

Prove that it's honey. Nothing else!

ThermoFisher
SCIENTIFIC

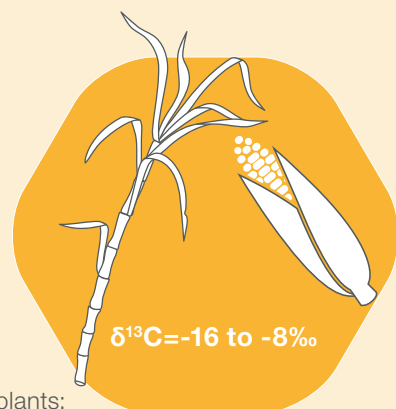
Overcome sticky challenges in your honey fraud analysis with Thermo Scientific solutions

Honey is a high-quality natural sweetener which is subject to fraud by adulteration with low price sugar syrups. Saccharides in syrups derived from cane, corn or beet sugar, for example, are difficult to distinguish from those in pure honeys. Thermo Scientific™ offers solutions to address honey fraud by using reliable, innovative technologies to identify sample adulteration.

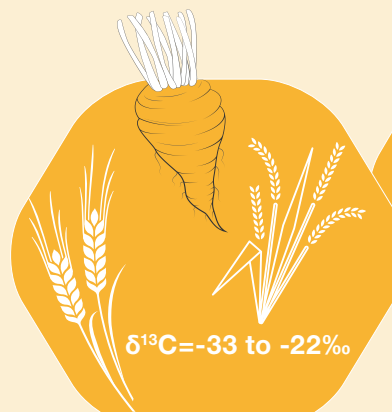


Why use isotope fingerprints for honey fraud analysis?

The carbon isotope fingerprints ($\delta^{13}\text{C}$) of plants are different because of photosynthetic processes, and broadly grouped as C3, C4 and CAM plant types. This allows detection of sugar addition to honey using isotope ratio mass spectrometry.



C4 plants:
sugar cane and corn syrups



C3 plants:
rice, sugar beet and wheat sugars



Authentic honey derived from C3 plants



- Extract the protein
- Centrifuge
- Dry
- Measure



Thermo Scientific™
EA IsoLink™ IRMS System

The differences in carbon isotopic composition allow detection of >7% addition of sugar cane and corn syrups to honey using Elemental Analysis Isotope Ratio Mass Spectrometry (EA-IRMS) based on the AOAC Official Method 998.12 "C-4 Plant Sugars in Honey".

[Learn more](#)



- Dilute
- Vortex
- Filter
- Measure



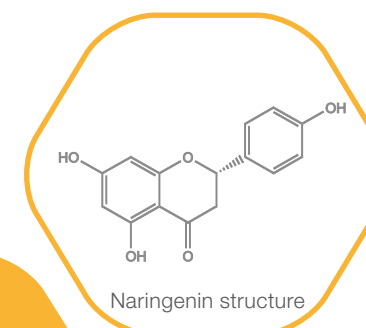
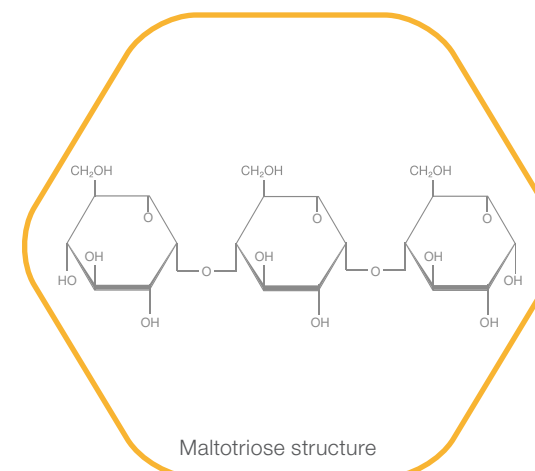
Thermo Scientific™
LC IsoLink™ II IRMS System

Detection of honey adulteration with C4 sugars at 1% levels can be done using compound specific isotope analysis of individual sugars by Liquid Chromatography Isotope Ratio Mass Spectrometry (LC-IRMS). LC-IRMS also successfully addresses honey adulterations with rice, sugar beet and wheat syrups at 10% levels.

[Learn more](#)

Why use a non-targeted metabolomics approach for honey fraud analysis?

- Principal Component Analysis differentiates honey samples from control samples
- Identify common sugar syrups that may indicate adulteration
- Thermo Scientific™ Compound Discoverer™ software enables rapid sample comparisons, has structural annotation features, and is connected to various compound databases



- Dilute
- Vortex
- Centrifuge
- Dilute
- Measure



Thermo Scientific™
Orbitrap Exploris™ 240 MS

The Orbitrap Exploris 240 MS is a highly accurate and sensitive instrument that can identify oligosaccharides, polysaccharides, and phytochemicals in honey samples. It can also detect samples that may have been adulterated with inexpensive sugar syrups. LC-MS complements other techniques as an effective screening and fingerprinting tool using a simple dilute-and-inject methodology and analysis by high-resolution accurate-mass (HRAM).

[Learn more](#)

Learn more at thermofisher.com/food-authenticity

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