



## **Compound specific stable isotope analysis vs. bulk stable isotope analysis of agricultural food products**

David Psomiadis, Balázs Horváth, Olaf Nehlich, and Bernd Bodiselitsch  
Imprint Analytics GmbH, Neutal, Austria (psomiadis@imprint-analytics.at)

The bulk analysis of stable isotopes (carbon, nitrogen, sulphur, oxygen and hydrogen) from food staples is a common tool for inferring origin and/or fraud of food products. Many studies have shown that bulk isotope analyses of agricultural products are able to separate large geographical areas of food origin. However, in micro-localities (regions, districts, and small ranges) these general applications fail in precision and discriminative power. The application of compound specific analysis of specific components of food products helps to increase the precision of established models. Compound groups like fatty acids (FAMES), vitamins or amino acids can help to add further detailed information on physiological pathways and local conditions (micro-climate, soil, water availability) and therefore might add further information for the separation of micro-localities.

In this study we are aiming to demonstrate the power and surplus of information of compound specific isotope analysis in comparison to bulk analysis of agricultural products (e.g. olive oil, cereal crops or similar products) and discuss the advantages and disadvantages of such (labor intense) analysis methods. Here we want to identify tools for further detailed analysis of specific compounds with high powers of region separation for better prediction models.