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**Statement on our current recommendation for honey authenticity testing**

Ensuring the authenticity of honey is a complex analytical task, as honey is legally defined as a mono-product that must consist of 100% pure honey, with no added ingredients and no removal of natural components. At the same time, honey remains among the top ten most adulterated foods worldwide, making robust authenticity testing indispensable (Moore, Spink and Lipp, 2012; Cozzolino, Dayananda and Chapman, 2024). Because no single analytical method can detect all known and emerging adulteration strategies, including dilution with C3/C4 sugar syrups, premature harvesting, mislabeling of origin, or modern “honey-tailored” syrups, our recommendation is to apply a comprehensive multi-method approach.

Several honey vendors have identified certain high-risk countries associated with low honey prices, for which the likelihood of economically motivated adulteration is significantly elevated (True Source Honey, 2026). While honey testing should always follow a risk-based approach, for high-risk countries we recommend a testing strategy that integrates EA/LC-IRMS (THH26), NMR profiling (AA0SG), LC-HRMS (THP01, THPB1), proteomics (THPP1), and pollen analysis (PTH04), providing the most reliable and future-resistant assessment of honey authenticity available today.

$^{13}$C EA/LC-IRMS provides highly reliable detection of both C3 and C4 sugar additions and is recognized and harmonized at the European level. Its performance has repeatedly demonstrated excellent accuracy in proficiency testing schemes (regular participation in the FIT-PTS 13C EA/LC-IRMS ring trial, Aries *et al.*, 2021), confirming its essential role in verifying honey purity. $^{1}$H NMR profiling offers rapid, comprehensive screening of honey, covering quality parameters, botanical and geographical origin, and common adulteration markers. However, recent experiences show that advanced “honey-tailored” syrups can sometimes evade NMR alone, underscoring the need for complementary methods. LC-HRMS provides superior sensitivity and broad marker coverage. It detects both known and emerging adulterants, including compounds that escape traditional or database-driven profiling. It can replace multiple single-marker methods and enables retrospective data evaluation, making it a powerful tool against evolving adulteration practices. Additionally, LC-HRMS demonstrates high accuracy in confirming both the geographical and botanical origin of honey (THPC0). Pollen analysis (melissopalynology) is indispensable for verifying the botanical and geographical origin of honey, a key regulatory aspect of honey authenticity that chemical methods alone cannot fully confirm. As an emerging technology, proteomics complements the classical analytical portfolio by enabling detection of protein-based markers relevant to honey authenticity. It strengthens confidence in results where biochemical composition plays a decisive role.

The combined application of these five analytical methods ensures a comprehensive, sensitive, and future-proof authenticity assessment. This approach effectively detects traditional adulterations, identifies novel syrup formulations, validates origin labeling, safeguards consumer trust, and protects honest beekeepers.

**References**

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