

# 1600 MiniG<sup>®</sup>

Tissue  
Homogenization  
Cell Lysis



## Stable Isotope Ratio Analysis for the testing of authenticity of food product origin and production method claims

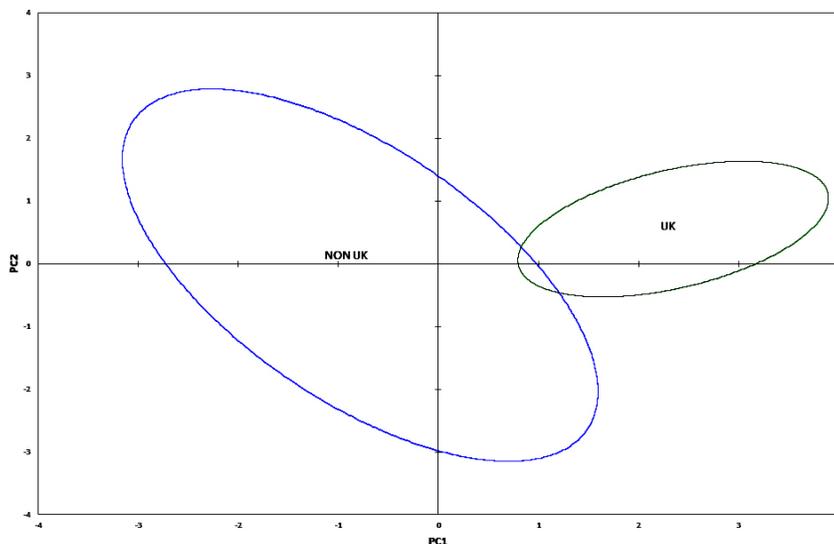
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### APPLICATION

Food Fraud is a global problem with a long heritage. With global food supply chains growing in complexity, fraudulent food labelling has become an ever increasing risk. Consumers are becoming more aware and concerned with how and where their food products originate. Suppliers are taking a more active interest in protecting their brand reputation. Through the application of Stable Isotope Ratio Analysis (SIRA), consistency with labelling claims for geographical origin and/or production method of food and food products can be established. By using this technique we are able to help protect consumer, supplier and producer interests.

### SAMPLE SETUP

When samples were received, they were processed according to pre-determined methodology, depending on product type. The essential aim is to transform a food product such as a chicken breast or an apple into a dry, homogenous powder that can be analyzed by Isotope Ratio Mass Spectrometry (IRMS). 5 grams of freeze dried samples were placed in six 40mL tubes, each with 10mL of 7mm agate balls. The samples were then placed into the SPEX SamplePrep 1600 MiniG<sup>®</sup> where they were milled into a fine homogenous powder. The powder was then weighed accurately into the small (<5 mg) aliquot required for IRMS analysis.



**:: APPLICATION NOTE SP027**  
Stable Isotope Ratio Analysis for the testing of authenticity of food product origin and production method claims.

**:: APPARATUS**  
1600 MiniG<sup>®</sup>

**:: APPLICATION**  
IRMS



## RESULTS AND DISCUSSION

The results of SIRA of the food product were tested for consistency to a database of authentic samples to establish a geographical origin and production methods such as organic, free range and corn fed. Isotope ratios measured and analyzed include; carbon ( $\delta^{13}\text{C}$ ), nitrogen ( $\delta^{15}\text{N}$ ), sulfur ( $\delta^{34}\text{S}$ ), hydrogen ( $\delta^2\text{H}$ ) and oxygen ( $\delta^{18}\text{O}$ ).

By combining the information acquired for each isotopic system using multivariate techniques, we were able to distinguish the difference between populations (i.e. UK and Non-UK). This produced evidence based intelligence that helped producers, suppliers and customers maintain confidence in the authenticity of the test product.

## CONCLUSIONS

The SPEX SamplePrep MiniG<sup>®</sup> plays a crucial role at Food Forensic Ltd for the sample preparation of food products for IRMS analysis. It enabled high throughput of samples and produced the fine and homogenous powders required for this application.

**Food Forensics**

[www.foodforensics.co.uk](http://www.foodforensics.co.uk)

For more information on the 1600 MiniG<sup>®</sup> Please visit [www.spexsampleprep.com](http://www.spexsampleprep.com).



### WATCH THE VIDEO!

Scan the QR code with your smart phone to watch the video or visit [www.youtube.com/sampleprep](http://www.youtube.com/sampleprep).

**SPEX<sup>®</sup> SamplePrep<sup>®</sup>**  
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**MiniG<sup>®</sup>**



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