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Sompon Wanwimolruk

Mahidol University, Thailand

Food safety associated with pesticide use in South East Asia, with Thailand as a pilot country

Food safety is a very important issue and has been recognized globally. Pesticides are excessively used in agriculture to increase crop production without considering the harmful impacts on human health. Numerous cases of cancer and other adverse health conditions have been reported to be linked with pesticide exposure. Therefore, in developed countries, routine pesticide monitoring and regulation on pesticide Maximum Residue Limits (MRL) in food were set up to protect consumer's health. For South East Asian (SEA) countries except Singapore, this regulation exists in law but is not fully implemented. Thus, pesticide residues in food have not been thoroughly monitored. Also there is a lack of information on contamination of pesticide residues in vegetables and fruits sold domestically in this region. Accurate and reliable information on pesticide residue contamination in foods is essential for planning and implementation of an effective national pesticide monitoring program. Utilizing Thailand as a pilot country, pesticide monitoring survey using Gas Chromatography–Mass Spectrometry (GC-MS) method has been conducted to determine the incidence of pesticide residues detected in vegetables and fruits sold domestically. The vegetables included Chinese kale, pak choi, morning glory, cabbage, tomato, snake bean, cucumber and chili. Fruits studied were watermelon, durian, mangosteen, orange (tangerine), apple, rose apple, guava, pomelo, papaya and mango. The results have shown that all of the vegetables and fruits studied were considerably contaminated with pesticide residues. The rate of pesticide detection in the vegetables ranged from 85% in Chinese kale to 100% in many vegetables including cabbage, tomato and snake bean. Similarly, high incidence of pesticide residues was observed in fruits which included watermelon (91%), 100% in orange, mangosteen and guava. It should be noted that there were many types of pesticide residues detected in the vegetables and fruits. Some of these had pesticide residues at levels of >MRL. The incidence of MRL exceedance for some produce was remarkably high ranging from 29% to 100%. However, it is safe to eat watermelon and durian as the pesticide residues were <MRL. This implies that there is increased likelihood of problems associated with food safety in Thailand. The existing findings provide scientific evidence of detected significant pesticide residues in the commonly consumed vegetables and fruits in Thailand. This situation observed with Thailand as a pilot country, is likely to be observed in the other SEA countries. It strongly suggests that government authorities should implement an effective routine monitoring program of pesticide residues in vegetables and fruits. This will lessen the health risk associated with ingestion of pesticide contaminated food. It also recommends that much research is essential by international and multidisciplinary experts to study the impact on economic, environmental, and health risks, of pesticide use in this region.

Biography

Sompon Wanwimolruk has graduated with BSc and MSc from Mahidol University, Thailand in 1976. In 1983, he obtained a PhD in Clinical Pharmacology from Flinders University, Australia, and spent two years as Postdoctoral research fellow at State University of New York. From 1988-2000, he was a Senior Lecturer at the Otago University, New Zealand. In 2004, he became a Professor of Pharmaceutical Sciences, School of Pharmacy, Loma Linda University, California, USA. He returned home in 2011 and worked as Professor at Faculty of Medical Technology, Mahidol University. He has published more than 110 papers and obtained many awards. He is the Director of Food Safety Research Center, Mahidol University in Thailand.

sompon-999@hotmail.com