A new scientific methodology could validate the geographical origin of EVOO

Researchers from the University of Salento (Italy) are working on a new and revolutionary methodology that, using NMR (Nuclear Magnetic Resonance) spectroscopy, could validate the geographical origin of extra virgin olive oil. This project could pave the way to apply a higher standard in the olive industry to guarantee the authenticity, transparency and traceability of this product.

The need for a scientific tool to assess EVOOs geographical origin is a growing concern since the implementation of the EU Regulation 182 of March 6, 2009 (on the compulsory labeling of EVOOs with the geographical origin of the olives in all European countries) still lacks an official validation methodology. Currently, there are no official scientific methods that certify the geographical origin of the product and authenticity.

In the last three years, a joint research project aimed to set up an "NMR" (Nuclear Magnetic Resonance) spectroscopy, is led by Professor Francesco Paolo Fanizzi from the Department of Biological and Environmental Sciences and Technology (DiSTeBA), University of Salento in Lecce, Italy, and Certified Origins srl. What can Nuclear Magnetic Resonance do? Similar to an MRI, "images" or chemical profiles, were taken from samples of EVOO from different Southern Italian regions (essentially Apulia and Calabria – major Italian producer regions). The "images" made with Nuclear Magnetic Resonance were able to generate a profile and reference model for classification of monovarietal and blend EVOOs.

"A methodological approach to obtain an olive oil fingerprint, related not only to the chemical composition, but also to the used cultivars from specific geographical areas, could be useful to guarantee transparency and traceability," explains Fanizzi, who specializes in applications of NMR spectroscopy in the fields of agricultural, chemistry, biology, and pharmaceutical sciences.

With a recent surge in block chain technology making its way into the food industry, this NMR evaluation method could satisfy consumers' desire to validate the quality and origins of their food. The results delivered a favorable predictive power of the reference model, and as a result, make it a quick and reproducible method to check the label declaration on commercial EVOOs. It can pave the path to

enforcing a higher standard in the olive oil industry that ensures authenticity, full transparency, and accurate traceability for consumer choices.

As a result of the rising costs of food globally, adulterations, not just in olive oil, cut across a wide range of categories and from all parts of the world. The complexity and scale of this fraud indicates that standardization, cooperation, and scientific implementation need to occur to protect the integrity of growers, suppliers, and consumers everywhere.

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