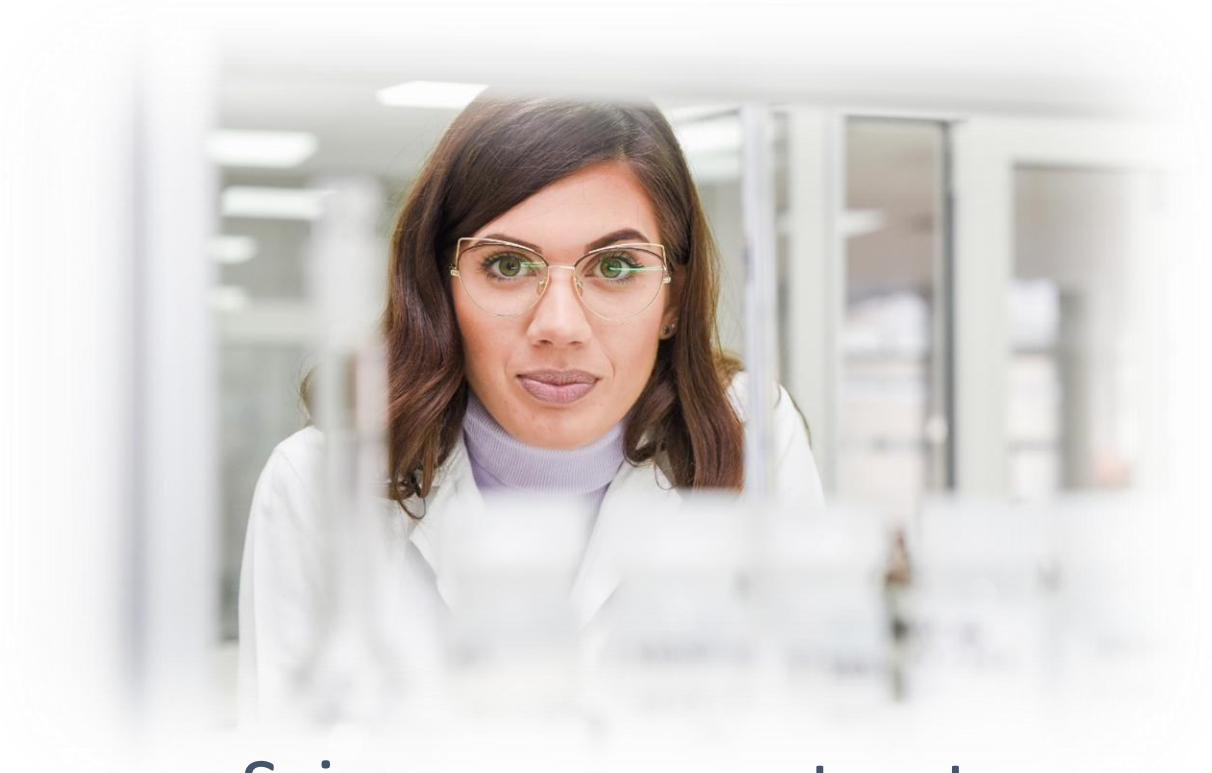
ISOTOPE
LAB SYSTEMS
INSTRUMENTING INNOVATION



Science you can trust

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Isotope Lab Systems DOO is a private research and development company focused on creating advanced analytical methodologies and equipment for isotopic testing of food and beverages. Through its revolutionary EIM-IRMS technology, the company delivers innovative solutions that enhance authenticity verification, origin tracing, and fraud detection. By combining scientific rigor with engineering excellence, Isotope Lab Systems DOO provides reliable tools that empower laboratories, regulators, and industry partners to achieve transparency and trust across global value chains.

Ivan Smajlović is the founder of Isotope Lab Systems DOO, with deep expertise in forensic science and authenticity verification. He has pioneered the revolutionary EIM-IRMS technology, bridging science, law, and industry. His vision is to provide reliable tools that strengthen transparency, protect producers, and build consumer trust in global markets.

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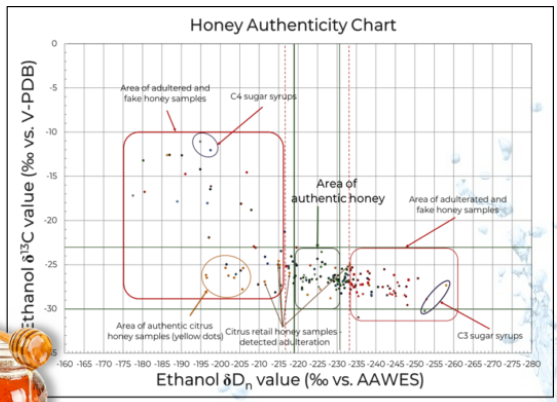
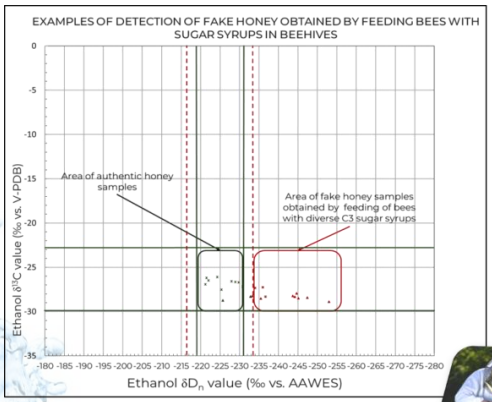
HONEY

With EIM-IRMS it is possible to detect the botanical origin of sugar in HONEY, regardless of whether it is a direct mixing of honey with industrial C4 and/or C3 sugar syrups or a question of bee feeding (indirect mixing of honey with sugar syrups).





HONEY TESTING SOLUTIONS:

- ◎ Examination of the basic quality of honey,
- ◎ Detection of added C3-sugar syrup,
- ◎ Detection of added C4-sugar syrup,
- ◎ Detection of oligosaccharides in honey
- ◎ Detection of industrial enzymes in honey

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WINE

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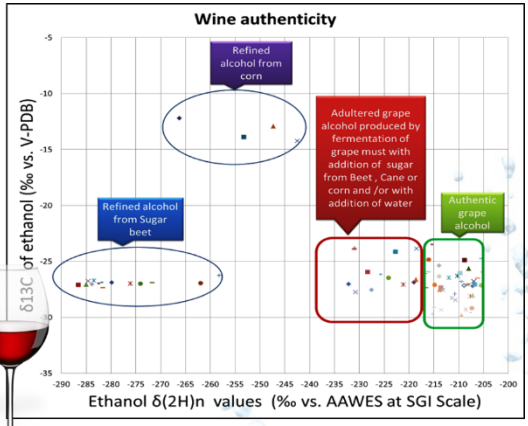
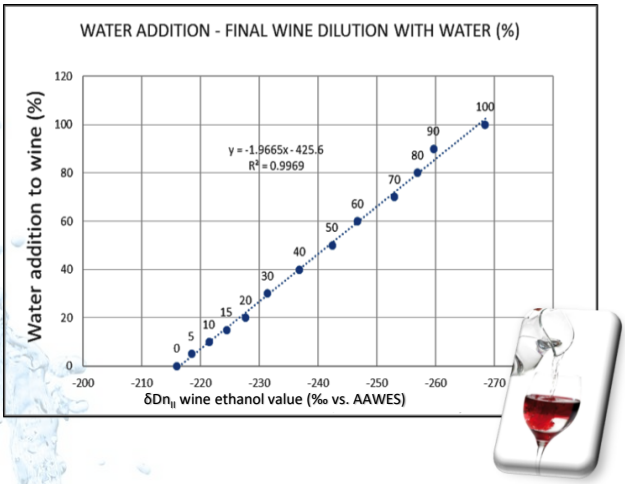
Our EIM-IRMS analytical solution for testing the authenticity of WINE includes detection of chaptalization (adding sugar to grape must before alcoholic fermentation), as well as detection of the origin of water in wine (whether water was added during the production process or dilution of the final wine with water).





SOLUTIONS FOR TESTING WINE AUTHENTICITY:

◎ Detection of added water in wine or grape must with and without geographical origin
◎ Detection of added C4-sugar/ethanol in wine or grape must with and without geographical origin
◎ Detection of added C3-sugar/ethanol in wine or grape spread with without geographical origin
◎ Generating an isotopic “fingerprint” of a wine product
◎ Examination of the basic quality of wine

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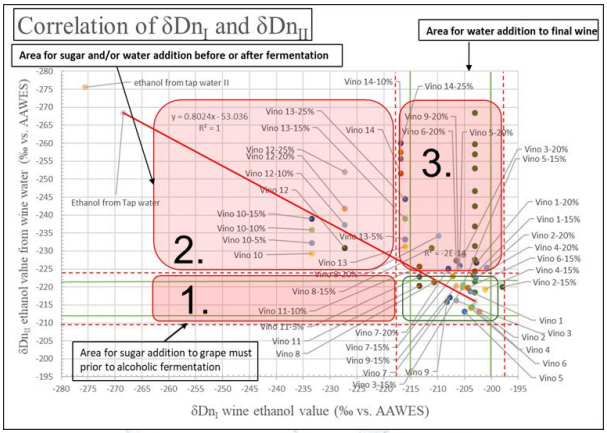
WINE
Oenological practices

EIM technology gives us much greater possibilities compared to all currently known instrumental techniques used in the world to confirm the authenticity of wine. By correlating the dDn_I and dDn_{II} values of ethanol, with EIM-IRMS it can be determine exactly when the practice of adding sugar and/or water was carried out - before alcoholic fermentation (case no. 1), during alcoholic fermentation (case no. 2) or the addition of water to the final wine after the completion of alcoholic fermentation - dilution of the final wine with water (case no. 3).



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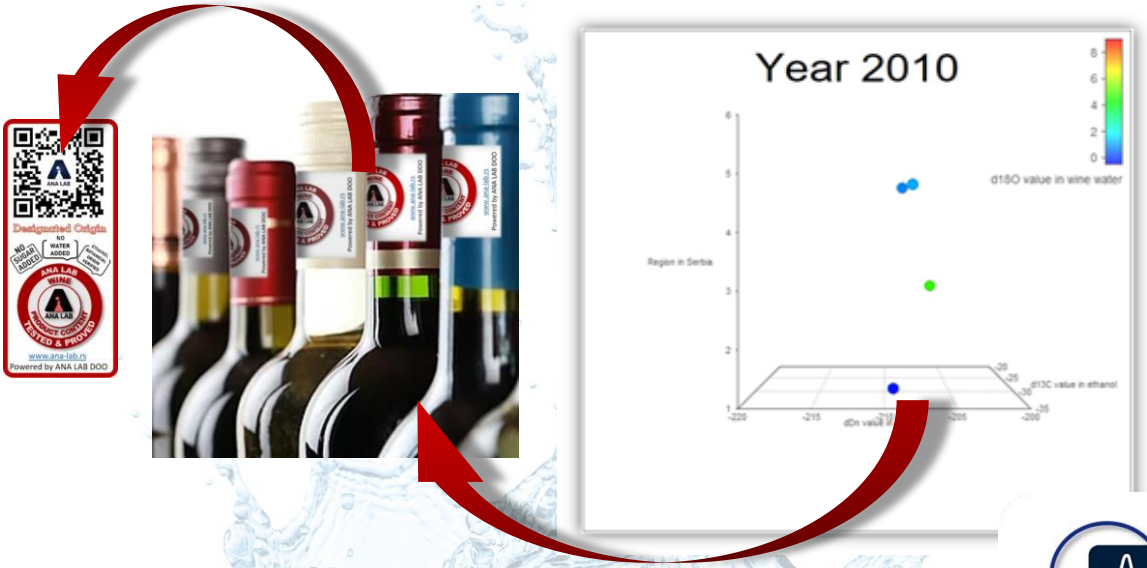
PROTECTION OF GEOGRAPHICAL ORIGIN OF WINE

The system of protection of the geographical origin of wine, provides phenomenal possibilities when we talk about the protection of the geographical origin of wine.

By creating isotopic databases for wines based on EIM-technology and integrating them with agroclimatic indices such as thermal index (TK), hydrothermal index (HTK), Winkler index (WI), Tgs index, heliothermic index (HI), drought index (DI) and night freshness index (CI), information is obtained on the basis of which projections can be made for future years and see where and how to react with agrotechnical measures, as well as enological means in the wine production process, or if such measures would be unnecessary.



◎ Determining the geographical origin of wine

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FRUIT BRANDIES & OTHER STRONG ALCOHOLICBEVERAGES

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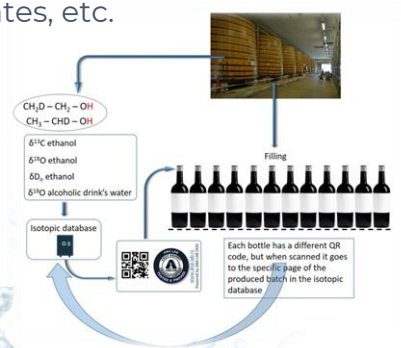
EIM-IRMS is the **ONLY** technology in the wolrd that is able to determine the botanical origin of ethanol in **FRUIT BRANDIES, especially coming from C3 industrial plants such as beet, wheat, rise, potato, grain, etc**. By determining the δDn_{I} value in ethanol from a strong alcoholic drink and the δDn_{II} value of ethanol from the water of a strong alcoholic drink, it is possible to separate the information about added water during the production process from the potential presence of ethanol of other botanical origin in relation to fruit ethanol that comes from fruit raw material.

Why is this important?

There is a lot of trade in distillates and soft brandies on the market, which are further used for the finalization or aging of distillates.

EIM-IRMS can now help laboratories to better determine botanical origin of ethanol from grape or fruit brandies, destillates, etc.

With use of EIM-IRMS laboratories can help legal producers to make the right decisions and get the best possible conditions when purchasing raw materials for their production.



SOLUTIONS FOR TESTING STRONG ALCOHOLIC BEVERAGES:

- ◎ Detection of botanical origin of ethanol in fruit brandies and other alcoholic beverages drinks,
- ◎ Generation of an isotopic "fingerprint" products for strong alcoholic beverages

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DETERMINATION OF BOTANICAL ORIGIN OF ETHANOL IN FRUIT BRANDIES AND FRUIT DISTILLATES

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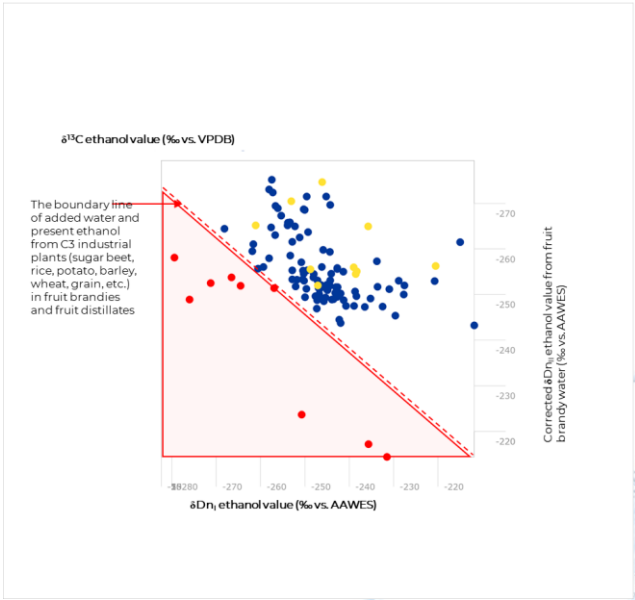
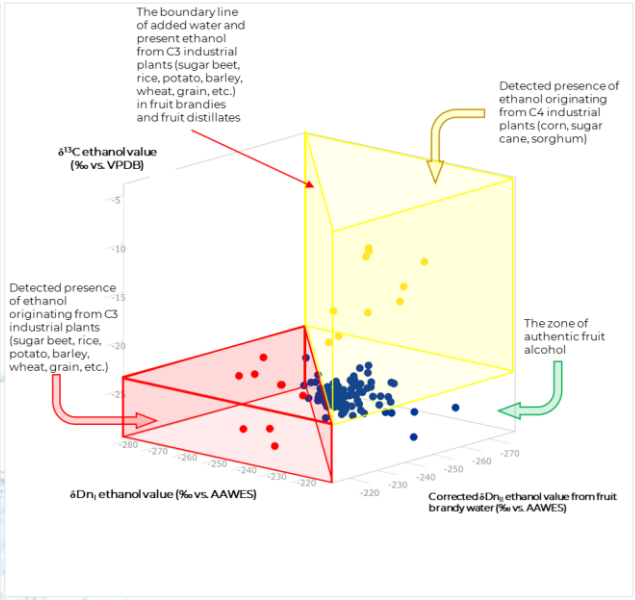
Authenticity of fruit brandies using EIM-IRMS isotopic concept





SOLUTIONS FOR TESTING STRONG ALCOHOLIC BEVERAGES:

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QR CODE PRODUCT CARD OF FRUIT BRANDY

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ADD VALUE TO YOUR PRODUCTS BY PLACING THE QR CODE LABEL ON YOUR PRODUCTS.

QR Code
Kartica proizvoda / Product Card

Laboratorija za ispitivanje autentičnosti prehrambenih proizvoda

(Click on the logo)

Naziv proizvoda /Product Name	RAKIJA OD DUNJE – 0,7 l
Proizvodi i puni / Produced and Bottled By	Petar Petrović PR, Destilerija Petrović, Šumadija
	Link to Google Earth (click on the logo) Logo proizvođača
Datum punjenja / Bottling Date	12.03.2023.
LOT Broj / LOT Number	3/2023
Datum završetka ispitivanja / End Date of Testing	21.03.2023.
Analitički broj uzorka / Analytical Sample Number	AL2303-0075
Deklarisana vrednost Alk. (% vol.) / Alc. (%vol) labeled value	40,0
Botaničko poreklo etanola / Ethanol Botanical Origin	Voćno poreklo etanola / Ethanol fruit origin — Testirano / Tested ✓

KONTROLISANO od strane ANA LAB DOO Pančevo – Akreditovana laboratorija za ispitivanje autentičnosti prehrambenih proizvoda/ CONTROLLED by ANA LAB DOO Pančevo - Accredited laboratory for testing the authenticity of food products

- BEZ DODATOG ŠEĆERA / NO SUGAR ADDED
- KONTROLISANO BOTANIČKO POREKLO ETANOLA / ETHANOL BOTANICAL ORIGIN CONTROLLED

Jedinstveni izotopski otisak proizvedene šarže – LOT broja

A unique isotopic fingerprint of the produced lot - LOT number

SRB. Oblik konture izotopskog otiska se dobija specijalizovanim Key generatorom i odgovara analitičkim vrednostima dobijenim tokom laboratorijskog ispitivanja uzorka proizvedene šarže datog proizvoda. Ovaj izotopski otisak je jedinstven samo za uzorak proizvedene šarže i ne može se njednim tehnološkim postupkom kopirati ili falsifikovati. Izotopski otisak proizvedene šarže je deponovan u bazu podataka kod ANA LAB i služi za potvrdu autentičnosti originalnog proizvoda.

ENG. The shape of the contour of the isotopic fingerprint is obtained by a specialized Key generator and corresponds to the analytical values obtained during the laboratory testing of a sample of the produced batch of the given product. This isotopic fingerprint is unique only to the sample of the batch produced and cannot be copied or forged by any technological process. The isotopic fingerprint of the produced batch is deposited in the database at ANA LAB and serves to confirm the authenticity of the original product.

Napomena: *Rezultati ispitivanja se odnose samo na uzorak serije / šarže - L: 3/2023., ustanovljen 24.04.2023. na bilansiji pogona proizvođača. ANA LAB DOO PANČEVO ne snosi odgovornost za moguće manipulacije nakon uzorkovanja prilikom finalizacije punjenja i puštanja proizvoda u promet.*

PRIMER

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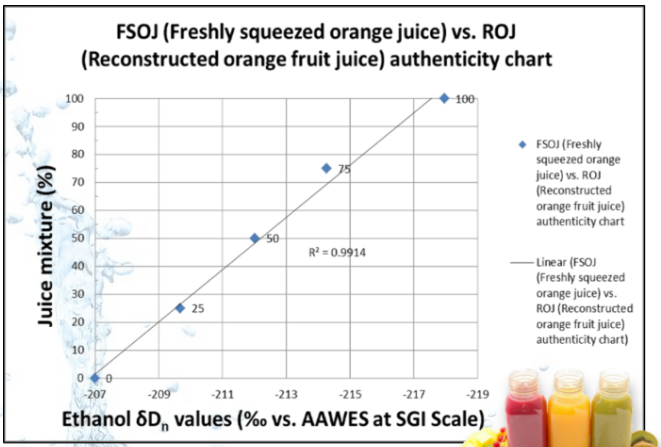
FRUIT JUICES

EIM-IRMS testing the authenticity of **FRUIT JUICES** includes the detection of added sugar, as well as the detection of the origin of the water in the fruit juice. Detection of the origin of water in fruit juice is important from the perspective of declaring such fruit juice, considering that fruit juice can be freshly squeezed fruit juice, or reconstituted fruit juice obtained by reconstitution from fruit concentrate with the addition of water to the dry matter that was before concentration.

Wrong and bad product declaration is a direct deception of consumers, considering that freshly squeezed fruit juices are in a higher price category compared to reconstituted fruit juices.



SOLUTIONS FOR TESTING FRUIT JUICES:

- ◎ Detection of added water in fruit juice
- ◎ Detection of added sugar based on C3 and/or C4
- ◎ Generation of an isotopic “fingerprint” of a product

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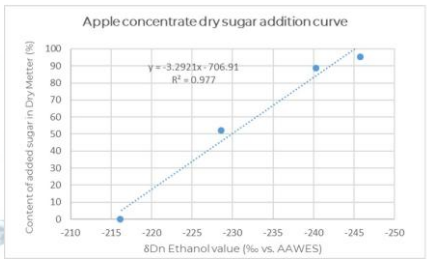
FRUIT CONCENTRATES

Advanced **EIM-IRMS** technology is the **ONLY** in the world that is able to determine the botanical origin of sugar in **FRUIT CONCENTRATES** especially coming from C3 industrial plants.

Adding sugar syrup or dry sugar to fruit juices before or during their concentration is an illegal production practice, in order to increase the percentage of dry matter and obtain the amount of the final product in the process of concentrating fruit juices.
In fact, the problem is much more significant, because the duration of evaporation process is shortened by adding sugar in the fruit juice concentration process, which is associated with lower energy consumption and shortening the time of the concentration process. **In that case, such a concentrate with added sugar is difficult to detect as an illegal practice.**

This can negatively affect all further steps in the production of fruit juices. Producers cannot know that foreign suppliers can cheat them and that instead of buying 100% fruit content they can be tricked into buying adulterated fruit concentrates. If the additives are detected in the final products, it would be very difficult to prove that they themselves are not responsible for the fraud.



SOLUTIONS FOR TESTING FRUIT CONCENTRATES:

- Detection of botanical origin of sugar in fruit concentrate

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FRUIT NECTARS

FRUIT NECTARS are drinks in which one part of the fruit content (from 50% to 75% of the fruit content) is replaced by sugar and water. Determining the fruit content in fruit nectars is a very important item, given that this information must be indicated on the product declaration, so that the end consumer would not be misled.

Economic frauds in fruit nectars are the most pronounced, because until now there was no analytical method that would unequivocally determine that the minimum content of fruit content for this product category was met.

Furthermore, mislabeling fruit nectar as if it were fruit juice is also a possibility, given that such statements could never be confirmed until now (detection of added water and sugar), given that fruit juices are in a higher price category compared to fruit nectars.

SOLUTIONS FOR TESTING FRUIT NECTARS:

- Detection of added sugar based on C3 and/or C4
- Determining the percentage of fruit in fruit nectars

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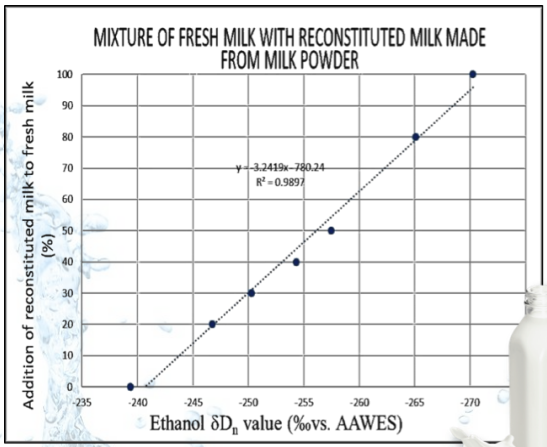
MILK

Economic adulteration of **MILK** by mixing milk components, then adding water and subsequently declaring such a product as fresh milk is the most common type of fraud on the milk market.

By determining the basic parameters of milk quality, it is not possible to determine that it is a fraud, because the freezing point is always the same for the same ratio of components in the mixture and depends only on their concentration.

With unique analytical protocol and sample preparation for EIM-IRMS testing laboratories are capable to detect illegal adulteration and mislabeling of fresh milk. Since all types of milk adulteration cannot pass without the addition of water, it is now possible to detect added water in declared fresh milk.



MILK TESTING SOLUTION:

- ◎ Detection of added water in fresh milk
- ◎ Detection of addition of reconstituted milk to fresh milk
- ◎ Matching the declaration with the product

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FRUIT PRODUCTS "NO ADDED SUGAR"

Fruit products (jams, marmalades, fruit spreads, pulps, purees, mixes, etc.) labeled “NO ADDED SUGAR” represent a category with added value for specific consumer groups.

Verifying such product claims provides additional assurance to buyers and end consumers that they are receiving genuine value for their money.

With the advanced capabilities of EIM-IRMS technology, it is possible to detect production practices by determining the botanical origin of sugars in these products and confirming the absence of exogenous sugars. This ensures that authenticity declarations are scientifically validated and transparently supported.

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JR SUCCESS IS OUR PRIORITY

Isotope Lab Systems is committed to supporting our clients with a highly qualified team of engineers and scientists across diverse fields of expertise. Our professionals are always available to provide consultation and guidance, helping partners address challenges in quality control, management systems, and technological processes.

By leveraging our knowledge and innovative solutions, we empower our clients to deliver superior products and services to their own customers, ensuring compliance with state regulations and building trust through recognized quality.

YOUR EXPERT TEAM of ISOTOPE LAB SYSTEMS

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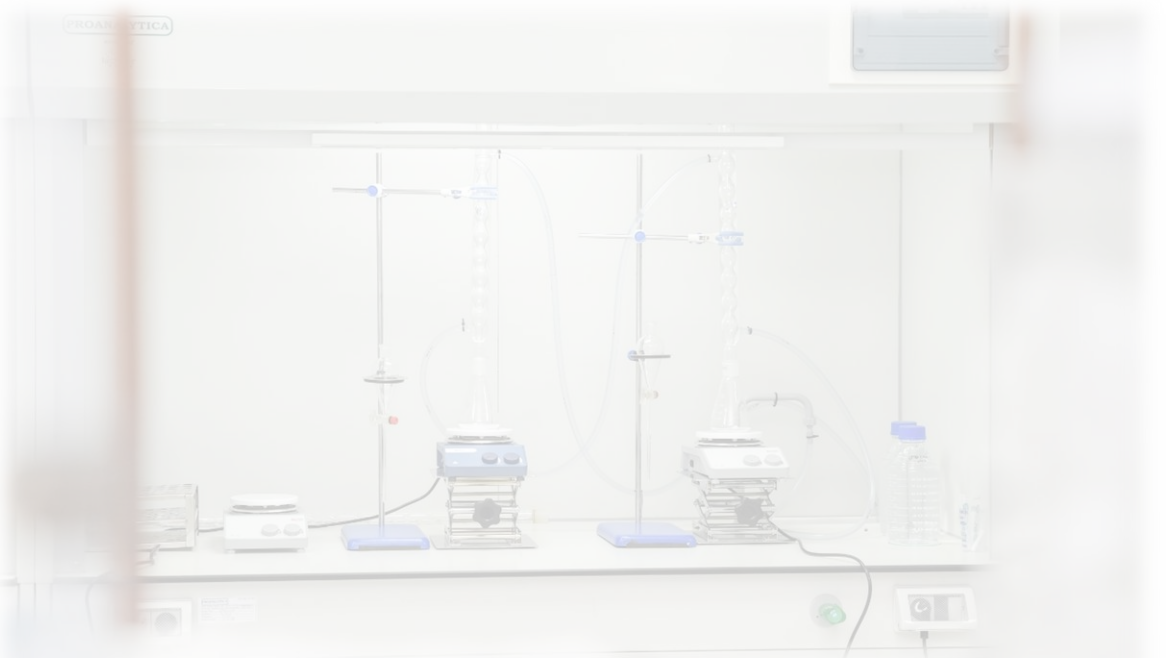

Isotope Lab Systems – behind your best results

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