

# Food Safety Testing



# Chemical Contaminants & Food Safety



Globalization of the food supply chain provides economic benefits to consumers. The U.S. currently receives 25,000 shipments of imported food each day. Imports have captured a large share of the market with 92 percent of fresh and frozen seafood, 75 percent of the apple juice, and 52 percent of the grapes consumed coming from outside the U.S.<sup>1</sup>. Food retailers and processors obtain an increasing amount of their products from developing countries where production costs are low and there is virtually no government regulation.

Monitoring imported food products for chemical contaminants has become a major consumer health and safety concern. Regulatory agencies in the U.S., Europe and Japan have established maximum chemical contaminant levels for food products that trigger legal action to remove products from the market<sup>2,3</sup>. Regulations in each of these major markets also define "positive" lists of permissible food ingredients. This regulatory framework has established screening procedures for contaminants and ingredients commonly associated with food products, (e.g.; pesticide residues, preservatives).

Purposeful adulteration of food products with illegal or improper toxic ingredients to cut costs has also emerged as a serious concern with food products imported from some developing countries. A case in point is the massive recall issued by U.K. authorities in 2005 when more than 580 different products were found to contain the banned synthetic dye Sudan Red I<sup>4</sup>.

Intentional contamination of drinking water or food products with cyanide or other chemicals represents another potential threat being addressed by multiple U.S. government agencies (CDC, DHS, EPA, and FDA) issuing analytical guidance documents and response plans.

The changing nature and sources of chemical contaminants will likely require an expansion of established food testing programs and the adoption of new techniques to ensure food safety.

<sup>1</sup> PBS On-Line News Hour Report: *Questions Raised on Food Safety*, June 1, 2007; [http://www.pbs.org/newshour/bb/science/jan-june07/foodfears\\_06-01.html](http://www.pbs.org/newshour/bb/science/jan-june07/foodfears_06-01.html)












































































<sup>2</sup> *Action Levels for Poisonous or Deleterious Substances in Human Food and Animal Feed*; <http://www.cfcan.fda.gov/~lrd/fdaact.html>

<sup>3</sup> *European Union Maximum Residual Levels (MRLs)*; [http://ec.europa.eu/food/plant/protection/resources/mrl\\_pesticide.pdf](http://ec.europa.eu/food/plant/protection/resources/mrl_pesticide.pdf)

<sup>4</sup> *Coloring Foods & Beverages, Food Technology*, Vol. 59, No. 5, May 2005.

# Sample Prep and Analysis for Food Safety Testing

OI Analytical provides sample preparation and turn-key analytical solutions for testing food products and water for chemical contaminants.

	Beverages	Bottled Water	Edible Oils	Fruit	Meat Products	Processed Foods	Tap Water	Fish & Seafood	Spices	Vegetables	Wine
Antibiotics											
Benzene											
Cyanide											
Endocrine Disrupting Chemicals (EDCs)											
Mycotoxins											
Nitrites											
Organochlorine Pesticides			 	 		 			 	 	
Organophosphorus Pesticides			 	 		 			 	 	
Rodenticides											
Semivolatile Compounds											
Sudan Red Dyes											
Sulfites											
Volatile Organic Compounds (VOCs)											



Sample Preparation



Sample Analysis

# Food Safety Testing Solutions



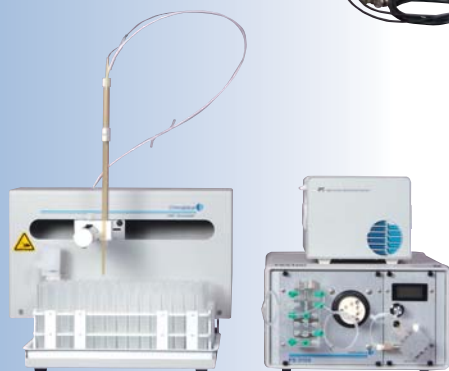
## GPC Sample Clean-up Systems

Gel Permeation Chromatography (GPC) systems clean up food sample extracts by removing co-extracted organic components such as lipids, pigments and proteins. GPC allows isolation and concentration of pesticides, antibiotics, artificial dyes, endocrine disrupting chemicals (EDCs) and mycotoxins from food samples and animal tissues for improved analytical results.



## Selective GC Detectors

Selective GC detectors are particularly effective for pesticide residue analysis because they detect and measure organophosphorus and organochlorine pesticides but do not respond to co-extracted matrix interferences in samples. Using selective detectors facilitates pesticide residue identification and confirmation when used in conjunction with a mass spectrometer.



## CNSolution™ Cyanide Analyzer

The CNSolution™ cyanide analyzer provides a rapid test capability for measuring cyanide in drinking water, beverages and food products. Automated analysis without a preliminary distillation step makes definitive data available in minutes, not hours.



## Eclipse 4660 Purge-and-Trap Sample Concentrator

The Eclipse 4660 processes water and food samples for GC/GC-MS analysis of volatile organic compounds (VOCs). The purge-and-trap technique can be used to analyze for the presence of volatile organic contaminants from food packaging materials, processing, or breakdown of preservatives and ingredients, (e.g.; benzoate salts and ascorbic acid forming benzene).



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