SUMMARY REPORT

Science Symposium on

Smart Eating

Harnessing Innovative Approaches & New Technologies for Health and Sustainability

April 23, 2019
Sheraton Imperial Kuala Lumpur, Malaysia
Innovation and new technologies including artificial intelligence, digitalization, genomics, and the Internet of Things (IoT) are advancing our knowledge, connectivity and the web of communication. 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.

This 1-day Science Symposium on Smart Eating – Harnessing Innovative Approaches & New Technologies for Health and Sustainability was held on April 23, 2019 in Kuala Lumpur, Malaysia. It was organized by ILSI SEA Region and its Malaysia Country Committee, and in collaboration with the Nutrition Society of Malaysia (NSM). The symposium aimed to understand and explore the definition of smart eating for health and sustainability. It also discussed on how new technologies and innovative approaches have revolutionized the agri-food industry and could be further harnessed to improve our populations’ health and nutritional well-being. Lastly, 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, consisting of health professionals in food and agriculture, sports, nutrition and healthcare arena, industry partners and technology providers as well as researchers, government officials and health policy implementers. Mrs. Boon Yee Yeong, Executive Director of ILSI SEA Region, and Dr. E-Siong Tee, President of NSM addressed and welcomed the audience.

Keynote Session

The symposium began with the keynote session chaired by Mr. Geoffry Smith, President of ILSI SEA Region. 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 understanding more comprehensively human variation in personal response to foods and nutrients in a holistic and systems approach might start with the ongoing refinement in the omics, the ability to handle large and disparate data and the ability to adopt the approaches of Complex Systems Science. This would be the essence of exploring the path to smart eating for personalized health and nutrition. He also highlighted that personalization might permit one to determine 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.

**Session 1: What is Smart Eating? Strategies and Opportunities in Charting our Nutritional Wellbeing**

Session 1 was co-chaired by Prof. Norimah A. Karim, from NSM and Universiti Kebangsaan Malaysia (UKM) and Dr. Emorn Udomkesmalee from Institute of Nutrition, Mahidol University (INMU), Thailand.

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 reevaluate 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 interrelated, 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 and 1,313 completed surveys respectively. 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 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, so 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-Acuín, 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. She noted that these exciting innovations were contributing to the “smart eating” package to ensure that rice will always be Asia’s grain.

Session 2: Smart Eating Perspectives on Agri-Food Processing Technologies, Safety and Sustainability

Dr. Stéphane Vidry, Director of Operations at ILSI Governance and Coordination, USA chaired Session 2 of the symposium and introduced Dr. Ainu Husna MS Suhaimi who is the Head of MYSaveFood Secretariat under the Malaysian Agricultural Research and Development Institute (MARDI). She gave her presentation on “MYSaveFood: Agri-Tech and Behaviour Approaches to Tackling Food Loss and Reducing Waste for Sustainable Future”. Dr. Ainu explained that 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 3000 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.

Session 3: Ideation & Innovation for Health & Sustainability Science to Market

Dr. Yen Ling Low, Area Center Director of Abbott Nutrition R&D Center for Asia Pacific in Singapore chaired Session 3. She started the session by introducing the first speaker, Mr. Daniel Wong, Chief Technology Officer of CrowdFarmX (CFX) from Singapore to give his 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 alienate 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 provides research, education and support these farmers. It also introduced farmers directly to the targeted demand, shortening the supply chain and maximizing the profits for these farmers. Lastly, it also provided P2P financing platform for farmers.
Next, Dr. Jeslyn Lee, Research fellow at School of Chemical and Biomedical Engineering in Nanyang Technological University, Singapore, shared her insights to 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 valuable cost-effective media to grow food-grade yeast and bacteria as well as low sugar probiotic beverages.

Dr. Dunyaporn Trachootham who is an Assistant Professor at INMU, Thailand, elaborated on her presentation 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 dysphagic oral cancer patients. It had since been distributed throughout Thailand and benefitting patients. Dr. Trachootham highlighted that these innovative functional foods are personalized diets for people with special needs and conditions that allowed them to support their nutrition needs and quality of life as well as to maintain and stabilized 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 take on “Disruptive Food Innovation Challenges - Creating Safer & Personalized Puree Meals with 3D Food Printing”. In her presentation, Ms. Wong highlighted on 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. One commercially viable solution of the future is through 3D food printing which could create consistently safer and personalized puree meals for the elderly population with dignified care. Ms. Wong explained that 3D food printing is the next journey in food imagination and innovation.

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 panellists: 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 on use of new technologies in food and the food chain as well as on the multi-stakeholder partnerships in the advancement of new technologies in smart eating and eating sustainably.

There was also discussion on the acceptance of new technologies used in the food industries and compliance with the national regulations. Despite using new technologies, it is important to take note of the taste and appearance of the food products during development and perhaps to involve consumers from the start of the new product development and educate them on the new technologies so that they are more willing to accept them. Dr. Tee summarized the panel discussion noting that it is important to think ‘smart’ on how to alleviate NCDs in the countries through multi-stakeholder partnership where everyone has a role to play. Mr. Geoffry Smith concluded the symposium and thanked all speakers, chairpersons, panelists and participants for their time and support.
Mr. Geoffry Smith is President of ILSI Southeast Asia Region based in Singapore, and a Member of the Executive Committee of the global ILSI Board. In addition, he is the Chairman of the Essential Micronutrients Foundation, a non-profit organization which addresses micronutrient deficiencies globally as a public health issue. He is also Director of Nutrition Strategies International which deals with food and nutrition issues in developing countries. In addition, he serves as a Member of the editorial board of the journal, Food and Nutrition Bulletin. Prior to his current positions, Mr. Smith was the Global Director, Health Chelates for Akzo Nobel Functional Chemicals, and directed the global business for these compounds in food and nutrition as well as pharmaceutical applications. He was responsible for the global project within Akzo Nobel addressing iron deficiency anemia. In addition, Mr. Smith directed the Asia Pacific activities for Akzo Nobel’s Innovation Unit. He is a thirty-year veteran of the chemical industry in the Asia Pacific and has resided in Singapore for more than 20 years. He is a Member of the Nutrition Society of the UK, the American Society of Nutrition and the American Chemical Society.

Emeritus Prof. Richard Head is a Pharmacologist and is currently Emeritus Professor in the Division of Health Sciences, University of South Australia, Affiliate Professor in the Discipline of Pharmacology, The University of Adelaide, and Honorary CSIRO Fellow. Previously, he was the interim Director of the Future Industries Institute at the University of South Australia, the Deputy Vice Chancellor & Vice President: Research and Innovation for the University of South Australia with a substantive position as the Director of the Sansom Institute for Health Research, Division of Health Sciences also at the University of South Australia. Formerly, Prof. Head was the Director of CSIRO’s Preventative Health National Flagship and Chief of CSIRO’s Division of Health Sciences and Nutrition, and prior to that Chief of CSIRO’s Division of Human Nutrition. Prof. Head provided leadership in integrating CSIRO’s fundamental and applied research in human health into Australian health R&D. He is known for operating in translational health on a national scale with multidisciplinary programs.

Prof. Purwiyatno Hariyadi is a 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. He was the Director of Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, IPB. Prof. Hariyadi was also the Vice Dean of Faculty of Agricultural Engineering and Technology (1995 to 2000) and the Head of the Department of Food Science and Technology (2000 to 2004) at Bogor Agricultural University, Indonesia.

Prof. Hariyadi is actively involved with many professional organizations, including the Institute of Food Technologist (IFT) and Institute for Thermal Process Specialist (IFTPS). Prof. Hariyadi has been consulting for the Government Agencies (National Agency for Drug and Food Control
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and Ministry of Agriculture) as well as for food industries. His research interests are (i) post-harvest handling and processing; especially for palm oil and (ii) food processing and engineering; especially on sterilization, pasteurization and aseptic processing/packaging, including irradiation of foods. In 2012, he was elected to the Indonesian Academy of Sciences as a Member of Commission of Engineering Sciences, and in 2016, he was elected to the International Academy of Food Science and Technology (IAFoST - IUFoST).

He is also a Member of CODEX National Committee since 2010, and in 2017, Prof. Hariyadi was elected the Vice-Chair of Codex Alimentarius Commission. He was the President of the Indonesian Palm Oil Society (2005-2009) and the President of Indonesian Association of Food Technologist (IAFT) for two periods (2006-2008; and 2008-2010). Prof. Hariyadi is also the Chief Editor of monthly magazine of FOODREVIEW Indonesia. He received his Ph.D. in Food Chemistry (with minor in Chemical Engineering) from the University of Wisconsin-Madison, USA (1995).

**Prof. Norimah A. Karim** is a Professor of Human Nutrition in the Nutritional Science Program, School of Healthcare Sciences, Faculty of Health Sciences, Universiti Kebangsaan Malaysia (UKM), Malaysia. She has been a Lecturer in Nutrition for almost 30 years. Her research expertise includes dietary assessment methods, in particular developing and validating food frequency questionnaire, public health nutrition, community nutrition, body image and development of nutrition education packages.

Prof. Norimah is the Chairman of Technical Working Groups for Nutrition Research, Ministry of Health which is responsible for Nutrition research under Malaysia’s National Plan of Action for Nutrition. She is a Member of the Task Force of Policy Priorities in combating obesity in Malaysia as well as a Member in the National Plan of Action for Nutrition Malaysia (2016-2025) working group. Prof. Norimah is the Chairman of the Working Group of the Editorial Bibliography of Nutrition Research in Malaysia. She is a contributor to chapters in Recommended Nutrient Intake for Malaysia and Malaysian Dietary Guideline for adults, children and adolescents.

Prof. Norimah is actively involved in research having led several projects on public health nutrition and food consumption habits of the community. She has received grants from the Malaysian Government, international agencies and industries. Prof Norimah is currently the Vice President of the Malaysian Association for the Study of Obesity (MASO) and the Honorary Secretary of the Nutrition Society of Malaysia (NSM). She is also a Fellow of NSM. She has served as a member of the Steering Committee and Expert Panel of the Nutrition Month Malaysia since 2005 and Expert Panel of Positive Parenting, an official guide series on maternal, child and family care since 2006.

**Dr. Emorn Udomkesmalee** is the Associate Professor and Former Director of the Institute of Nutrition, Mahidol University, Thailand. She holds a current position of Adjunct Associate Professor in the Department of International Health, Bloomberg School of Public Health, Johns Hopkins University. Dr. Udomkesmalee is currently a Member of international and national committees: Scientific Council - Institut de Recherche pour le Développement (IRD), France; The New York Academy of Sciences/Sackler Institute for Nutrition Science Board; International Food Policy Research Institute
Dr. Chor San Khoo is currently Senior Science Fellow at the North America Branch of the International Life Sciences Institute (ILSI) in Washington DC, USA, where she serves as Science Advisor to the institute’s Executive Director and its scientific programs. She leads the institute’s program on Emerging Science, and authors its biennially Emerging Science Trends and Signals Reports which provide insight for the food and nutrition communities. Dr. Khoo is a Co-Editor-in-Chief of the Frontiers in Nutrition and Food Science Technology Journal and has published articles on Food for An Urban Planet: Challenges and Research Opportunities; Food Science without Borders; Goals in Nutrition Science 2015-2020; and Grand Challenges in Nutrition and Food Sciences. Prior to ILSI, she held the position of Vice President of Research and Development (Global Nutrition and Health) at The Campbell Soup Company. She has published and presented in many areas of nutrition including nutrition and teenage pregnancy; nutritional intakes of elite athletes; pre-prepared meal regimens and improved health outcomes and compliance to dietary guidelines. She holds six patents on food meal programs for management of at-risk populations. Dr. Khoo received a B.S. in Chemistry from the University of Oregon, USA, and a Ph.D. in Nutrition Science from Iowa State University, USA, with minors in Biochemistry and Physiology. She completed her post-doctoral research training at the University of California, USA.

Dr. Gilly Hendrie is a Research Scientist of Health and Biosecurity at Commonwealth Scientific and Research Industrial Organisation (CSIRO), Australia. Her expertise lies in understanding dietary intake patterns and developing novel ways to improve our food choices. In particular, she has an avid interest in the assessment of diet quality and development of digital tools to capture what we eat and to initiate changes in our eating habits. Her research has resulted in the launch of the online CSIRO Healthy Diet Score Survey involving over 200,000 Australians. Dr. Hendrie has designed many technology-based interventions to change, support, and monitor dietary behaviour change for health and obesity. For example, she led the development and evaluation of a smartphone application to increase vegetable intake in Australian adults. She also has a strong track record in conducting evidence-based research. Currently, she leads the scientific evolution of the CSIRO’s Total Wellbeing Diet Online which has transformed a clinically tested dietary intervention into an evidence-based digital program.
Assoc. Prof. Jason Lee is Associate Professor in Yong Loo Lin School of Medicine at the National University of Singapore. He is also a Fellow of the American College of Sports Medicine. He serves in various national and international panels related to human performance and safety. His main research interests are in fluid balance, thermoregulation and mitigation strategies for improving human performance. A key outcome of his research is the formulation of a holistic heat management system. He recently completed his 12-year tenure at the DSO National Laboratories by directing the Human Performance Programme in his final appointment. He is also a Member of the WHO and WMO Work Group on Climate Change on Workers Health and Productivity and chairs the Scientific Committee on Thermal Factors at the International Commission on Occupational Health. He obtained his Ph.D. in Exercise Physiology at Loughborough University, United Kingdom under the sponsorship from the UK Overseas Research Scholarship and Faculty Studentship. He also received the award of G V Sibley Memorial Prize upon obtaining his B.Sc. (1st Class Honours) in Sports and Exercise Science at the same university.

Dr. Anadi Nitithamyong is Senior Advisor at the Institute of Nutrition, Mahidol University (INMU), Thailand where she served as the Deputy Director for Education and Special Affairs from 2008 to 2011 and Deputy Director for Policy and Planning from 2015 to 2016. Her research interests and experiences include food processing and product development for nutritional and functional purposes particularly dietary fiber related areas. Currently, she is the President of the Food Science and Technology Association of Thailand (FoSTAT) and a Member of the Nutrition Association of Thailand (NAT). She is also a Member of the Scientific Advisors of the International Life Sciences Institute (ILSI), Southeast Asia Region and is the Scientific Coordinator for its Thailand Country Committee. Dr. Nitithamyong received her Ph.D. in Food Science from the University of Wisconsin-Madison, USA.

Dr. Cecilia Cristina Santos-Acuin is currently Human Nutrition Scientist at International Rice Research Institute, Philippines. She participates in research that addresses 1) micronutrient deficiency through nutrient dense rice varieties, 2) metabolic issues related to rice consumption through the identification and testing of low glycemic index rice and other functional attributes of rice, and 3) rice safety concerns through investigations of heavy metal, mycotoxin and chemical contaminants in rice. Dr. Acuin chairs the Research Utilization Committee, Philippine National Health Research System, under the Philippine Council for Health Research and Development, and had been Head of the Secretariat of the Universal Health Care (UHC) Study Group, University of the Philippines Manila - National Institutes of Health, that generated a research and policy base towards the institutionalization of UHC as a country policy.

As the previous Chief Science Research Specialist of the National Assessment & Monitoring Division, Food and Nutrition Research Institute of the Philippines Department of Science & Technology (FNRI-DOST), she was responsible for the conduct of the Philippine National Nutrition Surveys, and provided oversight for nationwide nutrition research projects of three Sections: the
Nutritional Assessment Section, the Nutritional Statistics and Informatics Section, and the Nutritional Interventions, Evaluation and Policy Section.

Dr. Stéphane Vidry joined ILSI Governance and Coordination in Washington D.C., USA as Director of Operations in June 2018. Prior to that, Stephane was Assistant Director for ILSI Europe where for 12 years, he managed several food safety-nutrition activities including coordination of a European Commission-funded project on Benefit Risk Analysis of Foods, ILSI Europe's Scientific Advisory Committee and leading a group of 7 scientific project managers. Stephane also worked for the European Commission Joint Research Center, Lactalis, an International dairy company and taught at University. Dr. Vidry received his Ph.D. in Food Sciences-Nutrition from University of Sciences of Montpellier, France.

Dr. Ainu Husna MS Suhaimi heads the MYSaveFood Secretariat since 2016. The MYSaveFood Project is part of FAO's SaveFood Program aimed to create awareness and build network to reduce food loss and waste in Malaysia. In 2019, she is also Deputy Director for Advanced and Reproductive Biotechnologies in Livestock Science Research Centre, under the Malaysian Agricultural Research and Development Institute (MARDI), to focus on improving Malaysian Livestock industry using molecular, reproductive and other advanced technologies. She started working with MARDI in 2000 as a Research Officer in the Animal Breeding Program, focusing on ways to utilize Molecular techniques in animal breeding. In 2013, she became the Deputy Director of International Networking Program, Corporate Communication and Quality Centre, where she built the program to allow MARDI and MARDI Scientists participate in partnerships for research collaborations, capacity building and representation. Dr. Ainu obtained her B.Sc. in Microbiology from University of Arizona, USA, M.Sc. in Molecular Biology from Universiti Putra Malaysia, and Ph.D. in Animal Biotechnology.

Prof. Yandra Arkeman is a Professor in Agroindustrial Technology at Bogor Agricultural University (IPB), Indonesia. His expertise is in Artificial Intelligence (AI), Blockchain and Advanced Computing Technology. In May 2018, he established BRAIN (Blockchain, Robotics and Artificial Intelligence Networks) at IPB. He has published many research papers about the application of AI in agriculture, food, bioenergy and agroindustry in international journals. He is now also the Director of Surfactant and Bioenergy Research Center (SBRC) at IPB. He earned a Ph.D. in Manufacturing Systems Engineering with dissertation on Intelligent Manufacturing Systems using Genetic Algorithms from University of South Australia (2000). Then he conducted his first post-doctoral research at Department of Electrical Engineering and Computer Science, Kansai University, Osaka, Japan and second post-doctoral research at Department of Computer Science, George Mason University, Virginia, USA.
Dr. Lay Ching Chai is a Senior Lecturer from the Institute of Biological Sciences, Faculty of Science, University of Malaya, Malaysia. Her research focuses on food safety and microbiology. Dr. Chai serves as the Vice Chair of the Technical Working Group of Microbiology under the Food Analysis Committee (JKAM) chaired by the Department of Chemistry Malaysia, Ministry of Energy, Science and Technology, Energy and Climate Change. She has established great linkages with the industry and has been identified as the Key Opinion Leader in the field of food safety and microbiology. Her active contribution and involvement in food safety research has won her the Malaspina International Award by the International Life Science Institute (ILSI) in 2018.

Dr. Chai is now a Member of the scientific advisory panel of ILSI Southeast Asia Region that provides guidance and advice on the food safety and risk assessment in the region. She also serves as the Vice Chair of the Southeast Asia International Association of Food Protection. Dr. Chai was awarded the L’Oreal-UNESCO Women in Science Award in 2018 for her great passion and achievements in science. Also, due to her active contribution in promoting excellence in research in Malaysia, she has been appointed by the Academy of Sciences Malaysia as the Chairperson of the Young Scientists Network-Academy Sciences of Malaysia to lead scientific research development among the young scientists in the country. Dr. Chai received her Ph.D. in Food Safety from Universiti Putra Malaysia in 2008.

Dr. Kai Zhong is the Deputy Director of China Food Information Center (CFIC), and also a Standing Member of Chinese Preventive Medicine Association, health communication branch. Dr. Zhong is a well-known, productive science writer in food area, being very active in major media. He also serves different departments from central to local level and leading food companies as an independent consultant. Dr. Zhong was the former director of Risk Communication Division II in China National Center for Food Safety Risk Assessment (CFSA), responsible for media monitoring and response, science communication and risk perception research.

Dr. Yen Ling Low is the Area Center Director of Abbott Nutrition Research & Development Center for Asia Pacific. She leads a multi-disciplinary team of scientists, researchers and specialists to design and develop science-based nutrition innovations to help consumers live healthier lives. Dr. Low has many years of experience working in the field of food and nutrition, spanning government, academic and industry settings. Prior to Abbott, she held appointments at the Health Promotion Board under the Ministry of Health in Singapore and the Singapore Agency for Science, Technology and Research (A*STAR). She has published 36 papers in international peer-reviewed journals and is also currently an Adjunct Assistant Professor at the National University of Singapore. Dr. Low graduated with B.Sc. in Nutrition and Dietetics with First Class Honors from the University of Surrey, UK and completed her Ph.D. in Nutrition from the University of Cambridge, UK.
Mr. Daniel Wong is currently the Chief Technology Officer of CrowdFarmX (CFX), Singapore. He joined Netatech 10 years ago, learning all about water technology, and was soon combining his technical knowledge in full suite digital solution, SCADA and SAP, with water engineering. In 2014, Mr. Wong learnt about the plight of traditional small holder farmers who do not have access to technology, finance, and markets. He then channelled his expertise, and knowledge to building CFX, a platform that will bring small holder farms onboard, and improve their lives. Mr. Wong obtained a B.Sc. in Software Engineering from the University of Auckland, New Zealand.

Dr. Jaslyn Lee is a Research fellow at Nanyang Technological University, Singapore in the School of Chemical and Biomedical Engineering. Her research expertise is on food waste valorization using fermentation technology, and extraction of valuable compounds using supercritical fluid extraction and twin screw extrusion technology. Some of her technological innovations from food waste include the development of a novel nutrient yeast media using the food waste, soy bean residue. Additionally, she has also developed a probiotic powder using a stabilizer from durian seed. She obtained her Ph.D. under the Interdisciplinary graduate scholarship from Nanyang Technological University and completed her Bachelors with honours from Monash University, Australia.

Dr. Dunyaporn Trachootham is Assistant Professor at Institute of Nutrition, Mahidol University, Thailand. She is also currently the Secretary of the Curriculum Committee for Master Program in Toxicology and Nutrition for Food Safety. Dr. Trachootham’s research focuses on safety and efficacy of functional food for elderly population. Her research contribution has earned her an Award of Outstanding Nutrition Research from Thailand Congress of Nutrition. Furthermore, she serves as an assessor for Thai Food and Drug Administration (FDA) to evaluate the safety of dietary supplements, novel food and genetic-modified plants and the scientific integrity of health claims. Recently, she received the 2019 ILSI Malaspina International Scholars Travel Award (MIST) award. Dr. Trachootham obtained a Ph.D. in Biomedical Sciences (Pharmacology) at University of Texas Health Sciences Center at Houston, USA and a B.Sc. in Dentistry at Mahidol University, Thailand. She completed her postdoctoral fellowship in Cancer Biology from MD Anderson Cancer Center, Texas, USA, and received a graduation certificate in Nutritional Sciences for Health Professionals from Tuft University, USA. She also received training for safety assessment of genetically modified (GM) food from National Center for Genetic Engineering and Biotechnology, and novel food from Thailand Risk Assessment Center.
Ms. Gladys Wong is currently the Senior Principal Dietitian at Khoo Teck Puat Hospital (KTPH), Singapore. She relinquished her 17-year headship of Nutrition & Dietetics Department at KTPH at the end of 2017 to concentrate on dietetic placement education, community and geriatric dietetics, and special projects pertaining to health promotion and sustainability. Ms. Wong is a New Zealand (NZ) Registered Dietitian and Accredited Dietitian of Singapore Nutrition & Dietetics Association (SNDA). She trained and worked as a Dietitian in NZ before relocating to Singapore in 1995 to pioneer the nutrition diploma course at Temasek Polytechnic. She then returned to clinical/ foodservice dietetics in 2000. Ms. Wong is a Member of SNDA since 1985 and served as President, Treasurer, Membership Sub-Chair for numerous terms. She is an affiliated member of Foodservice Consultants Society International. She was also Chair of Dietetics Panel with Ministry of Health, Singapore and is currently a Member of National Diabetes Prevention & Care Task Force. Ms. Wong is a prolific speaker who has delivered countless professional public talks and workshops relating to a wide variety of nutrition-related topics. Her latest project is towards developing a commercially viable food supply model using 3D food printing to produce consistent, nutritious and personalised puree meals for patients with swallowing difficulties. Ms. Wong was awarded B.Sc. (Hons) and M.Sc. (Human Nutrition) from University of Otago, NZ.

Dr. E Siong Tee is a Member of the Board of Directors of ILSI SEA Region since 1996 and Coordinator for ILSI SEA Region Malaysia Country Committee since 2005. He is currently a Nutrition Consultant for TES SEA Region NutriHealth Strategic Consultancy. Dr. Tee was Head of the Cardiovascular, Diabetes and Nutrition Research Centre of the Institute for Medical Research (IMR) in Kuala Lumpur, Malaysia, until his retirement in February 2002, after serving for 30 years. He was Nutrition Advisor to the Food Safety and Quality Division of the Ministry of Health Malaysia from 2002-2011. In that capacity, Dr. Tee was Chairperson or member of several technical committees related to food regulations and Codex Alimentarius. He is still a member of the National Advisory Committee on Food Regulations and several Codex sub-committees. Dr. Tee is also President of the Nutrition Society of Malaysia (NSM) since 1996. In this capacity, he has led the implementation of various community nutrition promotion programs which included the publication of various education booklets and press articles. He is also Chair of the National Steering Committee for Nutrition Month Malaysia since 2002. He represents NSM in several Technical Working Groups in the Ministry of Health Malaysia, including the National Coordinating Committee for Food and Nutrition (NCCCFN) and the Technical Working Group for Nutritional Guidelines. He initiated the formation of the Southeast Asia Public Health Nutrition (SEA-PHN) Network and is the current Chairman for the 2nd Council of the Network from 2017 to 2020.
Prof. Lynne Cobiac is the Science Director and Deputy Director of CSIRO’s Health and Biosecurity business unit. This unit brings together a diverse team of approximately 300 scientists and technical specialists in health and biosecurity from across CSIRO and develops key partnerships and collaborations to create health and wellbeing benefits for Australians. In this role, Lynne works closely with the Director and the Leadership Team to develop and implement the strategy and the science vision for the business unit with a particular focus on human health, implementing a business unit-wide capability development strategy and developing an innovation culture across the business unit. Prof. Cobiac established the Precision Health Future Science Platform ($25M) between CSIRO and research and delivery partners, including Singapore-based partnerships. She has 30 years of experience and leadership in research and management in the nutrition and preventative health domains within both research organisation and university environments. Prof. Cobiac is a Member of whole-of-CSIRO’s Science Council, CSIRO’s Science and Gender Equity (SAGE) initiative and a member of the SAGE Self-Assessment Team providing leadership across the organisation and championing diversity and inclusion.

Ms. Norrani Eksan is currently the Deputy Director in the Food Safety and Quality Division, Ministry of Health, Malaysia. She joined the Ministry of Health in 1990 and has been working extensively in the area of food safety for the past 28 years. She has contributed significantly to the development and advancement of food safety programs and food standards nationally, regionally and internationally. Ms. Norrani is also the Chairman for the Expert Committee on Food Labeling for Food Regulations as well as Nutrition, Health Claim and Advertisement Food for Specified Health Uses where she is involved in the development, review, and harmonization of the national food standard with Codex standard. In addition, she participates in the planning, drafting and implementation of the Nutrition Labeling and Claims Regulations. Prior to her current role at the Ministry of Health, she is the Chairman for the National Codex Committee on Food Labeling and Food for Specified Health Uses. She also serves as a Member of the Technical Secretariat for the Codex Committee on Fats and Oils. At the regional level, she is the Vice-chairman of Scientific Committee for the ASEAN Risk Assessment Centre for Food Safety (ARAC) on Risk Assessment from 2016 to 2018. She has contributed in meetings of Codex Committee for Asia (CCAsia) and ASEAN Task Force on Codex (ATFC) and served as the Lead Expert which led to the development of the ASEAN Common Principles and Requirement for the Labeling of Pre-packaged Food. In addition, Ms. Norrani is the Team Leader for the ASEAN case study on Chloropropanol Chemical Risk Assessment under the Australia-ASEAN project in 2006.
Prof. Aman Wirakartakusumah is an Emeritus Professor of Food Science and Technology at Bogor Agricultural University (IPB), Indonesia. He is also the Scientific Director of ILSI SEA Region and has served in this role for more than 10 years. Prof. Wirakartakusumah is the Chairman of the Engineering Commission of the Indonesian Academy of Sciences, the Advisory Council to the Indonesian Association of Food Technologists, and the Indonesian Food and Nutrition Society. In 2018, he has been elected as the President Elect of the International Academy of Food Science and Technology of the International Union of Food Science and Technology and in 2019, he has been appointed as the Executive Director of IPMI International Business School in Jakarta, Indonesia. His interest and involvement in research and education is reflected in his distinguished career at IPB University, where he served as Rector from 1998 to 2002, and held positions as Head of Department, Dean of Faculty and Director of Research Center. Prof. Wirakartakusumah was also the Indonesia Ambassador to the United Nations Educational, Scientific and Cultural Organization (UNESCO) based in Paris, France from 2004 to 2008. In 2003, Prof. Wirakartakusumah was elected as a Fellow of the International Academy of Food Science and Technology, the International Union of Food Science and Technology. He obtained his M.Sc. and Ph.D. in Food Science from the University of Wisconsin-Madison, USA in 1977 and 1981, respectively.

Mrs. Megawati Suzari is the Director of New Product Development, Scientific Regulatory Affairs at Fonterra Brands (M) Sdn. Bhd., Malaysia. She has more than 20 years of working experiences in food industry with well-known multinational companies. She leads the new product development for Malaysia and Asia countries in her current role. Her extensive experiences in dairy innovation and product development of specialised nutrition products, provides her good insight into food trends and has strong technical capability in different processing technologies. Mrs. Megawati is also strong in stakeholder strategy management and incidence response communication. She graduated from the University of Wollongong, Australia and received Honorary M.Sc. from University Putra Malaysia.