamins, and since then, the development of the science showing the vital importance to human health of these vitamins and certain minerals in small amounts has expanded greatly. To address deficiencies of these micronutrients, various public health actions have been taken, including not only food fortification but also dietary diversification, supplementation, and more recently biofortification. These approaches have been implemented, often in conjunction, in many parts of the world to reduce or prevent deficiencies, with important success. The key nutrients that have received the most attention have been iodine, iron, zinc, vitamin A and more recently folic acid. The older scourges of deficiencies which cause clear disease or death, like scurvy (from extreme vitamin C deficiency) or beriberi (from thiamin deficiency), have been mostly eliminated (although thiamin deficiency has been widely found in Southeast Asia, and infantile beriberi has been diagnosed, along with outbreaks in Kiribati). There are more than 25 vitamins and minerals considered essential to human health, and some of these have received less attention in public health, often due to the lack acute disease symptoms. Some are starting to get more attention. Vitamin B_{12} deficiency, which is associated with increased risk of adverse pregnancy outcomes, impaired cognitive development, and health of the elderly has been called “a major public health problem worldwide”, but there is little data on status and intakes in Southeast Asia. Choline is an essential nutrient, vital in epigenetic
regulation of gene expression. Choline deficiency has been associated with increased risk of neural tube defects in offspring, but again, intakes and status in Southeast Asia are not measured or even estimated.

Recent studies have shown widespread vitamin D deficiency in most Southeast Asian countries, despite regular sunshine. Since vitamin D is critical for bone health and formation, it may be appropriate for action to be taken to address the deficiencies. Questions remain about calcium intakes and the efficiency of its incorporation into bone formation of Southeast (SE) Asian populations. The science of these issues will be reviewed in a SE Asian context.

Additionally, there have been scientific developments on vitamin K, and more particularly vitamin K₂ (menaquinones). At present, for countries that have a vitamin K dietary recommendation, all are based on vitamin K₁ (phylloquinone) intakes and requirements for coagulation. Originally discovered for this function as a factor in blood coagulation, more recent science has shown roles in bone health, vascular integrity, energy metabolism and brain function. Green leafy vegetables are generally a major source of phylloquinones.

References

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**Biographies**

**Ms. Nguyen Thi Phuong Trang** is Foods and Refreshment Research & Development Manager of Unilever Vietnam International Company Limited, Vietnam, responsible for the deployment of Unilever R&D program to make sustainable living a commonplace in Vietnam. Ms. Trang has 22 years of working experience in Research & Development for foods, tea and ice cream products for Knorr, Lipton, Wall’s brands respectively. She also has hands-on experience in food fortification and efficacy studies.

In 2012, she was involved in a project on “National Strategies for Food Fortification”, a collaboration between Unilever Vietnam and the National Institute of Nutrition, Vietnam. As the pioneering business in this meaningful project, Unilever Vietnam has conducted extensive research and launched “The Knorr Meaty Granule - fortified with Vitamin A” in 2013. With the new formulation, Knorr granules guarantee not only the rounded taste of dishes with 3 premium ingredients (shinbone, tenderloin & marrow) but also provide benefits to family health with the addition of Vitamin A. In addition to the new product launch, Unilever Vietnam has also intensified its PR activities against micronutrient deficiency to help consumers become more aware of the importance of micronutrients in the daily diet. In 2016, iodized salt was studied and used in all Unilever Vietnam products according to Vietnam regulation.

**Ms. Wei Tang** is Regional Head of Nutrition External Engagement (Asia) of Unilever China Company Limited, China. Ms. Tang supports Unilever’s external nutrition and health-related programs and collaboration across Asia. She has 12 years of working experience in Research & Development at various positions related to Nutrition & Science, Product Development and Scientific Affairs in France and China. She joined Unilever in 2017 as Regional Head of Nutrition External Engagement for North Asia and expanded her responsibility to Southeast Asia and Australasia (SEAA) region from 2018. Ms. Tang obtained her M.Sc. in Biology and Innovation in Quality and Productions of Vegetable respectively at University Paris XIII and University Paris XI.
Abstract

In Asia, between 21-47% of the women of reproductive age have anemia and many pregnant women do not have an adequate iodine status. Food fortification is one of the most cost-effective approaches to improve the health of the population. Bouillons, seasonings and condiments have been increasingly recognized as suitable vehicles for micronutrient fortification as they are regularly and commonly consumed.

Currently, evidence regarding the effectiveness of fortified bouillons, seasonings and condiments on improving micronutrient intake and status are currently lacking. Therefore, we performed a systematic review to evaluate the consumption patterns of bouillon cubes, seasonings and condiments in Asia and used the outcomes to perform a scenario analysis of fortifying these food vehicles with iodine and iron on micronutrient intake.

Our study showed that the use of iodized salt (at local regulated levels) in bouillon cubes and seasonings can increase iodine intake with 60 (7-93) µg/d and with 50 (9-119) µg/d when condiments contain iodine. In a second scenario analysis, foods that were fortified with iron at levels of 1 mg/g for bouillon cubes and seasonings and 0.575 mg/mL for condiments can result in an improvement of iron intake of 4.0 (1.9-6.2) mg/d for bouillon cubes and seasonings and 5.0 (1.3-9.1) mg/d for condiments. These results imply that using iodized salt and adding iron to bouillon cubes, seasonings and condiments can help to increase the intake of iron and iodine with approximately 33% of the RDA in Asian countries. However, in order to successfully implement fortification programs, it is important to address possible barriers faced by the industry with regard to technological challenges, additional/unnecessary costs of fortificants, and disharmonized regulations for fortified products among neighboring countries. Furthermore, it is important to ensure appropriate communication to the consumer in order to ensure consumer awareness of the need for fortified products and to allow consumer-friendly information on the fortified product.
SESSION 4

Case Studies on Micronutrient Fortification
Iodine Deficiency: Epidemiology, Consequences, Reduction Strategies

Biography

Dr. Fabian Rohner is an International Nutrition and Public Health Specialist of Groundwork, Switzerland. In his current position at GroundWork, he serves as the study sponsor of two large clinical trials investigating the impact of combined agriculture, nutrition and WASH intervention package on health and nutritional status in young children as well as in pregnant women and their offspring in Western Kenya. Also, he has recently completed a validation study of quantitative rapid methods to analyze the salt iodine content. Further, he is the principal investigator or technical lead on national micronutrient surveys in Africa and Asia, some of which include iodine status assessment.

Dr. Rohner focuses on the design and management of impact evaluations for large-scale food fortification and infant and young child nutrition programs. He is also a member of the US National Institute of Health’s ‘Biomarkers of Nutrition for Development’ iodine expert panel, the US CDC ‘Biomarkers Reflecting Inflammation and Nutritional Determinants of Anemia’ initiative and serves on the technical advisory panel of the ‘Power of Nutrition’. He has conducted clinical trials related to the prevention and treatment of malaria, helminths and micronutrient malnutrition in West Africa, as well as multiple research studies around iodine nutrition.

Abstract

Adequate iodine status is important for optimal physical and cognitive development from the unborn fetus up to adult life. Depending on the severity of iodine deficiency and the life stage in which it occurs, consequences can range from severe malformations to disadvantages that are not easily visible. Historically, most severe forms of iodine deficiency occurred in mountainous areas of the world, with goiters being highly prevalent prior to implementing salt iodization programs. But even in less prone areas, milder forms of iodine deficiency have had negative consequences on physical and cognitive development in large parts of the world.

The iodization of table salt has been a tremendous public health success in the past 2-3 decades, and the number of countries with iodine deficiency has dropped from 110 in 1993 to 21 in 2018. However, now that some of these iodization programs have matured, sustainability has become an issue: funding sustainability with decreasing contributions from external donors, as well as political sustainability, including ongoing support and commitment to monitoring and importantly, law enforcement.

Changing dietary patterns, with increasing consumption of processed foods, in particular in the SEA region, pose additional challenges to adapting legal frameworks, monitoring and law enforcement. Lastly, although at national levels, many countries have demonstrated iodine
sufficiency in certain population groups (e.g. school-age children), there are other population segments that may have inadequate iodine status (e.g. pregnant women), and within a country, there are often important geographic differences that are masked by a single national estimate.
Iodine Fortification in Thailand

Biography

Prof. Visith Chavasit is Faculty Member at the Institute of Nutrition, Mahidol University, Thailand. During 2007-2015, he was the Director of the Institute of Nutrition, Mahidol University. His research interests are on food fortification and health food product development which allowed him to serve as a consultant for many international organizations such as ICCIDD, World Bank, GAIN, UNICEF as well as Thailand’s Food and Drug Administration. A number of his innovations and developments have been adopted for commercialization and national policies. He graduated with Ph.D. in Philosophy and in Food Science from the Department of Food Science and Technology, Oregon State University, USA.

Abstract

Table salt iodization had been mandated in Thailand for more than 4 decades, but the quality of most iodized salts was below standard. In 2011, the government decided to categorize iodized salt as a specially controlled food item and adopted the Universal Salt Iodization (USI) strategy, which specified that iodine in iodized salt must be between 20-40 ppm. All salt used for food and feed production must be iodized. The problem of production, process control and quality control had been the challenge for Thailand’s Food and Drug Administration, especially among small and medium entrepreneurs. In addition, fish sauce and soy sauce, which are more commonly used condiments than table salt in Thailand, were also mandated in using iodized salt as the raw material; however, this process is not practical to the food industry since it can cause technical complication during fermentation and is not economically feasible. To ensure that the new regulation regarding USI strategy is implementable for small- and medium-scale salt producers, Thailand’s Food and Drug Administration and Institute of Nutrition, Mahidol University developed mixing machines appropriate for uses in batch process commonly used by small scale, low production capacity plants, and continuous process for medium production scale plants. These machines were developed aiming to be at affordable price and operation-friendly to the respective production scales. For iodization of fish and soy sauces, it was agreed to allow the industry to fortify their finished products instead of using iodized salt for fermentation. This technique is unique, much more economical and practical for industry. The in-line quality assurance is encouraged for the salt and sauce producers since the control at finished products using standard analytical methods is costly and needs technical support.
Thiamine and Riboflavin as Key Candidates for Fortification in Southeast Asia: A Case from Cambodia

Biography

Dr. Kyly Whitfield is Assistant Professor in the Department of Applied Human Nutrition at Mount Saint Vincent University in Halifax, Canada. She leads the Milk and Micronutrient Assessment (MAMA) Lab, which aims to explore several facets of maternal and infant feeding and nutrition (www.mamalab.ca). She is passionate about nutrition in the first 1,000 days, from conception to two years; she co-edited The Biology of the First 1,000 Days. A major focus of her research program is identifying culturally appropriate public health interventions to combat micronutrient deficiencies in low-resource settings, which currently includes the exploration of salt fortification to address thiamine deficiency among breastfed infants in Southeast Asia. Her previous work explored fish sauce as a fortification vehicle in Cambodia. Another focus is studying infant feeding behaviors, and the potential long-term effects of early feeding on eating patterns and disease risk later in life. She was awarded the inaugural Mount Saint Vincent University Early Career Research Award this year.

Abstract

Thiamine (vitamin B₁) deficiency remains an under-studied public health issue which was recently being called the forgotten disease of Asia, despite reports of deficiency throughout Cambodia, Myanmar, Laos, and other countries. In infants, thiamine deficiency causes infantile beriberi, which without treatment can lead to mortality within hours of clinical presentation. Recent evidence also suggests that even sub-clinical thiamine deficiency in early life has a negative effect on cognitive development and functioning. Riboflavin (vitamin B₂) is also another concern where there is evidence of low riboflavin status in Cambodia and Malaysia which is problematic given its role in anemia. Both thiamine and riboflavin deficiencies are common in regions where (B-vitamin poor) white, polished rice is the dietary staple. Women with poor dietary thiamine and riboflavin intake produce milk low in these vitamins, putting their exclusively breastfed infants at a high risk of deficiency. This presentation will review the biology and deficiency symptoms of thiamine and riboflavin, and provide recent epidemiological data on status throughout Southeast Asia. We will also review recent (and ongoing) thiamine fortification efforts in Cambodia with fish sauce and salt.
Introduction of Fortified Rice into the Canteen for Cambodian Female Worker

Biography

Dr. Yukiko Nakanishi is Consultant of ILSI Japan Center for Health Promotion who helps international projects to improve the workplace nutrition in South East Asian countries. Before working as a consultant of ILSI Japan CHP, Dr. Nakanishi worked as a Professor of Nutrition at University of Human Arts and Sciences, Koshien University, and Showa Women’s University. Since 1998, she has closely collaborated with National Institute of Nutrition, Vietnam, to develop and implement iron-fortified fish sauce and micronutrients-fortified rice. At present, she has been coping with the multi-micronutrient fortified rice through workplaces in Cambodia with collaboration with RACHA (Reproductive and child health alliance) Cambodia.

Abstract

Although the prevalence of anemia was as high as 43.6% (Cambodia health Survey 2014), the contribution rate due to dietary iron deficiency was low, suggesting the contribution of folic acid deficiency and zinc deficiency. The folic acid deficiency (<10 nmol / L) was 17.8%, and the zinc deficiency was 26.3% in the case of <7.65 µmol / L. Whitfield et.al, reported that women with thiamine deficiency (TDP ≤ 90 nmol / L) were 39% in urban areas and 59% in rural areas. In this study, we evaluated the effect of improving nutrition by introducing multi-micronutrients-fortified rice (MMFR) in the cafeteria, for female employees of reproductive age who work at factories, in Cambodia. Fortification levels were set based on WHO-WFP-DSM recommendation as followings. Micronutrient fortification levels were 0.169 mg/100g of folic acid, 6.0 mg/100g of Zinc, and 0.65 mg/100g of VB1 when the premix is mixed with the ordinary rice as 1:200. Study subjects were recruited from reproductive-aged women working for Japanese-Cambodian electronic parts factory. One hundred and eighty female workers were randomly selected and divided into two groups as a control group with 90 subjects and a fortified group with 90 subjects. The double-blinded intervention study was conducted for 12 weeks from November 2018 to February 2019. Questionnaire for Subjective health and health complaints, and blood analysis were examined. By introducing fortified rice into the canteen, serum folate concentration increased in proportion to the frequency of intake of fortified rice in the intervention group and significantly improved. In addition, the loss due to the decline in absolute presenteeism was improved. Conclusion: The possibilities of reducing the risk of neural tube closure failure in neonates and the loss of productivity due to the decline in presenteeism were shown.
ROUND TABLE DISCUSSION

Chairperson:
Dr. Regina Moench-Pfanner
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