Science InSight
News and Updates on Nutrition, Food Safety and Health

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ILSI Annual Meeting 2017

Special Report
4th Asia-Pacific International Food Safety Conference & 7th Asian Conference on Food and Nutrition Safety
In this issue of Science InSight, it is our pleasure to share a Special Report, covering the successful joint 4th Asia Pacific International Food Safety Conference & 7th Asian Conference on Food and Nutrition Safety, held in October 2016 in Penang, Malaysia. With the theme of ‘Advancing Food Safety in ASEAN, this conference was organized by ILSI SEA Region in collaboration with the International Association for Food Protection (IAFP) and the Ministry of Health Malaysia.

The conference brought together 400 participants from across Asia, US, Europe and Australasia, and our conference partners included several key scientific and research institutions. Renowned international experts, as well as regional scientists, shared updates on emerging issues in food safety, new technological developments, and opportunities for solutions.

On the nutrition front, the topic of healthy aging was the focus of a mini-symposium organized in Singapore in December 2016. Experts from Singapore and the US warned of inadequate intake of good quality protein and the lack of physical activities as contributing factors toward risk of frailty and sarcopenia among the elderly. Methods for assessing frailty, including physiological, physical and social aspects, were highlighted.

Ushering in the new year in January 2017, ILSI SEA Region staff and several invited scientists from Southeast Asia attended the ILSI Annual Meeting and Scientific Events in California, USA. In interviews with two scientists from the Philippines and Thailand, who were the recipients of the 2017 Malaspina International Scholar Travel Awards, they share their research focus as well as insights on their participation at the ILSI Annual Meeting.

I hope you enjoy reading the articles in this issue of Science Insight, and I look forward to your participation in some of our exciting scientific meetings and workshops in the upcoming months.

Boon Yee Yeong
Executive Director, ILSI SEA Region
As the Association of Southeast Asian Nations (ASEAN) enters its next phase of integration with the establishment of the ASEAN Community on December 31, 2015, food safety remains a high priority.

Recognizing the importance of food safety within the region, ILSI Southeast Asia Region, together with the Southeast Asia Association for Food Protection (SEA AFP), and in collaboration with the Food Safety and Quality Division (FSQD), Ministry of Health, Malaysia, and the International Association for Food Protection (IAFP), organized the 4th Asia-Pacific International Food Safety Conference & 7th Asian Conference on Food and Nutrition Safety from October 11 to 13, 2016 in Penang, Malaysia.

With the theme of Advancing Food Safety in the ASEAN Community, the conference covered a wide range of emerging food safety topics, and brought together more than 400 participants from across the Asia Pacific region.

Collaborators included the International Commission on Microbiological Specifications for Foods (ICMSF); Universiti Sains Malaysia (USM); Food Safety Research Centre (FOREC), Universiti Putra Malaysia (UPM); Food Science and Technology Programme, National University of Singapore (NUS); Institute for Food Safety and Health (IFSH), Illinois Institute of Technology; Nutrition Society of Malaysia (NSM); the Commonwealth Scientific and Industrial Organisation (CSIRO); and ILSI North America.

**Keynote Lectures**

The conference included 4 keynote lectures presented by IAFP, SEA AFP, ILSI and ICMSF.

Dr. Linda Harris from IAFP highlighted **Food Safety Challenges and Opportunities in Low-Moisture Foods** and explained that newer analytical techniques have helped to elucidate detection of pathogens in low-moisture foods. Meanwhile, Dr. Sridhar Dharmapuri from Food and Agriculture Organization (FAO) was invited to share on **Food Safety in the Asia Pacific – FAO’s Perspectives and Initiatives**, outlining FAO’s multiple ongoing projects and programs related to food safety and quality.

The ILSI Keynote Lecture on **Food Safety Situation in China – Past, Present and Future** was presented by Prof. Junshi Chen from the China National Food Safety Risk Assessment Center, who highlighted that the food safety system in China needs to be continually improved and reformed, with capacity building among government and industry the key to implementation of these improvements.
Lastly, Dr. Fumiko Kasuga from Future Earth Global Secretariat, Japan, provided the ICMSF Keynote Lecture on Environmental Change and Food Safety. The Future Earth Initiative aims to co-create knowledge with stakeholders in society through a trans-disciplinary approach and stakeholder engagement, including in the co-designing, co-production and co-delivery of research projects. She encouraged food safety stakeholders to identify future trends, threats and opportunities to the food and environmental systems, and work with other scientific disciplines and partners.

Food Safety in the ASEAN Community
The first plenary session of the conference discussed some of the ongoing food safety developments in ASEAN and challenges going forward.

Ms. Noraini Dato’ Mohd. Othman, Senior Director of the Food Safety and Quality Division, Ministry of Health, Malaysia, spoke on the topic of Advancing Food Safety in the ASEAN Community. Ms. Noraini shared some of the ongoing food safety-related initiatives within ASEAN, such as the development of Common ASEAN Food Control Requirements and ASEAN Harmonized Food Standards. A network for ASEAN Food Reference Laboratories (AFRLs) have also been established to support food safety testing activities within the region.

Among the most significant achievements is the recent establishment of the ASEAN Risk Assessment Centre, which aims to provide independent scientific opinions on food safety issues of common interest in ASEAN that can support work on harmonization of food safety measures within the region and food safety risk management during emergencies. The ASEAN Food Safety Policy and ASEAN Food Safety Regulatory Framework will also aim to provide a comprehensive and integrated approach to food safety within the region.

Dr. Roy Sparringa, Senior Researcher at the Agency for the Assessment and Application of Technology and Senior Advisor to the National Agency for Drug and Food Control, Indonesia, covered the topic of Scaling Up Food Safety for Small and Medium Enterprises (SMEs) in ASEAN. SMEs make up the backbone of the food sector in ASEAN, and they need support in dealing with food safety and quality challenges associated with the implementation of an integrated ASEAN single market, and in capitalizing on the potential market opportunities resulting from it.

Mr. Pisan Pongsapitch, Deputy Secretary-General of the National Bureau of Agricultural Commodity and Food Standards, Ministry of Agriculture and Cooperatives, Thailand, presented on Ensuring Food Safety and Fair Trade in ASEAN: Case Study of Risk-Based Aflatoxin Standard. Mr. Pongsapitch shared the process for developing aflatoxin standards based on the risk analysis framework in Thailand, using aflatoxin B1 in peanuts as a case example that could serve as guidance for food safety standards harmonization activities within ASEAN that is based on risk analysis.

Application of Whole Genome Sequencing in Food Safety
This second plenary session discussed the different uses of Whole Genome Sequencing (WGS) in food safety from the perspectives of government, food industry and academic research.

Prof. Jorgen Schlundt from Nanyang Technological University, Singapore, shared an introductory presentation on Food Safety Applications of Whole Genome Sequencing. WGS technology has advanced rapidly, and can provide policy makers with quick, accurate and comprehensive information for implementation of appropriate risk management
measures to reduce incidences of foodborne diseases. The Global Microbial Identifier (GMI) project aims to create a harmonized global database for microbial DNA sequences that could be used for various purposes including the surveillance of diseases and antimicrobial resistance. Nevertheless, some challenges remain in encouraging different stakeholders to share their data into such a common platform.

Dr. Peter Gerner-Smidt from the US Centers for Disease Control, USA, presented on “Public Health Food Safety Applications for Whole Genome Sequencing”, sharing that food safety authorities in the United States have started to use WGS in surveillance and outbreak investigations since 2013. He also explained the advantages of using WGS for public health investigations, and the potential public health benefit in applying WGS at the global level in addressing foodborne diseases.

Dr. Jing Ren from the MARS Global Food Safety Research Center in China shared perspectives on Applying Next Generation Sequencing to Food Safety Risk Management. For a global food company, WGS technology can potentially be harnessed to improve food safety management, help with traceability and identification of sources of contamination, as well as aid in the development of more accurate quantitative indicators for monitoring. Nevertheless, current challenges include the need for improved computational and network capability, availability of diverse data sources, and deeper understanding of food safety and genomic science that is generated through academic endeavour.

Dr. Lay Ching Chai from University of Malaya, Malaysia presented on Regional Perspectives on the Use of Whole Genome Sequencing for Food Safety, highlighting that WGS is increasingly being used for food safety and public health research in Southeast Asia, particularly in Malaysia, but there is still limited application of the technology among government and industry sectors. Challenges include high costs of establishing and maintaining WGS equipment and facilities; low availability and quality of WGS outsourcing services in-country; limited funding and skilled personnel; poor internet access that limits efficient access to genomic data from online database; as well as the lack of motivation/driving factors for its adoption in general due to the low awareness of the benefits of applying WGS, particularly among the food industry.

Food Fraud and Impact on Consumer Behaviour

The third plenary session discussed the issue of food fraud, its impact on consumer behaviour, as well as the impact of social media on food safety risk perception.

Prof. Roy Fenoff, from The Citadel, USA, and a member of the Michigan State University Food Fraud Initiative, provided a presentation on Food Fraud: Criminology and the Focus on Prevention. Food fraud is motivated primarily by economic gain, and the growing problem of food fraud is estimated to cost the global food industry approximately US$30 to 40 billion annually. As such, prevention of food fraud is important, while managing food fraud can be achieved by accurately detecting, deterring and preventing the opportunity for food fraud.

Dr. Ruby Ong from Thermo Fisher Scientific, Singapore, followed with a presentation on Analytical Challenges and Approaches to Detecting Food Fraud, sharing some common examples of food fraud such as dilution of wine and fruit juices, adding weight to animal protein using water, replacement of products such as honey and olive oil with cheaper substitutes, as well as passing off one species of animal meat protein with a cheaper substitute. Nevertheless, certain analytical techniques, such as chromatography, protein and DNA-based techniques, are available and case studies were shared for the detection of food fraud in products such as olive oil, dairy products and honey.

Dr. Sharron Kuznesof from the University of Newcastle, United Kingdom, gave an overview of Chinese Consumers’ Attitudes to Food Fraud based on study findings that show Chinese consumers have a high level of concern about adulterated, counterfeit and mis-described foods. They do not seem to trust the Chinese food supply as a whole, nor the government and media to provide accurate information and advice about food. However, demonstrating the authenticity of food and drink products had a positive effect on consumers’ attitudes, and Chinese consumers seem to trust products originating from countries where regulation is perceived to be more rigorous.

Prof. Yi Mou from Shanghai Jiaotong University, China, presented on Harnessing Social Media for Food Safety Risk Communication. Prof. Mou suggested that existing risk communication processes emphasize more on “risk” instead of “communication” due to traditional ‘top-down’ approach from governments. Social media may provide a new ‘bottoms-up’ risk communication platform as it provides easy
access to a wide variety of stakeholders, information in a timely fashion and has been highly popular. However, scientists and food safety experts must also engage in social media platforms and discussions to provide more accurate and factual information to the public.

**Food Safety Management**
The fourth plenary session covered new regulatory development such as the US Food Safety Modernization Act (FSMA), evolution of the application of testing for food safety management, as well as understanding how to transfer technical knowledge and expertise to help SMEs to improve food safety practices.

Dr. Katie Swanson, KMJ Swanson Food Safety Inc., USA, on behalf of Dr. Robert Brackett, Institute of Food Safety and Health, Illinois Institute of Food Technology, USA, provided a presentation on US Food Safety Modernization Act (FSMA) – Impacts on global Food Trade, Capacity Building and Training. Dr. Swanson explained that FSMA is the most sweeping reform of the US food safety laws in more than 70 years, focusing on four key themes of prevention; enhanced partnerships; inspections, compliance and response; and import safety. New FSMA requirements were likely to impact global food trade, as well as in Codex Alimentarius deliberations and standards. It may also drive more vertical integration among food companies, but could negatively impact smaller food businesses that are not able to comply with foundational rules. However, efforts are being made to support food businesses to comply with the new FSMA rules.

In his presentation on Application of Food Safety Testing for Validation and Verification of Food Safety Processes, Dr. John Donaghy from Nestle, Switzerland explained that the modern food production chain has become very long and complex with many testing points, including at primary production, intermediate processing, ingredient reception by the manufacturer, environmental control, prior to product release, as well as at national border controls. Nevertheless, assurance of food safety cannot be based on end-product food testing alone and proactive food safety management systems, such as Hazard Analysis Critical Control Points (HACCP) are needed.

Prof. Alonzo Gabriel from the Department of Food Science and Nutrition, University of the Philippines (UP) Diliman shared on Improving Food Safety Management for Micro, Small and Medium Enterprises – Transferring Knowledge and Best Practices. Most foodborne disease incidents in the Philippines are caused by food items produced by micro, small and medium scale food manufacturers or food service establishments, as these types of businesses lack access to food safety education. Ways to address such challenges include research from the Laboratory of Food Microbiology and Hygiene at UP, student-led community extension initiatives, as well as collaboration with private enterprises, NGOs, professional organizations and government stakeholders. Prof. Alonzo also cautioned that while the internet is a powerful tool that can be harnessed to provide food safety education, it is also necessary to address false information about food safety that may be circulated on the internet.

**New Trends and Emerging Challenges in Microbiological Food Safety**
The 5th session, supported by bioMérieux, focused on a number of emerging microbiological food safety challenges including foodborne viruses and pathogens in ready-to-eat foods, biofilms, as well as advances in new analytical techniques.

Prof. Alvin Lee from the Institute for Food Safety and Health, Illinois Institute of Technology, USA, presented on Foodborne Viruses – Public Health Impact and Control Options. He pointed out that in recent years, viruses, particularly Norovirus, have been the leading cause of foodborne infections in the USA and Europe. Infectious food workers, particularly for ready-to-eat foods (most of which are eaten raw), are found to be the main cause
of transmission and outbreaks of Norovirus who may contaminate the food during final preparation. Apart from thermal interventions, high pressure processing and pulse light technologies have been found to be effective in eliminating foodborne viruses from foods. Nevertheless, Prof. Lee stressed the importance of handwashing by food handlers as a means to prevent transmission of human cases of foodborne viruses.

In the next presentation on Emerging Foodborne Pathogens in Ready-to-Eat Food Products, Dr. Kitiya Vongkamjan from the Department of Food Technology, Prince of Songkla University, Thailand, noted that consumption of ready-to-eat (RTE) foods is becoming increasingly popular worldwide. As a major food and seafood producer, Thailand exports a significant amount of RTE food including some which contain seafood to other countries. Among the most commonly identified pathogens in RTE and seafood products are *Listeria monocytogenes* and *Salmonella* spp., which are major causes of foodborne infections.

The Role of Microbial Biofilm on Food Safety was discussed by Dr. Bassam Annous from the Eastern Regional Research Center of the United States Department of Agriculture Agricultural Research Service (USDA-ARS), USA. Dr. Annous explained that most bacteria grow in the form of biofilms, and which are commonly found in environments such as on industrial equipment, medical devices, living organisms and food processing environments. Bacterial cells growing in biofilms are physiologically different from non-biofilm cells, which may account for their resistance to certain antibiotic and disinfectant treatments, as well as host defences. In food processing environments, it has been found that water-based sanitizers, anti-bacterial agents and even irradiation treatments are less effective against foodborne pathogens that exist as biofilms. Foodborne pathogens found to form biofilms on food and food contact surfaces include *Salmonella* spp. and *E. coli* 0157:H7.

Dr. Wenting Ju from the Merieux NutriSciences Food Science Center, China, presented on Advanced Technologies for Foodborne Pathogen Detection. An ideal detection method should be highly specific, highly sensitive, rapid, robust, have high throughput and be cost-effective. However, development of an ideal detection method for foodborne pathogens can be quite challenging as food products are very complex matrices. Some new rapid and novel methods for foodborne pathogen detection that have been developed in recent years include improved traditional culture-based methods, genetic-based methods, as well as immunological-based methods. Looking into the future, further improvements in pathogen detection are to be expected.

**Microbiological Consideration in Food Safety Management**

The 6th plenary session, supported by ICMFS, provided an overview on concepts related to food safety risk metrics and their application for food safety risk management by government and industry stakeholders, as well as for the management of mycotoxins.

In her presentation on Introduction to Food Safety Risk Metrics, Dr. Katie Swanson highlighted the need to link government policies with food safety control measures implemented by food industries, in order to ensure efforts are aligned towards achieving the national public health goals. This can be achieved through the use of food safety risk metrics, such as Appropriate Level of Protection, Food Safety Objective, Performance Objective, and Microbiological Criterion.

The next presentation on Application of Food Safety Risk Management Metrics at Government Level was given by Dr. Wayne Anderson, Director of Food Science and Standards at the Food Safety Authority of Ireland. He explained that when it comes to food safety, governments need to balance different considerations including public health protection, food security, economic development, freedom of food choice, as well as international trade. There are traditional as well as newer food safety metrics being utilized by governments, although there are challenges such as the large amount and different types of data that need to be gathered in order to apply certain metrics.
Dr. Leon Gorris from Unilever Research Vlaardingen in the Netherlands shared on the Application of Food Safety Risk Management Metrics at Industry Level. He said that companies can apply risk assessment to develop products that are “safe by design”, where this involves a thorough understanding of the intrinsic, processing and handling factors of a product, as well as using available “benchmarks” for safety including government regulations and guidelines, industry standards and guidelines and data on history of safe use. Dr. Gorris then shared a few examples of how food safety metrics are used to guide food safety management for controlling pathogens in food products intended to be sold in different markets with differing climatic conditions.

Dr. Martha Taniwaki from the Food Technology Institute, Brazil gave a presentation on the Application of Food Safety Risk Management Metrics for Mycotoxins. She explained that when applying the FSO (Food Safety Objective) concept to mycotoxins, it is important to understand at which stages of the food chain these mycotoxins are produced. This may in turn guide the different pre-harvest, post-harvest and processing controls that can be implemented to reduce the level of mycotoxins to meet the FSO. Guidelines that have been developed by the Codex Committee on Contaminants relating to the maximum levels of mycotoxins in food commodities as well as the codes of practices to prevent and reduce mycotoxin contamination can be useful references to guide the implementation of the FSO concept for mycotoxins.

Mycotoxin Challenges and Detection Strategies. While many of the currently known types of mycotoxins are regulated by national food safety authorities around the world, there are a few “emerging” mycotoxins that have been discovered in recent years for which there is limited toxicity data and analytical methods to test for them. There are also some “modified” or “masked” mycotoxins which are known mycotoxins that may exist in a conjugated form in plants, which make them difficult to detect using conventional analytical methods. Progress has been made to detect these types of mycotoxins using non-conventional methods, such as using non-targeted metabolomics.

The next presentation on the Study on Dietary Exposure of Sweeteners in Thai Consumers was provided by Prof. Songsak Srianujata from the Institute of Nutrition, Mahidol University, Thailand and the Thailand Risk Assessment and Surveillance Center. Prof. Songsak explained that sweeteners, specifically low and non-caloric sweeteners (LNCS) are increasingly being used in Thailand and many countries around the world. A study conducted to determine the usage and potential/actual exposure of Thai consumers to LNCS (namely, aspartame, acesulfame-K and sucralose) found that dietary exposure among the general population was lower than the acceptable daily intake set by risk assessment bodies such as the FAO/WHO Joint Committee on Food Additives (JECFA). He added that any potential risks from the use of LNCS can be managed by applying the general principle of GMP for the use of food additives, in particular by using just the amount of food additive that is necessary to achieve the technological function.

Dr. Nuzul Amri Ibrahim from the Malaysian Palm Oil Board (MPOB) shared on the topic of 3-MCPD Esters: Current Knowledge and Status, explaining that 3-monochloropropanediol (3-MCPD) and 3-MCPD esters and glycidyl esters are processing contaminants that are formed during the refining process of the crude oils due to the addition of...
hydrogen and chlorine ions during the various refining steps. Studies have and are being conducted to identify various factors contributing to the formation of 3-MCPD esters in palm oil as well as possible mitigation measures to reduce the amounts.

Dr. Miro Smriga, Chief Executive Officer of the International Council on Amino Acid Sciences (ICAAS), Belgium, presented on Safety of Amino Acids as Essential Building Blocks of Human Nutrition. Dr. Smriga explained that as a nutrient, it is important to consider the risk of insufficient or excessive intake of amino acids. Several clinical trials to understand the safety and intake of amino acids have been conducted for some amino acids, and further trials for other amino acids are currently in preparation with the final goal to establish a framework for the safety assessment of high quality amino acids. With regards to risks resulting from deficiencies in the intake of amino acids, FAO and WHO have established daily amino acid intake requirements for the different types of amino acids.

Food Safety Innovations & Technologies
The 9th and final plenary session of the conference shared updates on emerging food safety intervention technologies and issues, including nanotechnology and other non-thermal food preservation methods.

Prof. Qasim Chaudry from the University of Chester, UK shared on the topic of Nano-Food Packaging – Current Trends and Future Issues. Prof. Chaudry explained that potential applications of nano-materials for the agri-food sector include the extension of the shelf-life of food products that reduces food waste; improvement of nutrition and functional foods through better bioavailability; creation of new tastes and flavours that reduce the content of salt, fat and sugar; as well as better food packaging that is ‘intelligent’, hygienic as well as being lightweight, stronger and functional. The main safety concern relates only to internal exposure of insoluble or bio-persistent nanomaterials, rather than nano-scale substances that are degradable in the body or environment.

In the case of food packaging and other food contact materials, a primary concern is the migration of such nanoparticles into foods. However, studies conducted thus far to quantify migration of nanoparticles have found that the rate of migration is very low and often times below the limit of detection or quantification. In general, while the application of nanotechnology for food packaging seems promising, a lot more research is still needed to ensure the efficacy of the applications, safety of its use in food, as well as social acceptance of the technology.

Dr. Roman Buckow, Research Group Leader, Agricultural and Food at CSIRO, Australia, presented on the topic of Advances in Non-thermal Food Processing Technologies. While food processing and preservation has been performed since ancient times, today’s consumers are increasingly demanding foods that are ‘less processed’ and retain their natural flavour, nutrients and quality. At the same time, it is important to optimize and extend shelf-life and ensure that foods are safe. Emerging food preservation techniques, particularly non-thermal techniques, may thus provide a solution to these contrasting needs. While these new food safety innovations represent positive advancements in food processing, it is nevertheless important to ensure that they are validated for effectiveness in controlling for microbial hazards according to the required standards set by government authorities.
The next presentation on Application of Blue Light-Emitting Diodes for Food Preservation by Prof. Hyun-Gyun Yuk, from the Food Science and Technology Programme at the National University of Singapore, continued with the topic of food preservation. Prof. Yuk shared that recent studies have found that certain wavelengths of light are able to destroy microorganisms by activating photosensitive compounds within a cell. The use of 405nm LED (blue light) was tested to determine its effectiveness in inactivating a number of different pathogens, and it was found that 90% of these pathogens were successfully inactivated during storage when exposed to blue light, without significantly affecting nutritional and quality parameters. As such, blue light LEDs may be an effective tool in extending shelf-life and reducing risk of foodborne diseases for fresh-cut fruits and vegetables that are sold in commercial retail chillers.

The last presentation of the session, Engineered Nanoparticles: Anti-Microbial Properties and Toxicity, was provided by Prof. Azlin Mustapha from the Food Science Program at University of Missouri, USA. Prof. Azlin shared that to date, several studies have demonstrated the effectiveness of engineered nanoparticles in eliminating pathogens including Salmonella spp., E. coli O157:H7, L. monocytogenes, Staphylococcus aureus, as well as mycotoxin-producing molds. While engineered nanoparticles may be helpful in eliminating harmful pathogens in foods, they may also eliminate the desirable microflora in the human gut. As such, Prof. Azlin cautioned that further research is still needed if engineered nanoparticles are to be used in food applications, including as anti-microbials.

ORAL PRESENTATIONS

Among the abstracts submitted by food safety researchers across the Asia Pacific region, six papers were selected for oral presentation.

- “Nitrite Production on Spore-forming Bacteria and their Impact on Safety of Powdered Infant Formula” by Mr. Tae Jin Cho, Korea University, Korea
- “Prevalence and Characterisation of Antimicrobial-Resistant Salmonella Serovars Isolated from Naturally Contaminated Poultry and Their Processing Environments” by Ms. Li-Oon Chuah, Universiti Sains Malaysia, Malaysia
- “The Survival of Listeria spp. on Apple Surfaces Under Various Storage Temperatures in 90% of Relative Humidity”, Dr. Pantimakorn Pasuwan, Khon Kaen University, Thailand
- “Application of Whole-Genome Sequencing to Elucidate Virulence Potential of Listeria Monocytogenes Strains Isolated from Ready-to-Eat Foods in Malaysia”, Prof. Kwai-Lin Thong, University of Malaya, Malaysia
- “Harnessing Environmental Biocontrol Lactic Acid Bacteria for Fresh Produce Safety”, Dr. Mark Turner, University of Queensland, Australia
- “Microbial Surveillance of Retail Food in Singapore”, Dr. Kyaw Thu Aung, National Environment Agency, Singapore
In Singapore, the rapidly aging population has led to an increase in the prevalence of sarcopenia and frailty. Sarcopenia is commonly used to describe the loss of muscle mass accompanying aging, while frailty is a broader term which represents a geriatric syndrome defined by a number of different classification criteria, including sarcopenia, decreased physiological reserve and homeostatic dysregulation.

Poor dietary intake and nutrition status, especially inadequate intake of good quality protein, are factors that increase the risk of frailty and sarcopenia among the elderly.

ILSI SEA Region organized a Mini Symposium on Sarcopenia and Frailty – Assessment, Prevalence and Prevention on December 6, 2016, to discuss the assessment, prevalence, biological and clinical factors, and other issues surrounding sarcopenia and frailty in Singapore. The experts presenting at the meeting also discussed the importance of adequate intake and proper daily distribution of good quality dietary protein for healthy aging and prevention of sarcopenia and frailty.

The speakers at the Mini Symposium included Dr. Rahul Malhotra from Duke-NUS Medical School, Singapore; Prof. Tze Pin Ng from the National University of Singapore; and Dr. Douglas Paddon-Jones from the University of Texas Medical Branch, USA. The meeting was chaired by Ms. Pauline Chan, Director of Scientific Programs of ILSI SEA Region.

Assessment of Frailty in the Elderly

Dr. Rahul Malhotra made the first presentation, focusing on Normative Values of Hand Grip Strength (HGS) for Singaporean Elderly, and Preliminary Results on SAFE (Singapore Assessment for Frailty in Elderly). He explained that HGS was used for assessing both sarcopenia and frailty, where low HGS would predict adverse health events among the elderly. The aim of the study was to develop age-specific normative values for HGS, utilizing data from a nationally representative sample of community-dwelling elderly Singaporeans. Age, gender and hand-specific graphs for normative values of HGS are presented at the 5th, 20th and 50th percentiles.

Results showed a decline of HGS with age, with HGS significantly higher for men, and for the dominant hand. These data will facilitate interpretation of HGS measurements among the elderly in clinical and research settings in Singapore.

Preliminary findings on the Singapore Assessment for Frailty in Elderly (SAFE) showed that the existing frailty measures have a disproportionate focus on physical frailty, neglecting psychological and social frailty, and pertain to non-Asians. Hence, the study aimed to develop a comprehensive frailty measure (SAFE-PPS, encompassing physical, psychological and social frailty) utilizing data from 3 waves of a nationally representative longitudinal survey of elderly Singaporeans.

The next steps for SAFE would include a better operationalization of the frailty variables used in the assessment, as well as obtaining complete information on healthcare utilization (hospitalization and emergency room attendance) through electronic medical records for a more composite outcome.

Prevalence, Factors and Interventions

Prof. Tze Pin Ng presented next on Frailty and Sarcopenia in Singaporeans: Prevalence, Biological and Clinical Factors, and Interventions. Frailty is a syndrome of decreased physiological reserve and homeostatic dysregulation, and defined it with the presence of weight loss, slowness, weakness, exhaustion and
physical inactivity, represented predominantly by sarcopenia. Sarcopenia is characterised by progressive and generalised loss of skeletal muscle mass and strength.

The prevalence of pre-frailty and frailty in the Singapore Longitudinal Ageing Studies (SLAS) was 44% and 5% respectively, and 70% of them were sarcopenic. The impact of frailty included a higher prevalence of depressive symptoms, cognitive impairment, increased incidence of hospitalization, and dependency in activities of daily living.

Prof. Ng highlighted that socio-demographic, lifestyle and clinical factors were associated with frailty. Results from SLAS also indicated that sarcopenia is associated with neuro-endocrine and metabolic deficiencies, in particular low testosterone and fasting insulin level. He went on to explain that frailty could be treated or prevented.

The Singapore Frailty Intervention Trial (SFIT) has demonstrated that physical frailty is reversible through nutritional, physical and cognitive training. He added that a combination of these trainings needs to be sustained even after the intervention to be more effective and have a longer impact.

The final presentation was given by Dr. Douglas Paddon-Jones, who shared on the Role of Dietary Protein in the Sarcopenia of Aging. Dr. Paddon-Jones said that moderately increasing daily protein intake beyond the RDA of 0.8g/kg/d might enhance muscle protein anabolism and provide a means of reducing the progressive loss of muscle mass with age.

As the human body is unable to store excess protein for later anabolism, it would be more effective to optimize protein intake at each meal, and there was evidence of a synergistic effect of protein intake and exercise. He also shared that studies have shown that physical inactivity, such as hospitalization, accelerates the muscle loss. Dr. Paddon-Jones then explained that leucine supplements could partially protect muscle mass but only as a temporary measure.

He recommended that individuals should establish a dietary framework which includes moderate amount of high quality protein at every meal. He emphasized the importance of even distribution of good quality dietary protein intake throughout the day, combined with physical activity in the prevention of sarcopenia.

**KEY CONCLUSIONS**

- Assessment methods for assessing frailty should include measures on physical frailty, as well as psychological and social frailty. The measure should also take into consideration ethnicity, as well as more comprehensive information such as healthcare utilization.
- Socio-demographic, lifestyle and clinical factors are associated with frailty, and this can be treated or prevented.
- Physical frailty is reversible through nutritional, physical and cognitive training. A combination of these trainings needs to be sustained even after the intervention for more effective and longer-term impact.
- An even distribution of good quality dietary protein intake throughout the day, combined with physical activity, are important in the prevention of sarcopenia.
ILSI Annual Meeting 2017: A Report from La Jolla

ILSI Annual Meeting 2017 was held on January 20 – 25, at La Jolla, California. This yearly get-together provides a platform for Members, Trustees, Board Directors, Scientific Advisors and Staff of all ILSI branches and entities to meet, exchange updates and foster partnerships. The Annual Meeting is also a good opportunity for various valuable stakeholders to share their perspectives and build closer ties.

The team from ILSI SEA Region who attended this year’s Annual Meeting included Ms. Pauline Chan, Director of Scientific Programs; Dr. Sofia Amarra, Director of Research (Nutrition) and Deputy Director of Scientific Programs; Mr. Keng Ngee Teoh, Senior Manager of Scientific Programs; Ms. Jocelyn Wong, Assistant Manager of Scientific Programs; and Ms. Yee Sin See, Executive of Scientific Programs.

Scientific Sessions
The Scientific Sessions were organized by ILSI North America and the ILSI Research Foundation, covering a diverse range of food safety and nutrition topics. Presentations by scientific experts from leading academic research institutions, government agencies and industrial organizations allowed for productive exchange of knowledge and open discussion on critical issues.

Developing Science on the Prevention & Management of Food Allergies: Charting a Path Forward
Invited experts provided updates on the causes, treatment, prevention, environmental influences and public policy regarding food allergies.

New knowledge and recommendations on allergen thresholds, reference doses and the use in labelling and management of food allergies were discussed.

Hungry Cities: The Global Revolution in Food System
The transformation of food systems and drivers of food choices in low and middle income countries were explored.

Invited experts shared their research and perspectives on the global revolution in food systems. The U.S. Agency for International Development (USAID) discussed their approach for rural economic growth.

Recommendations on how a rural-urban cooperation can benefit health, economic and sustainable development of populations were also provided.

Hot Topics on Protein: All Pros, No Cons
Emerging evidence supports increased dietary intake of protein for improving health, appetite control and weight management. Consumption of protein above the RDA has been proven to be beneficial to athletes as well as the elderly.

Different approaches to assess protein quality, and the merits and limitations of existing and proposed methods were discussed. The practical challenges of incorporating higher protein in product formulations and development of foods and beverages were also reviewed.

Cancer and Food – Moving from Toxicology to Whole Diet
Experts described and defined the underlying contributors of cancer, and the linkages between diet and cancer. The impact of carcinogens such as aflatoxins and arsenic in food was also discussed.

Water I: Pursuing a Safe & Reliable Supply
Speakers outlined drinking water contamination and water disinfection, shared the latest research for assuring safe, secure and sustainable water supplies.

Personalized Nutrition & Technology: What’s in it for Me
This session discussed the different perspectives, determinants and challenges of personalized nutrition therapies. Science, technology and data mining concepts and approaches are also explored for future personalized nutrition diagnosis and interventions.
Presentations made by speakers at the Scientific Sessions can be found on www.ilsi.org or at ILSI Global YouTube Account at https://www.youtube.com/user/ILSIGlobal

ONE ILSI: Food Safety and Nutrition Initiatives for 2017 and Beyond

Food Safety
The ONE ILSI Food Safety Approach, based on the theme of “Food Safety Risk Analysis, with a Focus on Risk Assessment”, aims to encourage ILSI branches to work together to develop and implement food safety risk assessment capacity building activities globally across.

Various branches, including ILSI SEA Region, ILSI South Africa, ILSI Focal Point China and ILSI India, shared their branch activities in capacity building, particularly in relation to the implementation of food safety risk analysis and risk assessment.

To help facilitate implementation of the ONE ILSI Food Safety Approach, the ILSI branches will serve as a valuable source to gather technical expertise and conduct of capacity building activities, particularly among developing countries.

Nutrition
In the area of nutrition, ILSI is establishing its Global Nutrition Strategy, with the key objective of exploring ways for a more effective strategy to improve nutrition, health guidance and promote positive behavior change.

This initiative is being led by the ILSI Research Foundation, and its focal areas include determining the drivers of food choices, and improving the understanding of dietary patterns in the context of public health needs across geography.

ILSI SEA Region, ILSI Europe and ILSI Argentina shared some of their branch activities related to these focal areas.

Malaspina International Scholar Travel Award

The Malaspina International Scholar Travel Award, named after Dr. Alex Malaspina, the founder and first President of ILSI, is designed to enable academic scientists who are at an early stage in their careers to participate in the scientific discussions during the ILSI Annual Meeting.

Candidates from the various regions in which ILSI has a presence are nominated and will be considered to receive the Malaspina International Scholar Travel Award.

ILSI SEA Region nominated two candidates who were successfully selected by the Malaspina International Scholar Travel Awardees & Selection Committee 2017 to receive the award. The awardees are Dr. Alonzo Gabriel, Professor of Food Science & Technology, Department of Food Science and Nutrition, University of Philippines; and Dr. Tippawan Pongchareon, Lecturer at the Institute of Nutrition, Mahidol University, Thailand.

Some Words from Our Awardees:

Dr. Alonzo Gabriel
I am very happy and inspired by the amount of work being done to address these relevant issues, and I was able to better appreciate the interface between food sciences and nutrition through the studies presented in the meeting.

Research on Food Safety and Microbiology
At the ILSI Annual Meeting, I presented my work on predictive microbiology and the establishment of models that estimate inactivation rates of relevant disease- and spoilage microorganisms in food. We are also establishing models for the determination of nutritional, physicochemical, and sensorial quality of food. These models may be applied for a more comprehensive control of safety and quality of food commodities.

"Attending the ILSI Annual Meeting allowed me to meet experts from the academe and industry who are working on research to address our challenges in food safety and nutrition."
In the Philippines and in many developing countries, there is an urgent need to improve the food safety knowledge and practices of micro- and small scale food manufacturers. With the ASEAN Integration, market competitiveness of locally-produced commodities must be ensured by enhancing the capability of our stakeholders.

I am grateful to ILSI SEA Region for the support it has given me. Through activities such as the 4th Asia-Pacific International Food Safety Conference and 7th Asian Conference on Food and Nutrition Safety organized by ILSI SEA Region in Malaysia in 2016, I have had the opportunity to learn from my peers.

Dr. Tippawan Pongchareon
I am very honored to receive the Malaspina International Scholars Travel Award, and I am very grateful to ILSI SEA Region and ILSI committee as they kindly considered and recognized the significance of my work.

With the support from this award, I was able to attend the 2017 ILSI Annual Meeting to gain up-to-date knowledge on health and environment as well as to network with other researchers. Attending the scientific sessions and the small group meetings among researchers/scientists from academic, private, and industry sectors have been very fruitful.

The scientific sessions of the ILSI Annual Meeting provided me up-to-date knowledge on critical issues relating to health and the environment.

I am hopeful that such interactions will enable us to share expertise and collaborate in the future.

ILSI SEA Region plays an important role in providing current and up-to-date knowledge in the areas of food safety and nutrition situation in our geographical region. It has also organized many scientific forums such as workshops, seminars and conferences, and thus offering the opportunity to exchange and learn new knowledge among researchers from various countries and sectors.

Dr. Suzanne Harris presenting Dr. Tippawan Pongchareon with the Malaspina International Scholar Travel Award

Research on Maternal and Child Nutrition and Health
My research emphasizes the relationship between nutritional status, feeding practices and socio-demographic influences during early life on nutritional status, health, and functional outcomes later in life. I have been leading the study on the effects of growth during infancy on nutritional status, cognitive function, and risk of non-communicable diseases during adolescence.

My recent work focuses on the development of nutrition care package, i.e., developing or improving the nutrition tools and recommendations which will be incorporated in the maternal and child health care services, to address malnutrition of all forms. We expect that the evidence from this work will assist health professionals and policy makers to implement optimized maternal and child nutrition and health programs.

In many Southeast Asian countries, changes in lifestyles, food access, and eating patterns are leading to the problem of double-burden of malnutrition. Stunting and micronutrient deficiencies are still prevalent, while childhood obesity has been increasing.

Emerging evidence shows that early life nutrition contributes to the occurrence of obesity and chronic diseases in later life, hence early life nutrition should be considered together with addressing obesity and chronic disease.

To ensure proper nutrition during early childhood, more comprehensive information on the quantity and quality of breast milk from mothers in this region is needed. There is also the need to address optimal nutritional status prior to pregnancy, during pregnancy, and during lactation period. More work needs to be done on nutrition care programs that provide support for pre-pregnant and lactating women.
 Drivers of Consumer Food Choices

Why do people eat the foods they do? A complex mixture of factors drive consumers’ food choices, including economic, physical, social and psychological determinants.

Healthcare professionals, nutritionists, researchers, policy-makers and the food industry need to understand how and why consumers make certain food choices. This will aid in the development of more effective policies, interventions, products and services that promote healthier eating patterns.

LSI SEA Region’s Malaysia Country Committee and the Nutrition Society of Malaysia co-organized a Seminar on Drivers of Consumer Food Choices held on November 15, 2016 in Kuala Lumpur, Malaysia. The seminar explored ways to improve consumer food choices through a multi-stakeholder approach.

Socio-cultural Determinants of Food Habits in Malaysia
Dr. Elise Line Mognard from Taylor’s University of Malaysia gave the first presentation on Drivers of Food Choice - Findings from Malaysian Food Barometer. Due to rapid urbanization and modernization, a sizable middle class has emerged in Malaysia. The traditional ways of life and eating habits are changing with the times. For years, nutrition surveys have captured changing food consumption habits but there has not been a comprehensive survey focusing on the socio-cultural determinants of food habits and eating decisions at the national level.

The Malaysian Food Barometer was conceptualised to fill this gap and to investigate the eating practices and cultural representations of food and eating in a multicultural context. Over 2,000 people across the country participated in the 2013 survey, and findings showed the correlation between the food lifestyle of individuals, social characteristics and body size status, or obesity. The survey also brought focus on the diverse rationalities driving food choices in the Malaysian context.

The Role of the Senses in Food Choice and Energy Intake
Dr. Ciaran Forde from the Singapore Institute for Clinical Sciences spoke on The Role of the Senses in Food Choice and Energy Intake. From infancy to adulthood and old age, food sensory signals play an important role in shaping our eating behaviors and the dietary patterns that influence health and well-being.

Dr. Forde said that their studies have explored how food texture moderates eating rate and total energy within a meal, and demonstrated the efficacy of using sensory approaches to control meal size.

Sensory cues can mask covert manipulations to dietary energy density. Findings from two studies showed that covert reductions in total energy content in sensory matched foods that maintain a high sensory appeal creates the opportunity to use sensory properties to guide healthier choices and provide satisfying product experiences for fewer calories. Beyond palatability, sensory properties also play a functional role in guiding calorie selection, informing eating rate, and enhancing the oral metering of energy intakes.

The implications of these perceptual and behavioral factors on nutritional well-being and health was discussed with examples from the current research by the Sensory Ingestive Behaviour group at the Clinical Nutrition Research Centre.

Food Labelling and Health Claims
Ms. Fatimah Sulong from the Negeri Sembilan State Health Department, Ministry of Health Malaysia talked about Food Labelling and Health Claims.
- Do They Make a Difference in Consumer Food Choices? Nutrition information on food labels play an important role in helping consumers to make healthier food choices at the point of purchase.

Promotion of nutrition labelling for all pre-packaged foods was a proposed policy measure highlighted in the World Health Organisation’s Global Action Plan for the Prevention and Control of NCD 2013–2020.

Recognizing this, Malaysia has made nutritional labelling mandatory for selected foods since 2003. Nutrition labels serve to inform the consumer of the nutritional quality of a food, while nutrition and health claims provided additional information on the functions of various nutrients and food components.

Although there is some published research (including the National Health and Morbidity Surveys), more studies on what consumers understand and how they use nutrition information on food labels is needed. This will assist stakeholders and policy-makers to develop evidence-based policies and interventions that promote healthier eating practices.

Communication with Consumers
Representing the Federation of Malaysian Manufacturers, Ms. Cher Siew Wei presented on Innovative ways to Communicate to Consumers.

She shared some ideas on how the industry communicates in the new digital age, and how they have engaged the consumers through various methods and channels through the digital media and social media.

Mr. Khoo Kar Khoon from the Malaysia Advertisers Association spoke on The Role of Advertising in Driving Food Choices. With global advertising spending estimated to reach US$2.1 trillion in 2018, there is clear evidence that businesses acknowledge the effectiveness and pivotal role of advertising.

With the fast-changing media communication landscape and consumer media consumption habits, the role of advertising has evolved and expanded to cope with the complexities of the digital revolution.

In recent years, the function of advertising has evolved from merely to inform or educate consumers on the functional benefits of the product, taste, availability and price, to a stronger personal engagement through contemporary humour, creativity, emotional affinity, with the hope to establish a stronger brand loyalty with the consumers.

With growing pressure and concerns on diet-related diseases, the food industry has started to explore healthier food options in both their products and advertising content. Advertisers have collaborated positively in combating the health issues at hand, particularly child obesity.

Consumers should continue to be informed, educated and engaged on positive eating habits through all the relevant channels including advertising. At the same time, the industry should be practice more transparency and responsible advertising.

Dr. Zhong Kai from the China National Centre for Food Safety Risk Assessment spoke on How to Use Risk Communication to Affect Consumers’ Food Choices. Food choice is a complicated and challenging issue for both the industry and the regulators. Decisions on food choices are based on knowledge, experience, habits, tradition, culture, socio-economics and many other determinants.

Digital technology has dramatically changed how consumers produce and consume information, with the impact of social media being the most significant. However, Dr. Zhong cautioned that social media brings both challenges and opportunities for communicators, and he highlighted some examples, challenges and interesting ideas for communication through social media.

Stakeholder Contributions and Collaboration
The next session explored contributions and collaborative projects among stakeholders that aim to promote healthier food choices.

Ms. Zalma Abd Razak from the Nutrition Division, Ministry of Health (MOH) Malaysia, gave an overview of the prevalence of overweight and obesity amongst adults and adolescents in Malaysia based on results of the National Health and Morbidity Surveys.

The prevalence of obesity amongst adults has increased dramatically from 4.4% in 1996 to 14.0% in 2006 and 17.7% in 2015. Amongst adolescents, the
prevalence of overweight and obesity was 31.8% and 24.4% for those aged 7 to 12 years and 13 to 17 years, respectively.

Studies show that Malaysians generally do not practice healthy eating, especially in terms of consumption of fruits and vegetables, and fat intake. Various strategies implemented by MOH Malaysia to promote and inculcate healthy eating habits include promoting healthier food choices, using various settings such as health facilities, schools, child care centers and supermarkets.

Frequent dialogues with food industries are also conducted to encourage production of healthier food products, with healthier food choices promoted through both conventional and social media.

Ms. Zalma highlighted that all these activities will continue to be implemented as outlined in the National Plan of Action for Nutrition (NPAN) of Malaysia III, 2016-2025, with the objective of enhancing nutritional status of the population and reduce diet-related non communicable diseases in Malaysia.

Prof. Dr. Norimah A Karim from Nutrition Society Malaysia (NSM) highlighted the Society’s contributions towards promoting healthy food choices, in support of MOH Malaysia’s efforts to combat diet-related diseases. For example, NSM collaborates with the stakeholders to organize the nationwide Nutrition Month Malaysia.

NSM has also carried out intervention programmes for specific target groups, with particular focus on infants and children so that healthy eating habits can be inculcated from young. Current programmes include Healthy Kids Programme, MyNutriBaby and Positive Parenting Programme. Attention has also been given to mothers and woman of reproductive age.

Publications and educational resources published by NSM inform the public with appropriate, unbiased information on healthy eating and food choices.

Representing the Federation of Malaysian Manufacturers (FMM), Ms. Sharidah Yusoff shared views from the food industry on promoting healthy food choices. Front-of-pack (FOP) calorie labels may be an important tool to assist consumers in making informed healthier food choices.

FOP labelling and nutritional information panel on product packaging, if applied correctly and if understood and trusted by the consumer, can assist consumers in taking into account the nutritional content of the food product in their purchasing decisions.

Advertising and marketing are powerful tools that can influence consumer behaviour and tackle the problem of rising obesity and NCDs. Voluntary efforts by the industry in responsible marketing to children should complement the existing and different approaches being taken by other stakeholders. This voluntary approach can potentially act quickly and effectively to tackle rising overweight and obesity rates.

There is also growing interest among the manufacturers on the role that reformulation can play towards healthier diets. In conclusion, Ms. Sharidah emphasised that various efforts could be taken by the industry as public-private-partnerships to help reduce obesity and NCDs in Malaysia.
Nanomaterials in Food and Beverages

On November 10, 2016, ILSI SEAR Australasia organized a 1-day seminar on Nanomaterials in Food and Beverages – Opportunities and Challenges.

A key objective was to better understand issues surrounding the use of nanomaterials in food and beverages, risk assessment processes and regulatory challenges, and to identify knowledge gaps and communication strategies for the use of nanomaterials in food.

An Overview of Nanotechnology

The first speaker was Dr. Maxine McCall, whose presentation Nanomaterials – What Are They and Why Use Them provided an overview of nanotechnology in regards to definitions used in Europe (European Commission) and Australia (NICNAS only), the types of nanomaterials in use and their properties in relation to size, surface area and surface chemistry.

The properties of a chemical in nano form can be very different to a larger particle of the same chemical because surface properties dominate in the nano form, while the internal composition mainly defines the properties of larger particles. This difference opens up a range of new uses for that chemical.

Nanomaterials may have potential uses in certain food areas as antimicrobials and monitors. One example is a UVA-activated indicator ink where the detector changes from colourless to blue in response to minute quantities of oxygen, providing a visual method for identifying a modified atmosphere in the package, and/or possible seal breakage.

Risk Assessment

Adjunct Professor Paul Brent, from University of Laval, Canada, introduced the topic of Risk Assessment of Nanomaterials – What is Needed. Traditional Codex-based approaches to risk assessment of chemicals in foods are acceptable and appropriate for application to the use of nanomaterials in foods. Processes put in place by food regulators for the risk assessment of nanomaterials in foods and beverages were shared.

Risk Management

Mr. Dean Stockwell’s presentation on Risk Management for Nanomaterials – What is Needed gave an outline of the definition of risk and risk management using the internationally accepted Codex model and definitions.

There is risk only if there is exposure, and processes to manage risk include avoiding risk, reducing the hazard, reducing the exposure, and risk communication. A graduated approach that takes into account the type and severity of risk, and the type of regulatory intervention that should complement the risk, is recommended.

The application of traditional risk analysis and risk management methods to nanomaterials in foods was discussed. Based on first principles, the risk of the use of nanomaterials in food was probably low, but questions about the limits of current knowledge and experience in risk assessment of nanomaterials have been raised.

Practical approaches to risk management of nanomaterials should include the use of robust science and risk communication processes to create and build trust with consumers.
Mr. Stockwell concluded that the community cannot afford to retreat from the use of nanotechnology, including in food applications. It is essential to conduct consumer-relevant science research to demonstrate evidence of safety and benefit, and this should be supported by communication.

Physiology and Toxicology
Adjunct Prof. Andrew Bartholomaeus gave a presentation on Physiology and Toxicology of Nanomaterials, sharing his thoughts on nanotechnology and nanomaterials in general, and toxicology of nanomaterials.

Food naturally and traditionally contains particles in the nanometre scale. Prof. Bartholomeaus suggested that particle size alone is not a sufficient metric to predict pharmacokinetics, and that there should be a focus on the novelty of the nanoparticle in relation to absorption, distribution, metabolism and excretion.

With regards to the potential toxicity of nanomaterials, Prof. Bartholomeaus said that nanomaterials have not been shown to produce any previously unknown (i.e. novel) toxic effect. However, the toxicity of a nano-material may differ from that of the bulk material, such that the nano-material may be more toxic, less toxic, or have the same toxicity.

In considering the potential toxicity of any material for use in food or agriculture, the most reliable approach is to systematically narrow the scope of novelty. He concluded by emphasizing that there are no toxicological endpoints unique to nanomaterials, although there are differences between absorbed particles and absorbed dissolved molecules.

Communications on Nanomaterials in the Food Chain
The next presentation by Dr. Wendy Russell from the Australian Centre for Public Awareness of Science, focused on the topic of Engaging with the Public about Nanomaterials in the Food Chain.

Nanotechnology issues have been raised in the media, and consumer insights show that consumers are cautious about technology in their food (e.g. the GM debate) and expect to be consulted on new technologies. However, with respect to nanotechnology, there seems to be a lack of unique ethical issues as a range of industry sectors are involved including medical, engineering, consumer goods, and food.

Important issues related to nanotechnology that need to be explored and addressed include risk assessment and regulation; education and communication; as well as balancing between research and community engagement, commercialisation and public interest.

To improve community acceptance of nanomaterials in the food chain, Dr. Russell suggested activities and training for young scientists that could have an impact on the research and engagement agenda; transdisciplinary research on areas of application; constructive or real-time technology assessment; and public dialogue on proposals and developments (e.g. public forums, citizen reference panel etc).

Regulation of Nanotechnologies in Food
Dr. Nick Fletcher from Food Standards Australia New Zealand (FSANZ), presented on the Regulation of Nanomaterials in Food in Australia and New Zealand. FSANZ has worked on a strategy to manage potential risks presented by the use of nanomaterials in foods, reviewing the available science and collaborating with national and international contacts in the field.

FSANZ’s approach had been developed based on internationally accepted and essentially harmonised processes.

Food produced using new technologies must be safe, hence FSANZ was not focussed on size of the nanomaterials per se, but on materials likely to exhibit physico-chemical or biological novelty. Dr. Fletcher agreed that the traditional risk assessment approach was appropriate for soluble materials, but that more information may be required for insoluble materials.

There had been no applications from industry for nanomaterials in food, and many previous
studies purporting to demonstrate safety concerns with the use of nanomaterials had been done poorly. Results of a recent independent review commissioned by FSANZ concluded that there was no objective evidence in the literature that food grade titanium dioxide, silicon dioxide or silver posed health concerns when used according to existing permissions in the Food Standards Code.

Safety and Efficacy Testing
On the topic of nanomaterial safety and efficacy testing, Dr. Bryce Feltis from Baxter Laboratories presented on From IBR to GISS – Developing and Commercialising in vitro Tools for Nanomaterial Safety and Efficacy Testing, focusing on tools being developed for rapid screening of nanomaterials, particularly the nanoparticles used in commercial sunscreens.

In the past, there was significant concern in some sectors that nanoparticulate zinc oxide and titanium dioxide might cause adverse health effects largely related to the generation of free radicals on the skin. Dr Feltis and his group investigated some aspects of these issues.

Through their research, the group could find very few differences between zinc or titania nanomaterials and their bulk counterparts, and that the overall assessment was that these materials were as least as safe as the organic UV blockers that have been used in sunscreens for many years.

Through development, adaptation and testing, the research group has been able to achieve commercial implementation of the Immune Balance Rating System™ (IBR™), a 5-test screening system that can assess commercial sunscreens for their potential to cause cellular irritancy in the immune and structural cells of the skin.

Communicating on Nanotechnology
Ms. Lorraine Haase, former Manager of Communication and Stakeholder Engagement at FSANZ, shared her considerable knowledge and experience in the field of stakeholder relations and risk communication, through her presentation on Sorting the Wheat from the Chaff when Talking about Nanotechnology.

Many issues related to public interest in nanotechnology have been clouded by misinformation and fear-mongering with respect to the use of new technologies in food applications, similar to the GM food debate.

To tackle the issues, speed, agility, use of social media and courage are critical. The use of social media is of critical importance to reach large populations of the community fast and efficiently. Leveraging specific scientific expertise such as the Australian and New Zealand Science Media Centres can also help to counter misinformation, misconceptions or flawed science.

Ms. Haase suggested that Government regulators such as FSANZ can determine whether and when an issue is worth focussing on, and this can be accomplished by using a strategic approach to interrogate responses to social media, to ascertain the real public interest. She concluded by emphasizing the critical importance of maximising opportunities for risk communication messages.

Challenges and Opportunities
- The use of nanomaterials is not new, having been present in the environment and in foods for many years.
- The safety of soluble nanoparticles can be adequately and appropriately managed using well-accepted conventional toxicological testing. For insoluble nano-particulates, some extra considerations may be needed on a case-by-case basis.
- There seems to be a reasonably harmonised approach being taken by food regulators around the world to manage the safety of nanomaterials in foods.
- Although there is an absence of publicly available risk assessment data for nanomaterials in foods, data already available in the public arena from studies in the medical, environmental and consumer product sectors can and should be leveraged to facilitate information on the safety of nanomaterials in foods.
- Communication with the general public on the use of new and innovative technologies in foods is of interest to all stakeholders. Engaging the community in the discussion, identifying areas of concern, increasing trust, and communicating scientific information on the safety of nanomaterials are of particular importance.
Upcoming Activity Highlights

Meetings

Seminar on
Re-assessing Macronutrient Needs - Requirement, Quality and Health Impacts
May 3-4, 2017, Bangkok, Thailand

The components of a diversified, balanced and healthy diet vary depending on individual needs, locally available foods, as well as cultural and dietary customs. In recent years, new developments and research in the field of nutrition and health and chronic diseases, have had an impact on recommendations for dietary intake of macronutrients.

This 1½ day seminar aims to provide an overview of the most recent scientific knowledge and research findings on current and optimal macronutrient intakes, and to discuss the implications for dietary recommendations in the ASEAN region.

Seminar on
Diabetes – Science and Prevention
October 2017, Singapore

The global prevalence of diabetes is rising, and in 2015, the Asia Pacific region accounted for 37% of the total number of diabetics in the world. While early detection is crucial in delaying the progression of diabetes and its effects, prevention is also vital to reduce the costs and impact of the growing burden of the disease. On the individual level, diabetes prevention includes raising awareness of diabetes prevention and detection, and encouraging healthier eating and lifestyle habits.

ILSI SEA Region will organize a seminar to look at the status, prevention and science behind diabetes, to explore prevention and management of diabetes on both individual level and community level, as well as to discuss innovation, emerging science, and a multi-stakeholder approach in the prevention and management of the diabetes phenomenon.

Research and Collaborative Projects

ONE ILSI Global Project on Healthy Aging
ILSI SEA Region has been coordinating a ONE ILSI Global Project on Healthy Aging involving several ILSI branches from Asia and South America. The overall goal of this project is to identify factors that contribute to healthy versus pathological ageing, including mid-life factors as well as practices to promote healthy and successful ageing. The project will also identify gaps, research and policy needs to achieve healthy and successful ageing.

Relevant data has been collected in countries including Malaysia, Thailand, Philippines, Taiwan, Korea, India, Argentina and Mesoamerica. Moving forward, each ILSI branch involved in the project will work on completing the reports and submitting to scientific journals for publication.

Publications

Report on Food Composition Tables: Review of Status in ASEAN Region
To assist stakeholders, including national health authorities and regulators, industry, researchers and scientists across Southeast Asia to better understand the status of Food Composition Tables (FCTs) in the region, ILSI SEA Region has published a report on FCTs available for use in the region.

Information in the report can be incorporated into a software program allowing for rapid and efficient nutrient analysis of food consumption data in the Southeast Asian Region countries. This will be useful towards the development of high quality FCTs, as well as nutrition and health programs and interventions in the Southeast Asia region.

The report is available at ILSI SEA Region’s website: www.ilsisea-region.org
# ILSI SEA Region

## Meetings

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<td><strong>Food and Nutrients in Health and Disease Science Cluster</strong></td>
<td>Seminar on Re-assessing Macronutrient Needs – Requirement, Quality and Health Impact</td>
<td>May 3-4, 2017</td>
<td>Bangkok, Thailand</td>
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<td>Seminar on Diabetes – Science and Prevention</td>
<td>October 2017</td>
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<td><strong>Technical Committee on Maternal, Infant and Young Child Nutrition</strong></td>
<td>Seminar and Expert Consultation on Maternal, Infant and Young Child Nutrition</td>
<td>July 24-25, 2017</td>
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<td><strong>Nutrition and Food Guidance for Public Health Science Cluster</strong></td>
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<td><strong>Food Safety and Risk Assessment Science Cluster</strong></td>
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<td>July 2017</td>
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<td><strong>Sustainable Food Systems Science Cluster</strong></td>
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<td>ILSI Southeast Asia Region Annual Meeting 2017</td>
<td>April 10-11, 2017</td>
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<td>ILSI Sponsored Sessions at IUNS 21st International Congress of Nutrition (ICN)</td>
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### Research and Collaborative Projects

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

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<td>Estimation of Sodium Intake among Filipinos and their Sources in the Diet</td>
<td>Completed; Publication submitted - in review</td>
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<tr>
<td>Data Analysis: Levels and Sources of Sugar Intake in the Philippines</td>
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<td>Vitamin D Status and its Correlates among Pregnant Thai Adolescents</td>
<td>Initiation/On-going</td>
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<td>Scoping Review on Maternal Nutrition and Birth Outcomes in SEA</td>
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<td><strong>Nutrition and Food Guidance for Public Health Science Cluster</strong></td>
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<td>Risks and Benefits of Intense Sweeteners: A Survey for Food Experts and Opinion Leaders</td>
<td>Completed; Publication under preparation as part of Symposium Proceedings for Sugar and Sweeteners</td>
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<tr>
<td>Understanding Consumer Perception and Attitudes Towards Sweeteners</td>
<td>Completed; Publication under preparation as part of Symposium Proceedings for Sugar and Sweeteners</td>
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<td>Pilot Project on Inclusion of Private Data into National FCDBs in Malaysia, Philippines and Thailand</td>
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<td>Study on Dietary Exposure of Sweeteners in Thai Consumers</td>
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<td>ASEAN Food Safety Standards Database</td>
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<td><strong>Special Projects and Others</strong></td>
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<td>Prevalence of Hemoglobinopathy among Anemic Individuals in Metro Manila: Data from the National Nutrition Survey</td>
<td>Phase 1 completed; Publication in press</td>
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<td>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</td>
<td>On-going</td>
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<td><strong>Dietary Sources of Sodium Among Filipinos Aged 19 to 50 years:</strong></td>
<td>Submitted to Asia Pacific Journal of Clinical Nutrition – In Review</td>
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<td>Findings from the 2008 National Nutrition Survey</td>
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<td><strong>Report on Food Composition Tables: Review of Status in ASEAN Region</strong></td>
<td>Published January 2017</td>
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<td><strong>Thalassemia and other Hemoglobinopathies among Anemic Individuals in Metro Manila, Philippines and Their Intake of Iron Supplements</strong></td>
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<td><strong>Evidence of a High Prevalence of Thiamin Deficiency in Early Childhood Among a Nationally Representative Sample of Cambodian Women of Childbearing Age and Their Young Children</strong></td>
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<td><strong>High Prevalence of Vitamin D Deficiency in Cambodian Women: A Common Deficiency in a Sunny Country</strong></td>
<td>Published in Nutrients, 2016, 8(5):290. doi:10.3390/nu8050290</td>
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<td><strong>The High Prevalence of Anemia in Cambodian Children and Women Cannot Be Satisfactorily Explained by Nutritional Deficiencies or Hemoglobin Disorders</strong></td>
<td>Published in Nutrients, 2016, 8:348. doi:10.3390/nu8060348</td>
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<td><strong>Low Urinary Iodine Concentration among Mothers and Children in Cambodia</strong></td>
<td>Published in Nutrients, 2016, 8:172. doi:10.3390/nu8040172</td>
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<td><strong>Sodium Consumption in Southeast Asia: an Updated Review of Intake Levels and Dietary Sources in Six Countries</strong></td>
<td>Published Book Chapter in Preventive Nutrition (5th Ed), 2016, 36:765-792.</td>
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<td><strong>Functional Food Monograph</strong></td>
<td>On-going</td>
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<td><strong>Report on Food Consumption Surveys: Review of Status in Southeast Asia Region</strong></td>
<td>On-going</td>
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<td><strong>Monograph 2 Volume 1: Safety Assessment of Low &amp; Non-Calorie Sweeteners (LNCS)</strong></td>
<td>On-going</td>
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<td><strong>Symposium Proceedings: Sugar and Sweeteners (Singapore Meeting)</strong></td>
<td>On-going</td>
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<td><strong>Updated Report on Regulatory Status of Micronutrient Fortification in Southeast Asia</strong></td>
<td>Proposed</td>
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The components of a diversified, balanced and healthy diet vary depending on individual needs, locally available foods, as well as cultural and dietary customs. In recent years, new developments and research in the field of nutrition and health and chronic diseases, have had an impact on recommendations for dietary intake of macronutrients.

The World Health Organization (WHO) released new dietary guidelines in 2015, with recommendations for fat and protein intake; while the Institute of Medicine (IOM), USA, has provided recommendations for adults in terms of Acceptable Macronutrient Distribution Ranges (AMDRs) for carbohydrate, protein and fat. Similarly, countries in Europe, Australia, and the Southeast Asia Region have national dietary recommendations for both macro- and micronutrients intakes and distributions.

This 1½ day seminar aims to provide an overview of the most recent scientific knowledge and research findings on current and optimal macronutrient intakes, and to discuss the implications for dietary recommendations in the ASEAN region.

OBJECTIVES:
1. Present new findings regarding macronutrient requirements and distribution for healthy population groups, and the health impacts
2. Characterize the intake, distribution and main sources of macronutrients in Southeast Asian diets (based on recent national surveys)
3. Discuss issues and future research needs regarding macronutrient requirements and distribution, particularly for Southeast Asian countries undergoing a nutritional transition

WHO SHOULD ATTEND
Nutrition and health professionals from government departments and agencies, academia, research organisations and food industries.

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<th>Industry</th>
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<tr>
<td>USD</td>
<td>400</td>
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<td>Local Rate (THB)</td>
<td>8000</td>
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*Local participant rates are only applicable to residents of Thailand

For enquiries, please contact:
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9 Mohamed Sultan Road #02-01
Singapore 238959
Tel: 65 6352 5220
Email: ilissea@ilissea.org.sg

Registration Link:
https://tinyurl.com/ILSISEAR-Macronutrients

For more information and registration, visit:
http://ilissea-region.org/event/macronutrients2017
Visit us at www.ilsisea-region.org to find out more about our upcoming activities and programs.

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