

Food Digest

How safe is your food?
SCIEX testing solutions will show you



When it comes to food safety, you can't afford a wrong result.

Find the solutions to get the right answer every time in every analysis, from contaminations to fraud.



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Follow us!



Do you know what's really in your food?



Nearly 4 billion tons of food are produced each year to feed our global population of nearly 7 billion people. The safety and quality of the global food supply is fundamental to human health and prosperity, and contaminated food has been linked to acute and long-term (and sometimes even life-threatening) health risks.

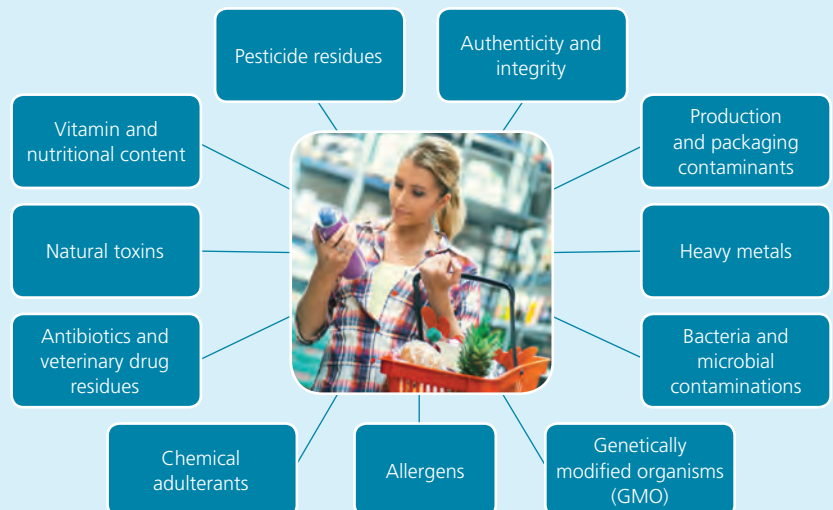
Food contamination affects everyone. Food producers are stressed to ensure the production of sufficient quantities of food to meet global demand. Chemical residues, such as pesticides or antibiotic drugs, are sometimes used to increase farming productivity, and those residues have the potential to accumulate in the resulting food products. Manufacturing plants are often required to process a variety of different

products in a single facility, resulting in cross contamination risks (a potential cause of unclaimed allergens). Food suppliers, farmers, manufacturers, and regulatory agencies remain on a mission to ensure global food safety, and they want consumers to feel good about what they are eating.

Just what are food safety scientists testing for? Your food can contain contaminations of all kinds, including heavy metals, microbial contaminants, allergens, or chemical residues such as pesticides or adulterants. It is the job of the food industry to assess the food supply on a daily basis to ensure that our food is free of hazardous contaminants and is good enough to eat.

What's in your food?

Food contaminations and adulteration can come in many different forms. Many food producers, manufacturers, and regulators work hard every day to ensure all food is safe and healthy to eat, meets label claims, and is free of potential hazardous contaminations.





The trials of a food tester

It is a great feeling to know that you are buying food that is safe to eat when you go to the grocery store. We have the food safety testing industry to thank for that. Food scientists work day-in and day-out testing food for contaminants and/or nutritional value, developing new methods to better test food for those assorted compounds, and surveying food samples for potential unknown residues, adulterants, or other components.

Food scientists have a number of things to consider when approaching a food testing workflow. The most critical is finding a contamination – an error could have devastating consequences, including consumer health impacts and product recalls.

Top considerations in food testing

Food samples are innately complex, making food analysis a challenge. Food products contain an assortment of chemical compounds, from proteins, carbohydrates, fats, and vitamins (healthy compounds) to residues and contaminants (unhealthy compounds). It is the job of the food tester to find anything unwanted, or potentially hazardous, among all the good.

Food samples are also perishable, so testing must be done in an efficient and timely manner. Food testing labs are often faced with stringent sample turnaround deadlines – they are not only pressured to produce accurate results, but must do so under significant time constraints.



Technical steps in food testing

The food testing workflow contains many steps – first, residues of interest must be extracted from the food sample. Then, any interfering or unwanted matrix components (such as the proteins, sugars, or other endogenous compounds) must be removed to reduce their impact on the measurements. Next, the samples are analyzed using the appropriate technology. The data is processed, and any findings reported. Each of these steps must be strategically considered and optimized to ensure the best results for the analysis.



The primary technical considerations can be summarized as follows:

Parameter	Description
Accuracy	The closeness of an analytical result to its true value, often reported as a % accuracy relative to the expected value.
Precision	The closeness of the results of multiple analyses to one another, often reported as a % coefficient of variation (CV) of the results of multiple measurements.
Selectivity and specificity	The degree of confidence that the desired measurement is due to the presence of the compound or contaminant of interest and not to other influences (such as matrix components or other chemicals or compounds).
Robustness	The evaluation of how well a method stands-up to changes in variables, conditions, and external factors. of how well a method stands-up to changes in variables, conditions, and external factors.
Sensitivity	The instrument response to the presence of a compound of interest relative to the instrument response to a blank sample (noise).
Reliability	Assurance that the method produces very few to no false positive or false negative results. Reliability is the culmination of the strength of the other 5 parameters listed.

There are additional elements and parameters essential for method development and validation. Laboratories are recommended to follow method development and validation guidelines provided by ISO, SANCO, AOAC, and other internationally recognized organizations.

All of these components funnel into one main question:

Confidence and reliability – are you sure your positive samples are actually positive, and your negative samples are actually negative?

When considering all of these elements, we can see how challenging food testing can be! SCIEX strives to empower food testing scientists with the best technology and support

to enable them to meet each of these challenges and demands. This eBook is designed to provide an overview of the SCIEX food testing solutions and innovations, supporting our valued food safety testing scientists, and giving consumers that extra confidence that the food they are eating is safe.



Experience SCIEX MS—Virtually and Around the World

Attend the ASMS in Case You Missed It Virtual Conference to learn all about the technology behind the X500R and how you can leverage it to bring balance to your lab. In the Presentations section, just Filter By: Food & Environmental Testing. Start exploring the future of high resolution mass spectrometry for all of your routine testing needs!

sciex.com/ASMSConf

Information Packed Virtual Conference



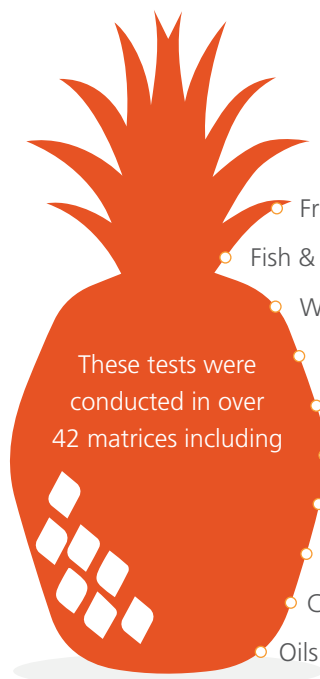
Food testing individuals in over 50 countries rely on SCIEX solutions in their work and later write about it. Since 2009, SCIEX instruments were used to publish nearly 800 articles in 47 food testing journals including

- Food Chemistry
- Journal of Chromatography
- Journal of Agricultural Food Chemistry
- Analytical and Bioanalytical Chemistry
- Food Additives & Contaminants
- Food Control



Articles cover the spectrum of food testing analysis including

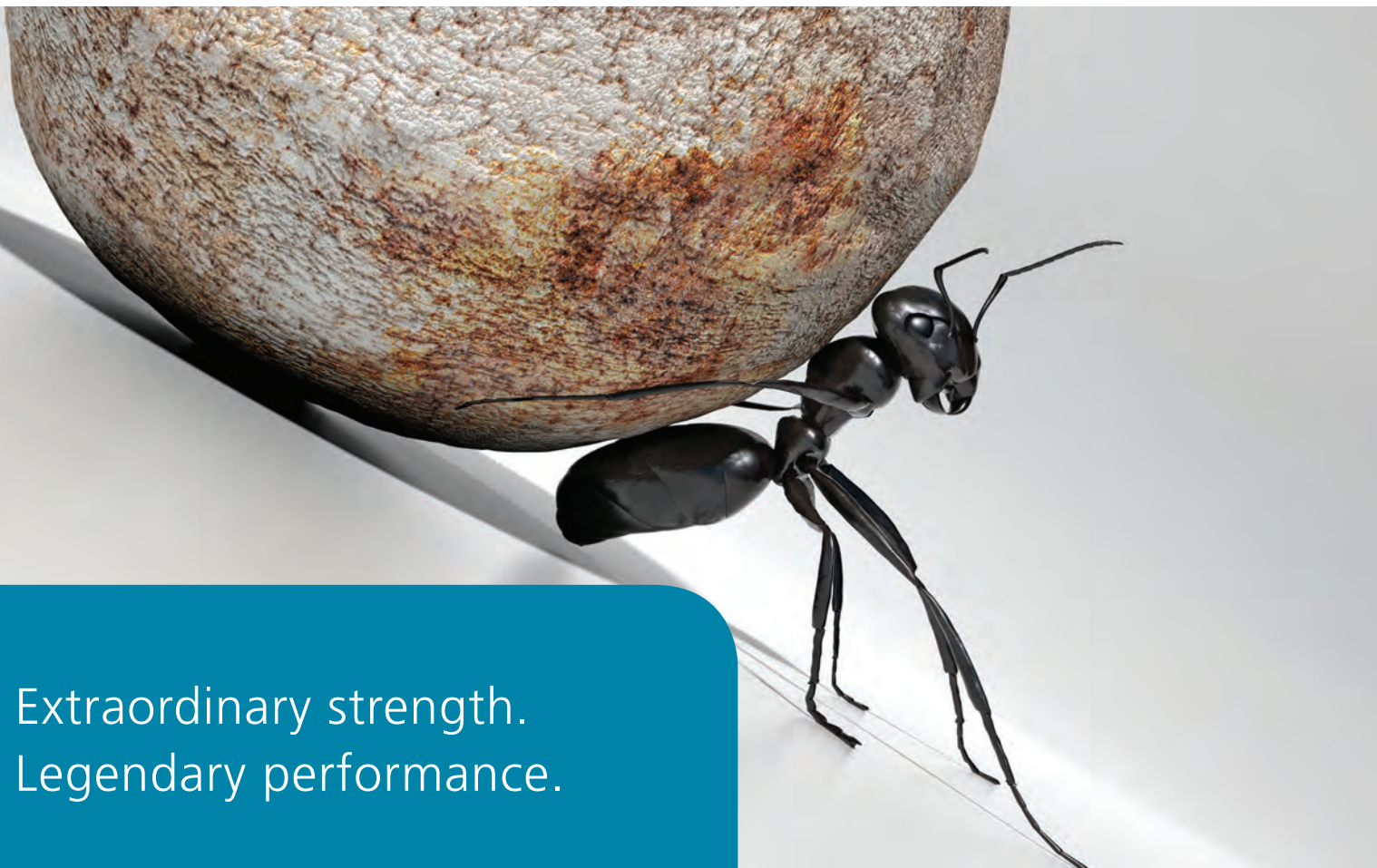
- Veterinary drugs
- Pesticides
- Bioactives
- Mycotoxins
- Marine biotoxins
- Adulteration
- Process contaminants
- Nutrients



These tests were conducted in over 42 matrices including

- Fruit & vegetables
- Fish & seafood
- Water
- Biological fluids
- Meat & meat products
- Cereals & bakery products
- Beverages
- Milk & dairy products
- Chinese medicines
- Oils & fats

Answers for Science. Knowledge for Life.™



Extraordinary strength.
Legendary performance.

THE LC-MS/MS WORKHORSE FOR ROUTINE FOOD TESTING



Real-world labs need an industrious LC-MS/MS workhorse for trustworthy results hour after hour, day after day. The SCIEX 4500 Series takes the legendary API 4000™ system's triple quad platform and intelligently re-engineers it to set a new benchmark for reliable quantitation.

When labs need a mass spec to stand-up to long runs of dirty food samples, they rely on the 4500 system.

[Explore the new workhorse at sciex.com](http://sciex.com)



Pesticides in foods and beverages



There is a growing need to increase the global food supply, putting pressure on farmers to maximize profitability from their crops. As a result of this growing need, there has been a surge in the use of pesticides, fungicides, and herbicides on crops to aid in preventing spoilage from insects, weeds, microbes, and fungi and to increase the life of the crop. Unfortunately, these pesticide compounds, and their metabolites and by-products, then enter the food supply and are consumed by the general public.

Health risk: Lab studies have shown that consumption of or exposure to pesticides can cause health problems ranging

from birth defects, nerve damage, and cancer*. There is little information on the health risks of long-term exposure to pesticides, however toxicological studies of the impacts of pesticides have led to many regulatory restrictions on the levels of pesticides that can be present in various food products.

Getting to a solution: SCIEX solutions for pesticide testing in foods and beverages enables food testing labs to get answers—what pesticides are in this food sample, and how much? Labs can easily implement a start-to-finish workflow to extract pesticides from samples and identify which pesticide compounds are present (and how much of them are present).

Featured software

SCIEX OS – The complete software solution for routine pesticides in food and beverage testing. Comprehensive and easy to learn this simplified software platform is designed for high throughput screening of 100s in no time at all.

Brochure: **SCIEX OS**

Video: **SCIEX OS Demo**

Video: **Using the X500R QTOF System and SCIEX OS Software to Identify and Quantify Food Residues**



* <http://www.epa.gov/pesticides/reregistration/status.htm>

Robustness for pesticide analysis, hour after hour, day after day

The QTRAP® 4500 System

It's time for legendary performance for reliable screening and quantitation of pesticides in food and environmental samples.

- Sensitivity, reliability, and robustness meet the needs for routine pesticide analysis
- Simultaneously quantitate with multiple reaction monitoring (MRM) and collect high speed full-scan MS/MS for ID confirmation with library searching
- Fast polarity switching to enable analysis of positive polarity pesticides and negative polarity pesticides in a single injection
- Superb software to enable high throughput data analysis – many analytes in many samples, but in less time

Brochure: [QTRAP 4500 LC-MS/MS SYSTEM](#)



Learn more!

[Comprehensive Quantitation and Identification of Pesticides in Food Samples using the QTRAP® 4500 System](#)

[Using QTRAP at full potential – Validation of quant/qual workflows for pesticide analysis in foods](#)

[Automated Sample Preparation and Analysis Workflows for Pesticide Residue Screening in Food Samples using DPXQuEChERS with LC-MS/MS](#)

[Pesticide Analysis Accelerated Lab Integration \(ALIT™\) Package](#)

Webinar: [Increasing analytical sensitivity for pesticide analysis in foods using microflow LC](#)



Antibiotic and veterinary drug residues



These days, it is quite common for antibiotics to be used in food animals as growth promoters and to prevent or treat infections. These antibiotics are often given to animals orally or through injection, and can potentially accumulate in the edible tissues or in other edible animal by-products (such as milk or eggs). Antibiotics are also sometimes used in the farming of seafood and in bee colonies, where antibiotics can accumulate in the honey.

Health risk: If you've heard of the term 'super bugs', then you are aware of the risks associated with overuse of

antibiotic drugs. The propagation of use of these drug residues in our food supply increase the risk of bacteria developing resistance to these antibiotics, thus reducing their efficacy to cure infections.

Getting to a solution: SCIEX solutions for antibiotic drug residue testing in foods and food products enables food testing labs to identify very low levels of antibiotics in food samples, to identify both the presence of antibiotic drugs that are prohibited for use and to quantify how much is there.

Featured software

We have created an extensive High Resolution library for antibiotic and veterinary drug residues. This detailed database can be quickly imported to SCIEX OS for fast residue screening and customized targeted analysis in seconds. This is also available for LibraryView™ and MasterView™.

Method Flyer: [Antibiotic analysis in food](#)

Video: [SCIEX OS: Data processing - Quant with Library Search](#)

Software Trial: [Download a free trial of the Antibiotics and veterinary library and a free XIC List](#)



Sensitivity and speed for low level antibiotic detection and quantitation

The QTRAP® 5500 System

With high performance sensitivity and MS/MS scanning speed, you can simplify sample prep and even combine screening assays to increase productivity for your antibiotic veterinary drug residue testing methods.

Perform multiple reaction monitoring (MRM) for quantitation and collect high speed MS/MS for ID confirmation

- Identify, and quantitate hundreds of analytes in a single run
- Enable high-sensitivity full-scan MS, MS/MS, and MRM

Brochure: [QTRAP 5500 LC-MS/MS SYSTEM](#)



Learn more!

[Screen for 169 veterinary antibiotic drug residues in tissue, milk, or honey: An iMethod™ Application](#)

[Analysis of multi-class antibiotic residues and assorted insecticides in feed samples in a single injection](#)

[Accurate quantitation of 9 Coccidiostat antibiotic residues in milk samples using 4000 QTRAP® system](#)

Webinar: [Enhanced sensitivity in residue testing with the QTRAP 6500 system – Analysis of residues in animal hair samples](#)



How to screen for unknown contaminants and adulterants



Sometimes contaminants in food can arise unexpectedly. For example, hazardous by-products resulting from chemical reactions that may occur during cooking or processing could cause a safety concern to human health. Or, toxic substances can be deliberately added to food to deceive the consumer (melamine as an example).

Health risk: Emerging contaminants and adulterants can sometimes pose the greatest health risks of all. In the case of melamine, little was known about the compound until animals and children were affected (some affects resulting in death).

For this reason, the ability to survey samples for unknown or unexpected compounds is very important in ensuring global food safety.

Getting to a solution: SCIEX solutions for unknown contaminant surveillance give food safety scientists the ability to screen food samples for any and all potential compounds that are present, then identify what those compounds are, and quantify how much of them are present – all in a single analysis. Sometimes you need to look for compounds that you don't know you're looking for, and our solutions allow you to do that.

Featured software

SCIEX OS and MasterView™ Software, enable the qualitative review of LC/MS and MS/MS data collected using X-Series QTOF and TripleTOF® systems for exploration and interpretation of mass spectral data, including comparative analysis, library searching, structural elucidation, and more.

Video: [Targeted list screening using MasterView Software](#)

Video: [SCIEX OS – Get to know the Interface](#)

Video: [Using the X500R QTOF System and SCIEX OS Software to Quickly Identify Unknowns in Food Samples](#)



Taking The Difficulty Out Of Difficult Matrices

The TOF X500R LC-MS/MS System

The X500R is the first high resolution mass spec system for labs tasked with routine detection of low levels of compounds in complex samples or required to profile the composition of samples full of unknowns.

- Simplicity in hardware and software design for ease of operation, regardless of technician's skill set
- Robustness delivered for analysis of complex samples with the Turbo V™ ionization source
- Balanced across key criteria to deliver performance without compromise
- Superior instrument uptime with fast and efficient maintenance
- Stability through long runs with automated calibration
- Sleek, compact design requires little lab space

Brochure: [X500R QTOF SYSTEM](#)



[Learn more!](#)

[Download your exclusive info kit here!](#)



Targeted multi-contaminant and adulterant testing



The previous section, 'Unknown Contaminants and Adulterants', described the need for food testing labs to search food samples to discover unknown, unexpected, and non-targeted contaminants. And, once any potential contaminants are discovered, they are often monitored routinely in food to ensure continued food safety and integrity. Some contaminants include azo-dyes, which have been known to be illegally used to adulterate spices, 4-methyl imidazole (or 4-MEI), which was identified as a by-product of caramel coloring used to darken food products (such as cola, soy sauce, and others), and many others.

Health risk: Contaminants and adulterants typically pose some of the greatest health risks to humans given that they are usually synthetic chemicals foreign to the body. Ultimately, the side-effects of consumption of these contaminants could be unknown, but some have been shown to result in significant toxicity and poisoning of the body's organs.

Getting to a solution: SCIEX offers sensitive, accurate, and simple methods for labs to quickly analyze food samples to find and quantify assorted contaminants and adulterants. We let our robust and sensitive instruments do the heavy-lifting of the analysis, enabling labs to implement straightforward sample preparation to ensure the best accuracies and recoveries for these analyses.

Featured software

MultiQuant™ Software – a powerful and easy-to-use quantitation software package that enables labs to quickly process targeted MRM data for many analytes in many samples, all at the same time, for a high level of productivity for food testing labs doing targeted contaminant quantitation.

Video: [Creating quantitation tables in MultiQuant](#)

Video: [Navigating results tables in MultiQuant](#)

Video: [Processing large batch data using query files](#)



Robust adulterant analysis, hour after hour, day after day

The QTRAP® 4500 System

Legendary performance for reliable screening and quantitation of multi-contaminants in food and environmental samples.

- Sensitivity, reliability, and robustness meet the needs for routine contaminant analysis
- Simultaneously quantitate with multiple reaction monitoring (MRM) and collect high speed full-scan MS/MS for ID confirmation with library searching
- Superb software to enable high throughput data analysis - many analytes in many samples, but in less time

Brochure: [QTRAP 4500 LC-MS/MS SYSTEM](#)



Learn more!

[Analysis of 13 azo-dyes in spices using LC-MS/MS](#)

[Analysis of packaging migrants in food products using LC-MS/MS](#)

[Fast and sensitive detection of melamine and cyanuric acid in pet foods](#)

[Sensitive detection and quantitation of 4-methylimidazole \(4-MEI\) in beverages](#)

[Quantitation of acrylamide in starch-rich food products](#)



Mycotoxins and natural toxins



Not all food toxins are introduced by human hands. Some toxins, including mycotoxins and marine biotoxins, occur naturally. Mycotoxins production (which are secondary metabolites resulting from mold produced in foods and grains) is often the result of natural environmental conditions, while marine biotoxins are simply the natural toxins produced by phytoplankton in the marine food products such as shellfish. The only way to ensure that the levels of these toxins are below human risk limits is to test for their presence.

Health risk: Mycotoxicosis, or poisoning due to the consumption of mycotoxins, can result in a variety of effects both acute (vomiting) and chronic (death). Similarly, marine biotoxin poisoning can result in symptoms ranging from mild (gastrointestinal upset) to major (respiratory paralysis and death).

Getting to a solution: SCIEX solutions for natural toxin testing enable labs to obtain more information in a single analysis, allowing the coverage of a wide range of toxins to be identified and quantified in just one short sample run.

Learn more!

Simultaneous Analysis of 14 Mycotoxins and 163 Pesticides in Crude Extracts of Grains by LC-MS/MS

Screening for 243 mycotoxins and metabolites in food samples: An iMethod™ Application

Webinar: **Determination of mycotoxins in milk-based products and infant formula**

Webinar: **Analysis of Biotoxins in Seafood and Phytoplankton by LC-MS/MS with QTRAP® Technology**

Flyer: **Mycotoxin analysis in food**



Sensitivity, reliability, and robustness to meet regulatory demands for natural toxin screening and quantitation

The QTRAP® 4500 System

Legendary performance for reliable quantitation of natural toxins in food and environmental samples.

- Simultaneously quantitate with multiple reaction monitoring (MRM) and collect high speed full-scan MS/MS for ID confirmation with library searching
- Mass ranges up to 2000 m/z to detect larger toxins with high accuracy
- Legendary robustness for reliability of results, hour after hour, day after day

Brochure: [QTRAP 4500 LC-MS/MS SYSTEM](#)



We're passionate about LC-MS/MS – it's what we do, day-in and day-out.

SCIEX mass spectrometry solutions are backed by a global customer support network comprised of certified engineers, technical specialists, training experts, application support chemists, and regional logistic centers – all dedicated to helping you get the most from your SCIEX system.

Contact our support team now for help from every topic ranging from sample preparation to mass spec optimization, and more.

sciex.com/support



Andre speaks your language

Talk to him about your applications

Andre is fluent in LC-MS/MS applications and his years of experience in application development for food and environmental testing speaks volumes. Give him a few minutes, and he can save you a few hours. He can streamline your workflow, reduce manual steps, and help you generate your data with improved efficiency and confidence. Ask him for a quick demonstration of one of our application software packages, and he'll show you how to bring your lab to new levels of productivity.

Andre is more than an application expert. He's a part of the SCIEX global support network here to help you achieve success.

- Andre Schreiber, Global Technical Manager, Food and Environmental Applications

Gluten and Allergen vMethods find out more



Discover more information about the comprehensive vMethods our experts have created for dedicated Allergen analysis which enables the reliable and accurate detection of 12 key allergens in different types of matrices at once to levels as low as 10 ppm or as high as 500 ppm without worry.

Our scientists have also developed a highly accurate and reliable vMethod for the quantitation and screening of 4 key gluten species of wheat, rye, barley and oats. With verified limits of quantitation for wheat at 5ppm in baked goods and raw materials the risk of reporting false positive or negative results is significantly less than that of existing technologies.



Sensitivity, Accuracy, Reproducibility and Speed for low level antibiotic detection and quantitation.

The SCIEX QTRAP® 6500+ System

The QTRAP 6500+ the boundaries of LC-MS/MS quantitation farther than ever before. The revolutionary sensitivity, speed, and performance delivered through these technology enhancements are designed so you can see it all, from low mass to high mass compounds, in positive or negative polarity – in a single injection, with high sensitivity, reliability, and confidence.

Perform multiple reaction monitoring (MRM) for quantitation and collect high speed MS/MS for ID confirmation

- Identify, and quantitate hundreds of analytes in a single run
- Enable high-sensitivity full-scan MS, MS/MS, and MRM
- MRM3 workflows provide enhanced quantitative selectivity in those complex matrices

Brochure: [QTRAP 6500+ LC-MS/MS SYSTEM](#)



Learn more!

[The Detection of Allergens in Bread and Pasta by Liquid Chromatography Tandem Mass Spectrometry](#)

[Allergen Detection in Wine by Micro Flow Liquid Chromatography Tandem Mass Spectrometry microLC-MS/MS](#)

[Gluten detection and speciation by LC-MS/MS](#)

Webinar: [Changing the analytical landscape of allergen detection](#)

Webinar: [Allergen screening in foods by LC-MS/MS](#)



Ingredient profiling and authenticity testing



Adulteration and misleading food labeling is a common problem in the food production industry, where producers sometimes employ fraudulent practices to save money or increase production. This can often be the case in fruit juices, where an expensive ingredient (for example, acai or pomegranate juices) might be replaced with a less expensive alternative (such as apple or grape juices).

Consumer benefit: Consumers want to feel confident and secure in the quality of the foods they are buying. Perhaps you are paying a higher premium for an ‘organic’ or ‘all natural’ product, or you are buying a product for the health benefits of a particular ingredient (such as acai or pomegranate).

In either case, you as the consumer should feel assured that the product is labeled accurately, and you are getting the quality of goods that you’re paying for.

Getting to a solution: SCIEX food testing solutions enable food profiling that allows food testing scientists to quickly survey the content of a food sample, or compare multiple food samples, to assess the authenticity of the food or profile the ingredients. These innovative testing approaches can ensure not only best practices by food producers but also give consumers the peace-of-mind that they deserve when it comes to the food they are buying.

Featured software

MarkerView™ Software – enables labs to process data acquired across multiple samples and perform a Principal Component Analysis (or PCA) to show the relationships between samples—both their similarities and any differences—to assist in profiling and comparing multiple food products.



Profile food samples to test for authenticity or ingredient content

The QTOF X500R LC-MS/MS System

The simple, balanced hardware design combined with the new SCIEX OS software user interface makes the system easy to learn, and the robust performance enables you to get the right results quickly, reliably, and with maximum uptime for all your routine testing applications.

- Simplicity in hardware and software design for ease of operation, regardless of technician's skill set
- Robustness delivered for analysis of complex samples with the Turbo V™ ionization source
- Balanced across key criteria to deliver performance without compromise
- Superior instrument uptime with fast and efficient maintenance
- Stability through long runs with automated calibration
- Sleek, compact design requires little lab space

Brochure: [QTOF X500R LC-MS/MS SYSTEM](#)



Learn more!

[Assessing the authenticity of fruit juices using TripleTOF and QTRAP® LC-MS/MS technologies](#)

[Testing for adulteration of extra virgin olive oils using Principal Component Analysis workflows](#)

Webinar: [Wine authentication using metabolomic fingerprinting with high resolution LC-MS/MS](#)

Webinar: [Meat authenticity using LC-MS/MS: Identification and detection of biomarker peptides specific for horse and pork in halal beef](#)



Analysis of vitamins and nutrients in foods and beverages



These days, nutritional labels are very important to the food consumer. People often make food purchasing decisions based on nutritional content and rely on that information to ensure they are consuming the proper nutrients to maintain their health and well-being.

Consumer benefit: Knowledge of the vitamin and nutrient content in foods can enable consumers to be sure they are eating the right foods with the necessary vitamins and minerals needed for a healthy life.

Getting to a solution: SCIEX has innovative new methods to enable the analysis of multiple vitamins and nutrients in food products, including solutions for the analysis of fat soluble vitamins (assorted forms of Vitamins A, D, E, and K) and water soluble vitamins (assorted forms of Vitamins B and C), as well as assorted antioxidant compounds, enabling labs to study nutrients in foods with ultimate sensitivity, selectivity, and reliability.

[Learn more!](#)

Analysis of the Vitamin B Complex in Infant Formula Samples by LC-MS/MS

Poster: **Analyzing water soluble vitamins in foods using LC-MS/MS**

Poster: **Analyzing fat soluble vitamins in foods using LC-MS/MS**

Poster: **Detection of polyphenolics and healthy antioxidants in foods and drinks by LC-MS/MS**

Webinar: **Innovations in vitamin analysis using LC-MS/MS**



Excellent productivity and performance on a small budget

The SCIEX Triple Quad 3500 System

This system offers excellent performance for the analysis of vitamins and nutrients in food products.

- Sensitivity, reliability, and robustness to meet the needs for vitamin and nutrient analysis in foods
- Easily interchangeable ion sources to cover the wide range of ionizations needed to cover vitamin and nutrient applications
- Hybrid triple quadrupole and linear ion trap technology to enable simultaneous quantitation and identification of vitamins and nutrients, even in complex food samples.

Brochure: [Triple Quad 3500 LC-MS/MS SYSTEM](#)



Legendary power, modern precision

SCIEX TRIPLE QUAD™ 3500 MASS SPEC SYSTEM



Meet the challenge and take charge of your lab's success.

Achieve productivity, reliability, and robustness for your routine mass spec analyses with the modernized entry-level mass spec system designed for today's analytical laboratories.

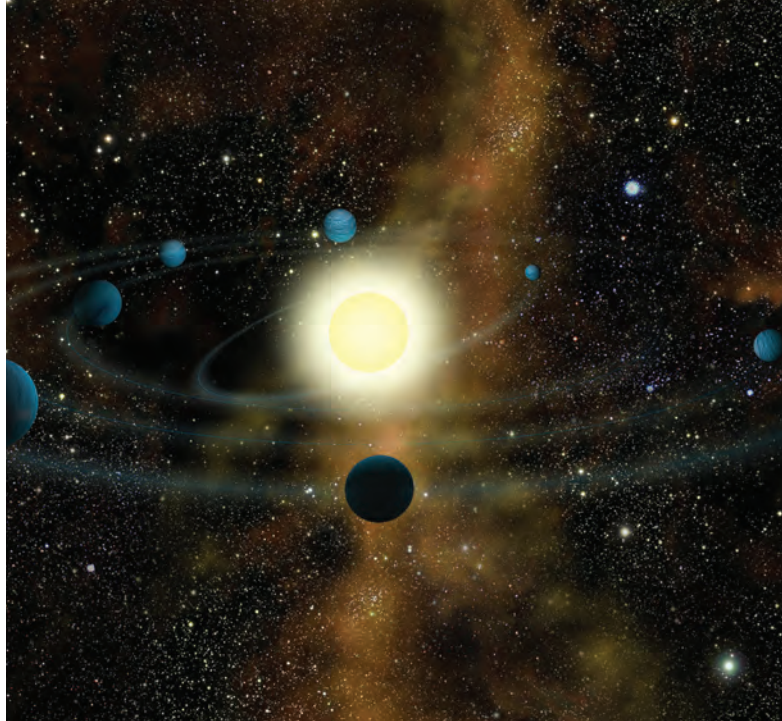
Detect more compounds with more uptime and more reliable results with the new SCIEX Triple Quad™ 3500 LC-MS/MS system.

Legendary power, speed, and accuracy are now more affordable than ever.

[Learn more at sciex.com/3500QQ](http://sciex.com/3500QQ)

Workflows that are out of this world!

How to improve food testing with QTRAP® technology



Most food or residue testing labs focus on identifying and quantifying chemical residues (pesticides, antibiotic drug residues, mycotoxins, and the assorted applications described in the previous pages of this eBook) in food or other samples using MRM quantitation on a triple quadrupole mass spec.

But did you know that QTRAP® MS/MS systems can do that MRM quantitation and a whole lot more?

QTRAP is not just an ordinary Triple Quad!

QTRAP can enable new and exciting workflows for your lab that are out of this world. Go beyond basic MRM detection to overcome some of the common issues you face every day:

- Battles to ensure proper sensitivity to meet regulatory demands
- Reducing matrix interferences that introduce ambiguity in data
- Ensuring added confidence in positive findings

The fundamental difference between SCIEX Triple Quad™ MS system and a QTRAP MS system is the linear ion trap (or LIT). In a QTRAP system, Q3 is able to function like a regular Triple Quad MS but also has some added capabilities. So, the system is able to do MRM but can also trap, dissociate, and accumulate those fragments to give you more power than ever before to collect:

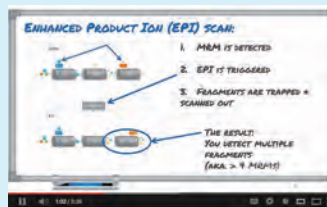
- Fast and high sensitivity full scan experiments, such as Enhanced Product Ion (EPI) scanning
- Second-generation MRM – the ability to detect fragments of fragments, or MRM³
- And much more!



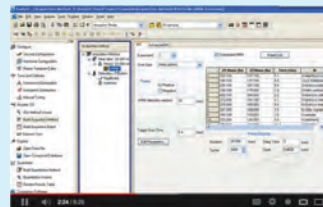
How to use EPI and MS/MS compound libraries for routine residue testing applications:



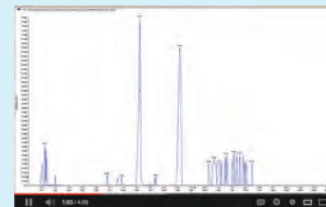
Video 1 gives you a quick overview of the benefits that QTRAP can bring to help improve some of the problems you might experience in your methods every day, such as overcoming matrix interferences and gaining more confidence in the results you report.



Video 2 provides a brief overview of Enhanced Product Ion (EPI) scanning, and how it can improve results for your routine residue quantitation methods beyond standard MRM detection.



Video 3 is a how-to video that will guide you through the 6 steps to setting-up an MRM-EPI acquisition method. Take your normal MRM method and upgrade it to trigger enhanced product ion scans to get more information from your sample – to detect, quantify, and confirm positive findings – in just one injection.



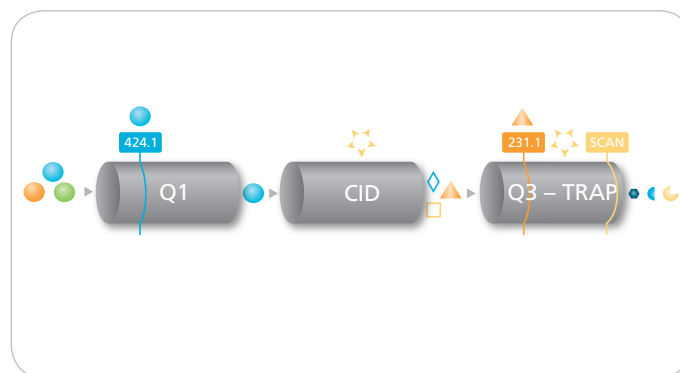
Video 4 will show you how you can use MasterView Software to process 13 food samples for 100s of compounds in less than 3 minutes - faster and easier than you think!

Learn how MRM³ can be used for enhanced selectivity in complex matrices for routine residue quantitation:

Watch the video: [Learn more about the basics of MRM³ for food testing](#)

Download the application note: [Applying MRM³ to enhance selectivity for quantitative analysis, even in complex matrices](#)

Get more resources on QTRAP applications for food testing at sciex.com/QTRAP-for-food-testing



The best in food safety testing: How to be successful and get answers

Technology and software innovations from SCIEX

The product	How it benefits a food testing lab	Learn more
6500 Series	The high sensitivity of the 6500 enables you to see low levels of contaminants in food never achievable before. This sensitivity can be used to better screen for residues of 'zero tolerance' or banned substances, or to enable dilution of samples to eliminate potential matrix interferences that can often complicate results.	Video: 6500 Series with IonDrive™ Brochure: QTRAP® 6500 LC-MS/MS system: Exceedingly sensitive. Sharply focused.
4500 Series	Considered the workhorse of mass spec instrumentation, the 4500 system can stand-up to repeated injections of dirty samples, requires minimal maintenance, and also has the performance features to provide excellent sensitivity, accuracy, and selectivity needed for reliable quantitation of contaminants in food. The 4500 series offers rugged and reliable performance for high-throughput food testing labs.	Video: 4500 Series workhorse MS Brochure: QTRAP 4500 LC-MS/MS system: The new workhorse for LC-MS/MS Technical Note: Comprehensive Quantitation and Identification of Pesticides in Food Samples Using the SCIEX QTRAP 4500 LC-MS/MS System
QTOF X500R	If you're looking to analyze food samples for compounds you know (your targeted list) and compounds you don't know (the unexpected, or non-targeted compounds), this instrument will give you both. The ability to acquire high resolution MS and MS/MS in a single injection enables both targeted and non-targeted workflows for food labs looking for a comprehensive analysis of their samples	Brochure: QTOF X500R system Technical Note: Using the X500R QTOF System and SCIEX OS Software to Identify and Quantify Food Residues
SCIEX OS	Whether you are doing a targeted list of analytes or unknown screening analysis SCIEX OS can process the data. The SCIEX OS interface delivers a simple yet comprehensive view of your data set for reliable and complete data interrogation. Data can be sorted by either sample ID or component name in the left panel, and the main panel clearly displays the results table, MRM peak integration, MS and MS/MS acquired spectra and how they compare to the library databases, and the full calibration curve for the compound of interest.	Brochure: SCIEX OS
LibraryView™ Software	How much data are you processing every day? If you are required to review large batches of food samples for 100s of residues using MRM quantitation, then that could mean 1000s of chromatograms to review every day. MultQuant Software makes quantitative data processing simpler, with tools to perform high-throughput batch analysis and reporting.	Brochure: SCIEX LibraryView software Video: Perform a Data Search on a Library using LibraryView Software Video: Learn how to Import and/or Build and Modify Libraries in the LibraryView Software
MasterView™ Software	Batch processing in less than 60 seconds? Do that and much more with MasterView Software. This simple and easy to use software enables you to perform fast library searching for food screening on your QTRAP system, or perform both targeted and unknown surveillance on your high resolution TripleTOF system. With library searching, automated formula finder, structural elucidation tools, and ChemSpider integration, you can be confident you are detecting and correctly identifying all peaks present in your food samples. Download a free trial version!	Video: What is in my sample? Using libraries to screen and ID contaminants in food Video: How much is in my sample? Screening your sample against a standard to quantify contaminants Video: Is anything else in my sample? Discovering non-targeted or unknown contaminants in a sample



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Mass spec training, right from your desk



Interested in learning more about mass spec or brushing up on your knowledge?

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- SCIEX University
- Get training on software for data acquisition and data processing

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Perfect Balance to Elevate Your Lab's Performance

Made just for you, the X500R QTOF system is the first robust, high performance high resolution MS system designed for routine use.

Simple workflows that deliver reliable results, it's the solution that's ready to meet your challenges today and for the future, from the trusted LC-MS/MS industry leader.

Designed exclusively from user input with the perfect balance so it's easy to operate, easy to maintain, and easy to grow.

The X500R QTOF from SCIEX.

You designed it, we engineered it. In perfect balance to elevate your lab's performance.

sciex.com/X500R-INFO



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