Science InSight

News and Updates on Nutrition, Food Safety and Health

Smart Eating
Innovation and Technology for Health and Sustainability

Asian Congress of Nutrition 2019
ILSI presents symposia and Young Scientist Awards

Physical Activity
Update on Status, Programs and Approaches to build sustainable physical activity behavior

Personalized Nutrition
Opportunities for Research, Health and Innovation
Greetings and Selamat! ILSI SEA Region hosted its Annual Meeting this April in Kuala Lumpur, Malaysia. Smart Eating was the theme of the Science Symposium held in conjunction with the Annual Meeting events, with invited speakers from across the region and beyond to share perspectives and emerging trends on smart eating for health and sustainability. By harnessing new technologies, advancements in nutritional and biomedical sciences, as well as innovative approaches, health authorities and private sectors can work together to achieve the adoption of healthier behaviours and lifestyles for better health outcomes.

Delving into the topic of Human Variability and Personalized Nutrition was the focus of 2 symposia organized in Australia and Singapore in May, in collaboration with CSIRO Australia and CNRC A*Star Singapore, respectively. Eminent researchers shared findings from their research which could shape the future direction of nutrition intervention and therapies through personalized nutrition and precision health tailored to the unique needs of each individual. It was recognized that addressing gaps in data and translating knowledge to application will require the collaboration and engagement of many different stakeholders.

In August, ILSI and ILSI SEA Region took part in the Asian Congress of Nutrition 2019 held in Bali, Indonesia and attended by over 2,500 participants. ILSI co-supported 4 symposia sessions, and presented the ILSI Young Scientist Award to 10 young scientists selected for best oral and poster presentations as encouragement to nurture and further their interests in science research and application. A 1-day symposium on Physical Activity was held in Singapore in collaboration with the National University of Singapore Yong Loo Lin School of Medicine, with participation from health care and sports bodies to update on status and approaches to improve the physical activity level of different sectors of the population.

In the area of Food Safety and Sustainability, 2 meetings were organized in May – a seminar and regional workshop on food safety risk communication was held in Bangkok, Thailand, while the ILSI SEA Region Philippines Country Committee organized the first meeting in its Food Safety and Nutrition Assurance Seminar series in Manila, Philippines.

With these meetings and programs, we are reminded that ILSI provides a unique, balanced and transparent platform for public and private sectors to share and deliberate on important nutrition and food safety issues, with the common objective of advancing public health. We greatly appreciate and thank the many scientists, members and stakeholders who volunteer their time to join our programs, and to share valuable and insightful scientific information, without which the excellent programs would not have been possible.

Boon Yee Yeong
Executive Director, ILSI SEA Region
In recent years, scientific studies on human variability have advanced tremendously, with the “omics” technologies (metabolomics, genomics, proteomics, etc) at the forefront. This has led to the development of “personalized or precision medicine” targeted at individuals. The latest science and research show a potential extension to Personalized Nutrition. These advancements will have a significant impact on the food supply, as well as implications for public health.

In May 2019, ILSI SEA Region and ILSI SEAR Australasia organized two symposia on the topic of Human Variability and Personalized Nutrition. The first symposium was held on May 15 in Sydney, Australia, in collaboration with CSIRO (Commonwealth Scientific and Industrial Research Organisation) Precision Health Future Science Platform, and the University of South Australia. This was followed by the symposium in Singapore on May 17, which was co-organized with the Clinical Nutrition Research Centre (CNRC), A*STAR, Singapore, and in collaboration with CSIRO. About 200 local and overseas participants from academia, industry and government attended the events to learn from international experts on the latest science and research on human variability, and the opportunities in personalized nutrition for research, development and innovation to achieve individual and public health benefits.


**Prof. John Mathers,** Director of the Human Nutrition Research Centre, Newcastle University, UK presented scientific evidence of inter-individual variation in response to fish oil supplementation and diet that corroborated the interaction of genetic variation with dietary lifestyle, stressing its importance in understanding disease development and more importantly, its prevention.

Delving into the principles of personalized nutrition, the effectiveness of personalized approaches as compared to conventional “one size fits all” approaches in changing dietary behaviors was exemplified using the pan-European web-based Food4Me randomized controlled trial. While results concluded that participants assigned to a personalized nutrition intervention had bigger, sustained changes in eating behavior after 6 months, more complex phenotypic and genotypic information in developing personalized nutrition advice did not contribute to added benefits.
Prof. Mathers suggested adopting a systematic approach to achieve more effective personalized nutrition through a collection of individual characteristics, barriers and facilitators, and working with their aspirations. He concluded by highlighting that behavioral genetics (attention, memory, reward and motivation) will play a crucial role in personalized nutrition and achieving targeted health outcomes.

Dr. Nathan O’Callaghan, Director of Precision Health Future Science Platform at CSIRO, Australia, shared his recent study on the influence of amylase copy number (AMY1 CN) on weight trajectories and glycemic control in obese individuals. The outcomes displayed a modest association between AMY1 CN and BMI but no association with baseline glycemic parameters as well as anthropometric or glycemic outcomes following either a low-calorie diet or weight management diet. This suggested that AMY1 CN is not a significant biomarker for weight loss and maintenance in overweight or obese subjects.

Dr. O’Callaghan also highlighted how precision health will proactively transform the management of health in individuals through decision support tools, highly tailored food and nutrition plans, and lifestyle interventions. Although precision health offers potential benefits to future health, conversation on building trust between consumers and service providers on data security and privacy needs to be fostered. A greater understanding of consumer attitudes and support mechanisms would also be important in this context. He shared that CSIRO is working on two projects in partnership with Nanyang Technological University and a joint initiative with A*STAR with a focus on precision health.

Dr. Suzan Wopereis, Senior Scientist at the Department of Microbiology and Systems Biology at TNO, The Netherlands, said that health can be seen as a dynamic state in which the ability to adapt can be an indicator of health status. In daily life, people cope continuously and subconsciously with changes in their environment, including the intake of suboptimal foods or levels of physical exercise. Their ability to adapt can act as an indicator for maintenance or improvement of physiological function.

Dr. Wopereis’ presentation focused on research that quantifies health from the perspective of phenotypic flexibility as a methodology to assess health effects from food and nutrition. She explained that the term ‘phenotypic flexibility’ expresses the cumulative ability of overarching physiological processes (e.g. metabolism, inflammation, oxidation) to return to homeostatic levels after short term perturbations.

Prof. David Bishop, Research Leader at the Institute of Sport, Exercise and Active Living (ISEAL), Victoria University, Australia, explored the issue of whether measurement tools are reliable enough to provide personalised nutrition for health and performance. Prof. Bishop pointed out that since 1999, when Professor Francis Collins published one of the first documents outlining the promise of precision medicine entitled “Medical and Societal Consequences of the Human Genome Project”, it has been predicted that individually tailored therapies would increasingly be used to prevent and treat disease, and to improve health. Since then, “personalized nutrition” has become a hot topic with researchers eagerly mining their data to try and find explanations for what appear to be between-subject difference in the response to a range of interventions (e.g., nutrition and exercise). Prof. Bishop concluded that “personalized nutrition” is an appealing concept as many practitioners, researchers, and members of the public can describe observing human variability in response to food and nutrients.

Human Variability and the Gut Microbiome
Dr. David Zeevi, a James S. McDonnell Foundation Researcher at The Rockefeller University, USA, provided an overview of his research study on Personalized Nutrition by Prediction of Glycemic Responses. Individual variability in response to food is governed by three factors, namely genetics, lifestyle and microbiome. His research outcome showed high interpersonal variability in post-meal glucose response to identical meals. Using a machine-learning algorithm that integrates blood parameters, dietary habits, anthropometrics, physical activity and gut microbiota in an 800-person cohort study, it was able to accurately predict post-meal blood glucose responses to real-life meals, paving the possibility of designing personalized diets to successfully lower post-meal blood glucose and its metabolic consequences.
Dr. Zeevi shared another recent study which uncovered several possible mechanistic links between the microbiome and its host through an examination of microbiome variable regions. He illustrated an example of people who have the 33-kb region in Anaerostipes hadrus, responsible for encoding a composite inositol catabolism-butyrate biosynthesis pathway, were associated with lower metabolic disease risk, shedding light on the association of microbiome variability with microbial adaptation and host health.

Dr. Meera Esvaran, Research Fellow at the School of Biological, Earth and Environmental Sciences, University of New South Wales, Australia, noted that the gut microbiome has been a central focus for many researchers from diverse fields, including metabolic, neurological, immunological and inflammatory associated diseases and conditions. There is an emergence of studies correlating particular gut microbiome profiles and specific microbial populations with specific conditions. These findings are possible because of the tools available that allow us to understand the microbes and what they are doing or have the capacity to do.

Dr. Esvaran shared that there is considerable evidence that diet can contribute to alterations in the gut microbiome and hence dietary intervention offers promise as a means to improve outcomes of diseases and conditions linked to the gut microbiome. Changes in the gut microbes also leads to a change in the metabolites such as the short chain fatty acids which play an essential role in health and well-being of the individual. However, numerous research publications have failed to show significant benefits with dietary interventions that were expected to yield positive results.

She concluded by highlighting that an important aspect often largely ignored is the variability of the gut microbiome within and across studies, and that the variable responses of the gut microbiome are most probably the single most important aspect to be considered. As each individual has a unique microbiome, there is hence a need for tailored dietary intervention strategies.

Prof. Jun Kunisawa, Director of Center for Vaccine and Adjuvant Research (CVAR), National Institutes of Biomedical Innovation, Health and Nutrition (NIBIOHN), Japan, elucidated the complex network and mechanisms of the interaction among diet, gut commensal bacteria as well as health and disease. From his research studies, he expounded the immunologic influence of fatty acid composition in dietary oils on the regulation of host immune responses showing that fatty acid compositions especially omega-3 fatty acid, ALA in dietary oils and eicosapentaenoic acid (EPA)-derived metabolite, 17,18-EpETE could potentially control the development of allergic and inflammatory diseases. The involvement of commensal bacteria in the generation of lipid metabolites from dietary oils in the intestinal lumen was also demonstrated. He noted that not all biological pathways are commensal bacteria-dependent as some pathways could be host-dependent.

Using natto as an example, he highlighted the potential of bacteria-mediated production of functional lipid metabolite in the development of anti-allergic and anti-inflammatory functional foods and drugs. The immunologic functions of vitamin B1 and B9 in regulating the host immunity and their contribution towards moderating the fine balance between physiologic and pathologic conditions of the intestine were also discussed.

Impact of Human Variation on Mother and Child Health

Drawing attention to the findings from the tri-ethnic mother-offspring cohort study, Dr. Neerja Karnani, Senior Principal Investigator and Systems Biology Lead, Singapore Institute for Clinical Sciences, A*STAR, Singapore, noted ethnicity differences in the infant, paternal and maternal genotypes. This influence was also consistently found in plasma arachidonic acid (AA) levels. Data also revealed that Indians tend to have higher levels of AA compared to Chinese and Malay due to the association with ‘G’ allele of FADS1 genetic variant. She pointed out that even suboptimal omega-6 polyunsaturated fatty acids in the utero environment could affect birthweight and neonatal epigenome, suggesting that genetics, epigenetics and prenatal environmental factors could dictate a child’s birth outcomes.

In addition to these key factors, she explained that microbiota composition in the first two years of life should also be taken into consideration attributing to its association with subsequent adiposity which is strongly influenced by the mode of delivery, breastfeeding and ethnicity. In the face of a highly complex and evolving human variome, Dr. Karnani concluded by encouraging greater research efforts towards integrated omics to build strength in association studies for the development of precision healthcare for future generations.

Applications for Personalized Nutrition

Prof. David Cameron-Smith, Chair in Nutrition, University of Auckland, New Zealand, shared that personalised nutrition aims to deliver nutritional interventions and therapies that are tailored to the unique needs of each individual. This level of tailored health delivery is increasingly possible with the gains being made with precision analyses, new technologies and opportunities presented with big data. However, he also noted that the benefits of personalised nutrition are most likely to be preferentially directed towards those with the financial resources, who can make the considerable time (and emotional) investment required and who then have the motivation to adhere to the ‘evidence’ of the ‘best diet’ for their unique needs.
Prof. Cameron-Smith then said that for early adopters, personalised nutrition is the domain of the ‘worried well’ who will be seeking a wellness ‘edge’ that is defined by ‘feelings’ and perceptions, or miscellaneous health indicators (i.e., sleep quality) that are marginally associated with variations in nutritional patterns. It is also not yet clear what health care practitioners currently understand of these current dilemmas, nor how they (and their accrediting organisations/professional bodies) will respond to this deluge of complexity and data. He concluded that from this complexity, regulatory standards should be established, health care providers will adapt, and that opportunities for clinical specialisation will emerge.

Dr. Flavia Fayet-Moore, Founder and Director of Nutrition Research Australia (NRA), said that nutrigenomics is a branch of nutritional sciences that aims to understand how nutrients interact with our genome to impact health and sports performance. Numerous studies have now shown that variations in certain genes can explain why some individuals respond differently from others to the same foods, beverages and supplements they consume for health.

Until recently, the effects of disclosing genetic information on diet and lifestyle changes were not known. Recent findings from a randomised controlled trial showed that people who receive DNA-based personalised dietary advice have a greater understanding of their recommendations, greater motivation to change dietary behaviour, and make specific changes to their dietary intake that persist up to one-year post consultation.

There is increasing awareness among researchers, educators, health care professionals and consumers that the one-size-fits-all population-based approach to nutritional guidance is inefficient and sometimes ineffective. This awareness has created a growing demand for personal genetic testing services. With increasing consumer demand, there is a need for healthcare professionals to have sufficient knowledge to understand the science behind these innovative tests, determine their benefits and limitations and learn which ones provide clinically actionable information. She concluded that nutrigenomics will continue to be part of the healthcare system and may become an integral part of an individual’s health management.

Prof. Sandra Capra, Emeritus Professor of Nutrition at the University of Queensland, Australia, shared that in the days prior to advanced technology, all dietary therapy was personalised but this was gradually replaced by a “one size fits all” approach starting in the 1980s. However, the trend has now come full circle back to tailored therapy, but this time with more tools, and more understanding of nutrition science, biology, and the environment. Combining these with an understanding of the new foods and human behavior allows health practitioners to provide practical, personalised advice which is tailored to achieve improved health outcomes.

Prof. Capra said that there is a clear benefit in understanding biological variability, as the new paradigm is about understanding that biology determines responses to dietary therapy as much as, or more than, the food chosen, knowledge or motivation. Thus, biology-based tools are now a critical tool for success.

Dr. Femke Hannes, DSM Nutritional Products Asia Pacific, Singapore shared the industry perspectives on personalised nutrition, including the challenges and opportunities in research application. She said that the rising demand for customized experiences, healthier eating, personalized medicine and quantification of personal characteristics to track and improve health are driving towards personalization. Trend data indicated that health and wellness is one of the fastest growing markets globally and the global demand for consumer genetic testing will also continue to grow rapidly.

While consumer attitudes towards personalised nutrition were positive, she encouraged greater efforts towards translation of personalized nutrition from research to consumers and building consumer trust in brands which would be pivotal to market success.

Dr. Hannes also underlined the need to design a framework for privacy, transparency and consent, adopt a risk-based approach towards data privacy and security and create a truthful and science-based value proposition where communication of benefits is substantiated with science-based evidence. Scalable access to expert advice, understanding of consumer appeal, and employment of gamification and incentivization will also be vital to achieving consumer retention and a sustainable business model in the ecosystem of personalized nutrition.
PANEL DISCUSSIONS
Panel discussions held at the end of both symposia addressed the future directions of personalized nutrition in an evolving global landscape, the challenges faced and the research gaps needed to move forward in this nascent, emerging field. It was agreed that as the paradigm of science and nutrition becomes increasingly complex, there is a need to broaden the concept of personalized nutrition and efficiently translate new knowledge from research to application to meet the nexus of supply and demand.

Issues, challenges and opportunities discussed included:

Data and Scientific Evidence
It was agreed that there is still a long way to go for better understanding of personalized nutrition and acceptance by the market. While big data offers exciting opportunities, it requires the correct tools and skills for effective interpretation and translation. Nonetheless, the panelists remained optimistic about its future and encouraged continuous efforts in building data and scientific evidence to close the research gaps and pursue rigorous scientific research to keep the momentum going.

Multi-disciplinary Approach
Cross-fertilization of nutrition with other disciplines such as psychology, sociology and biology, will help to build capabilities and foster collective ownership of personalized nutrition, which are vital towards creating an ecosystem for success.

Building Consumers' Trust
At present, personalized nutrition is still at its infancy with multiple hurdles to be overcome. Lack of public communication and engagement between academia and industry, concerns about consumer confusion, and ethical issues of data handling were identified as key challenges that need to be addressed. A partnership between the academia and industry, supported by a strong regulatory framework, could help bridge the gap between science, consumer insights, and tools to effectively deliver personalized nutrition solutions that could be trusted by consumers.

CONCLUSION
Overall, there was broad-ranging consensus that new technologies have the potential to improve a person’s health status as well as to enable characterization of what people eat. However, to truly realize the potential of personalized nutrition, there is a need to develop a collaborative network of researchers, clinicians and policy makers. This network should establish a research agenda to identify the research and data that are needed to bring the vision to fruition. In this regard, these symposia mark a step forward in linking researchers and stakeholders in this field.
New technologies such as artificial intelligence, digitalization, genomics, and the Internet of Things are advancing our knowledge, connectivity and the web of communication. At the same time, these technologies can be harnessed for better understanding of nutritional status, food intake and physical activity patterns.

With greater access to new technologies and information, consumers are increasingly aware of health-related aspects of food and diet. This has also enabled consumers to take initiatives, make smarter choices, and adopt more health-focused food consumption patterns. On the other hand, the convergence of innovation, conflicting information and the abundance of food choices have led to increased concerns on overall health and well-being, as well as environmental impact and sustainability.

On April 23, 2019, ILSI SEA Region organized a 1-day symposium on Smart Eating – Harnessing Innovative Approaches & New Technologies for Health and Sustainability that was held in Kuala Lumpur, Malaysia. Co-organized by the ILSI SEA Region Malaysia Country Committee, and in collaboration with the Nutrition Society of Malaysia (NSM), the symposium sought to explore the definition of smart eating for health and sustainability. Experts shared how new technologies and innovative approaches have revolutionized the agri-food industry, and how they could be further harnessed to improve our populations’ health and nutritional well-being. The meeting also provided a platform to discuss consumer perceptions and acceptance of such new technologies, and multi-stakeholder partnerships in the advancement of new technologies in smart eating.

The symposium was attended by more than 150 participants in the region, including professionals in food and agriculture, sports, nutrition and healthcare; industry partners and technology providers as well as researchers, government officials and health policy implementers.

Keynote Session
In his presentation on “Human Variation in Response to Food and Nutrients – Exploring a Path to Smart Eating for Personalized Health and Nutrition”, Prof. Richard Head, Emeritus Professor in the Division of Health Sciences at University of South Australia, shared that ongoing refinement in the “omics” sciences, the ability to handle large and disparate data, and the ability to adopt the approaches of Complex Systems Science could help lead to more comprehensive understanding of human variation in personal response
to foods and nutrients in a holistic approach. He pointed out that this could be the path to smart eating for personalized health and nutrition. He also highlighted that personalization may aid in determining if the tailoring of products and advice will be effective in improving health by novel dietary intervention.

Next, Prof. Purwiyatno Hariyadi, Professor in Food Processing and Engineering at the Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, Bogor Agricultural University (IPB), Indonesia presented on "Smart Eating & The 4th Industrial Revolution: Harnessing New and Innovative Technologies for Nutritious and Sustainable Foods". He noted that smart eating starts from the smart selection of many varieties of food that are available and discussed the importance of establishing the simple metric, considering all important aspects of smart eating, that could be used not only by consumers to make better food selection but also by producers, manufacturers, traders and retailers to provide food choices. Harnessing new and innovative technologies, such as genetic engineering, irradiation, high pressure processing, ohmic heating and modified atmosphere packaging, should be designed to provide safe, nutritious and sustainable foods, to support smart eating.

**What is Smart Eating?**

In her presentation on "The Science and Art of Smart Eating", Dr. Chor San Khoo, Senior Science Fellow at ILSI North America, USA, shared that the principles and rationale for healthy or smart eating for a population are derived from national dietary and nutrition guidelines that are used to assess and improve a population diet quality, physical activity status and food safety knowledge. She noted that there is a need to re-evaluate recommendations in the dietary guidelines (DG) for a weekly basis rather than daily goal.

Dr. Khoo also highlighted the drivers of food decisions and purchase towards the art of smart eating known as the 7 Ps: palatability; price; personal value; portability; portion; packaging; and personalization. These drivers are inter-related, hard to prioritize, yet highly individualized. She concluded that convergence in knowledge gained from science and art approaches may offer the best options for making the DG goals achievable.

Next, Dr. Gilly Hendrie, Research Scientist at Health and Biosecurity at Commonwealth Scientific and Research Industrial Organisation (CSIRO), Australia, presented on "Targeting Smart Eating Goals through Innovative Tools and Behaviour Nudge". She highlighted that large-scale population shifts in dietary intake are possible, and innovative tools can help to create behaviour change, and shared about the CSIRO Healthy Diet Score and VegEze smartphone app which had garnered 250,000 users and 1,313 completed surveys. The CSIRO Healthy Diet Score is an online survey of short food-based questions which estimates compliance with the Australian Dietary Guidelines, while the VegEze app was built around a target behaviour of 'having 3 different types of vegetables for dinner'.

These new tools helped to empower consumers with knowledge and choice. Dr. Hendrie mentioned that there is a need for robust nutrition tools to direct people to evidence-based paths for action and that evaluation could be embedded into tools and dissemination could be fast tracked to ensure that organizations could keep up with consumer expectations.

Assoc. Prof. Jason Lee, Associate Professor at the Department of Physiology, Yong Loo Lin School of Medicine under National University of Singapore, shared in his presentation on "Harnessing Smart Devices to Optimise Human Performance" that evidence-based recommendations often do not optimize performance of every individual in the cohort. He explained that adoption of general guidelines in hope to achieve optimal human performance could at times induce negative health implications such as impending increase in heat stress would degrade performance and health. Dr. Lee described how variability in thermal strain and fluid balance within and between activities and the correct selection of smart devices, accounting for individual physiology, are required to guide decision-making and intervention strategies.

Food science and technology has evolved throughout the years to respond to the needs of society as well as individual consumers. In order to achieve ‘smart eating’, consumer education plays an essential continuous role. In her presentation on "Smart Eating through an Evolution of Nutritional and Functional Enhancement of Foods and Ingredients", Dr. Anadi Nitithamyong, Senior Advisor at INMU, Thailand, elaborated on how to disrupt and redefine the food industry in response...
to the challenges. These include food innovation/renovation; nutrient enrichment; catering to the silver generation; food for prevention and/or therapy; minimizing food allergy; alternative food sources including novel foods and ingredients; and food safety prevention and detection. She also explained potential barriers that could be overcome by strengthening partnership among stakeholders.

Dr. Cecilia Cristina Santos-Acuin, Human Nutrition Scientist at International Rice Research Institute, Philippines, presented on "From "Makan Nasi" to "No-Carb"? Recalibrating Trends and Perceptions of Asia's Grain". She explained the importance of rice in Asia and how the quantities of white rice that Asians consumed was contributing significantly to the glycemic load of their diets, relative to other food sources, and was impacting especially on increased diabetes risk. This had resulted in a vigorous research track towards selecting rice traits with low glycemic index, increased resistant starch and dietary fiber, as well as omics technology that allowed breeders to tap the rich diversity of rice in identifying lines with enhanced nutrient density, flexibility in responding to consumer sensory expectations, while meeting farmers’ productivity expectations and environmental sustainability goals. Dr. Santos-Acuin noted that these exciting innovations were contributing to the "smart eating” package to ensure that rice will always be Asia’s grain.

Agri-Food Processing Technologies, Safety and Sustainability

Dr. Ainu Husna MS Suhaimi who is the Head of MYSaveFood Secretariat under the Malaysian Agricultural Research and Development Institute (MARDI), gave a presentation on "MYSaveFood: Agri-Tech and Behaviour Approaches to Tackling Food Loss and Reducing Waste for Sustainable Future". Dr. Ainu explained that the MYSaveFood Initiative was initiated in 2016, as part of the global SAVEFOOD Network, to build a network and create awareness on the detrimental effects of food loss and waste. Based on statistics, Malaysians throw away 3,000 tonnes of edible food each day and a concerted approach by multi-stakeholders is needed to reduce food loss and waste in Malaysia. Since then, MYSaveFood has partnered with more than 150 organizations and completed more than 100 awareness programs including educating more than 10,000 students at 50 schools.

Prof. Yandra Arkeman, a Professor in Agroindustrial Technology at Bogor Agricultural University (IPB), Indonesia, shared "The Role of AI and Innovative Technologies in Agri-Food Industry: Transforming Food Systems and Enhancing Nutrition Security". He explained the application of AI technology such as neural networks, deep learning, fuzzy inference systems and genetic algorithms for food contents prediction based on photos, non-destructive quality testing, food quality control systems and food damage diagnosis systems, and highlighted the use of blockchain application to improve food traceability system. Prof. Yandra also shared the use of AI and other innovative technologies to produce new agricultural products with high nutrients such as golden rice, pro-vitamin A-rich fish and omega-3-rich eggs to prevent stunting and ensure community nutrition security but is not harmful to humans and ecosystems. He emphasized that things that can be digitized in the Agri-Food Industry should be digitized.

Next, Dr. Lay Ching Chai, Senior Lecturer from the Institute of Biological Sciences, Faculty of Science, University of Malaya, shared on the topic of "Next Generation Sequencing (NGS) for Food Safety - Public Health Benefits and Food Industry Application". She described NGS as a powerful tool for food safety and explained their applications and challenges in whole genome sequencing (WGS), metagenomics as well as in targeted metagenomics, metabarcoding and amplicon sequencing. She noted that through NGS, food safety professionals can gain better insight into the microbial community in a food or environmental sample which then allow better management of food safety. Dr. Chai also believed that stronger and more sophisticated food safety programs are expected to emerge with the development of NGS.

Lastly, Dr. Kai Zhong, Deputy Director of China Food Information Center (CFIC), gave an overview of the blooming "Food E-commerce in China" as well as the issues and challenges that came with the new business model. Some of the challenges mentioned included food safety issues for food delivery, the number of unqualified restaurants that were selling food online, and use of misleading information such as health claims. Dr. Zhong provided some potential solutions to these challenges such as the use of AI for tracking services, implement and install real-time video stream of the kitchen in restaurants etc. He
explained that this new business model brought about a huge challenge to the regulators because of the different type of risk profile that is not easily traceable.

**Innovation for Health and Sustainability**

Mr. Daniel Wong, Chief Technology Officer of CrowdFarmX(CFX), Singapore gave a presentation on "Precision Technologies & Blockchain for My Spinach". He cited that 80% of the global food supply is provided by small stakeholder farmers in the 6 trillion dollars food industry. However, they were unable to leverage on market opportunities and were caught in the cycle that alienates them from market access due to the inability to reinvest in sustainable and safe farming practices. CFX was founded to help establish food cradles that provide research, education and support for these farmers. It also introduced farmers directly to the targeted demand, shortening the supply chain and maximizing their profits. Lastly, it also provided P2P financing platform for farmers.

Dr. Jeslyn Lee, Research fellow at School of Chemical and Biomedical Engineering in Nanyang Technological University, Singapore, shared her insights on the "Fermentation Technology for Nutrient Recovery from Soybean Residues". She elaborated on how technology innovation can provide a solution to food security, one of which is through food waste reduction so as to increase affordability and accessibility. Soybean residue, okara, is produced in surplus from the soybean industry in Asia, and has a high protein content of up to 30%. Through fermentation, a powerful and low-cost enzymatic technology, okara could become a valuable and cost-effective media to produce food-grade yeast and bacteria, as well as low sugar probiotic beverages.

Dr. Dunyaporn Trachootham, Assistant Professor at INMU, Thailand, presented on "A Multi-Discipline Approach for Innovative Functional Food", where she discussed about the development of Nutri-jelly, a standardized texture-modified nutritious diet for elderly with chewing and swallowing problems. Her research team also worked on another product, Nutri-PEITC jelly which contained anti-cancer compound, as a functional texture-modified diet for dysphagia. The product has since been distributed throughout Thailand and has benefitted many patients. Dr. Trachootham highlighted that these innovative functional foods are personalized diets for people with special needs and conditions, helping to support their nutritional needs and quality of life as well as to maintain and stabilize the condition of their diseases.

Last but not least, Ms. Gladys Wong, Senior Principal Dietitian at Khoo Teck Puat Hospital (KTPH), Singapore shared an interesting presentation on “Disruptive Food Innovation Challenges - Creating Safer & Personalized Puree Meals with 3D Food Printing”. Ms. Wong highlighted the global problem of feeding the silver generation as they age in sickness and in health. Meanwhile, fortified foods of various safe consistency are often unpalatable, visually unappealing, or labour intensive to mass produce for people with dysphagia. She suggested that a potential and commercially viable solution of the future is through the use of 3D food printing, which could create consistently safer and personalized puree meals for the elderly population with dignified care.

**Panel Discussion**

The panel discussion was chaired by Dr. E-Siong Tee, Scientific Director and Coordinator of ILSI SEA Region Malaysia Country Committee and comprised of panelists: Prof. Lynne Cobiac, Science Director and Deputy Director of CSIRO’s Health and Biosecurity business unit, Australia; Ms. Norrani Eksan, Deputy Director of the Food Safety and Quality Division, Ministry of Health, Malaysia; Mrs. Megawati Suzari, Director of New Product Development, Scientific Regulatory Affairs at Fonterra Brands (M) Sdn. Bhd., Malaysia; and Prof. Aman Wirakartakusumah, Emeritus Professor of Food Science and Technology at IPB, Indonesia.

It was an insightful discussion on the panelists’ views about:

- Consumers’ perception, understanding and acceptance of the use of new technologies in food and the food chain
- Multi-stakeholder partnerships in the advancement of new technologies in smart eating and eating sustainably
- Acceptance of new technologies used in the food industries and compliance with national regulations.
- The importance of considering consumers’ preferences on taste and appearance, when developing innovative food products using new technologies.
- Involving consumers in the early stages of product development, to educate them on new technologies and thereby increase the acceptance of new technologies by consumers.

In concluding the panel discussion, Dr. Tee noted the importance of thinking ‘smart’ on how to alleviate NCDs in populations through multi-stakeholder partnerships where everyone has a role to play.
The Asian Congress of Nutrition (ACN) is a four-yearly meeting of the Federation of Asian Nutrition Societies (FANS), which aims to encourage scientific interchange between food and nutrition researchers, academia and professionals from Asian countries and around the world.

ACN 2019 was held in Bali, Indonesia from August 4 – 7, 2019, and included three symposium sessions organized and sponsored by ILSI. The symposium sessions focused on the topics of Physical Activity, Diabetes Mellitus, as well as Nutrition and Cognition.

Advancing Physical Activity: Opportunities in Challenging Environment
The symposium session on Physical Activity was chaired by Dr. Siti Muslimatun from Food and Nutrition Society of Indonesia, who is also a Scientific Advisor to ILSI SEA Region.

Dr. Yuying Wang, Chinese Center for Disease Control and Prevention and ILSI Focal Point in China, opened the symposium session with a presentation on “Advancing Physical Activities in China – Challenges, Opportunities and Programs Impact”. With 86% of total deaths in China caused by non-communicable diseases (NCDs) in 2012, NCDs have become a major cause of death in China. While several studies in China have showed that physical activity can reduce the incidence of diabetes, hypertension, major cardiovascular disease and cancer, only a minority of adults, children and adolescents are able to reach 150 minutes of moderate physical activity per week. Dr. Wang shared that “Happy 10 Minutes”, a program first piloted in 2004 to promote physical activity for primary schools in Beijing, has been expanded nationally and is now widely recognized. This program also became one of the components in the Action on Healthy Living for all Nationals in 2011. Dr. Wang further updated that new the Physical Activity Guidelines for Chinese will be jointly issued by National Health Committee and General Administration of Sport in 2019.

Dr. Jason Lee, Associate Professor, Yong Loo Lin School of Medicine, National University of Singapore shared a presentation on “Heat Stress on Physical Activity – the Dos and Don’ts of Hydration”. Dr. Lee said that physical activities have shown to markedly improve human health and well-being. However, environmental heat stress often discourages or curtails outdoor activities through behavioural thermoregulation. In order to optimise exercise tolerance in the heat, various strategies can be employed to alter heat strain such as maximising aerobic fitness, heat acclimatisation, pre-exercise cooling and
fluid ingestion. Specifically on fluid ingestion, Dr. Lee noted that the recommended volume to ingest before and after exercise is widely accepted. However, there are differing views regarding fluid replacement during exercise. He added that optimising the cooling effect from hydration solution by manipulating drink temperature and thermal capacity can enhance exercise tolerance especially in the heat.

The presentation on “Dietary Protein in Support of Adaptation to Exercise: Finding the Signal in the Noise” was given by Dr. Stuart Phillips, Department of Kinesiology and School of Medicine, McMaster University, Canada. Dr. Phillips said that athletes who engage in vigorous training suffer from stress on physiological systems, therefore they require nutritional support for optimal recovery. Of paramount importance when optimizing recovery nutrition are rehydration and refueling. However, Dr. Phillips highlighted the benefits for dietary protein intake over and above recommended requirements for training adaptation, manipulating body composition and hypertrophy in athletes. He also pointed out that higher protein intakes do not necessarily require an overemphasis on protein-containing foods, but that there may be advantages to the consumption of higher quality proteins. In addition, Dr. Phillips shared practical advice on protein intakes that allow for optimal adaptive response among track and field athletes seeking to train effectively and to lose fat mass while energy restricted with minimal (or no) loss of lean body mass.

The next presentation was by Dr. Barakatun Nisak Bt Mohd Yusof, Associate Professor, Department of Nutrition and Dietetics, Faculty of Medicine and Health Sciences. The topic in focus was “A Low Glycemic Index Diet in The Management of Gestational Diabetes Mellitus: The Malaysian Experience”. Dr. Nisak highlighted that excessive postprandial hyperglycemia during pregnancy has been associated with substantial adverse health outcomes for women with gestational diabetes mellitus (GDM). However, the use of low glycemic index (GI) diet may be beneficial in the management of GDM. She then shared on a randomized controlled study investigating the effects of low GI diet on glycemic-related parameters and dietary intake in women with GDM. The study showed that Low GI and carbohydrate exchange produced similar improvement in overall glycemic control. Furthermore, a low GI diet may offer additional benefits by lowering 1-hour post-breakfast blood glucose levels, increasing calcium and fiber intake. Dr. Nisak added that the study results warrant further evaluation for longer duration during pregnancy.

Concluding the symposium session was Dr. Martalena Purba, a Registered Dietitian at Dr Sardjito Hospital, Gadjah Mada University, Indonesia, who shared on “Nutrition Counseling and Plant Based Diet in the Management of Diabetes”. The prevalence of type 2 diabetes is rising worldwide, especially in older adults; and Dr. Purba suggested that lifestyle and diet, particularly plant-based diets, could be effective tools for type 2 diabetes prevention and management. Plant-based eating patterns combined with exercise have been found to improve diabetes control and reduce the need for medication in intervention trials. Dietary choices

Dr. Acuin noted that more comprehensive studies from China, India, and Singapore provide a better understanding of the rice-diabetes relationship, showing that lifestyle, rather than diet alone, as the main problem and therefore the main target for solutions. She concluded that interventions ranging from harnessing omics technologies in identifying niche-specific rice varieties, to behavior change that replaces white with brown rice, are proving to be effective as Asians continue to include rice as part of healthier food choices and a more diverse diet.
are a key driver of insulin resistance, especially in an obese and more sedentary population. She said that multiple potential mechanisms underlie the benefits of a plant-based diet in ameliorating insulin resistance, including promotion of a healthy body weight, increases in fiber and phytonutrients, food-microbiome interactions, and decreases in saturated fat, advanced glycation endproducts, nitrosamines, and heme iron.

Dr. Purba then shared the results from a study in Jogjakarta, Indonesia showing that duration of the disease and type of occupation did not affect eating compliance in diabetic patients. Nevertheless, it was found that family support affected eating compliance as well as eating schedule among patients. She concluded that this finding suggests regular nutrition education is very important in increasing macronutrients and micronutrient intake among diabetic patients.

**Updates on Nutrition and Cognition**

The third Symposium session on Nutrition and Cognition was chaired by Dr. Siti Muslimatun from Food and Nutrition Society of Indonesia, who is also a Scientific Advisor to ILSI SEA Region.

The Symposium commenced with a presentation by Dr. Naoki Saji, Vice Director in the Center for Comprehensive Care and Research on Memory Disorders, National Center for Geriatrics and Gerontology, Japan. Dr. Saji shared his study which explored the “Relationship Between The Gut Microbiome and Dementia: A Cross-sectional Study Conducted in Japan”. He noted that dysregulation of the gut microbiome is associated with several life-threatening conditions and thus might represent a useful target for the prevention of dementia. However, the relationship between the gut microbial population and dementia has not yet been fully clarified.

Results from the study revealed that the number of bacteroides (enterotype I) was lower and the number of ‘other’ bacteria (enterotype III) was higher in demented compared to non-demented patients. Multivariable analyses showed that the populations of enterotype I and enterotype III bacteria were strongly associated with dementia, independent of the traditional dementia biomarkers. Dr. Saji commented that the study has shown that components of the gut microbiome, in particular bacteroides and ‘other’ bacteria, are independently associated with dementia. He concluded that further studies are needed to determine the mechanism underlying this association.

This was followed by Dr. Wen-Harn Pan, Professor in the Institute of Biomedical Sciences, Academia Sinica, Taiwan, who presented on “Taiwanese Eating Approach (TEA) Associated with Cognitive Function in the Elderly”. Dr. Pan said that dietary pattern or eating approach studies have been limited to a few types, such as the Mediterranean diet and DASH diet. She pointed out that Asian dietary patterns have not been widely studied and understood, with the exception of the Japanese diet. She then shared a study carried out using data collected from the Nutrition and Health Survey in Taiwan, which showed that a plant-based diet featuring with phytonutrient-rich foods (vegetables and fruits), drinks (tea) and multiple types of non-red protein foods was inversely associated with mild cognitive impairment. Some of these features (tea and fish) were also shown to associate with lower risk of dementia development.

Dr. Pan highlighted that such finding calls for more research in various ethnic and regional diets, including from the Asia-Pacific region, in order to contribute to in-depth understanding, prevention, and management strategy of dementia.

Last but not least, Dr. Elizabeth Leah Prado, Assistant Professor of Program in International and Community Nutrition, Department of Nutrition, University of California Davis, USA, presented on “Nutrition and Cognitive Development in Children: Impact on Adulthood”. Dr. Prado noted that animal models have demonstrated the importance of adequate nutrition for the neurodevelopmental processes that occur rapidly during pregnancy and infancy. However, several factors influence whether nutrient deficiencies during this period cause long-term cognitive deficits in human populations, including the child’s interaction with the environment, the timing and degree of nutrient deficiency, and the possibility of recovery.

Dr. Prado added that certain types of nutritional deficiency are clearly associated with long-term impairment in brain development, including severe acute malnutrition, chronic undernutrition, iron deficiency, and iodine deficiency. While strategies such as salt iodization and micronutrient powders have been shown to improve these conditions, direct evidence of their impact on brain development is scarce. She concluded that other strategies require further research, including maternal and infant supplementation with iron and other micronutrients, essential fatty acids, and fortified food supplements during pregnancy and infancy.
Snapshots from Asian Congress of Nutrition 2019

Staff from ILSI Global and ILSI SEA Region attended the Asian Congress of Nutrition 2019 held in Bali, Indonesia from August 4 – 7, 2019. Besides organizing three scientific symposia as part of the conference program, ILSI provided valuable opportunities for its members, scientists and advisors to meet, network and exchange ideas with leading scientists and experts in nutrition and public health who had come from the Asia Pacific region and all around the world to take part in this important event.
ILSI Presents Young Scientist Awards at ACN 2019

To recognise excellence in scientific research among young scientists from the Asia-Pacific region, ILSI presented Young Scientists Awards at ACN 2019 to 5 Oral Presenters and 5 Poster Presenters. Winners of the ILSI Young Scientist Awards received certificates of recognition as well as cash awards.

Winners in Oral Presentation

1. **Geethika Liyanage**, Ishijima Tomokoa, Inoue Ryo, Abe Keiko, Okada Shinji
   Department of Applied Biological Chemistry, Graduate School of Agricultural and Life Sciences, The University of Tokyo, Tokyo, Japan
   Soy Isoflavone Intake and Gut Microbiota Modulations Alleviate the Symptoms of Polycystic Ovary Syndrome (PCOS)

2. **Wilfred Mok Kok Hoe**, Lau Xiao Chuana, Wee Lei Hum, Ruzita Abd Talib, Poh Bee Koon
   Nutritional Sciences Programme & Centre for Community Health, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia
   Ceria, Respek, Gigih, Aktif, Sihat (C.E.R.G.A.S.): Factors Influencing Sustainability of a School-Based Obesity Intervention for Young Adolescents

3. **Dini Suciyanti**, Fiastuti Witjaksono, Annasari Mustafa, Sugeng Iwan, Risianti Kolopaking, Umi Fahmida
   Southeast Asian Ministers of Education Organization Regional Centre for Food and Nutrition (SEAMEO RECFON)/Pusat Kajian Gizi Regional Universitas Indonesia (PKGR UI), Indonesia
   Remaja ASIK: The Effect of Optimized Food Based Recommendations on Cognitive Performance among Adolescent Girls

4. **Peiqi Ye**, Weijia Wu, Nu Tang, Yajun Chen, Jin Jing, Li Cai
   Preventive Medicine, School of Public Health, Sun Yat-sen University, Guangzhou, China
   Effect of Maternal Food Consumption during Pregnancy on Eczema in Chinese Infants: A Cohort Study

5. **Saki Yamanaka**, Sanae Ito, Rieko Sato, Hiromi Ishida, Kazuhiro Uenishi
   Kagawa Nutrition University, Sakado, Saitama, Japan
   Body Fat and BMI Percentile Curves for Japanese Adolescents

Winners in Poster Presentation

   Bogor Agricultural University, Bogor, West Java, Indonesia
   Indonesiam-Adapted AHEI-P and Minimum Dietary Diversity of Madurese Pregnant Women

2. **Dyah Kumala Sari**, Diah Dwiana Lestiania, Syukria Kurniawati, Indah Kusmartinia, Endah Damastuti
   Center for Applied Nuclear Science and Technology BATAN, Indonesia
   Assessment for Food Matrices Reference Material Using Nuclear Activation Analysis

3. **Yu Zhi Lian**, Jane C-J Chao
   School of Nutrition and Health Sciences, Taipei Medical University, Taiwan
   Lycium barbarum Polysaccharides and C-Phycocyanin Protect Against Ethanol-Induced Gastric Ulcer in Rats by Anti-Inflammation and Cytoprotection

4. **Cynthia Andriania**
   Food Technology and Nutrition, Lund University, Sweden
   Alternative Strategy for Food Diversification in Papua through Provision of Nutritious Instant Papeda

5. **Haruka Takeuchi**, Rieko Tanaka-Yachi, Mana Nagase, Masahiro Kassai, Chie Takahashi-Muto, Chikako Kiyose
   Graduate School of Kanagawa Institute of Technology
   Effect of Sweet Basil Fractional Extract on 3T3-L1 Adipocytes
Food Safety Risk Communication

Risk communication is a very important component in the food safety risk analysis framework. The main objective of food safety risk communication is to increase understanding among various stakeholders regarding the rationale behind the decisions taken to assess hazards and manage food safety risks, and to help people make more informed judgments about the food safety hazards and risks they face in their lives. Therefore, developing an effective risk communication framework is not solely based on scientific knowledge, but also involves consumer perceptions, the relationship between consumers and risk communicators, as well as regulatory strategies on food safety.

ILSI SEA Region and its Thailand Country Committee, with the support of ASEAN Prepared Foodstuff Products Working Group (PFPWG) and the participation of Food and Agriculture of the United Nations (FAO), organized a Seminar and ASEAN Regional Workshop on Food Safety Risk Communication on April 2 to 3, 2019 in Bangkok, Thailand.

The objectives of the seminar were to share knowledge on the basics of risk communication, Codex guidelines and the key considerations of food safety risk communication; introduce the new concept of food information communication; highlight the importance of educating the public on science-based information relating to food safety; and emphasize the significance of partnership among stakeholders.

**Food Safety Risk Communication and Consumer Perception**

The opening presentation, Dr. Andrew Powell, Asia BioBusiness Pte. Ltd., Singapore* shared that risk communication is an integral part of risk analysis. The psychology of consumer risk perception drives public risk attitudes. Ethical representations, values, and concerns are the emerging determinants of societal and consumer decision-making. The experts and public perceive risk very differently: where the expert relies on technical risk assessments and scientific augmentation, the public uses their risk perception and emotions to make judgments. Dr. Powell highlighted that effective risk communication must be developed by understanding the target’s concerns, perceptions, characteristics of the target population, trust and credibility in information sources.

In the case of an acute risk, the focus should be on the process of communication; while in the case of a chronic risk, the focus should be on consumer perceptions on the risks and benefits, as well as the concerns of those who are most affected. He presented Avian Influenza as one of the case studies. It raised public health concerns due to the impact on poultry populations, potential to cause serious disease in people, and potential for pandemic. In this case, the communicators need to communicate the warnings and information rapidly and widely the warnings and information. Although the risk
Communicators have to communicate with different groups of people, the message content must be kept consistent across the groups. Dr. Powell also emphasized the importance of trust, as people who distrust risk messages are unlikely to believe in the information. In general, the target risk perception has to be taken into consideration, message content and communication media has to be tailored according to the groups’ needs. Lastly, emergency preparedness and communication plans need to be in place in advance of any crisis.

“Dr. Andrew Powell presented on behalf of Prof. Lynn Frewer, Newcastle University, UK, who was unable to attend the seminar.

**Codex Guidelines on Food Safety Risk Communication**

Dr. Masami Takeuchi, Food and Agriculture Organization of the United Nations Regional Office for Asia and the Pacific (FAO RAP), Thailand, presented on Codex Guidelines on food safety risk communication. Dr. Takeuchi pointed out that Codex has defined the risk analysis framework as a process consisting of risk assessment (science-based), risk management (policy-based) and risk communication. A food safety hazard is defined as an agent while the risk is a probability of an adverse health effect. She also gave several examples of how to differentiate between hazard and risk communication.

Thus, Codex definition of food safety risk communication is the interactive exchange of information and opinions throughout the risk analysis process concerning risk, risk-related factors and risk perceptions, among risk assessors, risk managers, consumers, industry, the academic community and other interested parties, including the explanation of risk assessment findings and the basis of risk management decisions. It involves a two-way process; understanding people’s perception of risk; opportunities for public involvement in decision-making; timely and accurate information; as well as internal communication. Dr. Takeuchi also informed the participants regarding the FAO/WHO Guiding Principles on risk communication.

**Key Considerations in Risk Communication**

Mrs. Lorraine Haase, Food Standards Australia New Zealand (FSANZ), highlighted factors and issues that affect risk communication, such the rapid exchange of information on social media, clickbait, marketing strategy, personal agendas, as well as journalists who may not always have the appropriate scientific literacy. These considerations often lead to challenges in explaining complex scientific issues to consumers clearly and accurately. Mrs. Hasse also pointed out that there could be a tendency amongst scientists and communicators who have worked in food science agencies for a long time to make assumptions about understanding consumer perceptions. She suggested that these challenges can be addressed by being open and listening to the stakeholders; planning and evaluating communications on food safety issues; collaborating with other credible sources; meeting the needs of the media, as well as communicating clearly and with compassion. Mrs. Hasse also emphasized that when communicating risk, communicators should take into consideration consumers’ outrage factor and perceptions; communication strategy that provides timely and accurate information; as well as transparency and public consultation. She then concluded by providing several case studies on food safety risk communication in Australia and New Zealand.

**New Concept in Food Safety Communication**

The next presentation was given by Dr. Junshi Chen, ILSI Focal Point in China, who noted that one of the difficulties in food safety is the communication of the issues to the public without undermining consumer confidence. However, the emphasis on “RISK” may not be the ideal approach as the word “risk” is naturally perceived negatively. Instead of the term “risk communication”, Dr. Chen suggested that the term “food information communication” may be part of the solution to restoring public confidence in the safety of the food supply. This could bring about a more positive approach by governments to communication, and this new approach is being explored in many jurisdictions. He pointed out that the core objective of food information communication is to establish trust among stakeholders, rebuild consumer confidence, reduce government’s pressure of public opinion.

Government and industries should communicate with each other based on science, with the aim of building trust through an open or transparent posture. The communication strategy should also be innovative, to make food information more attractive to the public. Training and education for front-line inspectors and staff, government officials and experts are critical, as building their capacity in science-based food information communication would influence their capability in enforcement, and ultimately influencing the public’s trust in the entire monitoring system. Each inspection could also be viewed as an opportunity to communicate with stakeholders, and to increase their understanding of new monitoring measures.

Dr. Chen concluded that the urgent challenge in food safety is that the social damage due to rumors and misleading information has exceeded the health risk of food itself. He suggested that the solution is to establish a food information communication system led by the government, and participated by multisectoral stakeholders, to carry out broader food information communication instead of risk communication. However, there is currently no existing model of such a system, and pioneers are needed to explore and implement such a system.
Dr. Chai Lay Ching, University of Malaya, Malaysia, said that science is part and parcel of risk communication. Effective science communication involves sharing thoughts, ideas, and feelings with others in commonly understandable ways. However, there are several challenges in communication nowadays, such as the lack of feedback mechanisms between communicators and target audiences; difficulties faced by scientists in understanding what are the information needed by the public; and difficulties in translating scientific information to consumer-oriented communication for the public.

Dr. Chai noted that when a crisis happens, the issue is often sensationalized by the media, resulting in misleading information being introduced to the community. She added that the concept of “citizen science” has been introduced to the community with the objective of involving the public in scientific research, and thereby educating the public on science. One example of a citizen science project is personalized nutrition, where all the data are collected from volunteer participants. In addition, Dr. Chai also explained the differences between science and “pseudoscience”. She commented that the major difference is that science invites criticism, is open to ideas, and is willing to change according to new evidence. However, “pseudoscience” views criticism as a conspiracy theory. Dr. Chai then introduced several platforms and channels for science communication with the public, such as Science Café in Malaysia which has been a very good initiative for scientists to talk to the public about science.

Powell noted that government and industry are the two major players in the ecosystem; thus, it is relevant that the government and industry should work together to maintain the integrity of this ecosystem.

Public-private partnership (PPP) can be viewed broadly as covering most interactions between the private and the public sectors; it can also be viewed as focusing on particular sets of risk-sharing and financial relationships. PPP can help to provide new resources, build capability and improve existing systems. Dr. Powell added that there are several important elements for successful partnerships, such as a clear understanding by the parties of their distinct roles and abilities in the collaboration; mutual trust and cooperation; transparent procedures; well-mapped performance criteria; and clear review mechanisms.

In conclusion, Dr. Powell commented that identifying appropriate partners, clearly specifying roles and responsibilities for each partner, developing proper monitoring and evaluation schemes, creating appropriate systems for managing conflicts of interests, as well as improving transparency in decision-making processes would all help to result in successful PPP.

Panel Discussion
After the presentations, an interesting panel discussion was held among the speakers and chaired by Dr. Anadi Nitithamyong, Senior Advisor, Institute of Nutrition, Mahidol University, Thailand. The topic of focus for the panel discussion was on the emergence of food e-commerce and concerns on food safety control.

- Dr. Chen noted that, as food e-commerce as become increasingly prevalent, many countries are drafting their food regulations for this area. For example, in China, home-prepared food is prohibited from being sold to the public. Dr. Chen commented that the food e-commerce market has bloomed in China but surprisingly, Chinese consumers perceive pre-packaged foods to have higher food risk than food delivered from restaurants.

- Dr. Chai pointed out that establishing a food safety system for food delivery services is an extremely complicated process due to the diversity of cooks and food handlers involved. She suggested that it is probably more suitable to have a food safety regulation in place to mitigate food safety risk.
On May 23, 2019, ILSI SEA Region Philippine Country Committee organized the 1st ILSI SEAR Philippines Food Safety and Nutrition Assurance Seminar Series, in Manila, Philippines.

During the 1-day seminar, speakers and experts discussed current epidemiology of different foodborne diseases, and presented new understanding of current food pathogens. They also defined and elaborated on concepts of ‘hazard’ and ‘risk’ in food safety; presented the government’s efforts and regulations to ensure the quality and safety food products; as well as shared and discussed challenges and opportunities on food safety practices across the food supply chain. Finally, the current road map and future directions in strengthening food safety culture and improving food safety in the country were discussed.

Epidemiology of Foodborne Diseases

The first presentation was shared by Dr. Theodora Cecile Magturo, MD, MHA, Disease Prevention and Control Bureau, Department of Health, Philippines. She highlighted that globally, people are at risk of developing food and waterborne diseases (FWBD) daily because food and water can be contaminated at any point of its production. FWBD are a major concern globally because of various reasons: 1) The contaminants are varied (bacteria, viruses, parasitic agents, and toxins); 2) The vehicle (medium) of the agent are the basic needs of humans, namely water and food; 3) Their outcome may be severe, causing sickness and death to many people; 4) It is difficult to measure the magnitude of the burden as a majority of the cases may manifest minor symptoms, or are self-limiting and unreported.

Dr. Magturo pointed out that outbreaks of FWBD may have consequences on the economic development of a country, impacting sectors such as tourism, food export industries, agriculture, marine products etc. She added that the promotion of hand hygiene in all settings and on all occasions is recommended to reduce transmission of microbes that cause acute infectious diarrhea. All efforts should be made to provide access to clean water, soap and hand drying materials. Food hygiene refers to measures that ensure consumption of safe food, and must be observed by any domestic or professional food handler. Dr. Magturo concluded that although there is limited evidence on effective and sustainable food hygiene interventions, the WHO promotes the Five Keys to Safer Food Manual as a tool to promote the principles of safe food handling.
Foodborne Pathogens
Dr. Ida F. Dalmacio, Professor Emeritus of the University of the Philippines Los Baños, Philippines, gave the next presentation on the topic of foodborne pathogens. Foodborne pathogens are mainly bacteria, viruses or parasites that are present in food. Some of these organisms can cause food infection, food poisoning, and food intoxication. Dr. Dalmacio presented on some important characteristics of these causal organisms, such as cultural, morphological and physiological attributes; and for some bacteria, the immunologic traits were shared too. She added that intrinsic and extrinsic parameters like pH, water activity and temperature are also important as they affect the survival and growth of the pathogens.

Strengthening the Philippines’ Food Safety Culture
Next, Prof. Alonzo A. Gabriel, College of Home Economics, University of the Philippines Diliman, Philippines shared his perspectives as an educator on strategies to strengthen the Philippines’ food safety culture. Firstly, he presented the framework of the Laboratory of Food Microbiology and Hygiene (LFMH) which comprises: role of teaching, research and development, and public service. These different roles are being explored to address the challenge of foodborne illnesses in the Philippines. The LFMH looks at this tripartite role as an opportunity to transfer food safety knowledge to micro-, small- and medium scale enterprises, which make up a majority of food industry stakeholders in the country. Dr. Gabriel also highlighted efforts of the LFMH in transferring knowledge to stakeholders from the food industry, academia, government units, and non-government organizations, and shared experiences in merging teaching of university students and community extension activities to inculcate the values of service and grassroots empowerment.

Strengthening the Food Safety Regulatory System
An overview of the Food Safety Act 2013 (the Act) of the Philippines was shared by Mr. Moises Timothy Mendoza, Food and Drug Administration, Philippines. The objectives of the Act are to (1) protect the public from foodborne and waterborne illnesses and unsanitary, unwholesome, misbranded or adulterated foods, (2) enhance industry and consumer confidence in the food regulatory system, and (3) achieve economic growth and development by promoting fair trade practices and sound regulatory foundation for domestic and international trade.

To achieve these objectives, the Food Safety Act 2013 created the Food Safety Regulation Coordinating Board (the Board) to ensure that various government agencies with roles in food safety shall perform their respective duties and responsibilities. The Board is chaired by the Secretary of Health and co-chaired by the Secretary of Agriculture with members comprising Food Safety Regulatory Agencies from the Department of Health and Department of Agriculture, support agencies from the Department of Interior and Local Government, Department of Science and Technology, Department of Trade and Industry, and the local Government Units.

Defining Risk in Food Safety
Prof. Abigail A. Rustia, College of Home Economics, University of the Philippines Diliman, Philippines, presented on the significance of risk as described in the Philippine Food Safety Act (RA 10611). She also elaborated on the framework of risk analysis and its components, namely risk management, risk assessment, and risk communication. Prof. Rustia emphasized the role of risk management; highlighted strategies to achieve food safety objectives, in particular existing food controls in the Philippines; and described concepts, and appropriate level of protection as introduced in the WTO SPS agreement. Initiatives on establishing risk profiles to support the national food safety risk management in the Philippines were also presented.
Best Practices on Food Safety across the Food Supply Chain
Government Programs

Dr. Julius Ceasar Sicat, Department of Science and Technology Region III Food Safety Team, Philippines, shared the initiatives of the Regional office through the establishment of a food safety team composed of skilled technical personnel from the Department of Science and Technology as well as different state universities and colleges in Central Luzon who were trained to lead the food safety-related activities in the Region. The Central Luzon Food Safety team designed its food safety program with reference to Singapore’s Points Demerit System (PDS). PDS is a systematic and fair approach that deals with the suspension and cancellation of licenses for food hygiene infringements, from local hawker fare to international cuisine. In line with this, DOST-3 launched the project entitled Establishment of Pilot Model for Ambulant Vendors and Canteen Concessionaires at Central Luzon State University (CLSU), funded under the DOST-3 Grants in Aids (GIA) program.

Dr. Sicat further shared that DOST-3 implements the Small Enterprise Technology Upgrading Program (SETUP) as a primary means to reach out to Filipino entrepreneurs in the region. SETUP supports MSMEs by providing technology assistance, technical training and consultancy services, packaging and labeling design, database information systems, and support for establishment of product standards, including testing and calibration of equipment. DOST-3 has its own analytical testing laboratory which is an ISO 17025:2005 accredited laboratory that caters to all. It acts as a third party laboratory that provides technical support to the food manufacturing, trading and production sectors through the physico-chemical and microbiological tests it offers. Dr. Sicat said that the aim of DOST-3 is to establish not just a food safety program, but a strong food safety culture in the region.

Food Industry Initiatives

Dr. Ena Bernal, Quality and Food Safety Manager, shared on how food manufacturing companies in the Philippines have used and applied for accreditation to ISO/IEC 17025 under the Philippine Accreditation Bureau (PAB). ISO/IEC 17025 is a global standard specifically developed for testing and calibration laboratories. Accreditation to this standard is the highest recognition of competence testing and calibration laboratories could achieve. All the requirements of ISO/IEC 17025:2017 are equally important for the desired competence. Metrological Traceability (Resource Requirement), Selection, Verification and Validation of Methods and Evaluation of Measurement Uncertainty (Process Requirements), and Actions to Address Risks and Opportunities (Management System Requirement) were highlighted as best practices of accredited food manufacturing test laboratories.
**In-flight Catering Service**
Representing the in-flight catering services sector, Ms. Maria Angela Ann Baylon, Macroasia Catering Service Inc. shared the company's best practices from procurement to service. Loading and off-loading of catering requirements to and from the aircraft were also presented.

**Food Service**
Ms. Nicole Laya Alunan, Jollibee Foods Corporation, presented on End-to-End Global Food Safety Strategy of Jollibee Foods Corporation (JFC). She noted that ensuring food safety is imperative in the company, which aims to achieve zero product recall and zero food safety crisis due to system error. JFC’s key strategy to safeguard the JFC food chain is to install a world-class end-to-end food safety and quality management system, covering from farm source, manufacturing, warehousing and distribution, to the stores.

The One JFC End-to-End Global Food Safety Strategy covers the following: (1) establishing and strengthening food safety leadership in the organization; (2) science-based assessment of risks and have science-based food safety governance; (3) formation of food safety databases and technology platforms; (4) establishing and implementing food safety and quality management systems in the entire organization; and (5) development of food safety intelligence and foresight. Ms. Alunan shared almost all in departments in JFC are involved in the implementation of these strategies - Quality Management, Quality Assurance, Purchasing, R&D, Manufacturing and Logistics, Restaurant Systems, Store Operations, Network Development Group, HR and Training, among others. Furthermore, partnerships with government agencies and 3rd party certifying bodies are also being undertaken. Lastly, development and implementation of some technology platforms have started to support food safety and quality systems and controls.

**Consumer Behavior**
Finally, Prof. Joanne R. Bantang, the College of Home Economics, University of the Philippines Diliman presented several cases of consumer behavior with respect to food safety, and explained those behaviors based on the risk information and factors that can influence consumer behavior. Prof. Bantang concluded that the value of expert opinion backed with evidence-based data, policies informed by research, and consumer education remain as essential components in promoting food safety at the consumer level.

**Food Safety Risk Analysis**
Dr. Ma. Concepcion Lizada, Professor Emeritus, University of the Philippines Diliman, Philippines, spoke on the topic of risk analysis. She explained that risk analysis is the process that provides the framework for ensuring that safety measures covering food from both domestic and international sources are science-based. This framework was developed and adopted in the Codex Alimentarius, which serves as the benchmark for food safety in the World Trade Organization. Food safety risk analysis is an iterative process consisting of three distinct, but interactive processes: risk assessment, risk management and risk communication.

Dr. Lizada illustrated these processes with specific food safety issues and the role that risk analysis plays in ensuring that responses to these issues are rational and defensible. She noted that the consuming public, as the target beneficiary of evidence-based food safety measures, need guidance in deciding which food to consume, in light of an abundance of available information, particularly in social media. She emphasized that even well-intentioned food safety-related statements have to be evaluated in relation to the consumer’s reaction, before dissemination. Dr. Lizada concluded that risk communication provides guidance in food safety information dissemination and is pervasive through the risk analysis process.

**Food Allergen and Globalization**
Finally, Mr. Jeremiah John Zafra, Glenwood Technologies, Inc., presented on the topic of food allergen. To protect the health and safety of Filipinos, the Food and Drug Administration of the Department of Health, proclaimed Administrative Order No. 2014-0030, mandating the inclusion of allergen information on labels of food products. Food manufacturers are now rapidly detecting and quantifying the presence of allergens by utilizing technologically advanced food allergen test systems, from rapid lateral flow kits which can be used on-site, providing qualitative results in minutes to ELISA-based kits which provide accurate and quantitative results. Mr. Zafra said that these systems are ideal in validating and verifying a food manufacturer’s allergen control program. By testing for food allergens, food manufacturers’ responsibility to protect the health and safety of the consumers is achieved. Labelling requirements and government regulations will be complied, avoiding the consequences of an expensive and damaging product recall.

Interesting discussion was held over the question and answer session. Ms. Jo Ann Marie Salamat concluded the seminar by thanking the speakers for their excellent presentations, and the participants for their attendance at the seminar. This event ended successfully with excellent feedback from the participants.
Physical Activity in Singapore
Status, Programs and Approaches

Globally, more than 1.4 billion adults are at risk of developing or exacerbating diseases due to a lack of physical activity, according to the recent World Health Organization (WHO) study in 2018. Physical inactivity is a complex and multi-factorial behavior whose determinants vary across countries. Over the past years, Singapore’s sedentary lifestyle influenced by rapid urbanization has been a public health concern with serious health implications. Lack of time or energy, and its tropical climate, further deter individuals from participating in physical activity.

ILSI SEA Region organised a one-day Symposium on Building Towards Sustainable Physical Activity Behavior: Status, Programs and Approaches on August 2, 2019. The symposium was held in the National University of Singapore (NUS), in collaboration with the Department of Physiology of Yong Loo Lin School of Medicine, NUS. Over 90 participants consisting of healthcare and sports professionals attended the symposium, which aimed to review the current status of physical activity in Singapore, share national programs and guidelines for promoting and performing physical activity, discuss technological tools for tracking and assessing physical activity, and highlight nutritional approaches and exercise strategies for maximizing health and physical performance.

The symposium commenced with a warm welcome address from Mr. Geoffry Smith, President of ILSI SEA Region, Singapore and Prof. Michael Chia, Professor from Physical Education & Sports Science, Nanyang Technological University, Singapore.

Nation-wide Programs to Promote Physical Activity
Ms. Alice Ong, Deputy Director of Physical Activity & Weight Management, Health Promotion Board (HPB), Singapore provided an overview of “Singapore’s Approach to Physical Activity for a Healthier Generation: Status, Guidelines and Programs”. She shared the current status of non-communicable diseases (NCDs) in Singapore, highlighting that the large disease burden of NCDs, mainly diabetes, together with an ageing population is taking a toll on Singapore’s health expenditure. One of HPB’s key strategies is to tackle the problem of growing obesity by increasing physical
activity levels. Ms. Ong shared how HPB uses a three-pronged approach to address sedentary lifestyles. She also introduced how technology and gamification were leveraged for health promotion in Singapore through the National Steps ChallengeTM (NSC), the first population-level pedometer-based physical activity initiative aimed at incidental physical activity. Despite being largely extrinsically-driven, the NSC was still able to instil habituation in its participants, as seen from the increase in baseline steps count. Ms. Ong concluded with a future vision of shifting NSC from programme-centric to person-centric with greater personalisation instead of a one-size-fit-all approach.

Next, Dr. Hock Woon Chiang, Deputy Chief Executive Officer of Sport Singapore (SportSG) shared the topic of “Empowering Health through Sport and Physical Activity: Active Health Lab as a Key Enabler”. He highlighted that the sports participation rate in Singapore has been increasing although a significant number of Singaporeans remains sedentary. Group participation in sports also declined with age due to a smaller social circle. Dr. Chiang presented how Sport Singapore’s infrastructure network of Active Health Labs, integrated with the ActiveSG platform, forges a strategic partnership to shape the national movement for personal ownership of health and wellness. He also shared the transformational shifts of Active Health and success stories of people embarking on the onboarding process. Together with People’s Association, SportSG has put in place numerous facilities and incentives to aid in active living at a community level. He emphasized the importance of collaboration with other health organizations, such as the Health Promotion Board.

Impact of Physical Activity on Health and Disease
“Exercise is Medicine: Prescription for Non-Communicable Diseases” was presented by Dr. Ivy Lim, Consultant, Singapore Sport and Exercise Medicine Centre at Changi General Hospital and Novena Medical Centre, Singapore. In her presentation, she noted a high global mortality rate attributing to NCDs and explained the relationship between insufficient physical activity and common NCDs, such as diabetes and high blood pressure. She cited a study conducted to measure the relationship between physical activity, healthy ageing and mortality and elaborated the different exercise prescriptions with condition-specific considerations for various NCDs, namely type 2 diabetes, hypertension and metabolic syndrome. Dr. Lim concluded with the importance of reducing sedentary behavior in addition to increasing physical activity.

Protein Intake and Exercise
The next speaker was, Dr. Stuart Phillips, Professor, Department of Kinesiology and School of Medicine, McMaster University, Canada, who talked about “Dietary Protein in Support of Adaptation to Exercise: Finding the Signal in the Noise”. He discussed the role of dietary protein supplementation in optimal recovery and in promoting adaptation which becomes less effective with age. In a research study, he illustrated that protein ingestion prior to sleep could increase muscle protein synthesis rates during overnight recovery from an exercise bout. Leucine amino acid was also demonstrated to trigger the highest level of muscle protein synthesis among various types of proteins. Dr. Phillips provided various recommendations on protein dosage and meal spacing and emphasized their importance in maximizing hypertrophy. He suggested that protein supplementation beyond a total daily protein intake of approximately 1.6 g/kg per day during resistance exercise training provided no further benefit on gains in muscle mass or strength. However, it is still important to note that the impact of protein supplementation is not as large as compared to exercise.

Influence of Technology on Physical Activity Behavior
The presentation on “e- & mHealth for Tracking and Changing Physical Activity” was delivered by Dr. Andre Matthias Müller, Lecturer, Saw Swee Hock School of Public Health, National University of Singapore. In his recent research findings under Physical Activity and Nutrition
Determinants in Asia (PANDA), he highlighted the issues in measuring the accuracy of two trackers measuring heart rate in lab and free-living conditions due to variation of settings and devices, such as difference in temperature, hardware and algorithms. He acknowledged that technology is a double-edged sword – it can encourage physical inactivity but is also able to improve physical activity surveillance and promotion. Dr. Müller suggested that activity trackers do promote physical activity, albeit only in the short term, especially among people who are motivated by either intrinsic or extrinsic rewards. Moving forward, it is imperative to focus on effective engagement for a more personalised approach, as well as behavioural change.

**Combating Heat Stress during Exercise**

Dr. Jason Lee, Associate Professor, Yong Loo Lin School of Medicine, National University of Singapore shared in his presentation on "Improving Physical Activity in a Tropical Climate: Challenges & Strategies to Combat the Heat" that impending increase in heat stress will severely degrade performance. By reducing the starting body temperature, attenuating the temperature rise and extending the maximum limit, one's heat capacity and work tolerance could be expanded. Dr. Lee noted that behavioural adjustment is the most effective heat mitigation strategy to reduce heat strain and thus, enhancing endurance performance in the heat. He pointed out that excessive dehydration could affect performance and health while over-drinking can lead to exercise associated hyponatremia (EAH). Dr. Lee concluded that pre-exercise hydration status may determine the impact of hydration during exercise although the amount of fluids required to induce benefits may be hard to achieve during exercise.

**Panel Discussion**

The panel discussion was chaired by Prof. Michael Chia, and comprised of panellists: Ms. Alice Ong, Dr. Ivy Lim, Dr. Stuart Phillips, Dr. Andre Matthias Müller, and Dr. Jason Lee.

Issues raised and discussed included:

- Future strategies and efforts to increase physical activity in Singapore, and how they can be effectively implemented.
- Concerns on whether heat impairs physical activity participation in non-exertional contexts
- Challenges faced in build facilities and infrastructure to promote physical activity in environments such as workplaces and schools.
- Potential for collaboration among statutory boards and government agencies in Singapore to support sustainable physical activity behaviour among citizens.

Prof. Chia summarized the fruitful panel discussion by sharing that while the problem of insufficient physical activity is highly complex, a change of attitude and physical activity behaviour, and the social influence in various settings may gradually encourage exercise involvement on less active individuals. Mr. Smith concluded the symposium and thanked all speakers, chairpersons, panellists and participants for their time and support.
**Awards and Recognition**

**Professor Christiani Jeyakumar Henry**

Prof. Christiani Jeyakumar Henry, Director of Clinical Nutrition Research Centre (CNRC), A*STAR, Singapore and a Scientific Director on the Board of ILSI SEA Region, was awarded the prestigious **W.K. Kellogg International Food Security Award & Lectureship 2019** on June 2, 2019 in New Orleans, USA.

Prof. Henry’s major research interests are in Energy Regulation, Functional Foods, Obesity, Glycaemic Index, Energy and Protein Metabolism and Nutrition in the Elderly. In leading the CNRC, he aims to spearhead the translation of nutrition research into food applications. He was also a member of the recent Joint FAO/WHO consultation on fats and fatty acids in human nutrition, and has acted as a consultant to the FAO, WHO and UNICEF.

This award was presented by the Institute of Food Technology (IFT) USA for Prof. Henry’s outstanding contribution to international food and nutrition research. ILSI SEA Region congratulates Prof. Henry for receiving this award!

**Dr. Rodolfo F. Florentino**

Dr. Rodolfo F. Florentino, Resident Advisor and Former Chairman-President of the Nutrition Foundation of the Philippines, as well as long-time Scientific Advisor to ILSI SEA Region, was honored with the **Living Legend Award** at the FANS (Federation of Asian Nutrition Societies) General Assembly on August 5, 2019, at the recently concluded Asian Congress of Nutrition 2019 held in Bali, Indonesia.

Dr. Florentino has been a leading scientist and pioneering expert in the fields of nutrition and public health in both the Philippines and Southeast Asia. His contributions to ILSI SEA Region as a Scientific Director, Scientific Advisor, and Coordinator of the Philippines Country Committee over the past 2 decades have been invaluable. ILSI SEA Region congratulates Dr. Florentino for receiving this award!

**Dr. Lisa Vincze**

The **2019 Dr. Dave Roberts Memorial Award in Food and Nutritional Science** was presented by Mrs. Estelle Roberts to Dr. Lisa Vincze, Lecturer and Early Career Researcher in Nutrition & Dietetics at Griffith University, Australia.

Dr. Vincze was awarded her PhD in June 2018, with her thesis titled, “**Weight management during pregnancy and following childbirth**”. Dr. Vincze’s PhD focused on preventing maternal and child obesity, and associated chronic disease, through a life course approach to physical activity and nutrition. She is continuing to develop a growing research track record in the developmental origins of health and disease.

ILSI SEA Region congratulates Dr. Vincze on receiving the Dr. Dave Roberts Memorial Award in Food and Nutritional Science.
Upcoming Activity Highlights

Meetings

Recycled Food Packaging: Scientific Advances and Regulatory Development
Sep 26, 2019, Bangkok, Thailand

Concerns about the sustainability and safety of food packaging have increased over the last few years. These issues are of particular importance in Thailand, one of the major food producers in Asia. This meeting will bring together international and regional experts from food safety and packaging professionals, representative from the regulatory agencies to discuss scientific advances and regulatory development of recycled food packaging.

This half-day seminar aims to discuss the status and challenges on food contact material regulation in Thailand; highlight safety concerns and US FDA’s regulatory approach for recycling PET (rPET); update on food contact material regulations in Southeast Asia countries; and share scientific procedures and regulation of rPET approvals in Europe.

More details are available here: https://ilsisea-region.org/event/foodpacking_thai/

Nutrition and Cognition
Sep 26, 2019, Quezon City, Philippines

This 1-day seminar aims to discuss the key processes and stages of brain and cognitive development and the nutrition considerations; increase awareness of the interactions of nutrients on brain functions across the lifespan; gain a new understanding of the potential of nutritional intervention in cognitive development; and present the different methodologies in the assessment of cognitive functioning.

More details are available here: https://ilsisea-region.org/event/nutritioncognition/

Whole Genome Sequencing in Public Health and Food Safety Practice – the 21st Century is Now!
October 31, 2019, Wellington, New Zealand

Whole Genome Sequencing (WGS) and Next Generation Sequencing (NGS) are now essential tools in public health and food safety whether they are used for precision identification of virulent pathogens and food microbial contaminants, understanding genetic changes in pathogens, forensic tracing of public health incidents and foodborne illness outbreaks, or developing preventive strategies.

This 1-day conference aims to introduce the scientific essentials of WGS and NGS; explore their application in industry, food safety and public health; discuss their benefits, hurdles and risks; and share national, international and legal implications of the use of this technology.

More details are available here: https://ilsisea-region.org/event/australasia_wgs/

Food Fortification in Southeast Asia: Current Challenges, Strategies for the Future
November 26-27, 2019, Hanoi, Vietnam

While there has been increased commitment towards fortification interventions in Southeast Asia over the last few decades, effective implementation and long-term sustainability of these fortification programs are often hampered by technical, regulatory and economic challenges. As Southeast Asia continues to evolve in the dynamic landscape of double burden of malnutrition, it is imperative to review the role, effectiveness and strategies of food fortification to ensure effective progress towards reducing or eliminating micronutrient deficiencies.

This 1.5-day seminar will update on micronutrient status and deficiencies, and regulatory status of fortification; provide guidance on the building and translation of data for evidence-based programs and decision-making; discuss the effectiveness of food fortification in eliminating micronutrient deficiencies; share SEA country experiences and industry perspectives on effective delivery of fortified food; and highlight key issues and strategies to overcome fortification barriers.

More details are available here: https://ilsisea-region.org/event/foodfortification2019/
# ILSI SEA Region Calendar of Activities 2019-2020

## Meetings

### Food and Nutrients in Health and Disease (FNHD) Science Cluster

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Location</th>
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<tbody>
<tr>
<td>Seminar on Nutrition and Cognition</td>
<td>September 26, 2019</td>
<td>Quezon City, Philippines</td>
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<tr>
<td>- Organized by ILSI SEA Region Philippines Country Committee</td>
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<tr>
<td>Seminar on Food Fortification in Southeast Asia: Current Challenges, Strategies for the Future</td>
<td>November 26 – 27, 2019</td>
<td>Hanoi, Vietnam</td>
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<tr>
<td>- Organized with ILSI SEA Region Vietnam Country Committee and co-organized with National Institute of Nutrition, Vietnam</td>
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<tr>
<td>5th Asian Conference for Frailty and Sarcopenia at Taipei</td>
<td>October 22 – 24, 2019</td>
<td>Taipei, Taiwan</td>
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<tr>
<td>- Symposium 13: Diet, Lifestyle and Sarcopenia</td>
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<tr>
<td>Scientific Session to be co-organized with ILSI Taiwan</td>
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<tr>
<td>Seminar on Food Fortification in Southeast Asia: Current Challenges, Strategies for the Future</td>
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### Nutrition and Food Guidance for Public Health (NFGPH) Science Cluster

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<th>Event</th>
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<tr>
<td>Workshop on Nutrient Profiling in Vietnam (By Invitation Only)</td>
<td>October 29 – 30, 2019</td>
<td>Hanoi, Vietnam</td>
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<tr>
<td>- Organized by Preventive Medicine Department, Ministry of Health of Vietnam, and in collaboration with ILSI SEA Region</td>
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<tr>
<td>Seminar on Food Fortification in Southeast Asia: Current Challenges, Strategies for the Future</td>
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<tr>
<td>- Organized with ILSI SEA Region Vietnam Country Committee and co-organized with National Institute of Nutrition, Vietnam</td>
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<tr>
<td>Scientific Session on Micronutrient Fortification in Food (In conjunction with the Global Micronutrient Forum to be held in Thailand)</td>
<td>1st Quarter 2020 (Tentatively March)</td>
<td>Thailand</td>
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<tr>
<td>Regional Symposium on Physical Activities, Nutrition &amp; Health Impact</td>
<td>3rd Quarter 2020</td>
<td>Venue TBC</td>
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<tr>
<td>11th Seminar and Workshop on Nutrition Labeling, Claims and Communication Strategies</td>
<td>2nd Quarter 2020</td>
<td>Venue TBC</td>
</tr>
<tr>
<td>Regional Symposium &amp; Workshop on Food Composition Data, Food Consumption &amp; Nutrients Intake in ASEAN</td>
<td>4th Quarter 2019</td>
<td>Venue TBC</td>
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### Food Safety and Risk Assessment (FSRA) Science Cluster

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<th>Event</th>
<th>Date</th>
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<tr>
<td>Symposium on Scientific Development of Food Packaging: Innovation, Safety and Sustainability (In conjunction with 11th ILSI BeSeTo Meeting)</td>
<td>September 24 – 25, 2019</td>
<td>Penang, Malaysia</td>
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<tr>
<td>- Co-organized with ILSI SEA Region Malaysia Country Committee and FSQD, MOH, Malaysia; collaborators: School of Industrial Technology, USM, NSM and MIFT.</td>
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<tr>
<td>11th ILSI BeSeTo Meeting</td>
<td>September 26 – 27, 2019</td>
<td>Penang, Malaysia</td>
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<tr>
<td>- In collaboration with ILSI Asian Entities</td>
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<tr>
<td>Seminar on Recycled Food Packaging: Scientific Advances and Regulatory Development (Back-to-back meeting with the Packaging Symposium)</td>
<td>September 26, 2019</td>
<td>Bangkok, Thailand</td>
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<tr>
<td>- Organized by ILSI SEA Region Thailand Country Committee</td>
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### Whole Genome Sequencing in Public Health and Food Safety Practice – the 21st Century is now!
- Organized by Australasia Country Committee, the New Zealand Food Safety Science & Research Centre and CSIRO
  
**October 31, 2019 Wellington, New Zealand**

### Sustainable Food Systems (SFS) Science Cluster

- ILSI SEA Region Australasia is one of the sponsors of this meeting.

**December 8 – 10, 2019 Bunker Bay, Western Australia**

### Others

- **2020 ILSI Annual Meeting & Science Symposium**
  
  January 17 – 21, 2020
  San Jose, Costa Rica

- ILSI SEA Region Country Committees events under planning
  Details will be provided upon available information.
  ASEAN and Australasia

### Research, Meeting Reports, and Collaborative Projects

#### Food and Nutrients in Health and Disease Science Cluster

- **Global Comparison of How Short-term Blood Glucose Response to Food is Measured and Translated**
  - Co-lead with ILSI North America
  
  Initiated

- **Patterns of Sodium Intake and Sources of Sodium Among Filipinos Aged 19 to 50 Years: Findings from the 2008 National Nutrition Survey**
  - In collaboration with the Food and Nutrition Research Institute (FNRI), Philippines
  
  Journal review completed; paper under revision

  
  In press

- **Data Analysis: Levels and Sources of Sugar Intake in the Philippines**
  - In collaboration with the Food and Nutrition Research Institute (FNRI), Philippines
  
  On-going

- **Survey on Physical Activity Assessment, Status, Data and Programs**
  
  Proposed

#### Technical Committee on Maternal, Infant and Young Child Nutrition

- **Vitamin D Status and its Correlates among Pregnant Thai Adolescents**
  - In collaboration with Mahidol University, Thailand (original study)
  
  On-going; report under preparation

- **Topic: Maternal Nutrition and Birth Outcome in Malaysia: Current Status and Risk Factors (review)**
  
  On-going

- **A Review of the Situation and Factors Affecting the Nutritional Status of Filipino Pregnant Women**
  - In collaboration with the Institute of Human Nutrition and Food, College of Human Ecology, University of the Philippines Los Baños
  
  On-going; report under preparation

- **Levels and Sources of Omega-3 Fatty Acid Intake Among Malaysian Children Aged 6 to 23 Months in an Urban Area**
  - In collaboration with the Universiti Sains Malaysia, University of the Philippines Diliman and International Medical University, Malaysia
  
  Proposed; in discussion

#### Nutrition and Food Guidance for Public Health Science Cluster

- **Review of Nutrition Labeling, Nutrition and Health Claims Regulations in Asia**
  - In collaboration with ILSI Asian Entities
  
  Available in May 2019
Measurement of Total Sugar Content of Commonly Consumed Foods in Malaysia  
*In collaboration with Malaysia Country Committee, Ministry of Health, Malaysia and Institute of Medical Research, Malaysia*

Initiated

Pilot Project on Inclusion of Private Data into National FCDBs in Malaysia, Philippines, Singapore and Thailand  
*Initiated (To be undertaken in phases)*

**Food Safety and Risk Assessment Science Cluster**

Study on Dietary Exposure of Sweeteners in Thai Consumers  
*In collaboration with Institute of Nutrition, Mahidol University, Thailand*

Completed; publication under final preparation

**Special Projects and Others**

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  
*Thailand: in collaboration with Mahidol University; Philippines: in collaboration with University of San Carlos; Malaysia: in collaboration with Universiti Kebangsaan Malaysia (Published)*

On-going; 1 paper published, 2 papers under preparation

**Peer-Reviewed Scientific Journals**


**Online Monographs/Reports**

Report on Food Consumption Survey: Review of Status in Southeast Asia Region  
Published in April 2019 on ILSI SEA Region’s website

ILSI SEA Region Functional Foods Monograph 2017  
Published revised version (August 2018) on ILSI SEA Region’s website

Report on Food Composition Tables: Review of Status in Southeast Asia Region  
Published January 2017 on ILSI SEA Region’s website

Monograph 2 Volume 1: Safety Assessment of Low- & Non-Calorie Sweeteners (LNCS)  
Under review for publication

Updated Report on Regulatory Status of Micronutrient Fortification in Southeast Asia  
On-going
Seminar on FOOD FORTIFICATION IN SOUTHEAST ASIA
Current Challenges, Strategies for the Future
November 26 - 27, 2019
Pullman Hanoi Hotel, Vietnam

WHY FOOD FORTIFICATION?

While there has been increased commitment towards fortification interventions in Southeast Asia over the last few decades, effective implementation and long-term sustainability of these fortification programs are often hampered by technical, regulatory and economic challenges.

As Southeast Asia continues to evolve in the dynamic landscape of double burden of malnutrition, it is imperative to review the role, effectiveness and strategies of food fortification to ensure effective progress towards reducing or eliminating micronutrient deficiencies.

REGISTRATION FEES

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<tr>
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<th>Local (VND)</th>
<th>Overseas (USD)</th>
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<tbody>
<tr>
<td>Industry</td>
<td>2,500,000</td>
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<tr>
<td>Government/</td>
<td>1,500,000</td>
<td>150</td>
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<tr>
<td>Academia</td>
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</table>

*Registration fee includes lunch and tea breaks
*Local rates are only applicable to residents of Vietnam

REGISTRATION IS NOW OPEN!

For information and registration: https://ilsisea-region.org/event/foodfortification2019
For enquiries, please contact ILSI Southeast Asia Region
Tel: +65 6352 5220 | Email: ilsisea@ilsisea.org.sg

WHY FOOD FORTIFICATION?

- Updates on micronutrient status and deficiencies, and regulatory status of fortification
- Building and translation of data for evidence-based program and decision making
- Effectiveness of food fortification in eliminating micronutrient deficiencies
- SEA country experiences and industry perspective on effective delivery of fortified food
- Key issues and strategies to overcome fortification barriers

WHO SHOULD ATTEND

- Policy makers and government representatives involved in the planning and implementation of fortification programs
- Non-profit and research organizations
- Academia, nutrition and health professionals
- Relevant industries and stakeholders interested in malnutrition issues

PROGRAM HIGHLIGHTS