



Media Backgrounder – perspective and detail for journalists:

AGILENT TECHNOLOGIES IN FOOD SAFETY AND FOOD QUALITY TESTING



Few things impact the quality of life of so many people as the quality and safety of the foods they eat. Agilent and its predecessor Hewlett Packard have a long history of developing analytical tools and methods used by government, food industry and private labs around the globe to test food for wholesomeness. Globalization, increasingly stringent import standards, a spate of high profile food-borne illness cases and consumer demand for more safety and for knowing exactly what they are eating are driving tremendous progress as the list of components being tested for grows.

Agilent tools are used to detect and measure food content and quality as well as food safety related to additives, contaminants and residues. Instruments are also used to test food authenticity and labeling accuracy.

Global dynamics.

While much of the world's attention is currently directed at tainted products from specific locations, the need to monitor foods and ingredients is truly global as food products are imported and exported virtually everywhere.

As one of the world's largest food importers, the European Union exerts a major influence on food safety testing globally. The EU Commission has named food safety a top priority, and published a [White Paper on Food Safety](#) designed to ensure safe product along every step "from farm to fork." This includes feed production, primary production, processing, storage, transportation and retail sale. Major food exporters to the EU, in descending order, are: Brazil, Argentina, the US, China, Turkey, Switzerland, New Zealand, Indonesia, Norway and Thailand. Thus, producers and supply chains in those countries must conform to the EU standards, hence its influence on food quality around the world.

There are increasingly stringent import standards in other countries such as Japan, where exporters such as the EU, China and the US must comply to export food there. Countries in Asia are also increasingly establishing quality regulations for food produced for in-country consumption.

Additional information about international food safety organizations and standards is available at”

- Codex Alimentarius Commission of the World Health Organization
 - www.codexalimentarius.com
- Food and Agriculture Organization
 - www.fao.org
- World Health Organization
 - www.who.int

Who does the testing and what issues do they face?

There are three main types of laboratories concerned with food safety testing:

- **Independent contract labs**
- **Commercial labs (connected with food manufacturers, importers/exporters)**
- **Government labs**

Many of these labs must continually acquire methods to detect new compounds. For example, labs did not need to test for melamine until the recent poisoning of thousands of dogs and cats. Now, large quantities of wheat, rice and corn gluten used throughout the world must be screened for melamine and related compound cyanuric acid.

Agilent instruments used for food safety testing.

Agilent instruments, systems and supplies are used throughout the food production chain, including incoming inspection, new product development, quality control, and packaging. There are three main categories of Agilent instruments used to test food ingredients and finished products for quality and safety:

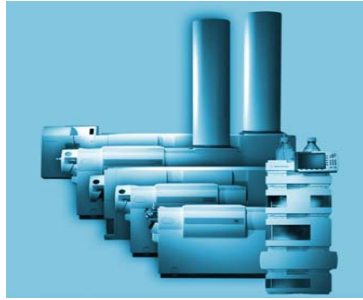


- Gas Chromatography (GC) and Gas Chromatography/Mass Spectrometry (GC/MS).
- Liquid Chromatography (LC) and Liquid Chromatography/Mass Spectrometry (LC/MS)
- Inductively-coupled plasma mass spectrometry (used to detect trace levels of metals).



1200 Series LC

GC and LC are used to separate mixtures into their individual components. These techniques can often be used on their own to screen food products for prohibited compounds. The GC is the instrument of choice when the sample can be vaporized without too much difficulty. LC is useful for separating nonvolatile and thermally fragile molecules. For more complex mixtures or when more information is required, a GC or LC is often used in conjunction with an MS. The latter is particularly useful in identifying unknown compounds and determining the amount of each substance encountered.



6000 Series MS



7700 ICP- MS

Pesticides

Most fruits and vegetables we eat are protected from insects during growth by chemical pesticides. Agilent GC, GC/MS, LC and LCMS systems are widely used to screen produce to see that Maximum Residue Levels are not exceeded and that traces of banned pesticides are not present.

Melamine

This is an industrial chemical that, when added to foods by unscrupulous vendors, provides the illusion of higher protein content. It also triggers kidney stone formation and kidney failure in humans and animals, and is a growing problem. Agilent has developed methods for detecting and measuring melamine in wheat, rice and corn products, and most recently in dairy products. These include recently developed SampliQ sample preparation cartridges, GC/MS and LC/MS/MS depending on the testing lab's requirements.

Fatty acid methyl Esters (FAMES)

This analysis of edible fats and oils is an important measure of food quality and healthfulness. The human body needs essential fatty acids for optimal health and wellbeing. Essential fatty acids control many functions in the body and are part of the cells. Agilent has developed two GC/MS methods, one for analyzing "classical" edible oils and fats and a second for more complex samples such as fish oils and hydrogenated fats.

Veterinary Drugs

Drugs are commonly administered to livestock and poultry to prevent/treat illness and also to enhance growth. Residues of these drugs may be found in milk, eggs, fish and meat, and government agencies around the world use strict surveillance and monitoring programs to prevent unsafe levels from reaching consumers. Various configurations of LC/MS systems are used to detect and measure these complex compounds.

Mycotoxins

Mycotoxins are widely regarded as some of the most serious naturally occurring toxins that can contaminate our food supply. Legislation has set stringent permissible limits, and Agilent LC and LCMS systems are used to analyze this important class of compounds.

Packaging

Packaging's role in protecting and keeping food fresh is well known. However, compounds can unintentionally migrate from the packaging materials to the food, and these must be monitored to assure a wholesome product.

Additives

A wide variety of additives are used to enhance food products' shelf life, color, texture and flavor. All additives must be proven to be safe, effective and measurable before being allowed in food. Most countries only permit additives on an approved list. Agilent's portfolio of instrumentation and applications expertise provides food scientists with the tools they need to analyze these compounds.

Metals

Metals occur in many foods, either naturally or as a result of pollution. While trace amounts of some metals are important nutrients, higher quantities and other metals can be highly toxic. An example of the latter is methylmercury found in fish and shellfish. Agilent is a leading provider of ICP-MS tools which are unsurpassed in the detection of trace metals.

Working with food customers around the globe.

Technical experts at Agilent Technologies are continuously updating their expertise in food safety testing by capturing new knowledge and perspectives from around the world directly from food customers: government agencies, routine food laboratories and food industry and transforming these inputs into creativity that brings innovative products and services to the global food customers.