FoodSafety magazine

Transform your Food Analysis

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Thermo Fisher Scientific recently set out to revolutionize mass spectrometry with our newest generation of instruments. To meet the increasing challenges food scientists face, we focused on setting new limits for sensitivity, reliability, usability, scan speed and even scan type.

Delivering Extraordinary Results

For routine analysis and quality control, we are pleased to introduce two new, state-of-the art triple-stage quadrupole systems. These systems offer advances in robustness, scan speed and sensitivity, all of which translate to higher throughput in the food lab. Designed for unparalled value, the Thermo Scientific™ TSQ Endura™ mass spectrometer features LODs and LOQs unrivaled in its class. The Thermo Scientific™ TSQ Quantiva™ mass spectrometer is designed to exceed the most stringent analytical requirements, and

is perfect for ultra-low-level quantitation of complex samples that are common in food testing.

Our new triple quadrupole systems have many innovative features. Robustness and sensitivity have been dramatically improved by two new components—a novel, curved ion beam guide with neutral blocker and a redesigned exhaust system. The ion beam guide actively steers ions around a barrier while neutrals are removed, keeping the ion optics path clean. The new exhaust system removes more solvent vapor than ever before, keeping the instrument cleaner. This is of particular importance to food scientists, whose samples are often from dirty matrices and undergo minimal sample preparation. Since many labs are high-throughput, instrument uptime is also an important consideration.

In addition, both systems incorporate a new active collision cell which has an axial field down its length. This accelerates ion transmission, yielding scanning up to 500 SRMs per second with zero cross-talk. You can analyze more compounds per run or shorten existing run times. This is important for food scientists, who are often doing multi-residue analyses and screening for hundreds of compounds at a time.

Unparalleled Sensitivity

The innovations described above plus several additional unique elements combine to deliver Active Ion Management (AIM) technology, the key to the sensitivity achieved with the TSQ Quantiva MS. All components of the ion optics path were designed and tuned in concert in order to maximize sensitivity for users that need to comply with strict regulatory requirements.

Interrogate Your Samples with Incredible Depth

For food researchers, we've introduced a powerful new system that incorporates three mass analyzers in one. The Thermo Scientific™ Orbitrap Fusion™ Tribrid™ mass spectrometer can perform nearly any MS or MSn experiment that scientists can imagine —achieve 500,000 resolution to resolve spectral interferences, choose from three dissociation techniques and detect with the Ion Trap or Orbitrap at any level of MSn for maximum experimental flexibility. And it's all powered by the new Dynamic Scan Management architecture that lets every user design experiments with ease and get the maximum information from every sample. The Orbitrap Fusion MS will allow scientists to explore new ways of detecting unknowns and to perform structural elucidation for both small and large molecules.

Close integration with application-specific software ensures maximum productivity on all systems. Thermo Scientific™ TraceFinder™ 3.1 software for data acquisition and processing of both triple-stage quadrupole MS and high-resolution Orbitrap data allows our customers to use one software platform irrespective of their workflow requirements.

For more information about our new suite of mass spectrometers, please visit ***www.thermoscientific.com/foodsafetyinsider***.

Active Ion Management Technology

- **Electrodynamic Ion Funnel**
  - *Careful shaping of electric fields to capture and desolvate the ion population*

- **Ion Beam Guide with Neutral Blocker**
  - *Ions are actively steered around a barrier while neutrals are removed*

- **Asymmetric RF Drive**
  - *The RF fields on the rods are carefully designed to minimize fringe fields between the rod sets and increase transmission*

- **HyperQuads**
  - *The worlds most precise Quadrupolar rods. Designed for high resolution isolation with amazing transmission*

- **Active Collision Cell**
  - Axial fields down the length of the rods are designed to accelerate ions into Q3 allowing 500 SRMS/sec