SUMMARY REPORT

ILSI SEA Region Science Symposium
The Science and Application of Food Consumption Data
Improving Nutrition and Food Safety in Southeast Asia
April 10, 2014
Hilton Singapore

The notion that we are what we eat underpins the recognition, with increasing scientific evidence, that food consumption patterns are linked to our nutrition and health status. Reliable data concerning the food consumption of individuals is needed not only for assessing the nutritional intakes for the population, but also to assess the exposure of individuals to the many other food components and substances such as food additives, chemical and microbiological contaminants present in our food supply, whether intended or not.

Dietary intake data is used by most nations for setting nutrition and safety guidelines, as well as for developing reference international safety standards for food ingredients and products. However, current differences in methodologies for assessing dietary intake mean limited comparability across countries. With dietary risk assessment increasingly carried out at international level, regional and international harmonization of dietary monitoring and intake assessment will become more important.

The symposium ‘The Science and Application of Food Consumption Data: Improving Nutrition and Food Safety in Southeast Asia’, held at the Hilton Singapore on April 10, 2014, was organised as part of ILSI SEA Region’s 21st Annual Meeting. Over 120 participants from food industry, academia, government and non-government organisations attended. The objectives of the symposium were to update on the latest scientific knowledge in food consumption research methods and tools and their current applications relevant to the region; discuss the use of food consumption data to assess population nutrient intakes, exposure to food additives and contaminants, and risk/benefits; review and discuss current challenges, limitations and potential advances in food consumption data collection for nutrition and dietary exposure assessment in the ASEAN region; review the current status of the food composition data in SE Asia, identify gaps, quality of data, and impact on food consumption data in ASEAN; and discuss benefits and challenges of harmonization of dietary assessment tools to enhance data comparability and for health guidelines.

Chaired by Professor Jeyakumar Henry, Singapore Institute for Clinical Sciences (SICS), the symposium commenced with a brief welcome by Mr. Geoffry Smith, President of ILSI SEA Region. Professor Gerhard Rechkemmer, Max Rubner-Institut, Germany, began by reviewing and comparing the different methodologies used in obtaining food consumption data, such as computer-assisted diet history interviews, 24 hour recalls or weighing protocols, each with specific advantages but also methodological weaknesses. He noted that a necessary prerequisite is the availability of reliable food composition data to link the frequency and amount of intake of foods or food categories (e.g. fruit, vegetable, meat, fish etc.) to the respective intake of nutrients. However, without also analyzing the nutrient status by measuring biomarkers in blood or urine, no conclusions about the sufficiency of nutrient supply through the diets can be drawn by just studying the nutrient intake. Prof. Rechkemmer noted that actual data about the consumption of food in the general population or of specific groups of the population (e.g. age, gender) are needed for science-based public health recommendations and for toxicologically relevant exposure assessment of naturally occurring or food processing related substances of concern and for environmentally relevant contaminants. He added that a distinction in the methodology has to be made between studies aiming to evaluate the regular food consumption of a specific population, and total diet studies related to risk assessment of substances in the diet. Prof. Rechkemmer introduced new analytical methods used to improve food consumption data, including metabolomics which aims to analyze hundreds or even thousands of substances in one single analytical sample that may be done in a targeted or non-targeted approach. The major methods used are based either on NMR- or on mass spectrometry-technology, and can
be applied to food or to human body fluids (e.g. blood, urine, saliva). These are new tools which still need to be verified in larger studies but already show huge potential for improving the standard food consumption methodology.

Dr. Wen-Harn Pan, Institute of Biomedical Sciences, Academia Sinica/Institute of Population Health Sciences, National Health Research Institutes, Taiwan, next introduced novel methodology for obtaining and analyzing food consumption data, currently being used in the Nutrition and Health Survey in Taiwan. As Asian food culture is diverse and has clear distinction from its western counterpart, Dr. Pan’s group developed a set of food piece models, corresponding model-to-weight equations, and protocols suitable for quantifying mixed dishes in 24-hour recalls. A comprehensive database documenting multiple characteristics of foods and dishes including amounts, shapes, brands, recipes and time and place of the consumption has been developed and maintained by Dr. Pan’s group. Dr. Pan noted that innovation is needed to estimate the prevalence of nutrient inadequacy, since 24-hour recall data has an inherent problem of poor representation of the long-term intake, and food frequency questionnaires (FFQs) cannot estimate the exact amount of foods consumed. Dr. Pan’s group has utilized a statistical method to remove this daily variation in nutrients, resulting in better population-level prevalence estimates. Dr. Pan cited a further challenge with 24-hour recall data – the difficulty in distinguishing between a non-eater and an eater who simply does not eat the food of interest on that specific day. A method to estimate this proportion of people was developed by combining information from both 24-hour recalls and FFQs. This method has been used to estimate the prevalence of nutrient inadequacy, for example the proportion of people who do not achieve the goal of consuming ‘five-a-day’, proportion of people who eat beef, and for deriving food intake distribution to estimate the exposure to food contaminants or toxicants for total diet studies.

The project ‘Strengthening ASEAN Risk Assessment Capacities: Food Consumption Data’ was initiated by the ASEAN Expert Group on Food Safety, with the support of ILSI SEA Region and the Food and Agriculture Organization of the United Nations (FAO). Mr. Keng Ngee Teoh, ILSI SEA Region, described the project and key outcomes, noting that reliable food consumption data is an essential element for undertaking dietary exposure assessment to support science-based regulatory decision making on food safety issues. However, many ASEAN countries have to-date collected national food consumption data mostly for nutrition purposes, through national nutrition surveys and national health surveys. Recognizing the need to expand the usage of existing food consumption data within the region to include food safety, ILSI SEA Region, FAO and the Food Safety and Quality Division (FSQD) of the Ministry of Health, Malaysia, serving as lead country of this initiative, organized a series of two workshops on ‘ASEAN Food Consumption Data and Exposure Assessment’. The first workshop, conducted in 2011, succeeded in reaching a consensus among national experts on food consumption data and risk assessment that such data should be made available for the purpose of conducting dietary exposure assessment, both at the national and regional levels. The compilation of existing national food consumption data into a common ASEAN database was recommended, with a draft list of food categories developed. The second workshop, held in 2013, succeeded in finalizing the list of food categories and sub-categories, in addition to other requirements for the database including statistical details and age groups. These were harmonized with those requested by FAO/WHO, so that food consumption data from ASEAN countries could be directly used for risk assessment conducted by international expert bodies such as the Joint FAO/WHO Expert Committee on Food Additives (JECFA) and Joint FAO/WHO Meeting on Pesticide Residues (JMPR). Mr. Teoh noted that work to complete the database, using the harmonized templates to compile national food consumption data, was currently underway. He added that future goals in relation to this ASEAN initiative may include harmonizing food consumption survey methodologies and finding ways to further disaggregate composite foods, allowing for more accurate dietary exposure assessment.
Ms. Panpilad Saikaew, National Bureau of Agricultural Commodity and Food Standards (ACFS), Ministry of Agriculture and Cooperatives, Thailand, presented the Thai perspective on using food consumption data for dietary exposure assessment. National food consumption surveys conducted in Thailand had primarily been conducted for nutrition purposes, until the ACFS, as the standard setting body, collaborated with the Institute of Nutrition, Mahidol University (INMU) Thailand, to generate a national food consumption survey for risk assessment purposes. A 4-year project running from 2002-2006, the survey allowed more efficient and accurate overall exposure assessment in Thailand and supported risk managers in their decision making on food safety. Data collection sites covered 17 provinces with a total of 19,000 respondents. The main data collection tool was a semi-quantitative food frequency questionnaire covering 530 items (respondents were shown pictures of various food portion sizes), supplemented with a one-day 24 hour recall. To serve the needs of all users, the consumption data, especially in processed food, was broken down into its ingredients and raw materials, with an electronic food consumption database developed for facilitating use of the data. Ms. Saikaew presented in detail one example of the use of the resulting food consumption data – the development of maximum residue limits (MRLs) for agricultural pesticides.

The Association of Southeast Asia Network of Food Data systems (ASEANFOODS), was established in 1986 with a membership of ten ASEAN countries, and INMU, Thailand as the network’s regional center under the guidance of the INFOODS project of the FAO. Dr. Prapasri Puwastien, ASEANFOODS Coordinator at INMU, noted that the aim of ASEANFOODS was to help strengthen members’ activities in developing good quality national and regional food composition databases. ASEANFOODS achieves this through regular network meetings; conducting training courses on food composition data (FCD) systems and development, and internal and external quality control systems; and facilitating international conferences on FCD. ASEANFOODS has also organized a laboratory performance study (proficiency testing program) and developed resources such as the ASEAN manual of food analysis, the ASEANFOODS website, and the ASEAN Food Composition Tables. The most recent version of the ASEAN FCD, developed in the year 2000, was compiled using data from 6 ASEAN countries (Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam) and included 17 food groups, 1750 food items and 21 nutrients. Dr. Prapasri noted that a new version of the ASEAN FCD should be available by the end of 2014 or early 2015. Despite the progress made over the years, she highlighted the many gaps in terms of the comprehensiveness of both the national and regional food composition data, and urged for more support to enable updates of the ASEANFOODS on missing nutrients and inclusion of data from manufactured and processed foods.

Dr. Sofia Amarra, ILSI SEA Region, Singapore, presented results of a literature review of sodium and sugar intakes in Southeast Asia, showing that, based solely on food consumption data, sodium intakes of adults in Southeast Asia exceeded the WHO recommendation of 2000 mg/day. Preliminary results of an analysis of nationwide survey data from the Philippines suggested that major sources of dietary sodium were instant noodles, dried fish, bread, and canned meat products. For sugar, results of a literature review for Malaysia indicated that the country’s sugar supply is high from Food Balance Sheet and intakes of sugar among adults were also high based on food consumption data. However, while dietary assessment methods are useful in identifying sources of sodium and sugar intake, biomarkers of intake can more accurately estimate their levels of consumption. Dr. Amarra recommended that countries use both food consumption and biomarker measures to enable better intake assessment to guide policy and interventions to reduce excessive sodium and sugar consumption for chronic disease prevention.