

ScienceInSight

News and Updates on Nutrition, Food Safety and Health



Dietary Intakes in Southeast Asia Assessing What We Eat, Evaluating Methodologies

Global Food Safety Partnership Food Chemical Risk Assessment
Training Sustainable Food Security Role of Genetics and New
Technologies Gut Health New Frontiers in Diet, Gut Microbiome and Health
Maternal, Infant and Young Child Nutrition Updates from Cambodia, Laos and Myanmar

From the Executive Director



This 2nd issue of Science InSight in 2016 is published amidst several key events of ILSI SEA Region in the region. It coincides with our hosting of the 7th edition of the **Asian Conference on Food and Nutrition Safety (ACFNS)**, a signature program of ILSI in Asia over the past 25 years since its inauguration in 1990 in Kuala Lumpur, Malaysia. It was the first scientific conference in the region focusing on food safety issues. In 2016, this conference series returns to Malaysia, where it will be held in the historic city of Georgetown in Penang state. Partnering with the newly formed Southeast Asia chapter of the International Association for Food Protection (IAFP), the Ministry of Health Malaysia's Food Safety & Quality Division, as well as several international and local institutions, ILSI will also have a joint platform with the **4th Asia Pacific International Conference on Food Safety**.

In August, ILSI SEA Region organized the pilot testing of the training module on **Food Chemical Risk Assessment** developed by experts under the World Bank's Global Food Safety Partnership (GFSP), in collaboration with the Agri-Food and Veterinary Authority (AVA) in Singapore. When ready, this training module will be rolled out in developing countries globally, and ILSI may likely play a significant role in its facilitation. Further keeping track with another ASEAN initiative under the Integrated Food Security Framework and Strategic Plan of action on Food Security for 2015-2020, in September we jointly organized seminars and dialogue sessions on **Sustainable Food Security in ASEAN** with key stakeholders in Singapore and Malaysia.

Besides issues in food safety and security, ILSI SEA Region is actively pursuing ways to better assess food intake and the nutritional value of foods consumed, recognizing that good quality food composition data are needed to provide reliable information that also reflect a country's rapidly changing food supply. In April, we organized a **Symposium on Assessing Dietary Intakes in Southeast Asia** in Singapore, in collaboration with ASEANFOODS and national health agencies from among the ASEAN countries. In August, we convened a seminar and a regional expert consultation on **Maternal, Infant and Young Child Nutrition** to identify gaps, and recommend areas for further research and work.

It is our pleasure to share brief reports on these and other ILSI SEA Region activities over the past 6 months in this issue of Science InSight, and we look forward to continuing support from our members and stakeholders, as well as active participation from our readers in our programs. Thank you!

Boon Yee Yeong
Executive Director, ILSI SEA Region

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Assessing Dietary Intakes in Southeast Asia

To better understand what populations are eating, and the nutritional value of the foods consumed, it is critical to have good quality, national food composition data that is updated and accurate. The food composition data should also provide reliable information that reflect a country's rapidly changing food supply. To analyze and assess food consumption and nutrient intakes, both dietary and biochemical assessment methods should be used. By collecting food intake data using the most accurate techniques available, and analyzing the intake data using appropriate statistical methods, countries will gain more accurate assessments of inadequate or excess nutrient intakes for their populations.

ILSI SEA Region organized a half-day symposium on **Dietary Intakes: Assessing What We Eat and Evaluating Methodologies** on April 26, 2016 and in conjunction with its 2016 Annual Meeting. The symposium aimed to discuss the current development and process for improving and expanding food composition databases in the Southeast Asian region; as well as share experiences and international best practices in dietary assessment methodologies. The symposium also aimed to provide updates on the latest findings from food consumption survey data in selected Southeast Asian countries, and discuss gaps, barriers and opportunities in the collection, analysis and interpretation of food consumption survey data in Southeast Asia.

The symposium was attended by more than a hundred relevant nutrition and health professionals from government departments and agencies, academia, research organizations and food industries.



Mr. Geoffry Smith, President of ILSI SEA Region, gave the welcome address, highlighting the importance of food composition data and food consumption surveys. Prof. Jeyakumar Henry, Singapore Institute for Clinical Sciences (SICS), Singapore, and Dr. Chor San Khoo, ILSI North America, USA, co-chaired the symposium.

Dr. E-Siong Tee, ILSI SEA Region, opened the symposium with a presentation on Improving and Expanding Food Composition Databases in ASEAN – Recent Initiative and Approaches. He highlighted two **recent activities to improve and expand food composition data in Southeast Asian countries** in which ILSI SEA Region collaborated with ASEANFOODS. The first activity was a Roundtable Discussion on Food Composition Database which focused on the development of good quality food composition tables (FCT) or databases (FCDB) in ASEAN. He shared that at the meeting, a system for evaluation was developed. It was then used to evaluate 8 existing FCT/FCDBs from 5 countries. Challenges and issues within each country and across the countries which participated were then identified. Dr. Tee also highlighted the second activity, ASEANFOODS-ILSI SEA Region Workshop on Food Composition Database which was a follow-up of the roundtable discussion held in December 2015. The workshop participants also agreed to a plan for the development of the 2nd version of ASEAN FCDB, to be done over 3 phases/workshops. They discussed action plans and funding sources for this project. A pilot project to discuss the collaboration with food companies to obtain nutrient composition of pre-packaged (processed) foods data for inclusion into national FCDBs was



Mr. Clifford Johnson giving his presentation

also initiated. Dr. Tee concluded that in order to improve and expand the food composition data in ASEAN, a long term program for generation and compilation of quality FCD should be established in each country.

The second presentation was by Mr. Clifford Johnson, Former Director, National Center for Health Statistics (NCHS), USA on US NHANES Dietary Data: Collection, Release, Analytical Considerations and Uses. He first introduced the **National Health and Nutrition Examination Survey (NHANES), which is a key source of information on the health and nutrition status of the US population.** He shared that the survey included both interviews and standardized physical examinations conducted in mobile examination centers. He highlighted that 24-hour recall was the primary measurement of intake data with the first interview conducted in Mobile Exam Centers and subsequent interview through telephone. The NHANES dietary



Dr. Malcolm Riley giving his presentation

component also included a targeted Food Frequency Questionnaire (FFQ) with questions on dietary practices and behaviors. Mr. Johnson then shared the analytical considerations included the processing of the data, quality control, editing, preparation and documentation. He also explained that the assessment of total usual intake can be done using two 24-hour recalls and intakes estimated from consumption of dietary supplements through FFQs. The two intakes were combined and modelled to create the estimate of total usual intake, as compared to usual intake from foods alone. He reported that the data generated was used for development of physical activity guidelines for Americans, revision of dietary reference intakes, and dietary guidelines for Americans, as well as the establishment of food fortification policies. He concluded that **a comprehensive nutrition status assessment and a well-chosen and appropriate set of dietary data are important to interpreting the health and nutrition status of a country.**

Dr. Malcolm Riley, Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia, gave the next presentation on Review and Evaluation of Latest Technologies in



Food Consumption Surveys – Australia Experience. **He introduced four new uses of technologies to gather data in food consumption surveys.** The first one, an interactive computer-based technology, is applicable to dietary methodologies such as FFQ and 24-hour recall. He explained that the interactivity can include touch screen functionality, use of audio, variable portion size indications and pop-up guides. Another new technology is image-assisted or image-based technology to aid traditional dietary methods. By using cameras to capture images of a person's meals, Dr. Riley observed that it can be used for portion estimation and as a memory prompt for participants. However, training for respondents would be required. Dr. Riley then highlighted that hand-held devices such as smart phones have been widely-used to give real-time collection and can incorporate digital photography and voice records. The device cost is small and is less reliant on memory. However, it would require training support as well. The last technology that Dr. Riley introduced was scan- and sensor-based methods. Scan-based methods included the use of loyalty cards, smart cards or food product labels, while sensor-based methods make use of a range of functions related to eating. He shared that scan-based methods are specific to the context and not to individuals and it relates directly to food. However, domestic waste would not be assessed and this method is not reliant on self-report. He also highlighted that sensor-based methods are in the early stage of deployment, but would have the potential to lower subject burden and reduce error in food identification and accurately identify an eating occasion for further investigation. With that, Dr. Riley concluded that **a combination of technologies would be promising to improving current dietary assessment methodologies.**

The presentation on Identification of Biomarkers of Habitual Dietary Patterns was given by Prof. Choon Nam Ong, National University of Singapore, Singapore. He **shared about his study that investigated the differences in plasma metabolic profiles between habitual high meat and seafood (HMS) eaters and low meat and seafood (LMS) eaters using mass spectrometry-based metabolomics methods, which aimed to reveal the link between plasma metabolic profiles and habitual dietary intake.** Plasma metabolites were profiled and compared between 83 HMS eaters and 82 LMS eaters from a healthy cohort in Singapore. Prof. Ong highlighted that the findings from his study revealed that levels of arachidonic acid, EPA, DHA, glycerophospholipids, D-glucose, lysine and valine were higher in HMS eaters.

Internal validation verified that these metabolite changes were significantly associated with meat and seafood intake. He **concluded that a higher consumption of meat and seafood has a substantial impact on plasma metabolic profiles, particularly on amino acids, fatty acids and glycerophospholipids, resulting in a higher risk for the future development of diabetes.**

Dr. Astuti Lamid, Ministry of Health, Indonesia, gave the next presentation on Key Findings of Recent Food Consumption and Nutrition Surveys in Indonesia. She shared that as **the pattern of leading causes of death in Indonesia shifted from Communicable Diseases to Non Communicable Diseases, which is allegedly linked to food consumption patterns.** The National Institute of Health Research and Development carried out the Food Consumption Survey (FCS) in 2014, and food and beverage consumption data was collected using 24-hour recall with 5-Step Multiple-Pass Method. Food consumption data was converted into nutrient consumption data using the Food Composition Table. She reported that the findings of the FCS showed that the highest food group was cereals while the lowest food group was offal, followed by milk. Dr. Lamid highlighted that energy intake below 70% of the Recommended Dietary Allowances was analyzed to be 45.7% across all ages. Protein intake below 80% of RDA was analyzed to be 36.1% across all ages. She also highlighted that 52.7% of the population exceeded the consumption limit of sodium as recommended by the Ministry of Health Decree 2013. The population that exceeded the consumption limit of sugar and fat was 4.8% and 26.5% respectively.

Dr. Nipa Rojroongwasinkul, Mahidol University, Thailand, shared the findings in Thailand in her presentation on **Key Findings of Recent Food Consumption and Nutrition Surveys in Thailand.** She reported that information on food intake was collected using a semi-quantitative FFQ in combination with



24-hour dietary recall. Data was collected using computerized programs with food photograph aids. Additional data on body weight, height and socio-demographic characteristics was obtained as well by trained personnel. She also shared that the data from the semi-quantitative food frequency questionnaire was used to assess the most commonly consumed food items and amount of daily food consumption per capita in two age groups, namely < 3 and ≥ 3 years. Dr. Nipa highlighted that the findings showed the most popular food items consumed in Thai population were eggs, steamed rice, pork, mackerel, chicken and long beans, where the percentage of consumption was more than 80%. The most popular food items consumed daily in the Thai population aged 3 years and above were steamed rice, glutinous rice, coffee and fresh milk while the most popular food items consumed daily in children aged below 3 years were steamed rice, fresh milk, formula milk.

Malaysia's food consumption data was also shared in the symposium by Mr. Mohamad Hasnan Ahmad, Ministry of Health, Malaysia, when he presented on **Key Findings of Recent Food Consumption and Nutrition Surveys in Malaysia**. He shared the Malaysian Adult Nutrition Survey (MANS) 2014 was a nationwide cross-sectional study using FFQ which contains 165 common food and beverages and one day 24-hour dietary recall. He highlighted the top ten popular foods consumed by the Malaysian population were cooked rice, eggs, green leafy vegetables, chicken, marine fish, local kuih, bread, bee-hoon/kuew-tiaw, noodles and soy sauce. He also highlighted that the daily median energy intake of Malaysian adult men and women was 1489kcal/day and 1445kcal/day respectively. The proportion of macronutrient contribution for the energy intake was 55% from carbohydrate, 16% from protein and 29% from fat, which was similar in both genders. He noted that there is an increasing trend of "processed foods" added with salts among adults and alternative healthier condiments and low salt processed foods should be recommended. He concluded that macronutrient contribution for energy was found lower than the Malaysian Recommended Nutrient Intake (RNI). Therefore, an effective strategy to inculcate consumption of nutritious foods among Malaysian is highly recommended. At the same time, **national data on food consumption needs to be regularly updated to keep track of today's rapid change of Malaysian lifestyles**.

Dr. Sofia Amarra, ILSI SEA Region, gave the final presentation on Identifying Sources of Sodium among Filipinos Aged



Organizers and speakers of the Symposium on Dietary Intakes – Assessing What We Eat & Evaluating Methodologies

19-50 Years: Processes and Challenges. She shared that her study aimed to **identify food sources that contributed significantly to the variance in sodium intake of Filipinos aged 19-50 years using data from 2008 National Nutrition Survey (NNS)**. Dr. Amarra pointed out that 22 out of the 61 food categories had significant positive contribution to the variance in sodium intake. Hence when the intake of these food increases, sodium intake increases as well. She shared that a multi-disciplinary collaboration is crucial for such studies, and the team included a food composition data compiler, nutritionist and statisticians. She added that familiarity with the local diet patterns and culture is necessary. Dr. Amarra also shared that one of the challenges they faced was the lack of open data sharing which was a major setback to obtaining information that can be used for policy and intervention to improve the health of the Philippine population. She concluded her presentation **highlighting that countries need better food composition data for dietary analysis**.

During the question-and-answer session held at the end of the symposium, the issue of over- and under-reporting of intake was discussed. Mr. Johnson shared that even with improved methodologies, over- and under-reporting is unavoidable. He gave the example that for the results from NHANES, there were about 5 to 10% of over- and under-reporting. He recommended that researchers be aware of the limitations of the methodologies such that the data can be interpreted appropriately.

The ideal sample size of food consumption surveys was also discussed. Dr. Amarra

shared that the survey in Philippines covered more than 3,000 individuals using multi-stage stratified sampling. Mr. Mohamad also shared that MANS interviewed 3,000 individuals using multi-stage sampling. Mr. Johnson added that though the sample size for NHANES was 5,000, the published database contained data collected from two years, hence totaling up to a sample size of 10,000. The required skill sets to conduct dietary intake surveys or assessments were discussed as well. Mr. Johnson noted that with new technologies such as the Automated Self-Administered 24-Hour Dietary Assessment (ASA24), there would be less need for highly-skilled trained interviewers. However, appropriate skill set is still required for data analysis.

In concluding of the symposium, the experts agreed that food intake research should be prioritized, and that collaboration between institutions, government and public-private partnership is important and necessary.



Sustainable Food Security in ASEAN - Role of Genetics and New Technologies

ASEAN is moving towards its next phase of development with the establishment of the ASEAN Community on December 31, 2015. In view of this, ASEAN Member States have laid out their common vision for sustainable agriculture and food security in the region through the ASEAN Integrated Food Security Framework and Strategic Plan of Action for Food Security for 2015-2020.

One of the key elements highlighted in the Framework and Plan of Action is the promotion of sustainable food production, such as by adopting new agricultural technologies to improve productivity and efficiency, reduce post-harvest losses, address climate change, as well as enhance nutrition. To facilitate the adoption of new agricultural technologies, it is important that key stakeholders along the value chain, including technology providers, food transporters, food processors, as well as regulatory authorities, are aware of new technological developments and their potential implication on their respective responsibilities.

Recognizing this, ILSI SEA Region and AACC International, together with the Genetic Modification Advisory Committee (GMAC) of Singapore and United States Department of Agriculture (USDA) in Singapore; and with the Malaysian Biotechnology Information Centre (MABIC) in Malaysia, organized a series of **Seminars on Sustainable Food Security in ASEAN – Role of Genetics and New Technologies** in Singapore and Kuala Lumpur, Malaysia. The seminar in Singapore was held on September 5, while the seminar in Kuala Lumpur was held on September 7. About 90 participants in Singapore and 70 participants in Malaysia

attended the seminars, comprising of academic researchers, seed/technology developers, grain processors and food industry personnel, NGO representatives and government regulators.

The objectives of the seminars were to: 1) provide an understanding on scientific and policy challenges for ASEAN agriculture production and food security; 2) share the latest information on advancements in current and future food and agricultural technologies and to provide insight on the developments; and 3) potential impacts of new genetic-based technologies on various stakeholders along the food production chain.

Mr. Geoffry Smith, President of ILSI SEA Region, Ms. Joani Dong, Regional Agricultural Attaché from USDA, and Dr. Anne Bridges, Technical Director at AACC International gave the welcome and opening speeches in Singapore; while this was provided by Mr. Keng Ngee Teoh, Senior Manager, Scientific Programs at ILSI SEA Region, Dr. Mahaletchumy Arujan, Executive Director of MABIC and Dr. Anne Bridges in Malaysia.

The first presentation, **Challenges for ASEAN Agriculture and Food Security**, was given by Prof. Paul Teng from Nanyang Technological University, Singapore. Prof. Teng explained some of

the challenges ASEAN currently facing in terms of agriculture – the decline in crop yield-growth, environmental degradation and the impact of climate change; as well as in relation to food security, which include the declining and ageing farmer population, urbanization and population growth, dietary changes such as increased animal protein consumption, as well as diversion of food crops for other uses such as biofuels.

In response to some of these challenges, a few recommendations were provided including adoption of emergent approaches and technologies to assure food availability and stability, as well as tackling food utilization issues such as nutrition, food safety and food loss and waste. Such strategies may include the use of genetic technologies to improve aspects related to nutrition insecurity, food safety and food loss; as well as introducing Information and Communication Technologies (ICT) to farmers, such as in precision farming. Prof. Teng explained that **food security is not a single-issue problem and its different dimensions need to be addressed simultaneously to successfully overcome the challenges.**

Prof. Timothy Murray from Washington State University, USA, then gave the second presentation on **Challenges for Agriculture and Food Production –**



Understanding Plant Pathology. Prof. Murray highlighted that plant diseases are the main cause of food crop losses worldwide. He explained that three key factors, known as the 'disease triangle', influence the development of plant diseases. These include the resistance or susceptibility of a plant, virulence, pathogenicity and specialization of a pathogen, and the environment such as temperature and moisture. Drivers of future plant disease epidemics include rapid globalization, evolution and genetic changes, as well as climate changes. Prof. Murray further explained some of the plant disease management principles, which include exclusion such as implementing quarantine and border control measure; eradication of pathogens either by destroying its plant hosts, physical controls or biological controls; the use of plant protection products; and the introduction of resistance through plant breeding.

Following the presentations on the challenges, Mr. Sean Roberts from Syngenta, Singapore gave the next presentation on **Crop Protection Solutions – Current and Future Technologies**. Mr. Roberts shared the current drivers for developing crop protection products, which are related to some of the agriculture and plant disease challenges mentioned by previous speakers. These also include factors such as labor shortages, regulatory developments, chemical resistance of pests and weeds, climate change, as well as availability of new technologies. As the primary basis, all plant protection products have to be made safe, where the products do not result in harm to humans or the environment, through data generation and risk assessment.

Dr. Anne Bridges from AACC International then gave the next presentation on **Modern Plant Breeders Toolbox – Current Technologies**. In her presentation, she listed different techniques including mutagenesis, wild crossing of similar species, gene stacking, transgenic plants and back-crossing of genes into varieties as some of the existing plant breeding techniques. She then described some of the current transgenic traits that are available on the market including herbicide resistance, insect resistance, and other agronomic traits such as drought resistance and those relating to more efficient nitrogen use. Gene stacking of genetic engineered traits, in particular 'breeding stacks', was explained to be the crossing of two or more genetically engineered traits into a single plant variety using conventional breeding techniques. This may occur intentionally as a 'seed stack', whereby the events are combined during breeding, or as a 'field stack', where the events are combined from cross-pollination in the field.



Following Dr. Bridges's presentation on current technologies, Prof. Les Copeland from University of Sydney, Australia, presented on **A Modern Plant Breeder's Toolbox: Upcoming Technologies**. He explained that technological change has been the main driver for productivity growth in agriculture. He highlighted the emerging application of next generation genome sequencing combined with bioinformatics as a means to improve the efficiency of plant breeding. This is achieved through the identification of genetic potential of food plants and animals, better understanding of environmental and plant-soil interactions, as well as exploration of the microbiome and epigenome of crop plants. More recently, gene editing technologies, such as CRISPR technology, has also opened up new potentials for plant breeders to improve food crops and animals.

The next presentation on **Meeting the Challenges: Managing Food Ingredients from Multiple Sources – Grain Handler's Perspective** was shared by Mr. Jonathan Fischer from Cargill, USA, in Singapore, and by Ms. Ratih Puspitasari from Cargill, Singapore, in Malaysia. It was explained that identity preservation is a way to transform a commodity product to a higher value product, as these identity preserved products possess special attributes. The primary objective of identity preservation systems are to minimize leakages or dilution of a specialty product by commodity products that would lower its value. Mr. Fischer further explained that prior to developing a particular identity preservation value chain, a number of factors need to be considered including demand, availability of stable supplies, supply chain expertise, as well as testing for contractual specifications. Biotechnology has helped to develop specific identity preservation markets. This includes non-biotech identity preserved products, as well as functional biotechnology products that require identity preservation, such as high oleic acid soybeans.

In Singapore, Dr. Allan Lim from Nestle, Singapore, gave the presentation on **Practical Approaches to Address Sustainable Nutrition in Asia**. He explained that sustainable nutrition encompasses the entire value chain from agricultural supply to consumer use, and food companies such as Nestle are actively adopting such approaches. One of the case studies he elaborated on involved a sweet potato variety that was developed as a sustainable source of beta-carotene.

In Malaysia, Dr. Anne Bridges gave a presentation on **Quality Management from the Bin to the Box**. Dr. Bridges explained how food companies manage their supply chain to ensure food safety and satisfy consumer choices. The main approaches in doing so is the adoption of food safety management systems, such as Hazard Analysis Critical Control Point (HACCP) programs, as well as provision of food labelling. Success in this regard is also supported by strong food safety governance and culture across food companies at all levels of the organization.

The final presentation in both Singapore and Malaysia was provided by Dr. Janet Gorst from Food Standards Australia New Zealand (FSANZ), Australia, who shared on **Perspectives on Regulation of Technologies for Food Cop Improvement**. She provided an overview on the regulation of food produced using gene technology in Australia and New Zealand, which are enshrined in the Australia New Zealand Food Standards Code. She explained that food derived from genetically engineered (GE) plants were initially regulated because there was no history of safe use. For stacked GE crops, Dr. Gorst explained that FSANZ does not separately assess them if their GE parent lines have already been approved. Current thinking on regulation of so-called 'new breeding techniques' was also discussed and FSANZ had previously hosted a series of technical workshops to discuss these technologies and identify are any potential safety concerns.

Maternal, Infant and Young Child Nutrition - Updates from Cambodia, Laos and Myanmar

Malnutrition among pregnant women and young children has been a resurging issue to be addressed globally. The first 1,000 days from pregnancy to the first 2 years of the infant's life is a critical period where malnutrition, especially undernutrition, results in irreversible physical and cognitive impairments that prevent children from achieving their full potential. In particular, Cambodia, Lao PDR and Myanmar belong to the 20 countries identified with the highest burden of malnutrition, which contributes to 80% of the world's undernourished children.

As such, ILSI SEA Region organized a 1-day seminar on August 11, 2016 in Phnom Penh, Cambodia, with the objectives to review current maternal, infant and young child nutrition status in Cambodia, Laos and Myanmar, review and discuss complementary feeding and strategies for pre-term, low birth weight and stunted children and to discuss current programs and strategies for improvement of nutritional status with follow-up actions. The seminar was attended by about 60 invited participants consisting of invited professionals from government departments and NGOs, academia, and research organizations.



Mr. Geoffry Smith, President of ILSI SEA Region, welcomed the speakers and delegates, and provided a brief overview of ILSI SEA Region's goals and activities, as well as the support of scientific activities by the Technical Committee of Maternal, Infant and Young Child Nutrition in Southeast Asia.

Prof. Corazon Barba, from University of Philippines Los Banos, Philippines, first gave the opening presentation on **Nutritional Requirements of Infant and Young Children in ASEAN**. She introduced the Philippine Dietary Reference Intakes (PDRI) 2015, and highlighted that the PDRI 2015 included new recommendation for breast milk and gender group-specific DRIs for infants, revised age groups for young children, and new child growth standards and Acceptable Macronutrient Distribution Ranges (AMDR) for both infants and young children.

Prof. Barba then went on to summarize the RNI among infants and young children from IOM-FNB, FAO-WHO, Philippines, Singapore, Malaysia, Indonesia, Thailand, Vietnam as well as the set of harmonized RDA developed at workshops facilitated by ILSI SEA Region. Issues in the derivation of DRIs for infants and young children were also explained. Prof. Barba concluded by explaining that more research is needed on the analysis of breast milk

composition and extrapolating method. She also shared that there should be more dietary intake data related to biomarkers validated in children and studies with stable isotopes to determine vitamin and mineral bioavailability.

Updates from Cambodia, Laos and Myanmar

Prof. Barba then proceeded to chair the first session, which gave an overview of the current maternal, infant and young child nutrition status in Cambodia and Lao PDR.

The first paper presented was by Ms. Daream Sok from the Department of Fisheries Post-Harvest Technologies and Quality Control (DFPTQ), Cambodia, on **Micronutrient Survey in Cambodia for Children Age under 5 Years and Women of Reproductive Age**. She shared that the micronutrients survey was included as part of the Cambodia Demographic and Health Survey (CDHS) in 2014, and showed that 32% of children under age 5 in Cambodia were stunted, 10% were wasted, and 24% were underweight. 3% of mothers and 9% of children had vitamin A deficiency while 78% of mothers and 66% of children were found having insufficient urinary iodine concentrations. She concluded that Cambodia is still facing a malnutrition problem and this

issue should be considered in the national development agenda, requiring full participation from all key stakeholders. She recommended that as Cambodia is a country rich in agricultural resources, food-based interventions would be an effective strategy to combat micronutrient deficiencies in Cambodia.

Dr. Bounthom Phengdy from National Nutrition Center, Ministry of Health, Lao PDR, gave the next presentation on the **Nutrition and Health status for Maternal, Infant and Young Child, and Government Response to Malnutrition in Lao PDR**. She shared that recent data from Lao Child Anthropometric Assessment Survey (LCAAS) and Food and Nutrition Security Survey (FNSS) in 2015 showed improvement in maternal and child health and nutrition status, where chronic malnutrition in children under 5 reduced from 44% to 35.6%. However, with regards to micronutrient deficiencies, about a third of children under five were estimated to be vitamin A deficient, while more than 60% of children under two were anemic. Among the women aged 15 – 49 years surveyed, the percentage of underweight women ranged from 9.4% to 19.8%, and 40.4% of the pregnant women were anemic, while 36.5 % of breastfeeding women were anemic.

Dr. Phengdy shared that National Nutrition Strategy (NNS) was updated in 2015, outlining the key responsibilities of other sectors and ministries such as health, education, agriculture, planning and investment, poverty reduction development and acknowledging that reducing malnutrition requires a multi-stakeholder, multi-sectoral and multi-level coordination. The stakeholders reached a consensus on a set of 22 priority actions that include nutrition specific and nutrition sensitive interventions. The accompanying National Plan of Action for Nutrition (NPAN) provided a roadmap for each sector to follow and the governance mechanisms are in place to ensure sectoral accountability to those agreed upon actions.

Representatives from Myanmar were regrettably unable to join the seminar and present the current status in Myanmar.

Complementary Feeding and Strategies

The second session, chaired by Prof. Geok Lin Khor, Universiti Putra Malaysia, Malaysia, discussed complementary feeding and strategies for pre-term, low birth weight (LBW) and stunted children.

Dr. Jossie Rogacion from Philippine General Hospital, Philippines, gave an overview of **Feeding Strategies for Pre-term and Low Birth Weight Infants**. She highlighted that consequences of LBW include high risk for growth retardation, infections, neurodevelopmental delay and even death in early infancy and childhood

as well as increased risk of adult lifestyle diseases such as coronary heart diseases following rapid weight gain thereafter in later childhood. The WHO guidelines, which recommended that LBW infants, including those with very low birth weight (VLBW), should be fed mother's own milk. However, LBW and VLBW infants, who cannot be fed mother's own milk, should be fed donor human milk if available. LBW infants who are able to breastfeed should be put to the breast as soon as possible after birth when they are clinically stable and be exclusively breastfed until 6 months of age. Dr. Rogacion added that there should be a balance between rapid and gradual weight gain to avoid long-term consequences from rapid weight gain. Dr. Rogacion concluded by emphasizing that further studies are required to elucidate the metabolic changes that occur among adult pre-terms.

Prof. Umaporn Suthutvoravut from Mahidol University, Thailand, gave the next presentation on **Optimizing Nutrition in Stunted Children: Interventions and Practices**. She defined stunting as length or height below 2 SDs from the WHO Child Growth Standards median for the same age and sex. Prof. Suthutvoravut emphasized that optimizing nutrition in stunted children requires integrated approaches combined with infection control and child development intervention, including psychosocial stimulation and responsive feeding. It should also cover both pregnancy and post-natal periods as stunting often occurs in utero and extends through childhood.

Nutrition interventions include dietary diversification, selection of nutrient-rich foods, exclusive breastfeeding from 0 to 6 months, improved complementary feeding practice, staple food fortification, multiple micronutrient supplementation, and use of fortified food products. She explained that the challenges were implementation and evaluation of a healthy food environment, hence requiring effective partnership among various stakeholders and sectors.

Prof. Suthutvoravut then shared the strategies for prevention and control of malnutrition in Thailand, namely food fortification and the Food-based Dietary Guidelines in Thailand. Micronutrient supplementation is also provided to women and children accordingly. Prof. Suthutvoravut also shared about the school milk program in Thailand that aimed to provide milk to children in kindergartens and primary school.

Next, Prof. Pattanee Winichagoon from Mahidol University, Thailand gave a presentation on **Complementary Feeding: Cultural Practices versus Scientific Evidence**. She highlighted the key issues in complementary feeding, including timely introduction, quality, quantity and nutrient adequacy, and the impact on growth, development and



obesity in later life. She explained that cultural practices on complementary feeding in Southeast Asia include early introduction of solid foods, which are usually rice-based with little or no other ingredients. Using food-based approaches, efforts have been made to improve nutritive quality of complementary foods, for example, improving local recipes and adding animal food sources. Other interventions such as micronutrient fortification, crushable foodlets and home fortification powders were shown to be efficacious.

Prof. Winichagoon also highlighted that even though WHO indicators on complementary feeding are useful for monitoring practices, recent data on early introduction before 6 months is limited. She emphasized that education and counselling with key messages on complementary feeding along with current interventions on improving complementary feeding will give a better impact.

Dr. Mary Chea, from National Nutrition Programme, Ministry of Health, Cambodia, presented on **Complementary Feeding Practices in Cambodia / Baby Friendly Community Initiative (BFCI)**. She shared that the BFCI is a community-based initiative to support, promote, and protect breastfeeding and to promote appropriate complementary feeding. The main components include breastfeeding, adequate complementary feeding, maternal nutrition, early childhood and development, and hygiene. Dr. Chea explained that the staff at the health centres and the Mother Support Group was trained before they conducted group and door-to-door counselling sessions. She also shared about the implementation of Multiple Micronutrient Powders (MNPs) for children aged 6-23 months.

As part of a Cambodia Harvest program, mobile kitchen teams provided cooking demonstrations and training with MNP distribution, together with counselling and growth monitoring on a monthly basis. Dr. Chea also highlighted the NOURISH project which integrated nutrition training at community level in villages. Dr. Chea concluded that though these programs improved the diet for infant and young



children, they are not without challenges. Approaches to minimize the cost of interventions and optimize the impact are required.

Strategies and Programs

The final session, chaired by Dr. Chandavone Phoxay from Ministry of Health, Lao PDR, discussed current programs and strategies for improving maternal, infant and young children nutritional status in ASEAN.

Prof. Geok Lin Khor presented a paper titled, **Compliance with WHO IYCF Indicators and Dietary Adequacy in 6-23 Months of Age: A Cross-Sectional Study in Malaysia**. The study aimed to estimate the prevalence of compliance with IYCF indicators among toddlers aged 6-23 months, and the extent of compliance with the core complementary feeding indicators predicting dietary adequacy. The recruited subjects showed high compliance for timely introduction of complementary foods at 6-8 months, minimum meal frequency among non-breastfed children aged 6-23 months, consumption of iron-rich foods at 6-23 months, and minimum dietary diversity.

However, there was low compliance for minimum acceptable diet among non-breastfed children and breastfed children. While intake of energy, protein, iron, and calcium met more than half of the recommended levels, intake of some micronutrients was inadequate. This denotes the need for nutrition education among care providers. Prof. Khor concluded that the WHO IYCF indicators are helpful for monitoring trends of breastfeeding and complementary feeding within and between countries, and this study provided a quantitative measure of assessing the extent compliance with the IYCF core complementary feeding indicators predicts. The usefulness of the analytic approach in this study in the context of individual country's priority nutrition issues should be further discussed.

Next, Dr. Umi Fahmida from SEAMEO RECFON, Indonesia gave a presentation on **Young Child Food-based Dietary Guidelines Using Linear Programming: Application in Indonesia and Other Southeast Asian Countries**. She first

explained that linear programming (LP) is a mathematical modelling which can identify an optimal diet while simultaneously taking into account local food availability, food patterns, food portions, food cost, food affordability and the diet's energy content. It can be used to identify specific problem nutrients and dietary adequacy in a population given their dietary pattern, the available nutrient-dense foods to fill the gap of these problem nutrients, and to compare alternative food-based recommendations (FBRs).

Dr. Fahmida elaborated that in Indonesia, LP was used to compare problem nutrients in under-two children across age groups, and to estimate the optimal frequency of micronutrient powder. In Myanmar, optimized complementary feeding recommendations were developed to optimize intakes of nutrients, while in Cambodia, LP assisted in designing complementary feeding recommendations with locally fortified complementary food. She shared that efforts to improve micronutrient intakes through fortified foods should take into account the actual nutrient gap in the population. Commitment and partnership are needed to build capacity and support the implementation of LP in countries to provide capacity building and assist program implementers at province/district levels to promote local specific FBRs.

Dr. Le Thi Hop, from Vietnam Nutrition Association (VINUTAS), Vietnam, gave the next presentation on **Reducing Stunting in Vietnam – Addressing Basic and Underlying Causes of Malnutrition**. She shared nutrition projects and activities in reducing stunting in Vietnam, namely the National Malnutrition Control Program, which included nutrition education, training of health staffs and growth monitoring, and micronutrient supplementation program. The main approaches of nutrition programs were preventive, prioritizing high risk groups, and community-based interventions. Many of these programs and interventions were jointly supported by international organizations such as WHO and UNICEF. Dr. Hop concluded that strong commitment of the authorities at all levels and the inter-sectoral collaboration has helped to reduce the rate of child malnutrition in Vietnam. However, the stunting rate and micronutrient deficiencies still remain high. Therefore, nutrition policies are very important with priorities towards disadvantaged areas with high stunting rates and regular monitoring and evaluation is essential.

The final presentation by Dr. Sengchanh Kounnavong from Ministry of Health, Lao PDR, was on **Opinion Leader Assessment on Infant and Young Child Feeding Practices**. Dr. Kounnavong explained that the assessment aimed to inform strategy developers to build political and public

will for policies and practices that support families in implementing optimal Infant and Young Child Feeding (IYCF) practices in Lao PDR. The results reflected the opinion of leaders in various organizations including government organizations, leading mass media, collaborative agencies, UN agencies and civil society, hospital leaders, medical association, nutrition-related centres and MOH code monitoring centres.

The key findings on barriers to optimal child health and nutrition include individual barriers, such as limited IYCF knowledge and skills; implementation barriers, where there were poor IYCF counselling skills and inadequate monitoring and supervision; as well as policy level barriers and governance barriers, where there was a lack of multi-sectoral collaboration. Dr. Kounnavong concluded that recommendations include maternal protection such as extending maternity leave, strengthening health systems and IYCF counselling, and improving channels of communication and frame.

During the discussion session, one of the topics discussed was on maternal malnutrition. The participants agreed that maternal factors are one of the underlying causes for LBW and pre-term infants. Hence, maternal nutrition should be included in the government policies and strategies in both preventing and combatting malnutrition. It was recognized that many malnutrition problems are related and intervention strategies that were focussed solely on one problem might lead to the rise of another problem, such as overeating and obesity. It is therefore essential to have a holistic approach. There is also a need to seek correlation between different malnutrition problems where there may be common determinants.

Finally, Mr. Geoffry Smith delivered the closing remarks, emphasizing the need for more research and interventions for pre-maternal and maternal nutrition. With that, he thanked the speakers and the participants for their insightful contributions and closed the seminar.



New Frontiers in Diet, Gut Microbiome and Health

Bone health is a rising issue in Asia, where building peak bone mass in youth and retaining it with advancing age is a key strategy to reducing risk of osteoporosis. Gastrointestinal microbes also play important roles in the health and disease of the human body. It is of great interest to characterize both composition and succession of the intestinal microbiota. Interaction among the diet, our gut microbiome, and health, such as bone health, is a new frontier with a rapidly expanding body of research.



Organizers and speakers of Mini-Symposium on The New Frontier: Diet Microbiome & Health

ILSI SEA Region co-organized and held a mini symposium on **The New Frontier: Diet Microbiome & Health** on May 26, 2016 with the Clinical Nutrition Research Centre of the National University of Singapore. During the meeting, experts presented on and discussed the interactions of diet, microbiome and bone health. They also reviewed and discussed the microbiota profiles among different populations in Asia. The meeting was well-attended by researchers and academia in gut microbiome, nutrition and health professionals, and food and nutrition industry professionals.

Welcome and opening remarks for the symposium were given by Prof. Jeyakumar Henry, Director of Clinical Nutrition Sciences at the Singapore Institute for Clinical Sciences (SICS) and Mr. Geoffry Smith, President of ILSI SEA Region. Prof. Henry then proceeded to chair the symposium.

Diet, Gut Microbiome and Bone Health

Prof. Connie Weaver, Purdue University, USA, presented the first paper on **Diet, Gut Microbiome and Bone Health**. She gave an introduction of how adequate calcium intake can help to prevent osteoporosis, and that increasing dietary calcium will increase calcium absorption and reduce bone resorption. She pointed out that prebiotic fibers can also improve calcium absorption and net bone balance. In one of her studies,

galactooligosaccharides (GOS) have been associated with increased bone mineral density and bone strength in rats. She reported a more recent study looking at the effects of GOS on colonic calcium absorption in pre-menarcheal girls has concluded that both 5g and 10g per day of GOS supplementation increased calcium absorption by 10%. She shared that an increase in peak bone mass by 10% has been estimated to delay osteoporosis by 12 years. She also highlighted that prebiotic fiber consumption has been associated with shifts in microbial communities, typically in fiber fermenters. These shifts are significantly positively associated with increased calcium absorption.

Prof. Weaver's latest study on the effect of added soluble corn fiber (a prebiotic fiber) on net bone calcium retention in postmenopausal women has also concluded that soluble corn fiber improved bone calcium retention in a dose-responsive manner among postmenopausal women. The same fiber shifted the gut microbiome and altered several functional pathways in healthy men too. She concluded that more research can be done to study the possible benefits of prebiotic fiber for the non-healthy population.

Profiles of Asian Gut Microbiota

Prof. Yuan Kun Lee, National University of Singapore, gave the next presentation **Mapping Asian Gut Microbiota Across Age and Geography**. He introduced

the Asian Microbiome Project (AMP) and shared that Phase I was initiated in 2009 to examine the microbiota profile among healthy children in 10 Asian cities as a pilot study. Phase II was launched in 2013 to examine the adult and elderly, and Phase III was launched in 2014 to examine mother and infant pairs.

Prof. Lee pointed out that the study data indicated that variation in the gut microbiota of Asian children is clustered into two groups, each defined by *Prevotella* (*P-enterotype* of the South East Asia and Northern Asia) and *Bifidobacterium/Bacteroides* (*BB-enterotype* of the Central Asia). He explained that the geographical location, immigration pattern and the diet impacts on the variation of the gut microbiota. He also shared that the type of carbohydrate diet could affect the bile acid metabolism. He explained that high resistant starch would reduce bile acid in the colon, which in turn promoted the *P-enterotype* species. In contrary, a diet with less resistant starch increases bile acid in the colon, which reduces the growth of the *P-enterotype* species, hence promoting the *BB-enterotype* species. The profile is confirmed by the microbiome of the adults and elderly of the respective cities, albeit a general decline in *Bifidobacteriaceae*, increase *Enterobacteriaceae*, and overall decrease in bacterial diversity.

Prof. Lee concluded that such perspective studies provide markers for the stage of health and positive guidance for microbial colonization through interference. Currently, regardless of regions, urbanization-like effect was observed. The microbiota profile among Asians is different from that of Westerners due to different dietary and cultural habits and ethnicity, and the differences in profile may correlate to the differences in susceptibility to different diseases.

The symposium concluded with the experts emphasizing this new frontier of research, where methodological advances can provide more insights to the interactions of the diet, human gut microbiome and health.

Pulses – Nutrition Benefits and Food Innovations

2016 is the United Nations International Year of Pulses, which include beans, peas, lentils and lupins. In recognition, the Grains & Legumes Nutrition Council in Australia held a one-day Symposium: On the Pulse. The Symposium was held on May 2, 2016 in Adelaide, Australia, and was sponsored by the Nutrition Society of Australia. ILSI SEA Region Australasia was a partner of the Symposium, and other partners included the Commonwealth Scientific and Research Organisation (CSIRO), and the Australian Institute of Food Science and Technology (AIFST). The Symposium brought together leading researchers to discuss the latest evidence in the health and nutrition benefits of pulses and recent developments in pulse food innovation.



The keynote speaker of the meeting was Prof. Lynne Cobiac, CSIRO, who spoke about the **potential role of pulses in addressing the triple challenge of the global food supply: ensuring food security, producing food within a changing environment and producing healthy food to mitigate the chronic disease burden whilst still addressing malnutrition**. Dr Cobiac discussed four of the mega trends set to affect the global food supply in the next 30 years: a growing global population, an aging population, the rise of the Asian population, and the dual issues of malnutrition and overconsumption. It is estimated we will need to increase available energy by 127 x 10¹⁵ kcal to feed the world in 2050. The planet cannot produce this with current production practices and eating patterns. Therefore, this will need to be achieved through more efficient production practices, reduction in wastage and innovation in the types of foods we eat and the way they are processed. Prof. Cobiac outlined how pulses can play a role as an environmentally-positive crop that provides nutritional security by delivering protein and minerals, while also helping reduce risk of non-communicable diseases.

The health and nutrition session commenced with Dr. Hodgson from the University of Western Australia, who provided an **overview of the research on the role of pulses in cardiovascular disease (CVD) risk reduction**. Diets including pulses have been shown to reduce CVD mortality by 30%, have a positive effect on glucose metabolism, reduce blood pressure by 1–3 mmHg and reduce LDL cholesterol by 4–7%. In fact, a recent study estimated a 7-8% reduction in mortality risk for every 20 g/d increase in pulse intake. As whole pulse intakes are low in Australia, Dr. Hodgson explained how trials involving incorporation of the Australian crop lupins in commonly eaten foods such as breakfast cereals and pasta have been undertaken to determine potential health effects. Trials to date have shown lupin-enriched foods including breads can reduce energy intake by 25% in a meal and 15% at the next meal. Additionally, both blood glucose control and blood pressure has been shown to be improved by clinically significant amounts.

Population studies have shown positive associations between diets rich in legumes and cognitive function but direct evidence supporting a benefit

of consuming legumes on cognitive function from randomized controlled trials has been lacking. Associate Professor Alison Coates from the University of South Australia outlined the initial results of a trial run in collaboration with the University of Manitoba on the **effect of regular pulse consumption on cognitive function, in older overweight/obese adults**. The Australian arm of the study has not shown adequate power to detect a significant effect but when the Canadian data is complete this may provide a more comprehensive picture of this interesting new area of research.



A Review of Food-based Dietary Guidelines as a Communication Tool for Promoting Health

Food-based Dietary Guidelines (FBDGs) are primary recommendations that promote good health through proper nutrition. The first such guidelines for Filipinos termed “Nutritional Guidelines for Filipinos” (NGF) was developed by an expert committee led by the Food and Nutrition Research Institute (FNRI) and printed in 1990. In the intervening decades since then, dietary patterns and lifestyles have changed, but the nutrition of the population have not noticeably improved. Moreover, the so-called lifestyle diseases including diabetes, heart disease, cancer, osteoporosis, and especially obesity, have become more prevalent in the population.

As such, ILSI SEA Region Philippine Country Committee, together with FNRI organized a symposium to review FBDGs as a communication tool, discuss the scientific evidence behind the recommendations of the 2012 Nutritional Guidelines for Filipinos (2012 NGF), and develop a framework for implementation, dissemination and evaluation of FBDGs. The half-day symposium, *Food Based Dietary Guidelines: Mining the Evidences, Exploring their Full Benefits*, was held on July 27, 2016, at EDSA Shangri-la Hotel, Mandaluyong City, Philippines. The symposium was conducted back-to-back with the 3rd Council Meeting of SEA Public Health Nutrition (SEA PHN) Network held a day earlier. Some 147 participants from the academia, nutrition and health community, and food industry attended the symposium.

After the welcome remarks from Ms. Mary Jude Icasiano, Chairman of the ILSI SEA Region Philippine Country Committee, the symposium opened with a presentation by Dr. E-Siong Tee, President of the Nutrition Society of Malaysia, on the compilation and analysis of the **key messages and scientific rationale of the FBDGs of six Southeast Asian countries. These countries were namely, Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam.** A total of 17 topics were identified for analysis, covering topics ranging from eating a variety of foods, healthy body weight, physical activity, breastfeeding, to reading food labels, and food safety. Several topics featured in at least 5 of the 6 FBDGs studied, namely: enjoy a variety of foods; consume more fruits and

vegetables; consume adequate amounts of milk and milk products; reduce intake of foods high in sugar, fat and salt; and maintain healthy body weight. All six countries had adopted a visual guide to assist in conveying messages regarding the consumption of relative amounts of the different food groups.

Next, a **panel discussion** was led by Dr. Socorro Ignacio of the Nutrition Foundation of the Philippines **among representatives of the nutrition societies in Indonesia, Malaysia, Thailand and Vietnam. The experiences on how they used and disseminated their respective FBDGs, and the problems they encountered were discussed.**

Dr. Hardinsyah Ridwan, President of Food and Nutrition Society of Indonesia, presented Indonesia's new guidelines with its 10 messages and pictorial guide. He then cited a number of ways by which their FBDG is being promoted. Using promotion tools such as booklets, videos, games and songs, they utilize the government health system and the private sector through the schools, multimedia, parades, public meetings and others in promoting the guidelines.

Prof. Dr. Mohd Ismail Noor, Vice President of the Nutrition Society of Malaysia, shared the Malaysian Dietary Guidelines with 14 key messages including 6 new ones. With the collaboration of many public and private agencies, a large variety of channels have been utilized for dissemination, including nutrition promotion through the health system and schools, and other popular activities,



Dr. E-Siong Tee giving his opening presentation

to help educate pre-schoolers, school children, adolescents and adults on healthy eating. Finally, Prof. Noor described the various education tools disseminated by the Nutrition Society of Malaysia to promote the country's FBDG.

Prof. Umaporn Suthutvorarut, currently the Nutrition Advisor of the Nutrition Association of Thailand, presented the various strategies of which the Thai FBDGs have been disseminated at national and community levels through health, agricultural and educational services and training activities, as well as regular campaigning via mass media. The first campaign was promoted through health service infrastructure. Subsequently in 1998, the Nutrition Flag campaign was launched. Promotion packages and other communication kits have been developed by the Bureau of Nutrition, Ministry of Public Health, and distributed nationwide. The continuing activities related to FBDGs include campaign program for lowering sugar consumption through the “Sweet Enough Network”, the healthy eating index for Thai people, and school milk

and school lunch programs.

Next, Prof. Le Thi Hop, President of Vietnam Nutrition Association explained that from 1995 to the present, four versions of FBDGs have been developed in Vietnam and they are revised every 5 to 10 years. The first version for the period 1995 to 2000 had a special advice for better organizing family meal and to self-guarantee family food security. The second version of FBDGs showed political will to tackle nutrition-related health problems. The third version of FBDGs was developed with the involvement of multiple stakeholders such as Ministry of Health (MOH), Ministry of Agriculture and Development (MOAD), and Women Unions. Printed materials which carry the FBDG recommendations were distributed up to the commune level. The fourth FBDGs was developed and approved by MOH of Vietnam in 2012. It is regarded as a crucial tool for nutritional education and communication to improve the nutrition knowledge and proper practices of the community.

The Panel Discussion among the representatives of the nutrition societies of Indonesia, Malaysia, Philippines, Thailand and Vietnam was followed by two papers pertaining to the 2012 NGF.

The first paper was presented by Ms. Marilou Madrid, Senior Science Research Specialist of the Food and Nutrition Research Institute, Department of Science and Technology (FNRI-DOST). Ms. Madrid presented **evidences behind the 10 guidelines of the 2012 NGF** which are obtained from local and foreign scientific studies, results of the Philippine National Nutrition Surveys, and current data and information on nutrition and related interventions addressing the country's nutrition problems. The strength of the evidences of the scientific studies and published reports were examined and categorized from "A" to "D", patterned after the 2010 American Association of Clinical Endocrinologists Protocol for Production of Clinical Practice Guidelines (AACCE CPGs). Results of exhaustive search of the literature revealed few local studies of acceptable quality, and evidences were mostly in category "C", thus necessitating the use of higher quality foreign studies, reviews and meta-analysis.

The second paper that dealt with the 2012 NGF was presented by Ms. Jovina Sandoval, Science Research Specialist II, FNRI-DOST, who first discussed the development process of the Philippine Food Plate – the *Sangkap Pinoy*[®]. The process adopted a **science-based approach using the best available scientific evidence from local and international sources on food and nutritional requirements, while taking into account the usual dietary pattern**



Organizers and speakers of the Symposium on Food Based Dietary Guidelines: Mining the Evidences, Exploring their Full Benefits

of Filipinos, and their health and nutritional status, as well as other related data. The *Pinggang Pinoy*[®] shows the three basic food groups: Go (rice and alternatives), Grow (fish and alternatives), and Glow (vegetable and fruits). The Glow food takes up half of the plate, while the Go and Grow foods take up the other half, with more rice than fish. Portion sizes of each food group vary on the plate depending on the age and physiologic group. The cycle menus met 95 to 105% of the daily energy requirement and at least 70% of some micronutrient requirements.

Dr. Celeste C. Tanchoco, ILSI SEA Region Philippine Country Committee, presented a **framework for the implementation, dissemination and evaluation of FBDG**. She presented a framework adopted from the WHO global strategy on diet, physical activity and health. The framework aimed to explain how policies and programs and their implementation influence behavioral changes in a population and have longer-term social, health and economic benefits. It also shows how adequate monitoring and evaluation indicators can be integrated into the process of behavior change. According to the framework, the Department of Health can provide national strategic leadership through the development and implementation of supportive environments, policies and programs. During this process, all interested stakeholders are to be involved. Research, monitoring, evaluation and surveillance need to continue throughout the process so that feedback on modifications can be provided to the institutions involved.

The last section of the symposium was another panel discussion, but this time **among representatives of food industry, food service, and media.**

Ms. Jo Ann V. Salamat, Nutrition Manager of Fonterra Brands Philippines, highlighted what food companies have done so far to support FBDBs. She cited the trend towards the use of natural ingredients in their products and the avoidance of ingredients that are commonly perceived as harmful, such as artificial flavors. Nutrition labelling regulations are strictly

followed. Big companies engage in many forms of factual information dissemination. Finally, Ms. Salamat drove home the point that making healthy food choices is not only just the responsibility of the consumer but of the food manufacturer as well. Ms. Ma. Veritas Luna, Chancellor of Center for Culinary Arts, presented the Cravings Group (TCG), a 27 year-old home grown food and hospitality service and education business, to illustrate the role of food service in supporting the FBDG. For example, she cited the *Pinggang Pinoy*[®] as an information resource among the company chefs, trainers, faculty, staff and students. She pointed out that the provision of healthful and nutritious meals to TCG customers goes beyond mere information and education to the concerted effort of many units of the foodservice organization.

Finally, Ms. Ma. Belen Fernando of Alaska Friesland Campina discussed the role of mass and electronic media in promoting the FBDG. She discussed the advantages and disadvantages of different methods of communication and how to make the communication of FBDGs sustainable. The communication strategy should be based on tangible and achievable objectives and tailored to the different target groups. The government can learn one important lesson from industry: the food industry is successful in communicating messages to the public using a variety of tools, strategies and approaches that are understandable to the consumers.

The symposium ended with closing remarks by Dr. Rodolfo Florentino, ILSI SEA Region Philippine Country Committee, who concluded that **while over the years, FBDGs have attempted to address the changing nutritional concerns of the population, the symposium showed that scientific evaluation of their effectiveness in promoting desirable dietary patterns and consumption have been scarce; much more should be done in this area.** In closing, Dr. Florentino thanked the speakers, organizers, sponsors and participants for their contribution to the success of the symposium.

Workshop for Food Chemical Risk Assessment Training

In 2012, the World Bank launched its Global Food Safety Partnership (GFSP) initiative as a unique and ambitious global public-private partnership dedicated to improving food safety worldwide, particularly among middle-income and developing countries. Since its inception, ILSI has been a strong supporter of the GFSP's work and has been recognized as an official in-kind contributor to the GFSP.

As part of the work of GFSP, a project to support capacity building on food chemical risk assessment was initiated in late 2012, culminating in the preparation of a draft set of training modules on food chemical risk assessment that were finalized in early 2016. To support the piloting of these newly developed training modules, ILSI Southeast Asia Region together with the Agri-Food and Veterinary Authority of Singapore (AVA), which is also an in-kind contributor to the GFSP, helped to organize the **Pilot Workshop for the World Bank GFSP Food Chemical Risk Assessment Training Program**. The 2-day workshop was organized on August 25-26, 2016 and hosted by AVA at their Veterinary Public Health Centre in Singapore.



Organizers and participants of the Pilot Workshop for the World Bank Global Food Safety Partnership (GFSP) Food Chemical Risk Assessment Training Program

The workshop was led by the three lead developers of the chemical risk assessment training modules, including Dr. Paul Brent, Adjunct Professor at the University of Laval, Canada, and the former Chief Scientist at Food Standards Australia New Zealand; Dr. Manfred Luetzow, Principal and CEO of saqual GmBH, Switzerland, and a former Joint Secretary of the Joint FAO/WHO Expert Committee on Food Additives (JECFA); as well as Dr. Leon Brimer, Professor Emeritus for Food Safety and Zoonoses at the University of Copenhagen, Denmark. 18 participants from China, Indonesia, Malaysia, Singapore and Thailand joined the workshop. They were selected based on their background and expertise on the topic of food chemical risk assessment.

The objectives of the workshop were to review and discuss the content and presentation of the chapters in the draft modules of the food chemical risk assessment program, as well as to discuss and plan for next steps in relation to the future global roll-out of the program. Through intensive discussion and debate about the different chapters of the food chemical risk assessment modules, the authors were able to gather valuable feedback from the participants that could be used to further refine the training program.

The outcomes of the workshop will be shared with other food safety stakeholders during the next World Bank GFSP meeting to be held at the end of 2016 in Singapore.

Upcoming Activity Highlights

Meetings



Food safety remains a key priority within the newly established ASEAN Community – both in relation to ensuring the health and wellbeing of ASEAN citizens, as well as in facilitating food trade within the region. Recognizing the need to raise awareness on the importance of food safety among the food industry, academic researchers and government authorities within the region, ILSI Southeast Asia Region and the Southeast Asia Association for Food Protection (SEA AFP) will jointly organize the 4th Asia-Pacific International Food Safety

Conference & 7th Asian Conference on Food and Nutrition Safety on October 11- 13, 2016, in Penang, Malaysia. The theme of the conferences – ‘Advancing Food Safety in the ASEAN Community’, emphasizes the need for ASEAN to further develop its food safety capability by harnessing knowledge from across the Asia-Pacific region, improving the scientific understanding of various food safety issues, as well as adopting new food safety technologies and innovations. Exciting new advances and issues relevant to food safety, such as whole genome sequencing and foodborne viruses, will be discussed at the conference.

Seminar on Drivers for Consumer Food Choices

November 15, 2016, Kuala Lumpur, Malaysia | November 17, 2016, Bangkok, Thailand

The high prevalence of non-communicable diseases and their risk factors has been attributed to inappropriate food choices and a sedentary lifestyle. Understanding how consumers make food choices, and why they like what they choose to eat is of central importance to nutritionists, other healthcare professionals, researchers, policy makers and the food industry. Promoting healthy diets and increasing physical activity have been recognised as key factors to preventing diet-related chronic diseases. A better understanding of the main determinants of

food choices will facilitate the development policies and interventions to promote healthier eating patterns.

These seminars will update on food consumption patterns in Malaysia and Thailand; share results of studies on consumer food choices and details of programmes and food regulations in promoting healthier food choices; discuss ways to improve consumer food choices through a multi-stakeholder approach; and identify research gaps in understanding drivers of consumer food choice.

Seminar on Re-assessing Macronutrient Needs – Quality, Requirement and Optimal Distribution 1st Quarter 2017, Thailand (TBC)

In the past few years, there have been new developments in the field of nutrition that impact on recommendations for dietary intake distribution of macronutrients. This seminar aims to provide an overview of the most recent scientific knowledge regarding optimal macronutrient distribution, and discuss its implications for dietary recommendations in the region. The objectives are to present new findings regarding

macronutrient distribution for healthy population groups, and identify sources of macronutrients and their differential health effects. It will also characterize the macronutrient distribution of Southeast Asian diets (based on recent national surveys), and discuss issues and future research needs regarding macronutrient distribution, particularly for Southeast Asian countries undergoing a nutritional transition.

On-going Research and Collaborative Projects

Vitamin D Status and Related Factors in Pregnant Thai Adolescents In collaboration with Mahidol University, Thailand

Adolescent pregnancy is a major health burden in Thailand. It has been associated with adverse maternal and fetal outcome including increased risks of maternal anemia, micronutrient deficiency, preterm delivery, low birth weight, and postpartum complications. A collaboration research between Mahidol University, Thailand and ILSI SEA Region will be conducted to examine pregnant adolescents attending the Adolescent Clinic at the Ramathibodi Hospital and compare several biochemical parameters, such as serum 25(OH)D and calcium levels, with a matched group of non-pregnant adolescents. In addition, the study will compare vitamin D sufficient and deficient pregnant adolescents on various factors including anthropometric characteristics, lifestyle factors and dietary intake. It will also examine the risk factors for pre-clampsia and gestational diabetes.

Pilot Project on Inclusion of Private Data into National Food Composition Databases in Malaysia, Philippines and Thailand In collaboration with ASEANFOODS

Communities are consuming more pre-packaged food products but data (e.g. nutritional values) from such products are not fully captured in the existing national Food Composition Databases (FCDBs) in the region. Thus, there is a need to find ways to obtain and include such data. During the meeting on ASEANFOODS – ILSI SEA Region Workshop on Food Composition Database: Facilitating Analyses of Food and Nutrient Intakes which was held in March 2016, participants including food composition data (FCD) developers, FCD users, and key representatives from government and industry from ASEAN countries discussed the feasibility of incorporating nutrient content of pre-packaged food products available in the region into national FCDBs. A case study on USDA Branded Food Products Database involving ILSI North America’s work with USDA in obtaining private data from food companies was shared and useful. Among one of the key recommendations from the workshop was to establish a working group to further implement a pilot project involving 3 countries: Malaysia, Philippines and Thailand, to collaborate with food companies in obtaining primary data of pre-packaged branded food products for inclusion in national FCDBs.

ILSI SEA Region Calendar of Activities 2016/2017

Meetings

Food and Nutrients in Health and Disease Science Cluster

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|---|------------------------------------|
| Seminar on Re-assessing Macronutrient Needs – Quality, Requirement and Optimal Distribution | 1st Quarter 2017 Thailand (TBC) |
| Seminar on Diabetes and Metabolic Syndromes | 1st Quarter 2017 Singapore |

Nutrition and Food Guidance for Public Health Science Cluster

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| 2nd Workshop on ASEAN Food Composition Database (By Invitation) | 4th Quarter 2016 TBC |
| Seminar on Drivers for Consumer Food Choices | November 15 & 17, 2016 Malaysia & Thailand |
| National Workshop on Food Composition Data | November/ December 2016 Indonesia |
| Seminar on Food Consumption Survey Methodologies | 2nd Quarter 2017 TBC |
| Seminar on Food Fortification | 3rd – 4th Quarter 2017 TBC |

Food Safety and Risk Assessment Science Cluster

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| 4th Asia-Pacific International Conference on Food Safety & 7th Asian Conference on Food and Nutrition Safety | October 11-13, 2016 Penang, Malaysia |
| Symposium on Nanomaterials in Food and Beverage – Opportunities and Challenges | November 10, 2016 Sydney, Australia |
| Forum on Risk Analysis in ASEAN (By Invitation) | 1st Quarter, 2017 Kuala Lumpur, Malaysia |

Others

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| Presentation on Importance of Risk-Based Approach to Food Safety for AEC @ International Conference On Food Innovations: ASEAN Economic Community (AEC) Challenges | September 21-23, 2016 Jakarta, Indonesia |
| ILSI Annual Meeting 2017 | January 20-25, 2017 La Jolla, California, USA |
| ILSI Southeast Asia Region Annual Meeting 2017 | April 2017 (TBC) |

Research, Meeting Reports, and Collaborative Projects

Food and Nutrients in Health and Disease Science Cluster

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| Systematic Review on Salt Sensitivity: Is there a Genetic Pre-disposition that Predicts Cardiovascular Disease Risk? <i>In collaboration with CSIRO, Australia</i> | Draft report completed; Decision on further analysis pending |
| Estimation of Sodium Intake among Filipinos and their Sources in the Diet <i>In collaboration with the Food and Nutrition Research Institute (FNRI), Philippines</i> | On-going data analysis |
| Scoping Review on Sugar Intake in Southeast Asia: Levels of Consumption and Major Sources in the Diet | Malaysia: Published; Indonesia: Publication accepted Thailand: Publication in review Others: On-going |
| Data Analysis: Levels and Sources of Sugar Intake in the Philippines <i>In collaboration with the Food and Nutrition Research Institute (FNRI), Philippines</i> | On-going |

Technical Committee on Maternal, Infant and Young Child Nutrition

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| Compliance with WHO IYCF Indicators and Dietary Adequacy in 6-23 Months of Age: A Cross-Sectional Study in Malaysia <i>In collaboration with International Medical University (IMU), Malaysia</i> | Completed; Publication submitted – In review |
| Vitamin D Status and its Correlates among Pregnant Thai Adolescents <i>In collaboration with Mahidol University, Thailand</i> | Planned for 2016-2017 |

| Nutrition and Food Guidance for Public Health Science Cluster | |
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| Risks and Benefits of Intense Sweeteners: A Survey for Food Experts and Opinion Leaders <i>In collaboration with Newcastle University, UK and Universiti Kebangsaan Malaysia</i> | Completed; Publication under preparation |
| Understanding Consumer Perception and Attitudes Towards Sweeteners | Completed; Publication under preparation |
| Pilot Project on Inclusion of Private Data into National FCDBs in Malaysia, Philippines and Thailand | Proposed |
| Food Safety and Risk Assessment Science Cluster | |
| Study on Dietary Exposure of Sweeteners in Thai Consumers <i>In collaboration with Institute of Nutrition, Mahidol University, Thailand</i> | On-going |
| ASEAN Food Safety Standards Database <i>In collaboration with ACCSQ PFPWG</i> | On-going |
| Special Projects and Others | |
| Investigation of Commodity Food Standards and Methods of Analysis in East Asia <i>In collaboration with ILSI Japan-MAFF, ILSI Focal Point China, ILSI Korea, ILSI India and ILSI Taiwan</i> | On-going |
| Prevalence of Hemoglobinopathy among Anemic Individuals in Metro Manila: Data from the National Nutrition Survey <i>In collaboration with the Food and Nutrition Research Institute (FNRI), Philippines</i> | Phase 1 completed; Publication under preparation |
| ILSI SEA Region Contribution to the One ILSI Project on Nutrition, Health and Wellbeing: Multi-Country Survey - Profiling the Elderly and Review on Healthy Ageing <i>Thailand: in collaboration with Mahidol University</i> <i>Philippines: in collaboration with University of San Carlos</i> <i>Malaysia: in collaboration with Universiti Kebangsaan Malaysia</i> | On-going |

Publications

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| Consumption Levels and Sources of Added Sugar in Thailand: A Review of the Best Available Evidence | Submitted to <i>Asia Pacific Journal of Clinical Nutrition</i> – In Review |
| Consumption and Sources of Added Sugar in Indonesia: A Review | Submitted to <i>Asia Pacific Journal of Clinical Nutrition</i> – Accepted for Publication |
| ILSI Southeast Asia Region Conference Proceedings: The Gut, Its Microbes And Health - New Knowledge And Applications For Asia | Submitted to <i>Asia Pacific Journal of Clinical Nutrition</i> – Accepted for Publication |
| Intake of Added Sugar in Malaysia: A Review | Published in <i>Asia Pacific Journal of Clinical Nutrition</i> , 2016, 25(2). doi: 10.6133/apjcn.2016.25.2.13 |
| High Prevalence of Vitamin D Deficiency in Cambodian Women: A Common Deficiency in a Sunny Country | Published in <i>Nutrients</i> , 2016, 8(5):290. doi:10.3390/nu8050290 |
| Low Urinary Iodine Concentration among Mothers and Children in Cambodia | Published in <i>Nutrients</i> , 2016, 8:172. doi:10.3390/nu8040172 |
| Sodium Consumption in Southeast Asia: an Updated Review of Intake Levels and Dietary Sources in Six Countries | Published Book Chapter in <i>Preventive Nutrition (5th Ed)</i> , 2016, 765-792. |
| Functional Food Monograph | On-going |
| Food Composition Database Monograph: Review of Status in ASEAN Region | On-going |
| Food Consumption Surveys Monograph: Review of Status in ASEAN Region | On-going |
| Updated Report on Regulatory Status of Micronutrient Fortification in Southeast Asia | On-going |
| Symposium Proceedings: Sugar and Sweeteners (Singapore Meeting) | On-going |



ILSI SEA Region Malaysia Country Committee

9th Scientific Seminar on Drivers of Consumer Food Choices

15 November 2016 • Istana Hotel, Kuala Lumpur

Introduction

The question that is often asked is: "Why do people eat the foods they do?" People eat to satisfy their hunger. They generally do not consider what foods they need to consume to meet physiological and nutritional needs. Instead, there is a complex mixture of factors driving consumer food choice, including economic, physical, social and psychological determinants.

Understanding how consumers making food choices, and why they like what they choose to eat is of central importance to nutritionists, other healthcare professionals, researchers, policy makers and the food industry. Promoting healthy diets and increased physical activity have been recognised as key to preventing diet-related chronic diseases. A better understanding of the main determinants of food choices will enable us to develop policies and interventions to promote healthier eating patterns. In addition, in-depth understanding on drivers of food choices will be essential in any initiative aimed at developing successful products and services by the private sector, including the food industry.

The high prevalence of non-communicable diseases and their risk factors in this country has been attributed to inappropriate food choices and a sedentary lifestyle. The way forward to arrest the further increase of these diseases among Malaysians is to promote healthy diet through informed food choices. First of its kind in the country, we invite all stakeholders involved in promoting healthier diets to join us to further understand the major determinants of food choices among Malaysians. Let us explore collaborative approaches to interventions.

Seminar Goal

Gain insights into the drivers of consumer food choices that could be useful for implementing intervention programmes.

Objectives

- Gain insights into studies on consumer food choices in Malaysia
- Update on methodologies for the study of consumer food choices
- Review programmes and food regulations in promoting healthier food choices – issues and challenges
- Provide a platform for discussing ways to improve consumer food choices through a multi-stakeholder approach
- Identify research gaps in understanding drivers of consumer food choices

Who Should Attend

Nutritionists, dietitians, food scientists, behavioural scientists, policy makers and programme managers from government departments and agencies, academia, research organisations, professional bodies as well as the food industry.

Seminar Topics (Tentative)

1. Studies of food choices among Malaysian consumers
2. Methodologies for studies of consumer food choices
3. Socio-economic status and food choices
4. Role of advertisement in driving food choices
5. Food environment – a driver of food choices
6. Contribution of various stakeholders towards promoting healthy food choices
7. Senses and food choices
8. Food labelling and health claims – do they make a difference in consumer food choices?
9. Innovative ways to communicate to consumers
10. Improving consumer food choices through a multi-stakeholder approach: Issues and challenges

Call for Abstract

Participants who are interested to present in the poster session are invited to submit an abstract of their paper (200-300 words in MS Word format) to the email addresses indicated below not later than 14 October 2016.

Registration

| Category | Registration Fee |
|------------------------------|------------------|
| Industry/Private sector | RM400 |
| Government agencies/Academia | RM200 |
| Postgraduate students* | RM100 |
| International participants** | USD120 |

Registration fee covers seminar material, 2 refreshments and lunch

*Only a limited number will be accepted; proof of student status has to be submitted with registration form

**Refers to participants residing outside Malaysia

Please register online at <http://nutriweb.org.my/seminar-reg/registration/> **ILSI2016 by 28 October 2016** to reserve your seats. All online registration will only be confirmed upon receiving proof of payment. Seats are on a first-come-first-served basis.

For enquiries, contact: Dr Tee E Siong / Muhaini Hussin / Asyikin (03-5637 3526)
Email: estee@nutrihealth.com.my/nsm.scientificupdates@gmail.com

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Visit us at www.ilsi.org/sea_region to find out more about our upcoming activities and programs.

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