



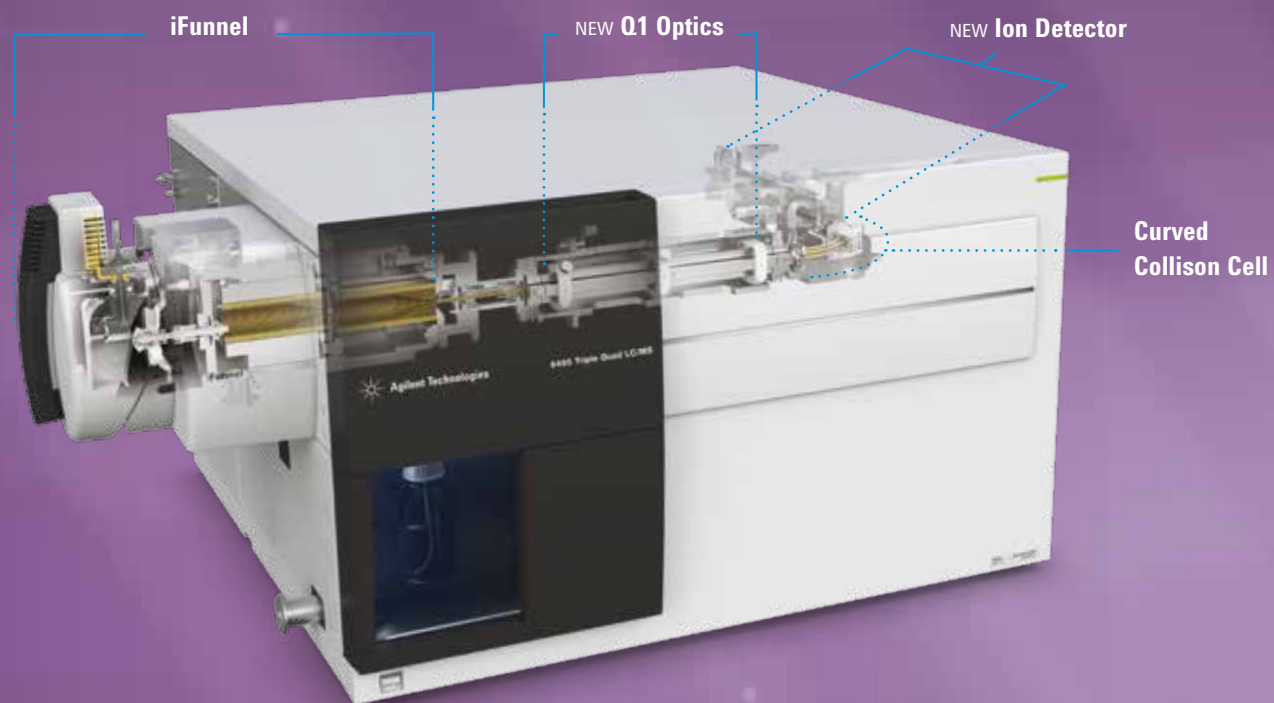
Agilent 6495 Triple Quadrupole LC/MS System

EXPERIENCE A NEW LEVEL OF CONFIDENCE

The Measure of Confidence



Agilent Technologies



IMPROVED SENSITIVITY AND ROBUSTNESS, GREATER PRODUCTIVITY

With its new 6495 Triple Quadrupole LC/MS System, Agilent Technologies has raised the standard for quantitative analysis.

Built on the proven performance of Agilent's iFunnel Technology, the 6495 extends sensitivity, dynamic range, robustness, precision, and accuracy to new levels. Through these improvements, users experience increased productivity and greater confidence in their results.

Agilent's proprietary iFunnel Technology combines high-efficiency ESI ion generation and ion sampling to deliver unprecedented sensitivity.

New triple quadrupole design innovations work in concert to optimize performance and improve quantitation at the lowest concentrations.

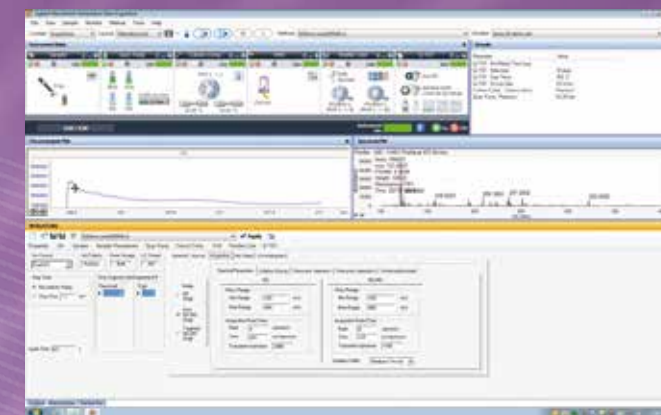
- **Enhanced Q1 ion optics** with optimized prefilter geometry increases ion transmission and reduces contamination.
- **A tapered hexapole collision cell** enables effective collection and transmission of fragment ions.
- An ion detector with **new high energy conversion dynode and low noise characteristics** promotes more efficient positive and negative ion detection and quantitation across a wide mass range.

WORK SMARTER, DO MORE

MassHunter Software

Agilent MassHunter Workstation software simplifies sample management, MS method optimization, data processing, and data reporting for quantitative analyses. An impressive suite of tools facilitates sample analysis, particularly for pharmaceutical and regulated laboratory environments. These tools include:

- **Optimizer software**—delivers automated determination of MRM transitions for quantitation and optimized collision energies for each analyte
- **Dynamic MRM (dMRM)**—ensures the best possible quantitative results for multi-analyte assays compatible with fast UHPLC separation, by specifying cycle times and allowing the software to determine the maximum dwell time for each MRM transition
- **Triggered MRM (tMRM) data-dependent acquisition**—allows fast analyte quantitation together with compound confirmation at the lowest assay levels



tMRM Kits

Simplify your assay development and minimize the need for tedious manual adjustments with kits that provide pre-tested methods and a tMRM database and library. Each kit features all the information needed for setting up screening methods and quickly adapting them to your needs.

Pesticide Screening tMRM Application Kit

Pre-tested analytical methods with a tMRM database and library for over 700 pesticides help you quickly establish customized screening methods that meet your needs.

Forensic Toxicology Screening tMRM Application Kit

Optimize the monitoring and quantitation of forensic toxicology compounds with a tMRM database of over 2,500 compounds and pre-tested analytical methods.



ANALYTICAL CONFIDENCE

The story of the Agilent 6495 isn't simply about its design and performance; it's also about what it allows you to do—better, faster, and with greater confidence than ever before.

Analytical Application: Food Safety

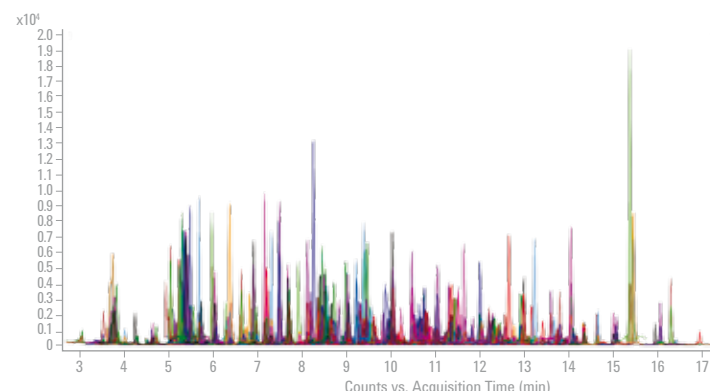
Complex Multi-Residue Pesticide Analysis at The Highest Sensitivity

Quantifying hundreds of low-level pesticides in food is a particularly challenging analytical problem due to the need to detect, confirm, and quantify many different compound classes in diverse matrices, such as black tea. One very effective approach for minimizing matrix effects is the use of sample dilution, which decreases matrix interference and improves method robustness. However, this approach requires the use of a high-sensitivity instrument in order that target analytes

can be detected and quantitated accurately below the Maximum Residue Level (MRL). The figure shows a 20-fold dilution of over 250 pesticides spiked into black tea at 10 µg/kg (MRL level). Most pesticides can be diluted as much as 100-fold and still be confidently detected. Lower Limits of Quantitation (LLOQ) levels with improved precision ensure more pesticides are accurately quantitated and confirmed at the lowest concentrations.

Pesticides	LLOQ (pg/mL)	IDL (pg/mL)
Fipronil	1	0.39
Bentazon	1	0.36
Tefiubenzuron	5	2.13
Hexaflumuron	5	1.09
Flubendiamide	5	0.54
Fluazinam	5	2.13

Demonstration of selected pesticide (Fluazinam) calibration curve with 5.5 orders of LOD

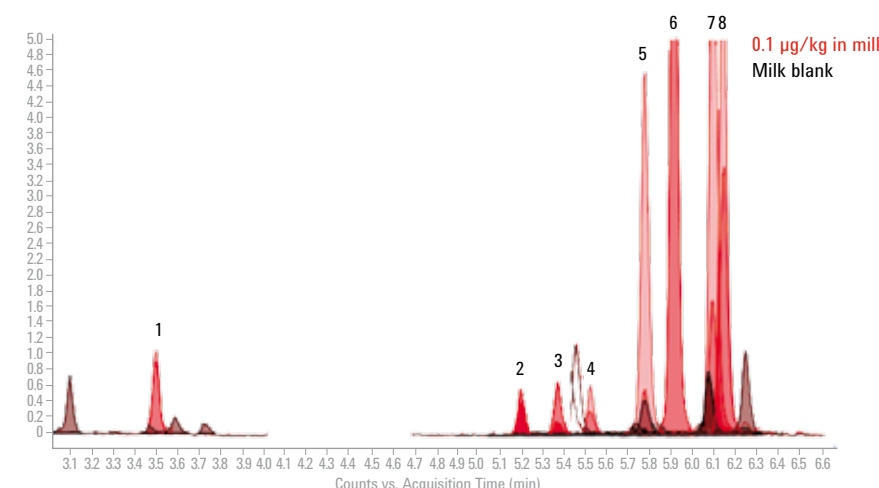


MRM chromatograms of 20-fold dilution of 250 pesticides spiked into black tea at 10 µg/kg with insert demonstrating the pesticide LLOQs and IDLs.

Analytical Application: Food Safety

Confidently Measure Estrogens in Milk Products

New and existing threats to the food supply are leading to increasingly stringent regulations aimed at ensuring product safety. The superior combination of sensitivity, precision, and robustness of the 6495 LC/MS system allows the determination of a variety of estrogens at less than 5 pg/mL, and enables assays that easily quantify at levels lower than 0.1 µg/kg.



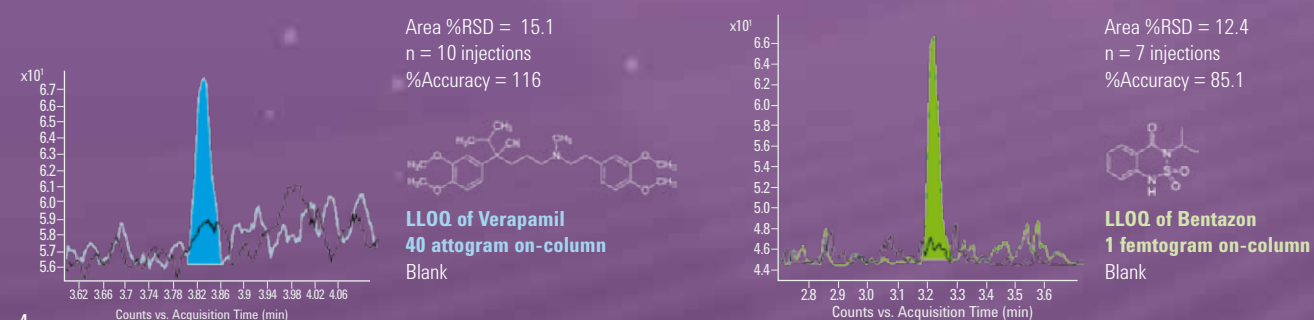
ID	Estrogen	LLOQ (pg/mL)	%RSD (n = 7)	IDL (pg/mL)
1	Estriol	5	11.3	1.8
2	17-α-Estradiol	10	8.4	2.7
3	17-β-Estradiol	10	11.4	3.6
4	Ethinyl estradiol	10	11.7	3.7
5	Estrone	5	9.6	1.5
6	Diethylstilbestrol	10	12.8	2.0
7	Hexestrol	5	11.1	1.7
8	Dienestrol	5	7.6	1.2

Overlaid MRM chromatograms of estrogens spiked in cow milk at 0.1 µg/kg.

Performance Spotlight

Enhanced Sensitivity and Precision Yields the Lowest Limits of Detection and Quantitation

Greater ion sampling and ion transmission efficiency yields better assay performance.

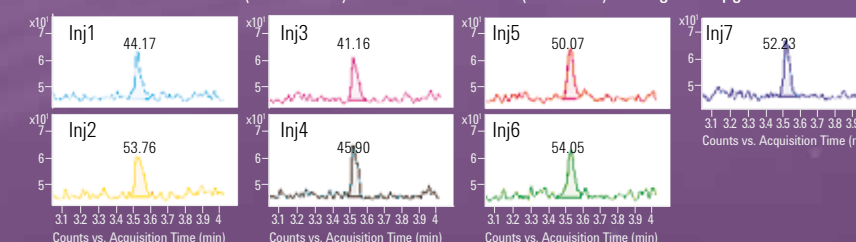


Performance Spotlight

Agilent is leading the way with a new measure of sensitivity performance. **Instrument Detection Limit (IDL)** is a rigorous, statistically based metric that is a practical sensitivity performance indicator for quantitative assays.

Estriol amount measured	Replicates	%RSD	t(99%)	Estriol IDL
5 pg/mL (LLOQ)	n = 7 injections	11.3	3.143	1.8 pg/mL

$$MDL = t \times (\%RSD/100) \times \text{Amount} = 3.143 \times (10.4/100) \times 25 \text{ fg} = 1.8 \text{ pg/mL}$$

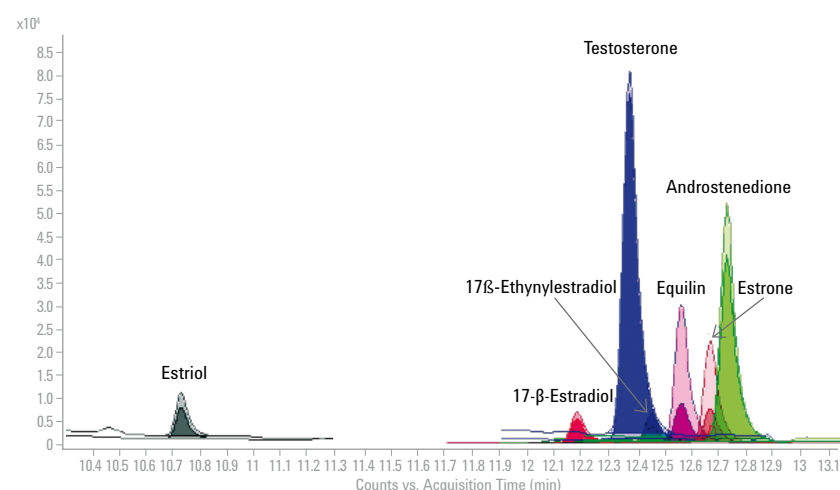


ANALYTICAL CONFIDENCE

Analytical Application: Environmental Analysis

Quantitation Of Hormones in Drinking Water Via Direct Injection

The extreme sensitivity of the 6495 LC/MS system allows the quantitation of key endocrine disruptor chemicals (EDCs) at the sub ng/L level in drinking water, using direct injection without the need for time-consuming offline SPE. Excellent assay performance is achieved, including peak area precision (%RSD) at LLOQ levels.



EDCs	LLOQ (ng/L)	%RSD (n = 8)	IDL (ng/L)
Estriol	1	5.6	0.168
17β-Estradiol	<0.5	13.5	0.202
Testosterone	0.1	10.3	0.031
17α-Ethynylestradiol	1.75	14.8	0.78
Equilin	<0.2	3.7	0.022
Estrone	<0.2	7.2	0.043
Androstenedione	<0.2	4.3	0.026

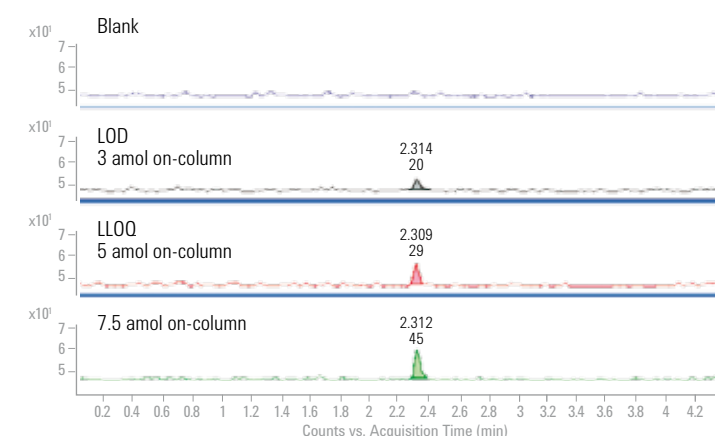
Demonstration of selected seven EDCs' MRM chromatograms at LLOQ level with excellent precision and accuracy (inserted table summarizes the LLOQ and IDL levels)

Analytical Application: Peptide Quantitation

Sub-Attomole Level Peptide Quantitation You Can Depend On

Developing assays for target peptide quantitation requires high sensitivity together with a wide dynamic range. The examples shown below for the peptide LVNEVTEFAK demonstrate low attomole on-column detection using the Agilent Jet Stream source with standard flow chromatography. Sub-attomole on-column detection was

achieved with nanoflow chromatography. These results exhibit 6 orders of linear dynamic range with excellent reproducibility and accuracy at all levels down to and including the lower limit of quantitation.

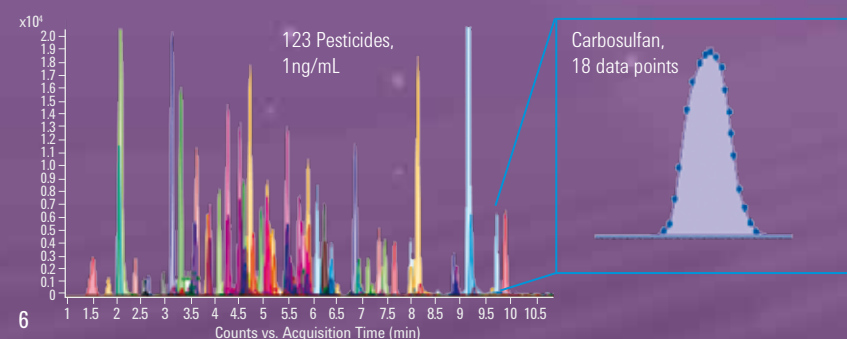


Outstanding low attomole sensitivity for synthetic peptide LVNEVTEFAK spiked in tryptic digest. LOD is 3 attomol on-column and LLOQ is 5 attomol on-column.

Performance Spotlight

High Sensitivity MRM at the Fastest Analysis Times

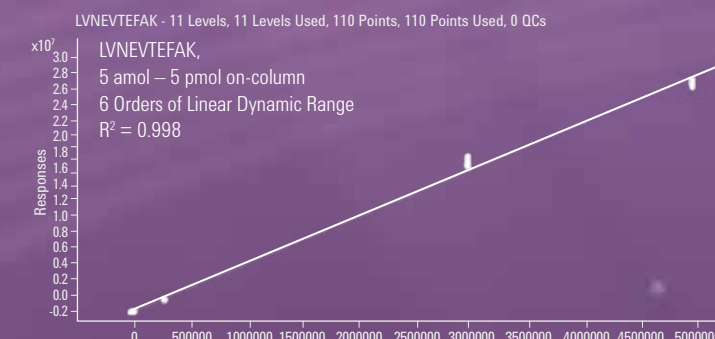
The analysis of multiple compounds in targeted applications requires the ability to intelligently schedule multiple MRMs while maintaining high sensitivity at short MRM dwell times. Dynamic MRM sets optimal dwell times to allow confident analysis of a large panel of compounds with enough data points across the peak for precise and accurate quantitation.



Performance Spotlight

More Information From Every Experiment

Attomole-level sensitivity and wide dynamic range make it feasible to quantitate multiple proteins in a single analysis.



Levels	%RSD (n = 5)	% Accuracy	RT %RSD (n = 40)
5 amol	14.0	109.8	
7.5 amol	16.0	108.7	
15 amol	9.4	105.0	
30 amol	1.6	85.2	0.12
3 fmol	1.2	81.4	
30 fmol	0.6	86.4	
300 fmol	0.7	87.4	
3 pmol	2.1	105.6	
5 pmol	10.0	97.5	

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