

Our Food Analysis Solutions

Elementar offers analyzers for:

Nitrogen & protein determination

Fast, safe and efficient Dumas analyzers for a wide range of food and feed matrices.

Origin verification

Stable isotope analyzers to investigate the geographical origin and authenticity of food products.

Adulteration detection

Stable isotope analyzers to identify food fraud and protect product integrity.

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exceed PLUS series (page 2)

Efficient, high-throughput Dumas analyzers for food, feed and other demanding sample matrices.

Visit our website for more information ↗

02 | Honey authenticity & adulteration detection

BiovisiON Honey (page 8)

Stable isotope ratio analysis (SIRA) system for detecting C3 and C4 sugar adulteration and investigating the geographical origin of honey.

Visit our website for more information ↗



Ready. Set. ANALYZE!

The new exceed PLUS series

**Designed for simple and
efficient nitrogen and
protein determination
using the Dumas method**



Carefully designed in every detail

Two instruments, one goal: maximum laboratory efficiency

Our new exceed PLUS series analyzers are based on the fast, safe, and environmentally friendly Dumas method. They eliminate the need for hazardous substances and complicated sample preparation techniques and are consistently designed for efficiency, flexibility, and continuous operation in everyday laboratory use. This makes them a future-proof alternative to the traditional Kjeldahl method. Whether for routine analyses or changing matrices, both analyzers offer reliable and precise nitrogen and protein determination – even for complex use cases.

rapid N exceed® PLUS

Lowest cost of ownership

Max. sample weight: 1.5 g / mL

Lowest cost per sample

Analysis time: 3–4 min



Sample preparation in tin foil or tin capsules

Cost-effective carrier gas CO₂



Two instruments, one approach

Improved process control and simplified operation

Status display directly on the instrument

Simple, tool-free maintenance

Optimized consumables and proven EAS REGAINER® technology for even longer operating life

Matrix-independent, long-term stable calibration for maximum sample throughput and years of precise measurement results

Best-in-class sample throughput: Fewer calibration measurements mean more space for real samples

Outstanding precision and accuracy thanks to optimal oxygen dosing and complete combustion

rapid MAX N exceed PLUS

Highest sample variety and highest sample throughput in unattended operation

High weighing capacity of up to max. 5 g / mL for inhomogeneous samples without time-consuming grinding

Highly automated analysis process with low maintenance requirements

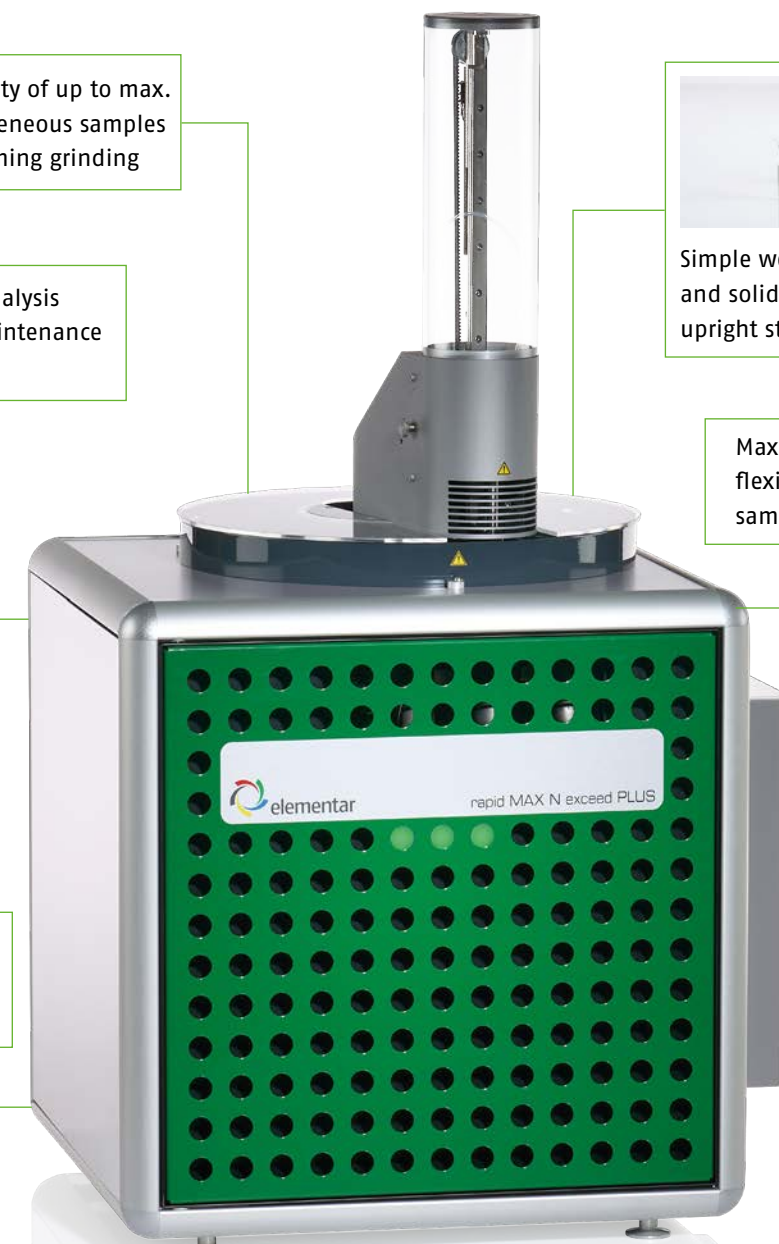


Simple weighing of liquid and solid samples in upright steel crucibles

Maximum sample flexibility, minimal sample preparation

Argon carrier gas as a cost-effective alternative to helium

Analysis time: 5 min



Range of applications

Diverse samples. Clear results.

Two instruments, one purpose: Norm-compliant nitrogen and protein determination

Whether running food, feed, or soil samples – the exceed PLUS series delivers reliable analysis across a wide range of matrices. The instruments' intuitive operation ensures that even challenging samples are processed reliably and precisely, making nitrogen and protein analysis simpler in everyday laboratory work. Ideal for laboratories with high sample throughput, varying sample types, and demanding quality standards.

The exceed PLUS series complies with numerous international standards for food, feed, and fertilizer samples, such as ISO 16634-1, ISO 16634-2, ISO 14891, ICC 167, EBC 3.3.2, EBC 4.3.2, EBC 8.9.2, EBC 9.9.2, AOAC 990.03, AOAC 992.15, AOAC 992.23, AOAC 993.13, and AOAC 997.09. National standards such as Lufa and DIN are also met.

Typical sample types



Ideal solution for:

Food and feed industries

Contract laboratories

Public food and feed monitoring

Universities and research institutes

Software

Measurement data can be processed flexibly and securely

Thanks to its ease of use, even users without specialist knowledge can achieve precise and reliable results with the exceed PLUS series

More overview. More control. More insights.

With optimized navigation, smart workflows, and clear traceability, the exceed PLUS software provides precise and efficient support for your everyday laboratory analysis.

INTUITIVE SOFTWARE

Optimized menu structure, maintenance interval monitoring, role-based user rights

SMARTER WORKFLOWS

Software-supported leak tests, calibration assistant, optional sequence termination when limit values are exceeded

OPTIMIZED 21 CFR PART 11 OPTION

With encrypted database, electronic signature, and updates in the audit trail

RELIABLE QUALITY ASSURANCE

Full traceability and dedicated evaluation of control standards

LIMS-READY

Fully integrate into existing laboratory information systems

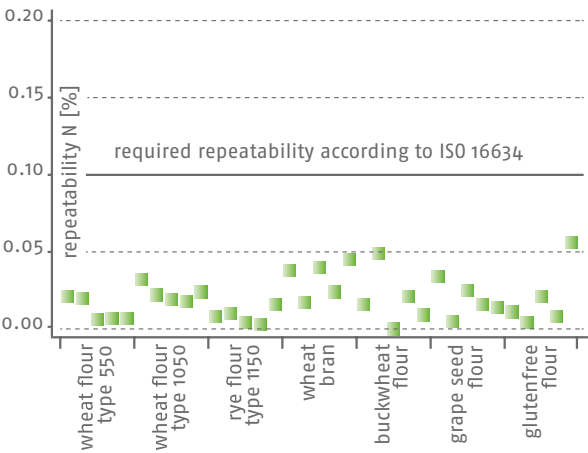
MORE THAN DATA: INSIGHTS

Powerful statistical analyses and flexible data processing

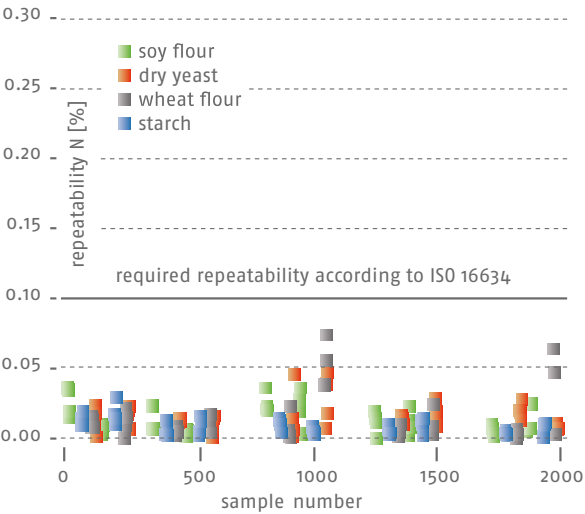
High precision without compromise

Substance	Weight (mg)	Protein (%)	abs. SD (%)
Cattle feed	588	18.5	0.110
Pet food	500	21.43	0.201
Yoghurt	1000	3.05	0.156
Sausages	500	11.44	0.145
Parmesan cheese	500	45.03	0.549
Wheat flour	500	11.12	0.052
Gluten-free flour	500	3.98	0.074
Milk	1500	3.13	0.025
NPK fertilizer	100	1.16	0.031
Manure	1500	0.06	0.002

↑ In argon mode, the rapid MAX N exceed PLUS delivers reproducible protein measurements across a wide range of sample types – with maximum precision and low standard deviation.



↑ The rapid MAX N exceed PLUS provides outstanding repeatability for the analysis of different grains according to ISO 16634. Sample weight: 500 mg, carrier gas: argon.



↑ Outstanding repeatability for different sample matrices over 2,000 consecutive analyses using the rapid N exceed PLUS. Each data point is calculated according to the given norms. The required repeatability is marked by a line.

Two different methods. One route to efficiency.

The analysis of the protein content of a wide range of food and feed samples is central to determining their quality, labeling, and pricing. Two methods are recognized as the standard for this: the classic **Kjeldahl method** and the modern **Dumas method**.

Both deliver precise results – but they differ significantly in terms of effort, speed, and handling. While the Kjeldahl method, as the classic reference method, is based on wet-chemical digestion with sulfuric acid, the Dumas method, based on the principle of high-temperature combustion, scores points for speed, automation, and safety.

The exceed PLUS series takes advantage of these benefits and sets new standards for efficient protein analysis in everyday laboratory work.



Why choose the exceed PLUS series?

The most important advantages at a glance



Our services for you

Installation, consulting, training

From instrument installation and consulting to method development and qualification of your analytical processes, we support you in maximizing analyzer performance and achieving reliable, reproducible results. Our portfolio also includes GMP-compliant qualifications. Through the Elementar Academy, we offer customized training programs to expand or refresh your expertise.

Customer service, maintenance, system checks

Our technical customer service team is always available to support you with any questions regarding our instruments. When required, we provide on-site service support. Our maintenance agreements include regular system checks to ensure long-term reliability and optimal analyzer performance. And should an issue arise, you can rely on fast, competent, and dependable assistance.

Controlled quality with a long-term guarantee

Our instruments are characterized by exceptional robustness and durability. That is why we offer a 10-year commercial guarantee on the high-temperature combustion furnace and the thermal conductivity detector cell of most combustion analyzers. Our commitment doesn't end with your purchase: spare parts are available for at least 10 years, helping to reduce operating costs and protect your investment over the long term. Consumables can be conveniently ordered through our customer service team or online via the Elementar Customer Portal – ensuring reliability, efficiency, and sustainability throughout the entire lifecycle of your instrument.



Scan the QR code and discover further information such as Application Notes, Technical Notes, and Customer Spotlights in our online database.

Elementar – your partner for excellent elemental analysis

Elementar is one of the leading manufacturers in high performance analysis of organic and inorganic elements. Continuous innovation, creative solutions and comprehensive support form the foundation of the Elementar brand, ensuring our products continue to advance science across agriculture, chemical, environmental, energy, materials and forensics markets in more than 80 countries.

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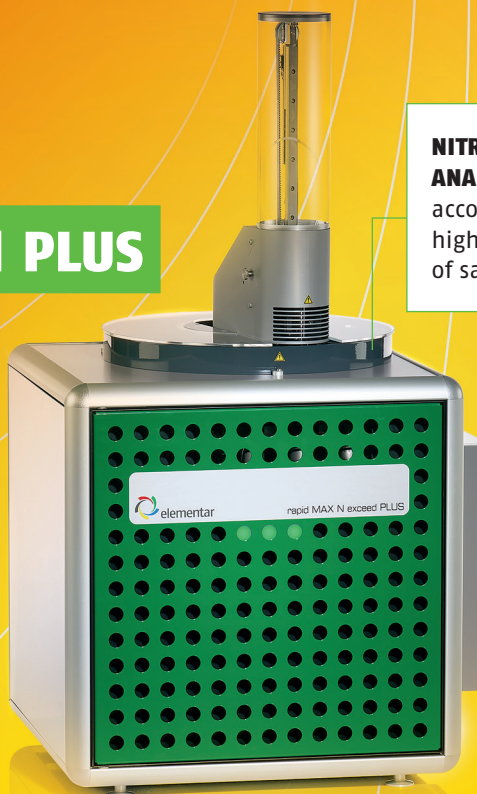
Ready. Set. ANALYZE!



The new rapid MAX N exceed PLUS

NITROGEN & PROTEIN ANALYZER

according to Dumas for
high-throughput analysis
of samples up to 5 g / 5 ml.



**High-performance
nitrogen and protein
determination.
Made simple.**

Your Benefits

MAXIMUM SAMPLE VARIETY

- Large weighing ranges up to 5 g / 5 ml
- No sample homogenization
- Ideal also for challenging matrices

RESULTS IN MINUTES

- No sample preparation
- Results in five minutes per sample
- For up to 200 sample measurements per day

SIMPLE, SAFE & ROBUST

- Intuitive operation
- No use of acids
- Designed for unattended 24/7 operation



From Kjeldahl to Dumas

Discover which protein determination methods meet the demands of today's dairy laboratories.

Scan or click the QR code to download the white paper free of charge!



BiovisiON Honey

A dedicated solution for the detection of honey adulteration



Extreme durability



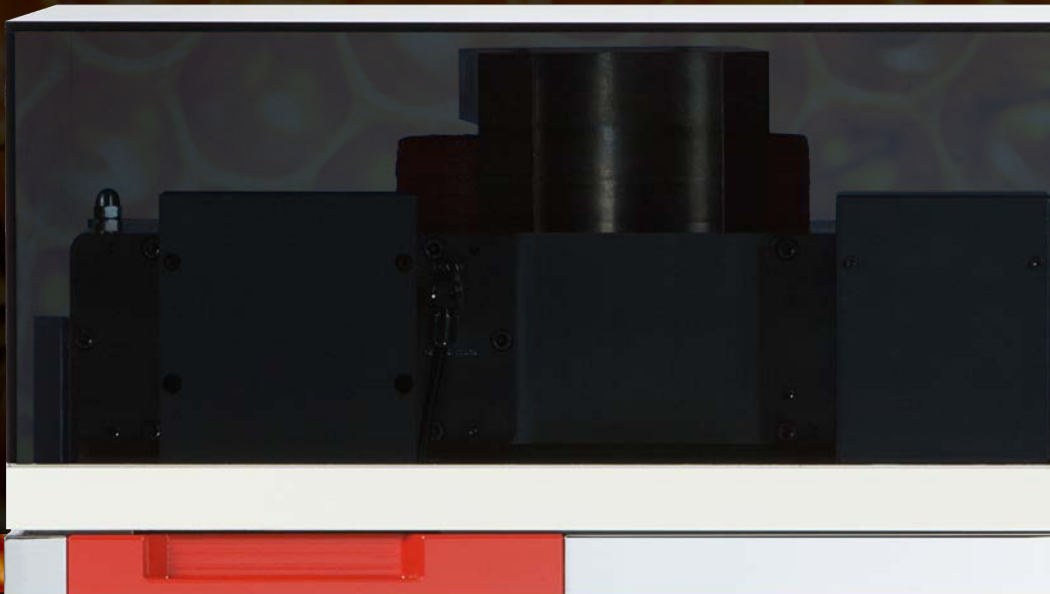
Ease of use



Low cost of ownership



High data quality



BiovisiON Honey

Authentic or adulterated?

KEY FEATURES

- Dedicated solution for the detection of honey adulteration and authenticity
- Unique high-temperature combustion LC-IRMS technique for detecting C₃ honey adulteration
- Exceptionally robust and easy to use
- High return on investment due to significantly longer maintenance intervals
- Optional EA-IRMS for C₄ adulteration detection and geographic origin determination

The most robust IRMS for honey adulteration studies

isoprime visiON is a compact, benchtop IRMS which offers market leading performance. Crucially, the instrument uses a thorium coated filament which makes it significantly more robust against oxidation failure so much so that we provide a 12 month guarantee against filament failure (T&C apply). Combined with a vacuum chamber constructed from stainless steel rather than aluminium, **isoprime visiON** is ideal for LC analysis with high water and oxygen loads entering the IRMS. That means less time is lost venting and servicing your instrument and you run more samples generating higher return on investment.

BiovisiON Honey CONFIGURATION

- Agilent 1260 Infinity II Liquid Chromatograph for separation of honey sugars
- iso **CHROM**® LC high-temperature combustion interface for conversion of separated honey sugars into CO₂
- **isoprime visiON** stable isotope ratio mass spectrometer (IRMS) for ¹³C, ¹⁵N, ³⁴S, ¹⁸O & ²H analysis
- lytic**OS**® software suite for sample acquisition and data processing
- Optional vario ISOTOPE select elemental analyzer for the ¹³C, ¹⁵N, ³⁴S analysis of bulk honeys and honey protein
- **ArDB** cloud license for managing analytical results

Human civilization has sought out the nutritional and medicinal benefits of honey for thousands of years, placing great value on this natural, energy-rich product which is enjoyed for its purity. Today, the Codex Alimentarius (2011) states that no other substances or additives can be added to honey. But with increasing pressure from growing worldwide demand and declining honeybee populations, there is greater incentive to fraudulently improve honeys.

BiovisiON Honey is a new, dedicated solution for the detection of C₄ (cane, HFCS) and C₃ (beet, rice) sugar adulteration of honey. Utilizing Elementar's extensive knowledge of high-temperature combustion chemistry, BiovisiON Honey provides a significantly more robust and simpler solution than other technologies making it quicker, cheaper and easier to detect honey adulteration.

isoprime visiON is the most elegantly simple stable isotope analyzer ever created.

isoprime visiON offers a completely new experience of stable isotope analysis. An experience where the user is free from the routine chores of maintenance allowing them to focus on the science, not the instrumentation.



isoprime visiON KEY FEATURES

- Thorium coated filament is substantially more resistant to oxidation failure during LC-IRMS analysis
- Stainless steel vacuum chamber provides better tolerance to high water loads
- Almost 50% smaller instrument than any other currently available
- Significantly reduced consumption of laboratory resources
- Good-For-Go control significantly reduces instrument contact time
- Automated switching between LC and EA inlet systems
- Modern lytic**OS** software suite built for Windows 10

A powerful combination.

Market leading
isoprime visiON
stable isotope analyzer

Market leading
iso **CHROM**® LC
inlet for LC-IRMS

Market leading
Agilent 1260 Infinity II
Liquid Chromatograph



iso **CHROM LC**

Detect C₃ honey adulteration using high-temperature combustion LC-IRMS

KEY FEATURES

- High temperature ¹³C LC-IRMS analysis
- Outstanding robustness
- Enhanced maintenance intervals
- Easy to use
- Exceptional precision and accuracy

Innovative high temperature combustion method

LC-IRMS has been an established method for C₃ honey adulteration studies for over 10 years. The LC-IRMS technique has utilized wet chemical oxidation at 90 °C which suffers from significant downtime due to maintenance requirements. The high temperature method (925 °C) has substantially less maintenance and is easier to use making it more suitable for contract analysis laboratories.

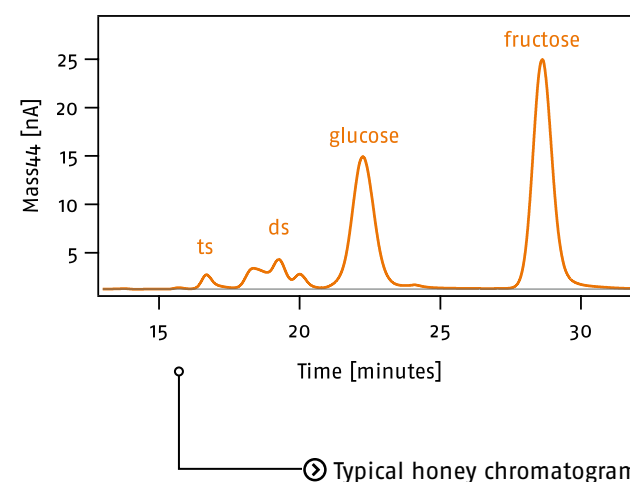
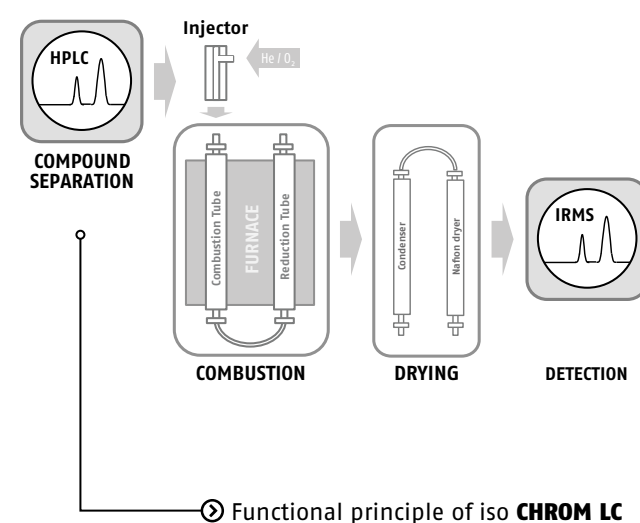
C₃ HONEY ADULTERATION

Honey adulteration refers to the improvement of a low quality honey by the addition of extraneous sugars. These added sugars have different origins which can be identified by ¹³C isotope analysis. Honeys adulterated with C₃ type sugars can be detected by liquid chromatography (LC) IRMS analysis of the constituent sugars to detect the addition of sweeteners such as beet, rice and tapioca sugars.



iso **CHROM**® LC presents a new technique for the detection of C₃ honey adulteration. Unlike existing technologies which use wet chemical oxidation, iso **CHROM** LC harnesses Elementar's depth of experience in high temperature oxidation chemistry to create

a high performance liquid chromatography interface. This new technique is more robust, easier to use and offers higher analytical precision without any compromise in chromatography, precision or accuracy.



Outstanding performance

The iso **CHROM** LC delivers exceptional precision and levels of detection. The instrument produces low and noise-free baselines due to the unique delivery of LC mobile phase into the furnace system whilst the high temperature combustion chemistry ensures the isotopic fractionation-free conversion to CO₂.

Agilent 1260 Infinity II LC

The iso **CHROM** LC interfaces seamlessly with the market leading Agilent 1260 Infinity II LC system. The LC system is specially configured for the analysis of honey samples using the iso **CHROM** LC so there is no overhead in method development allowing your instrument to immediately start producing data.



lyticOS SOFTWARE CONTROL



lyticOS software controls the Agilent 1260 Infinity II LC, iso **CHROM** LC and **isoprime visION** IRMS making sample programming, analysis and data processing quick and easy. Using lyticOS Calculated Columns function automatically performs compound-to-compound calculations and flags suspicious results to the user. The on-board maintenance interval counter and warning system ensures that the system is kept in optimal condition.

vario ISOTOPE select

Detect C₄ honey adulteration using quick, simple EA-IRMS analysis

KEY FEATURES

- Market-leading accuracy and precision due to Temperature Programmable Desorption technology
- Superior ease of use through sophisticated self-diagnosis and tool-free routine maintenance
- Outstanding robustness
- 10-year guarantee on the high-temperature combustion furnace and the thermal conductivity detector cell of the thermal conductivity detector (TCD)
- Integrated 240 position autosampler as standard
- Patented ball valve for blank-free sample transfer
- Optional upgrade

Rapid ¹³C honey analysis

The vario ISOTOPE select is ideal for ¹³C analysis of honey. With an autosampler capacity of up to 240 samples the system can perform long unattended runs. Routine maintenance such as ash finger and reduction tube replacement can be performed within minutes and without tools. And with a 10-year guarantee on the high-temperature combustion furnace and the thermal conductivity detector cell of the thermal conductivity detector (TCD), your system will deliver low cost, high throughput analysis for years to come.

C₄ HONEY ADULTERATION

Honey adulteration with C₄ type sugars can be detected using the AOAC 998.12 method which detects adulteration down to 7 % added sugar. This is due to the different photosynthetic pathways between the original nectar producing plants (C₃) and sweeteners such as HFCS and cane sugar (C₄) having different ¹³C signatures. vario ISOTOPE select is the ideal system for performing AOAC998.12 thanks to high throughput and ease of use.



Adding the optional vario ISOTOPE select EA upgrade allows the conversion of bulk organic material to pure gases for isotope ratio analysis. With a range of unique features for robust analysis and straightforward maintenance, the instrument is the ideal choice for compliance with AOAC 998.12 method for the detection of C₄ honey adulteration.

The vario ISOTOPE select is also ideal for investigating the geographical origin of a honey using multi-elemental isotope analysis. Here, the ¹⁵N, ¹³C & ³⁴S values can be determined quickly from a single sample analysis due to the unique Temperature Programmable Desorption (TPD) technology. This allows laboratories to rapidly screen samples and build a authentic sample database.

Complete software control

The EA-IRMS system is fully automated with no manual control or optimization required. Sample programming is done quickly through a single software and automated diagnostic functions makes fault-finding simple and effective. Detailed maintenance counters ensure that pro-active intervention maximizes instrument up-time.

Reduced He consumption

For the preservation of finite laboratory resources such as helium the instrument utilizes digital mass flow controllers which enables sleep/wake-up functions to be implemented to further reduce the cost per analysis of the system.

The highest throughput

Routine maintenance tasks are performed using only your fingers minimizing downtime and fully automated system diagnostics ensures the instrument keeps running at its highest capacity for longer.

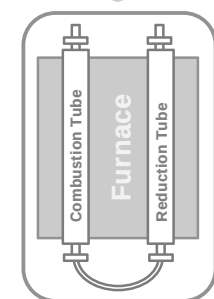
DETECTION OF GEOGRAPHIC ORIGIN

Many honeys command a premium price due to their geographic origin. Biovision Honey is the ideal tool to detect fraudulently declared origins by exploiting the concept of a unique isotopic fingerprint which is a result of the location that the honey was produced. The vario ISOTOPE select is able to analyze multiple isotopes in a single analysis making it possible to compare unknown samples against genuine honeys using the included ArDB software.



Sample Carousel

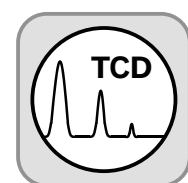
Blank-Free Ball Valve



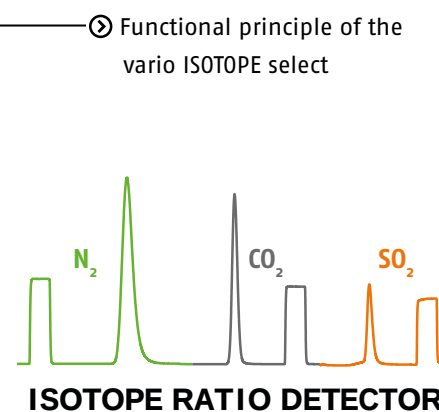
COMBUSTION

GAS SEPARATION
TPD* Trap Column

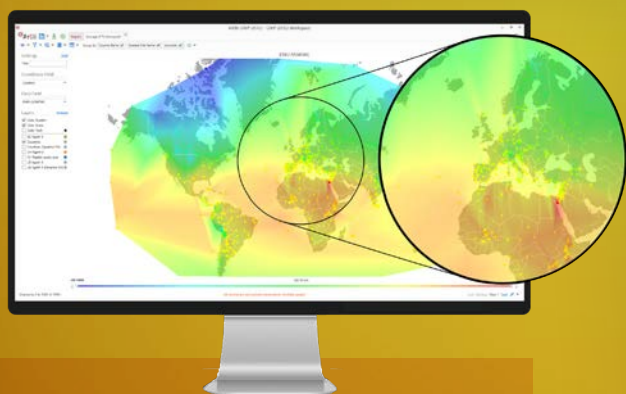
*Temperature Programmed Desorption



DETECTION



Make your database work for you with **ArDB**



Centralize



Integration with
Elementar Instruments



Collaborate



Data Security & Trust



Statistics



Visualize

Biovision Honey includes an **ArDB** cloud license which has been designed for flexible integration into your laboratory workflow, allowing seamless transfer of sample information and results between the database and your instruments. Bringing together sample results for numerous analytical techniques – IRMS, ICP-MS, TIMS, etc. – it eliminates transcription errors, duplication and inconsistent data handling, offering:

- Hassle-free construction and maintenance of centralized sample databases
- Easy handling of sample meta data, such as names, dates, coordinates, types, etc.
- Straightforward creation of sample run lists for use by instrument control software
- Automatic recording of calibrated analytical results for each sample
- Full audit trail for any changes made to database

Once a database is constructed and analytical results are published, **ArDB** provides an array of sophisticated analytical tools for interrogating and visualizing the data, helping you confirm a honey's true geographic origin.

IDEAL SOLUTION FOR

- Contract analysis laboratories
- Public health laboratories
- Honey importers / exporters
- Industrial honey producers

POSSIBLE ANALYSES

- C3 sugar adulteration of honey (LC-IRMS)
- C4 sugar adulteration of honey (AOAC 998.12)
- Confirmation of geographic point of origin



Extreme durability

Outstanding robustness and longevity thanks to state-of-the-art technology. 10-year guarantee on the high-temperature combustion furnace and the thermal conductivity detector cell of the thermal conductivity detector (TCD).



Ease of use

Easy, labor-saving instrument operation and sample preparation. Simplified maintenance.



Low cost of ownership

Sleep/wake up functions and complete automation increases return on investment.



High data quality

Outstanding precision and accuracy through high performance combustion, no isotope fractionation.

Elementar – your partner for excellent elemental analysis

Elementar is the world leader in high performance analysis of organic and inorganic elements. Continuous innovation, creative solutions and comprehensive support form the foundation of the Elementar brand, ensuring our products continue to advance science across agriculture, chemical, environmental, energy, materials and forensics markets in more than 80 countries.

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