

Systematical Assessment of Exposures to Hazards in Daily Consuming Foods by Biomonitoring

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Abstract

In the past more than 10 years in Taiwan, several major incidents associated with foods adulterated with melamine, di(2-ethylhexyl)phthalate, and maleic acid not only significantly impacted the food industries, but also shifted the general public to pay attention to hazardous materials in foods to prevent adverse effects from daily dietary intakes. The assessment of the daily exposures to hazardous compounds in foods through daily ingestion would lay the foundation for the study potential effects resulting from chemical hazards in foods. However, dramatic variations of chemical contents vary with different foods and daily consumption of different foods lead to extremely difficult to assess their exposures. Biological monitoring could an alternative to systematic assessment daily exposures to chemicals in foods if chemically-specific biomarkers could be analyzed and validated. In this paper, acrylamide (AA) will be used as an example to select urinary AA-mercaptopuric acids and AA-induced hemoglobin adducts for analysis and validation as chemically-specific short-term and long-term biomarkers for exposures to AA spontaneously generated from high-temperature processed foods. AA-induced DNA adducts was also analyzed to serve as biologically-effective doses resulting from AA exposures. Our results demonstrated that selection of appropriate chemically-specific biomarkers would be very important for the future epidemiology study of food-borne diseases caused by hazardous materials in foods.