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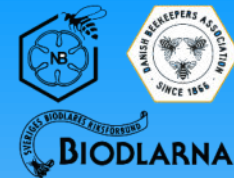
Confirming of honey authenticity is increasingly relevant in the context of global problem of food adulteration. The requirements of EU legislation on honey largely comply with the Codex Alimentarius, but the approaches to control quality indicators are still not harmonized and diverge in different countries, causing assessment discrepancies of the commercial quality of exported honey.

Adulteration of large honey batches using sophisticated but accessible modern fraud technologies often results in the products indistinguishable from natural honey using classical methods, necessitating costly advanced analyses. Addition of hydrolyzed sugar syrups from certain plants remains common method of fraud, being difficult to detect even with isotope ratio methods. The analysis of market prices, the balance of supply and demand, which are economic motives for fraud, also should be considered. In late 2024 and early 2025, it was reported that from 80 to over 90% of honey samples purchased from large retailers in Germany, the UK and other European countries failed new authenticity tests, which raises concerns about the spread of honey adulteration. Significant part of samples were marked as suspicious due to presupposed dilution of honey with cheap sugar syrup. This highlights an increase of honey adulteration cases and imperfections in current control approaches, reducing consumers' trust and affecting the global honey market.

According to new EU Honey Directive, coming into force in mid-2026, the European Commission will have the right to introduce harmonized analytical methods for detecting honey adulteration with sugar for 4 years. Assessing the importance of honey authenticity for combating the threats of honey adulteration from the point of view of importing countries, we have concluded that the first priority measures aimed at detecting possible honey falsification are attention to basic indicators of honey quality. In particular, metrics of diastase activity and GMF content regarding the levels established in the national legislation of Ukraine on honey, which was in force before its repeal in 2019. The second important task is the selection of fast, cost-effective and reliable screening methods to control honey adulteration with hydrolyzed sugar syrups at various stages of the formation of large honey batches for export.



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ASSESSMENT OF EXPORTING EXPERIENCE OF UKRAINIAN HONEY IN THE CONTEXT OF MODERN CHALLENGES AND CHANGES OF INTERNATIONAL LEGISLATION

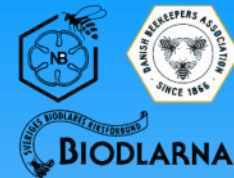
Tetyana Vasylykivska

24 September 2025

Copenhagen



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Production & Ranking

Ukraine is a world leader in honey production and export, ranking among the top five countries globally. The industry's export potential is significant, with major markets in the EU and USA. However, it faces challenges from the ongoing war, including the destruction of apiaries and mined lands, which impacts production. Despite these obstacles, Ukrainian honey is competitive due to its low price and high quality, with growing international demand for organic products.



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23-27 SEPTEMBER

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There is substantial potential for further growth, as demand for Ukrainian honey remains stable and continues to expand into the Middle Eastern and Asian markets. The low price of Ukrainian honey compared to that from other leading countries is a key factor in its international competitiveness.



The beekeeping sector is largely amateur, and professionalizing the industry is crucial for sustainable growth and increased export volumes. Developing sustainable beekeeping practices, including reliable financial support, veterinary assistance, and environmental protection, will improve the sector's long-term prospects.



Production & Ranking

The specifics of Ukrainian beekeeping are shaped by the country's climatic, geographical, agricultural, and socio-economic features. Pre-war data indicated there were 80,000 to 100,000 beekeepers (with 43,000 officially registered apiaries), managing 2,236,144 bee colonies. Recent estimates suggest that 25% of these colonies have been lost due to military actions and population displacement. The vast majority of operations are small, family-run apiaries.



Production & Ranking

While melliferous plants like phacelia, sainfoin, dogwood, linden, acacia, and buckwheat are common in moderate and dry climate zones, the most widespread are oil-producing plants like rapeseed and sunflower. In 2023, the cultivated area for these crops was 65,000 km², larger than some European countries.



COPENHAGEN Production & Ranking

Ukrainian honey is globally known as "Ukrainian polyflora," with sunflower pollen content ranging from 40% to 70%. The high annual supply of this type of honey contributes to its relatively low purchase price. This, combined with low income levels for both producers and consumers, creates favorable conditions for exporting honey to wealthier countries to meet higher demand for quality food.



COPENHAGEN Production & Ranking

Ukraine produces about 100,000 tons of honey annually, with more than half being exported. Under the current circumstances, exporting honey is a more profitable business than producing counterfeit honey from hydrolyzed sugar syrups. Ukrainian honey is not the cheapest on the global market; honey from China, India, Vietnam, and Turkey can cost less.



Export Requirements and Challenges

According to European requirements, honey for export can only be supplied to the European market in a homogenized state in large containers, which allows for effective quality and safety control of large batches as stipulated in contracts. These EU requirements were a condition for granting Ukraine official permission to export to EU countries starting in 2003. This permission has been in effect until recently and is renewed based on regular audits by authorized EU representatives.



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Export Requirements and Challenges

The main importers of Ukrainian honey are traditionally the USA, Germany, Poland, and France. However, the European Union sets quotas for duty-free honey deliveries, which change based on export dynamics. Recent data suggests a significant reduction in these quotas is expected. Only 15 of the 90 private companies on the national registry of exporters had stable, developed businesses, with seven of them being family-owned.



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Since November 2023, the State Service of Ukraine on Food Safety and Consumer Protection has amended its requirements for exporters to ensure the traceability of all export batches and updated the registry of exporters. As a result, only 12 honey producers and suppliers remain with permission to export to the EU. The main honey-producing regions in Ukraine are in 8 oblasts: Vinnytsia, Donetsk, Dnipropetrovsk, Zaporizhzhia, Zhytomyr, Mykolaiv, Poltava, and Kirovohrad, which together accounted for up to 70% of the annual honey production.



Honey Quality Control and Authenticity

From 2005 to 2019, Ukraine had a national honey standard, DSTU 4497:2005, which defined only two categories: highest and first grade. For the highest grade, the Diastase number in Gothe units had to be no less than 15, and for the first grade, no less than 10. The HMF content in mg/kg had to be no more than 10 and 25 for the highest and first grades, respectively.



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A retrospective review of statistics from 2010 to 2019 shows that the average annual diastase values for highest-grade export honey batches were between 18 and 19 units with an RSD of 18%. Even after Ukraine officially adopted the indicators of Directive 2001/110/EC, the diastase values for export honey in recent years averaged 17 units with an RSD of 17%. The situation with HMF content is similar. In the early 2000s, export companies had to put in a lot of effort to meet the high requirements of the national standard.



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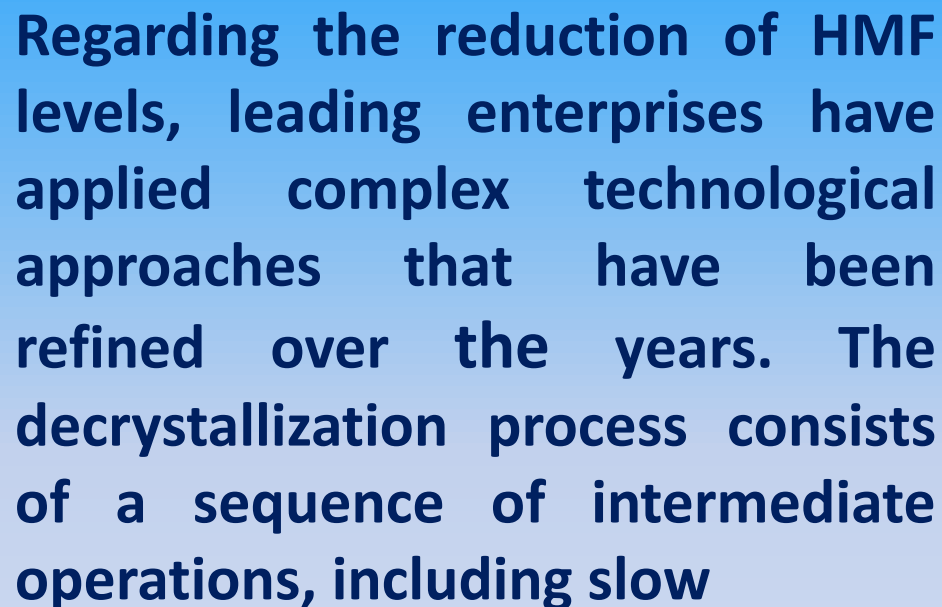
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heating under controlled conditions until the crystalline mass is released from the containers, followed by mixing under temperature control. The finely crystallized mass is then placed into 20-ton mixing containers for batch homogenization, where the minimum required temperature is strictly controlled by automated water thermostat systems until the process is complete.



This technology has been refined over years, taking into account the impact of decrystallization temperature programs on diastase and HMF values. The decrystallization process is an integral part of the process, previously agreed upon with importers, and the introduction of new quality criteria and indicators that have not been sufficiently studied and are not based on a verified methodological framework could have negative consequences.



The implementation of the requirements of Directive 2001/110/EC in Ukraine since 2019 did not lead to a deterioration in the quality of Ukrainian export honey batches, although it did weaken national honey requirements compared to European ones.



The Challenge of Honey Adulteration

Proving the authenticity of honey is becoming increasingly relevant in the context of the global food fraud problem. The requirements of EU legislation on honey largely correspond to the Codex Alimentarius, but approaches to controlling quality indicators are not yet harmonized and differ across countries, leading to discrepancies in the assessment of the commercial quality of exported honey.



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Market price analysis and the balance of supply and demand should also be considered as economic motives for fraud. In late 2024 and early 2025, it was reported that 80% to over 90% of honey samples purchased from large retailers in Germany, the UK, and other European countries failed new authenticity tests, raising concerns about the spread of honey adulteration. A significant portion of the samples were flagged as suspicious due to probable dilution with cheap sugar syrup. This points to an increase in honey adulteration cases and the imperfection of current control approaches, which reduces consumer trust and affects the global honey market.



According to the new EU Honey Directive, which will come into force in mid-2026, the European Commission will have the right to introduce harmonized analytical methods for detecting sugar adulteration of honey over a 4-year period.



A Strategic Approach to Quality Control

Assessing Ukraine's previous twenty years of experience in honey exports, it's clear that success was possible due to the correct strategy followed by the leading companies importing Ukrainian honey. Stable success was achieved by companies that were able to ensure the continuity of the supervision and control chain at all stages, from honey collection to the control and formation of export batches.



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Significant success in implementing this selected quality control strategy at all stages was achieved through the timely introduction of effective screening methods for undesirable substances in honey, particularly residues of antimicrobial agents. The implementation of quick and effective methods at the initial control level made it possible not only to remove substandard products from circulation but also to eliminate the causes of contamination. The introduction of an effective control system in laboratories at different levels led to a significant reduction in cases of undesirable substances entering the honey.



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Although there are few proven cases of Ukrainian honey adulteration on the European market, according to data from both national and European laboratories, these cases require deeper study. The determination of honey authenticity has become the biggest challenge due to the increase in honey adulteration cases on the world market. Despite strict legal regulation and the requirements of the Codex Alimentarius standard for honey, the lack of harmonization of methodological approaches leads to different results in honey quality assessment.



The absence of a single reference method for verifying honey authenticity requires a whole series of tests, such as NMR profiling, screening for C4 and C3 sugars in honey, the detection of foreign oligosaccharides, and trace markers for the addition of sugar syrups and caramel colorants.



Since honey adulteration is most often accompanied by the use of inverted starch-based sugar syrups, the detection of enzymes foreign to honey such as beta-fructofuranosidase, β - and γ -amylases, thermostable alpha-amylase, and mannose can also be a sign of adulteration. It should be noted that most of the results for the above indicators require additional evaluation, taking into account the characteristics of the honey and its region of origin.



Conducting such a number of tests using expensive analytical equipment and commercial databases of spectra and non-targeted analytes leads to increased overhead costs and thus affects the price of honey. Small companies and beekeepers who sell their own honey may be the most negatively affected by the mandatory application of such identical testing approaches to all honey on the market.



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2025

23-27 SEPTEMBER



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An important step in developing and implementing a system aimed at protecting honey from adulteration is to create inexpensive methods capable of confirming honey authenticity based on individual indicators, while also taking into account the evaluation of classical indicators such as HMF content, diastase activity, pollen composition, and others.



Therefore, an important task is to develop quick, cost-effective, and reliable screening methods for controlling honey authenticity. The selection of target analytes should be carried out considering the specifics of honey that Ukraine exports. The methods should be used by laboratories at different stages of forming large batches of honey for export.



The creation of national reference laboratories in honey-exporting countries is of great importance. The task of these reference laboratories should be not only to create databases and a pollen atlas for the honey of the importing country but also to develop and implement modern methods for controlling honey quality and safety, taking into account national specifics.



- Honey and other apiculture products intended for human consumption can only be exported from Ukraine if they are shipped, received, and/or produced at establishments listed by the competent authority of the exporting country.
- A system must be implemented to ensure the traceability of honey in the chain, from the producer to the exporter, taking into account the national specifics of beekeeping and the requirements of current legislation.



Summary

- Production laboratories of enterprises involved in the process of forming large batches of honey must be equipped with quick and reliable screening methods capable of confirming the authenticity of the honey.
- Reference laboratories accredited according to the ISO 17034 standard need to expand their scope of services to assess the qualifications of production laboratories based on the indicators specified in the Codex Alimentarius standard for honey and the indicators of screening methods for honey authenticity.



**Thank you
for your attention!**