Media release

Using stable isotopes to trace the regional origin of foodstuffs

The paper "Assessment of multiple stable isotopes for tracking regional and organic authenticity of plant products in Hesse, Germany", the result of a collaboration between FiBL, Agroisolab GmbH, the University of Giessen and the University of Freiburg, has been published in the journal "Isotopes in Environmental and Health Studies"

(Frankfurt, 17.05.2021) - The data analysed in this paper originally came from the project Wasserzeichen, in which FiBL Germany and Agroisolab GmbH from Jülich took a total of over 1.000 samples of various agricultural plant and animal monoproducts, mainly from the German state of Hesse, and analysed them for their isotopic composition. The isotopic compositions ^{18}O, ^{2}H, ^{15}N, ^{13}C and ^{34}S were investigated with the aim of verifying the suitability of isotopic analysis as an investigation method for tracing the regional origin of agricultural raw materials. With the help of the data, a database of Hessian products was set up, which is freely accessible at https://www.fibl.org/en/locations/germany/work-areas-germany/quality-de/watermark.html.

Particularly noteworthy is the sample procurement: all samples were taken and documented directly on the farms or in the respective slaughterhouse by FiBL staff trained in advance. This ensured that all samples were taken in the same way and are therefore authentic and highly comparable. The samples were sent immediately to Agroisolab after labeling with individual identification numbers and were analysed for their isotopic composition.

Publication

In the published paper, the plant products from the samples evaluated above were considered. A total of 286 samples of wheat, potatoes and apples from different German regions were compared for their stable isotope composition of oxygen, hydrogen, carbon, nitrogen and sulphur. The aim was to find out whether a regional differentiation of the products is possible on the basis of the different isotopic compositions. The corresponding results have been published.

For some products and isotopes considered, an allocation at postcode level was possible. However, it also showed the need for different isotopes to be considered together: one alone is only of limited significance for a regional origin analysis. Same for the differentiation of organic and conventional origin of plant products based on isotope composition. Furthermore, a broad reference database is required as basis as well as uniform and authentic sampling of reference samples.

Forschungsinstitut für biologischen Landbau (FiBL) | Postfach 90 01 63 | 60441 Frankfurt am Main
Tel. +49 69 7137699-0 | Fax +49 69 7137699-9 | info.deutschland@fibl.org | www.fibl.org

To ensure the origin and authenticity of food, the examination of the stable isotope composition of food can be used as a supporting method. Beyond that, document and plausibility checks are of great importance. Xenia Gatzert, Robert Hermanowski and Rolf Mäder from FiBL were involved in the publication, as were Markus Boner from Agroisolab GmbH, Lutz Breuer and Andreas Gattinger from the University of Giessen and Natalie Orlowski from the University of Freiburg.

The paper "Assessment of multiple stable isotopes for tracking regional and organic authenticity of plant products in Hesse, Germany" can be found at DOI: 10.1080/10256016.2021.1905635

FiBL contact

Xenia Gatzert
Phone: + 49 69 7137699-62, Mail: xenia.gatzert@fibl.org

Partners

Agroisolab GmbH, JLU Gießen, Universität Freiburg

Links

This media release and pictures can be accessed online at www.fibl.org/en/media.html.

About FiBL

The Research Institute of Organic Agriculture FiBL is one of the world's leading research institutions in the field of organic agriculture. FiBL's strengths are interdisciplinary research, joint innovations with farmers and the food industry as well as rapid knowledge transfer. The FiBL Group currently includes FiBL Switzerland (founded in 1973), FiBL Germany (2001), FiBL Austria (2004), ÖMKi (Hungarian Research Institute of Organic Agriculture, 2011), FiBL France (2017) and FiBL Europe (2017), which is jointly supported by the five national institutes. Around 300 employees work at the various locations. www.fibl.org