

Issue 6 • December 2024

NO BEEES LIFE

EBA MAGAZINE



27 COUNTRIES

FROM WHICH EBA HAS MEMBERS

(41 beekeeping organizations)

In order of confirmation of the Statute of EBA

366.368 beekeepers



Serbia
Slovenia
North Macedonia
Bulgaria
Greece
Romania
Malta
Germany
Hungary
Ukraine
Montenegro
Lithuania
Bosnia and Herzegovina
Sweden
Croatia
Czech Republic
Poland
United Kingdom
Netherlands
Italy
Ireland
Belgium
Cyprus
Türkiye
Switzerland
Prishtina
Portugal
Spain

THE EBA WAS ALREADY IN CONTACT

WITH THE CANDIDATE FOR
THE EU COMMISSIONER
FOR AGRICULTURE AND FOOD,
MR. CHRISTOPHE HANSEN
BEFORE THE HEARING, **THE RESULTS**
WERE ALREADY **VISIBLE AT THE HEARING!**

The candidate for EU commissioner for Agriculture and food, Mr. Christophe Hansen is clear – control over counterfeit honey must be tightened!

Today, November 4, 2024 the European Parliament questioned the candidate for EU Commissioner for Agriculture and food Mr. Christophe Hansen.

For more than 3 hours, I listened to the hearing of the candidate for EU Commissioner, Mr. Christophe Hansen. He received a question from a Member of the EU Parliament on the topic of labeling honey. He made it very clear that there is a need to improve the work in terms of labeling. He emphasized that a very important achievement of the European Commission in the past mandate was the amendment of the Honey Directive, which very clearly requires the labeling of honey by country of origin. He was also clear that more needs to be done against counterfeit honey, as the honey must be of good quality, so control in this area must be increased, as it is a matter of misleading consumers. He also mentioned the importance of bees for pollination. In short, I can say that he showed knowledge of beekeeping issues and that we EBA members can be happy

that we were in contact with him before the hearing and already presented the issue to him.

We inform you that already on October 1, 2024, contacted the candidate for the European Commissioner for Agriculture and food, Mr. Christophe Hansen.

We sent him the following letter:

Dear Mr. Christophe Hansen,

I would like to sincerely congratulate you on your re-election as a Member of the European Parliament and wish you the best of luck in the upcoming hearing for the position of European Commissioner. I am writing to share with you a letter (attached) regarding an urgent issue affecting the honey industry in Europe: honey adulteration. As stated in the letter, we are concerned for both consumers and honest beekeepers across the EU.

We greatly appreciate your support and look forward to your feedback.

<https://ebaeurope.eu/>

Boštjan Noč
President of the
European Beekeeping Association



Mr. Christophe Hansen sent us the following reply on October 4, 2024:

Dear Mr. Noč,

Thank you very much for your letter. Beekeeping and honey production have always been high on my political and professional agenda. The latest example was the change in the opinion of the ENVI committee on the EU budget, which emphasizes the key role of pollinators. That com-

mitment will remain true if I pass the hearing and become the next Agriculture and Food Commissioner.

In the meantime, I will explore options to address the issues you rightly mention. I also suggest that we try to have a meeting shortly after the next Commission's mandate begins.

Best regards,
Christophe Hansen

Boštjan Noč
President of the European Beekeeping Association



FIRST MEETING OF THE HONEY PLATFORM

In June, the European Commission opened a call for applications for setting up the expert working group, called the Honey Platform. Out of 33 organisations that applied, only 8 were selected. EBA's application has been successful, and our representatives, prof. dr. Andreas Thrasyvoulou and dr. Urška Ratajc, have attended the first Honey Platform meeting on 6th of November 2024.

The meeting was in hybrid form, which means that representatives could attend the meeting either in person in Brussels or via video conference. Representatives of Members States' authorities, laboratories, stakeholders, civil societies and other experts were invited to share their knowledge and points of views on the topics on the agenda. At the first meeting, the discussion was on two important topics: (1) composition criteria for honey to exclude overheated honey and the destruction/deactivation of natural enzymes and (2) gathering data for methods to improve authenticity controls, with a view to possibly harmonising them.

In the weeks before the meeting, the EBA Scientific Committee on Safety and Quality of

Bee Products prepared a proposal with answers to the European Commission's specific questions, which was then adopted and confirmed also by the Executive Board. The proposal was sent to the European Commission and defended at the meeting, which took place between 9.30am and 5pm. The discussion of representatives of different entities was lively, but at a high and very professional level. While consensus on some decisions will probably be easily achieved, there is still a lot of work ahead of the working group. Honey Platform members will meet twice a year in the following years and communicate in written format in the meantime. The next meeting is scheduled for 13 May 2025. The EBA representatives will continue to work towards EBA's main goals and we hope we can soon report on some important decisions and further amendments to the Honey Directive.

Dr. Urška Ratajc

Food Safety Advisor, Slovenian
Beekeepers' Association

Head of the Scientific Committees, European
Beekeeping Association



UNIQUE TO GOAL

EBA thanks the entire Scientific Committee on Safety and Quality of Bee Products for the excellent preparation for today's Honey platform meeting in Brussels, which will be attended by the Head of the Scientific Committee on Safety and Quality of Bee Products dr. Urška Ratajc.

The document was prepared comprehensively, in detail and very professionally, taking into account the latest achievements of the profession and science. In fact, the Scientific Committee on Safety and Quality of Bee Products answered the questions of the European Commission, and thus established the official position of the EBA, which was adopted and confirmed unanimously yesterday at the meeting of the Executive Board of the EBA.

The Executive Board of the EBA made a decision yesterday that this, as well as future har-

monized documents of the EBA Scientific Commissions, must be uniformly represented in public by all members of the EBA Scientific Commissions. If someone in public represents different positions from those agreed on the Scientific boards and adopted and confirmed by the Executive Board EBA, he cannot have a place in the scientific boards of the EBA, so he will have to leave them himself or the Executive Board EBA will remove him from their membership. .

The Executive Board of the EBA unanimously believes that a unified public appearance of all our bodies and working bodies is key to future success in achieving our goals, and that is why we agree on the language of arguments before any public appearances.

EBA

GOOD NEWS FROM APIMONDIA

At the meeting on November 2, 2024, the Apimondia Executive Council reviewed and cleared EBA's application for membership in Apimondia as an Associate Member.

In the further process, the Application will be submitted to the final endorsement to the Apimondia General Assembly in Denmark in September 2025 on the occasion of the 49th Apimondia Congress.

We thank the Apimondia Executive Council and look forward Apimondia General Assembly in Denmark.



MEETING OF EBA WITH THE MANAGEMENT OF APIMONDIA

On November 29, 2024 a meeting was held between EBA President Mr. Boštjan Noč and EBA Vice - president Mr. Rodoljub Živadinović with the top management of Apimondia, consisting of Apimondia President Mr. Jeff Pettis, Apimondia General Secretary Mr. Riccardo Jannoni Sebastianini and Apimondia Commission President for Europe Mr. Robert Chlebo.

The meeting lasted almost two hours and covered all important issues related to the cooperation between

Apimondia and EBA in solving the most important problems of world and European beekeeping.

The greatest emphasis was placed on the main goal of the EBA - combating counterfeit honey.

An absolute consensus was reached on the damage counterfeits do to beekeeping. President Apimondia said that beekeepers give up beekeeping because of the abnormally low prices of fake honey, which also lowers the price of real honey, because they represent unfair competition to beekeepers.

An agreement was reached regarding further joint action towards all decision-makers in the widest possible beekeeping front. It was agreed to create a partnership statement of all international beekeeping organizations on common goals related to adulterated honey, which will be sent to decision makers in the European Union.

The new EU Commissioner for Agriculture takes office on December 1, 2024 and will receive our letter as soon as possible.



ESTABLISHMENT AND FIRST MEETING OF THE EBA SCIENTIFIC COMMITTEE ON BEE HEALTH



The European Beekeeping Association (EBA) established its Scientific Committee on Safety and Quality of Bee Products in early July, and we are pleased to report that the committee has already made enthusiastic progress in its work. As the EBA continues to expand its efforts in various areas of European beekeeping, the need for additional specialized committees has become apparent. Therefore, the Scientific Committee on Bee Health has been established in September 2024. It will serve as a collaborative platform for leading researchers and scientists dedicated to addressing the challenges facing honey bees, and will provide scientific counsel, focusing primarily on the matters of bee health and welfare. Members were confirmed by the Executive Board on the 17th of September. Cur-

rently, it consists of 9 experts from 9 countries with expertise in bee biology, genetics, biosecurity, pathology, disease management, good veterinary practice, etc.

Members of the Scientific Committee on Bee Health (in September 2024):

Turkiye: Prof. Dr. Aslı Özkırım – President
Italy: Dr. Giovanni Formato – Vice-President
Spain: Prof. Dr. Xesús Feás
Austria: Assoc. Prof. Dr. Dalial Freitak
Greece: Dr. Fani Hatjina
Slovenia: Prof. Dr. Vlasta Jenčič
Ukraine: Dr. Olena Metlytska
Bosnia and Herzegovina: Dr. Violeta Santrač
Croatia: Prof. Dr. Ivana Tlak Gajger

The Scientific Committee on Bee Health held its first meeting online on the 17th of September. The Committee discussed the main objectives and activities of the Scientific Committee, a possibility of an in-person meeting of both Scientific Committees in spring at the conference APIS Slovenia I Europe (15. March 2025, Celje, Slovenia), but the main item on the agenda was the revision of the CVMP (Committee for Veterinary Medicinal Products) guideline on veterinary medicinal products controlling *Varroa destructor* parasitosis in bees. The guideline was adopted in 2008, and the last revision was carried out in 2021. In summer, the European Medicines Agency published a concept paper on a new revision of the guideline for public consultation, and the Scientific Committee on Bee Health successfully submitted their comments at the end of October. You will be able to read more about the

activities of the Scientific Committee on Bee Health in the future issues of EBA Magazine.



Dr. Urška Ratajč
Food Safety Advisor,
Slovenian Beekeepers' Association
Head of the Scientific Committees,
European Beekeeping Association



**BEES
LIFE**

INVITATION

TO JOIN THE EBA SCIENTIFIC COMMITTEE ON APITHERAPY

The European Beekeeping Association (EBA) established its Scientific Committee on Safety and Quality of Bee Products and Scientific Committee on Bee Health, and we are pleased to report that the committees has already made enthusiastic progress in its work.

As the EBA continues to expand its efforts in various areas of European beekeeping, the need

for additional specialized committees has become apparent. In light of this, we are excited to announce the formation of the Scientific Committee on Apitherapy and invite applications for membership.

Apitherapy is complementary scientific discipline of traditional medicine, mostly created based on the centuries-old experience of people

who lived in close contact with bees. It combines preventive and therapeutic methods which are based on the application of bee products: pollen, royal jelly, honey, propolis, bee venom and wax for the purpose preserving and improving human health. Bees product it best used preventively and prophylactically, in order to maintain health. The use of bee products for preventive and therapeutic purposes dates back to the time when man existed, and the need for this area to be instructed by the knowledge of professional and educated people is another step for the EBA to base its work on the views of professional people in that field. Apitherapy, as a modern, integrative method in the function of human health, occupies everything a more significant place within the methods of traditional medicine in the modern approach to caring for the health of the human population.

If you are passionate about contributing to our mission, we invite you to apply for member-

ship on the Scientific Committee on Apitherapy. Please submit a brief application (maximum 300 words) to eba@ebaeurope.eu by December 15th, 2024. Your application should include a statement of motivation, your area of expertise, and a brief list of references highlighting your professional or academic contributions in the field of Apitherapy. One of the tasks of future members of the EBA SC on Apitherapy would be to prepare short texts on the scientifically confirmed effects of bee products, in order to market them through the media and raise awareness of the importance of using bee products. The texts would be prepared, at intervals of one article every two months for each member.

We look forward to your participation.

Boštjan Noč

President of the European Beekeeping Association

GRANT AWARD

DECISION:

EBA AS CO-ORGANIZER OF EVENTS IN 2025

In accordance with the Decision of the Executive Board on the launch of the EBA Public Call for co-organization of events by EBA members in 2025, which was announced by November 1, 2024, 6 applications were received and arrived within the given deadline. Out of 6 applications, ONLY three met the criteria from the Public Call.

After a detailed analysis of the applications received, three applications did not meet the criteria from the Public Call and were rejected as incomplete, while three applications were accepted and completed and as such met the criteria from the Public Call.

EBA Executive Board made a Decision to support three events. of our members in 2025

whose applications met the criteria published in the Public Call, as follows:

1- Beekeeping Association of Slovenia- APIS Slovenia / Europe; Celjski sejem, Dečkova cesta 1, 3000 Celje, Slovenia; 15-16. March 2025;

2- International Association of the dark bee- SICAMM – SICAMM Conference; Stavanger, Norway; 27-30. March 2025;

3- Serbian Federation of Beekeeping Organizations – Symposium »Challenges in the European beekeeping sector and how to solve them« during the XVI State Beekeeping Fair; BELGRADE FAIR, Bulevar Vojvode Mišića 14 St, 11000 Belgrade; 08. February 2025;

We thank all the participants of the call for their participation.

EBA LAUNCHES THE EUROPEAN BEEKEEPING DAY

AT THE CONGRESS OF APIMONDIA IN DENMARK

EBA will give apimondia the initiative that Apimondia and EBA TOGETHER organize the 2025 European beekeeping day at Congress of Apimondia in Denmark.

In the coming days, the first official meeting with the president of Apimondia and the president of Apimondia RC Europe will be held on that topic.

APIMONDIA

SCANDINAVIA

SWEDEN | DENMARK | NORWAY

2025



COPENHAGEN



DATA COLLECTED FROM EBA MEMBERS



THE NAME OF ASSOCIATION	AVERAGE HONEY YIELD IN 2024 PER HIVE	PURCHASE PRICE OF ACACIA HONEY IN 2024	PURCHASE PRICE OF MEADOW HONEY IN 2024	PURCHASE PRICE OF FOREST HONEY IN 2024	AVERAGE PRICE FOR ACACIA HONEY IN DIRECT SALE TO CONSUMERS IN 2024	AVERAGE PRICE FOR MEADOW HONEY IN DIRECT SALE TO CONSUMERS	AVERAGE PRICE FOR FOREST HONEY IN DIRECT SALE TO CONSUMERS IN 2024	PERCENTAGE OF HONEY SALES ON THE DOORSTEP	PERCENTAGE OF HONEY SALES TO HONEY BUYERS
Beekeepers' Association of Slovenia	7,52 kg	6 EUR	6 EUR	7 EUR	13,19 EUR	13,18 EUR	13,71 EUR	91%	9%
Union of Beekeeping Associations of North Macedonia	10 kg	no pure acacia honey in NM	7 EUR	7 EUR	/	10 EUR	11 EUR	90%	10%
Serbian Federation of Beekeeping Organizations	12 kg	3,6 EUR	2 EUR	6 EUR	10 EUR	8 EUR	12 EUR	40%	60%
Union of Beekeeping Organizations of Montenegro	5 kg	no honey	9 EUR	9 EUR	/	15-18 EUR	15-18 EUR	80%	20%
Union of Beekeepers Association of Republic of Srpska	8 kg	6,5 EUR	6,5 EUR	7 EUR	11 EUR	11 EUR	12,5 EUR	90%	10%
Hungarian Beekeepers' Association	32 kg	2,8 EUR	1,5 EUR	3,7 EUR	8 EUR	5,5 EUR	no available	20-30%	70-80%
Romanian Beekeepers Association	8-12 kg	3,1 EUR	1,7 EUR	insignificant quantities	7 EUR	4 EUR	4 EUR - insignificant quantities	~30%	~20% ~50% still in beekeepers stock
National Bee Branch Association									
Association 'Organic Beekeeping Society' (Hellas)									
Non-Governmental Organization Brotherhood of Ukrainian Beekeepers	25-40 kg (2024 was a bad year for honey harvesting) 40-100 kg (in good year for honey harvesting)	2,4 EUR	1,3 EUR	#VALUE!	Retail price (on Open-Air Markets) - 4,8 EUR Retail price (in supermarkets) - 13,3 EUR	Retail price (on Open-Air Markets) - 3,1 € per 1 kg Retail price (in supermarkets) - 10,5 € per 1 kg	Retail price (in supermarkets) - 12,5 € per 1 kg	30%	70%
Lithuanian Beekeepers Association	27,7 kg (in 2022)		1,8-2,2 EUR	5 EUR		4,5 EUR	5-6 EUR		
Malta Beekeepers Association VO 1527									
Slovenian Professional Beekeepers Association	7,52 kg	6 EUR	6 EUR	7 EUR	13,19 EUR	13,18 EUR	13,71 EUR	91%	9%
New Beekeeping Association	25 kg	3,6 EUR	2 EUR	6 EUR	12 EUR	10 EUR	12 EUR	100%	0%
Belgrade of Association of Beekeepers									
German Beekeepers Association, Deutscher Imkerbund e.V									
Honungsringen									
Beekeeping Society Zagreb	12,5 kg	9 EUR	10 EUR	-	9 EUR	10 EUR	-	77,6%	-
ICVB- International Centre for Young Beekeepers									
Association of Beekeepers of Lodzg Region									
Union of Beekeepers of Ukraine									
British Beekeepers Association									
Dutch Beekeepers Association									
Association of Beekeeping Association of Primorje-Gorski Kotar country-Beekeepers Federation of Primorje-Gorski Kotar									
Ulster Beekeepers Association									
Bee Improvement and Bee Breeders Association									
Apimcitta' aps									
Foundation for the Conservation of the Maltese Honey Bee									
Imkers Nederland									
Bulgarian Association of Organizations of Honey Producers and Beekeepers									
Irish Bee Foundation	6,5 kg	no pure acacia honey in Ireland	no pure meadow honey in Ireland	n/a	mixed floral 20 EUR per kg to consumer	mixed floral 20 EUR per kg to consumer	Normal sale is 22,7 g jar 7 EUR	90,00%	
Cercle apicole de Charleroi (CAC asbl)	+/- 12 kg	no pure acacia honey in Belgium	no pure meadow honey in Belgium	no pure forest honey in Belgium	not applicable (all-flowered honey sold to consumer: approx. 16eur/kg)	not applicable (all-flowered honey sold to consumer: approx. 16 EUR/kg)	not applicable (all-flowered honey sold to consumer: approx. 16 EUR/kg)	80-90% (non professionals)	?
Pancyprian Beekeepers Association									
Turkish Association of Beekeepers-TAB									
International Association of the dark bee-SICAMM									
National Beekeeping League									
Thessaloniki Beekeepers Association									
PU" Matica" Pjlevlja									
Honey Authenticity Network UK (HAN UK)									
Apilegre									
FNAP – Federação Nacional dos Apicultores de Portugal	20 kg	4,5 EUR	4 EUR	4 EUR	9 EUR	8 EUR	8 EUR	15%	85%
Asociación El Rincón de la Abellanas - Spain									



EUROPEAN BEEKEEPING ASSOCIATION

MAIN GOALS:

- Successful fight against counterfeit honey
- Successful fight for the introduction of special subsidies per beehive based on the contribution to the pollination
- Successful fight against the improper use of pesticides

WILL WE ALLOW THE FAKE HONEY INDUSTRY TO **BURY US?**

27 countries

366,368 beekeepers

FREE MEMBERSHIP FEE

FREE DIGITAL MAGAZINE

“NO BEES, NO LIFE” (www.ebaeurope.eu)

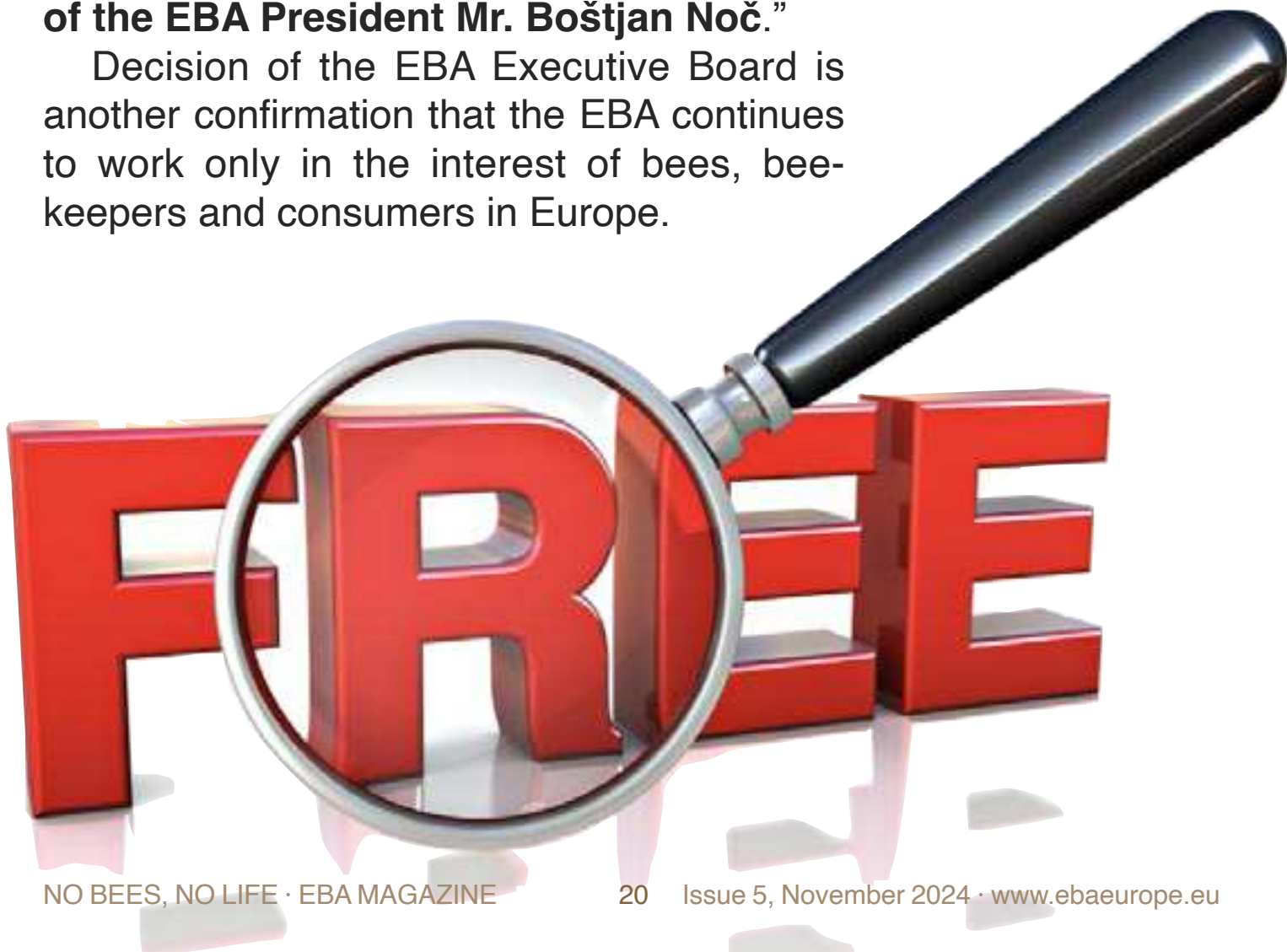
Request your beekeeping association
to join EBA, together we are

STRONGER!

TO THE EBA WITHOUT MEMBERSHIP FEE

At the meeting of the EBA Executive Board, on the proposal of the EBA President Mr. Boštjan Noč, an important decision was made regarding membership in the EBA in the upcoming period: **“Membership in the EBA is free for the duration of the mandate of the EBA President Mr. Boštjan Noč.”**

Decision of the EBA Executive Board is another confirmation that the EBA continues to work only in the interest of bees, beekeepers and consumers in Europe.



WHAT IS THAT?

HONEY METAGENOMIC DNA ANALYSIS (MDA)

Honey is one of the most adulterated foods in the world. The crooks are so skilled that the mixtures used for adulteration are advertised at trade fairs with the clause that it also cheats the tests of European food laboratories. And it is truth. However, that is not true about honey total DNA-based method because none of the DNA tests have been cracked in history, not in forensics, medicine, or food safety.

Compared to previous tests, which only show, for example, how much extraneous sugars have been added to the honey, the honey DNA test of the Estonian research company, Celvia, is so accurate that it reveals the composition of honey; which plants the honeybees have collected pollen and nectar from, what about their health is the microbiome of the honeybee, whether the yeasts are in balance and what parasites afflict them.

The honey Metagenomic DNA Analysis, the MDA test, was developed by Celvia researchers over three years in cooperation with more than a few hundred Estonian and foreign beekeepers. The initiative came from beekeepers, who find it challenging to fight fraudsters. Surprisingly, many traders still agree to sell syrup or honey diluted with syrup instead of genuine honey and ask for a price worthy of honey.

A scandalous start

The results of the MDA test have shocked the European honey market several times in a short period; 80% of the samples collected from the German trade failed, 60% of the samples that arrived from the Finnish market did not pass the test, only one of the twenty-five samples sent for testing from the British trade was authentic honey (96%). And finally, twenty-five samples sent from the Austrian trade all failed (100%). How did they make it?

"If the situation is terrible, then help is sought from science. Although science needs time and resources, we have reached the point where we have a solution to beekeepers' concerns," said Kaarel Krjutskov, head of the Celvia laboratory. In three years, with the support of beekeepers and the Estonian government, Celvia researchers put together a functional testing protocol that is a top achievement in terms of food technology and safety.

Big data has high value

But how is the honey DNA test different from other tests? The head of Celvia explained that, for example, the currently used NMR methodology only shows a few individual components, such as whether extraneous sugars in the sample are being tested. The honey DNA test gives a comprehensive picture of honey composition at the DNA molecule level. The main difference is that existing tests ask questions, such as whether one substance or another is present in the sample.

The scope of the honey DNA test is much broader; the MDA test shows what and who is here, so the test answers to which plants the honeybee has collected pollen, whether the honeybee has a natural microbiota, whether the beehive's yeasts are in the right balance and which parasites live in the hive. Thus, the honey DNA test is thorough and tells the whole story of a beehive, its condition and its micro-ecosystem.

When honey is diluted with syrup, the DNA picture of the honey changes significantly, and this test cannot be cheated or faked. Celvia has also tested the syrup bought in Asia, which is mixed with genuine honey from Europe. The result is a very uniform DNA picture with traces of a handful of plants, and the added syrup also stands out. On the other hand, the DNA profile of authentic honey shows hundreds of different plants in a genuine sample.

The test is suitable for small- and large-scale producers

The DNA test provides the botanical composition of the honey. Hobby beekeepers often



use the honey test to determine which plants their honeybees pick. All pathogens and parasites can be detected by DNA testing. The pathogens' information is beneficial for beekeepers because it can be used to decide whether it is necessary to carry out additional analyses or improve the situation for the sake of the bees' health and well-being. "We currently have twenty different honeybee parasites and pathologists in the test that the DNA test detects," said Krjutskov. The list of parasites and pathogens that the test can detect is constantly updated during the development of the test.

An honest beekeeper can prove with a DNA test that he has honey produced correctly. Some Estonian beekeepers already use it. If the Estonian beekeeper can order the test to study the bees' health and find out from which plants the honey reaches the hive, the honey DNA test comes into play again in the case of export and trading. For example, a local honey producer commissioned Celvia to DNA test an entire batch of honey to send a truckload of honey to Japan.

Since Japan can produce only barely five percent of the country's honey needs, it is essential for them that the imported honey is genuine. Almost 47,000 tons of honey are sold annually in Japan, of which 45,000 tons are imported. Over

70 percent of imported honey comes from China, where counterfeit honey often comes from.

For Japanese customers, it is essential that the products they resell meet the highest quality standards and are authentic, Nordmel manager Peeter Matson said. According to him, more was needed that the company confirmed it - the Japanese client went to Estonia with its purchasing and quality team, made it clear to himself, and inspected all Nordmel's work processes in detail to see for himself.

A universal test

In the case of the honey DNA test, it doesn't matter which part of the world the honey sample is taken from because the honeybee follows the same physiology worldwide.

During the development of the Celvia MDA test, it was considered that plants are a constantly changing factor because the harvest plants are very different everywhere. At the same time, plants and nature do not change depending on the country's border. Spruce, for example, spreads throughout Eurasia, this species is almost identical across thousands of kilometres. Some plants are specific to very strict region. Therefore, plants alone do not determine the

authenticity of honey. An essential components are other sources of honey DNA, i.e., bacteria, fungi, insects, mammals, and DNA viruses, all of which form a complete picture of honey DNA profile. If the balance is spoiled by feeding the bees with syrup or diluting the honey, the DNA betrays it.

But for now, Celvia is focused on the European market for continuous development. Their goal is to first collect a minimum of tens of authentic honey samples from almost all European countries to supplement their database in this way. Completing the database is also vital for the honey DNA test to be more widely used in market surveillance. "Authentic honey characterizes the face of European honey; sooner or later, this type of testing will become a standard," noted Kaarel Krjutskov.

Honey DNA data is analysed using machine learning methods, artificial intelligence (AI) trained on authentic honey data. If you show the machine a new sample of interest, it can classify it as authentic or fake. "When the machine says that it is on the limit, a specialist intervenes because we know the markers of fake honey," explained the head of the Celvia laboratory.

Honey DNA data consist of 10-20 million of DNA sequences. Powerful computing finds the origin of every sequences. That is possible thanks to research community that have char-

acterized tens of thousands of species worldwide over the last 20-30 years. Despite this, about 50% of sequences remain unmatched.

The missing part showing that not all species and their DNA are not studied completely and there is room for improvements in the future.

There are also plans to develop the Celvia honey test so that it will be possible to determine bee RNA viruses as well.

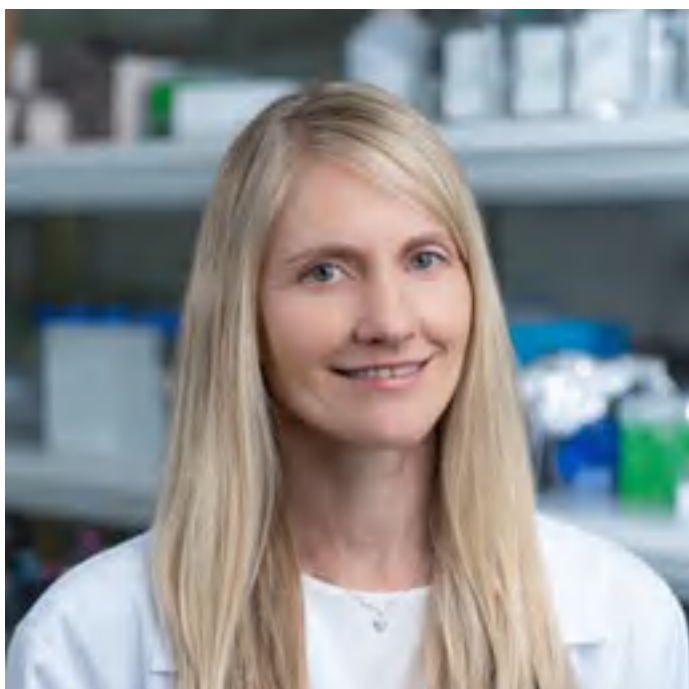
"There are two types of viruses: DNA viruses, which are milder, and we can already detect them, and RNA viruses, which are more evil and devastating," Krjutskov explained.

He gave an example that the COVID-19 that gripped the whole world was also an RNA virus. As the RNA virus ravages bees more, the Celvia laboratory is already developing a test to detect them.

The key people behind the MDA test

Kairi Raime
PhD in bioinformatics
Head of Food Metagenomics Lab, Celvia CC

Kairi's family is directly involved in beekeeping, and she has always been interested in food DNA analysis. Kairi actively participated in devel-



Kairi Raime



Kaarel Krjutškov

oping the honey DNA test in 2020-2023 and has always been an active communicator with beekeepers.

Kairi has a vital role in the development of the honey DNA test. In 2024, she was chosen as the friend of the beekeeper of the year by the Estonian Beekeepers' Association, and the European Professional Beekeepers Association recognized Kairi for his contribution in 2024 at the EuroBee fair in Munich.

Kaarel Krjutškov
PhD in molecular diagnostics
Laboratory Manager and CEO, Celvia CC
Associate Professor, University of Tartu

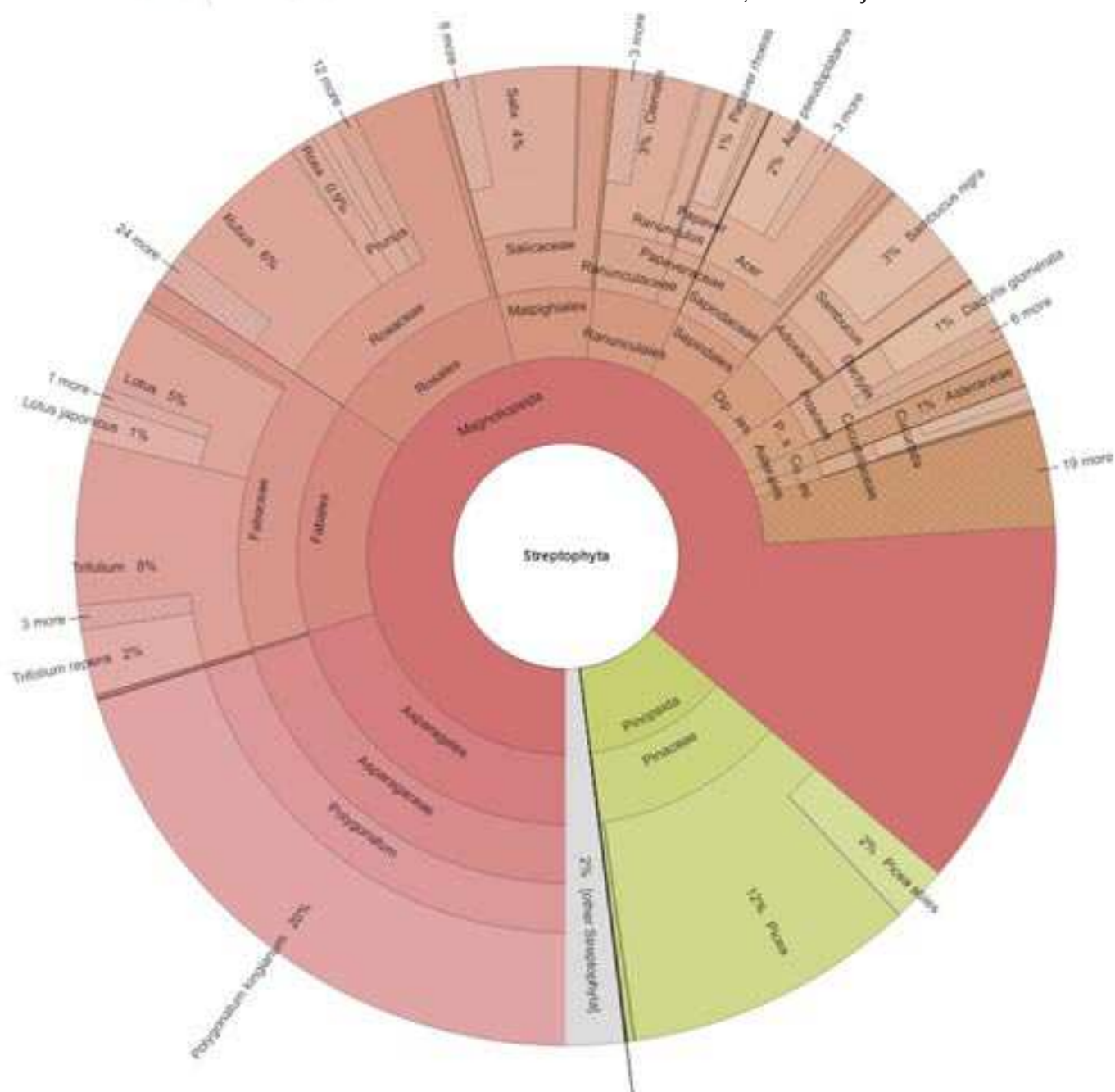


Figure. Botanical composition of adulterated sample (left) and genuine honey sample (right). The Krona plot shows the handful of detected plants in non-authentic honey sample. Authentic honey always contains tens to hundreds of different plants.

Kaarel likes honey, but he is afraid of bees. Under the leadership of Kaarel, the state-of-the-art and robust DNA technology used in medicine was applied to the analysis of honey. As the head of the laboratory, Kaarel stands for the standards and precise measurements used in medicine to become the new testing standard in food safety.

Celvia CC is a private company and research unit at the ministry level. Celvia operates in Tartu, Estonia. The address is Teaduspargi 13, 50411, Estonia. More information at www.mda-test.com/en/

What does the MDA report show?

The honey DNA test report consists of two parts. The first part, a PDF file, shows whether it is authentic honey and which plants and pathogens have been identified.

The second part is an interactive graph, krona plot, where you can see the botanical content of honey by sector and follow the collection plants in detail.

The honey DNA test requires 100 grams of honey, which is analyzed in the Celvia laboratory. The customer ships the sample together with the order form to the laboratory. Answers will arrive within a few weeks.



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CELVIA

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We measure with scientific precision

Celvia, formerly known as CCHT, is an Estonian company and research institute that is paving the way from basic research to genetic testing. Our field is medicine and food safety.





EIM-IRMS

A GAME-CHANGER IN HONEY MARKET REGULATION: THE ACCREDITED METHOD AT WORK

In previous issues of the EBA magazine *No Bees, No Life*, we discussed the EIM-IRMS isotopic method, designed to authenticate honey and detect the presence of industrial sugar syrups. Last year, the Pančevo-based consumer association Consumer Movement for Food

Quality conducted a large-scale campaign in the Republic of Serbia.

Testing revealed that out of 25 honey samples collected from seven retail chains, 22 (88%) failed the authenticity test due to the presence of sugar syrup (Figure 1).

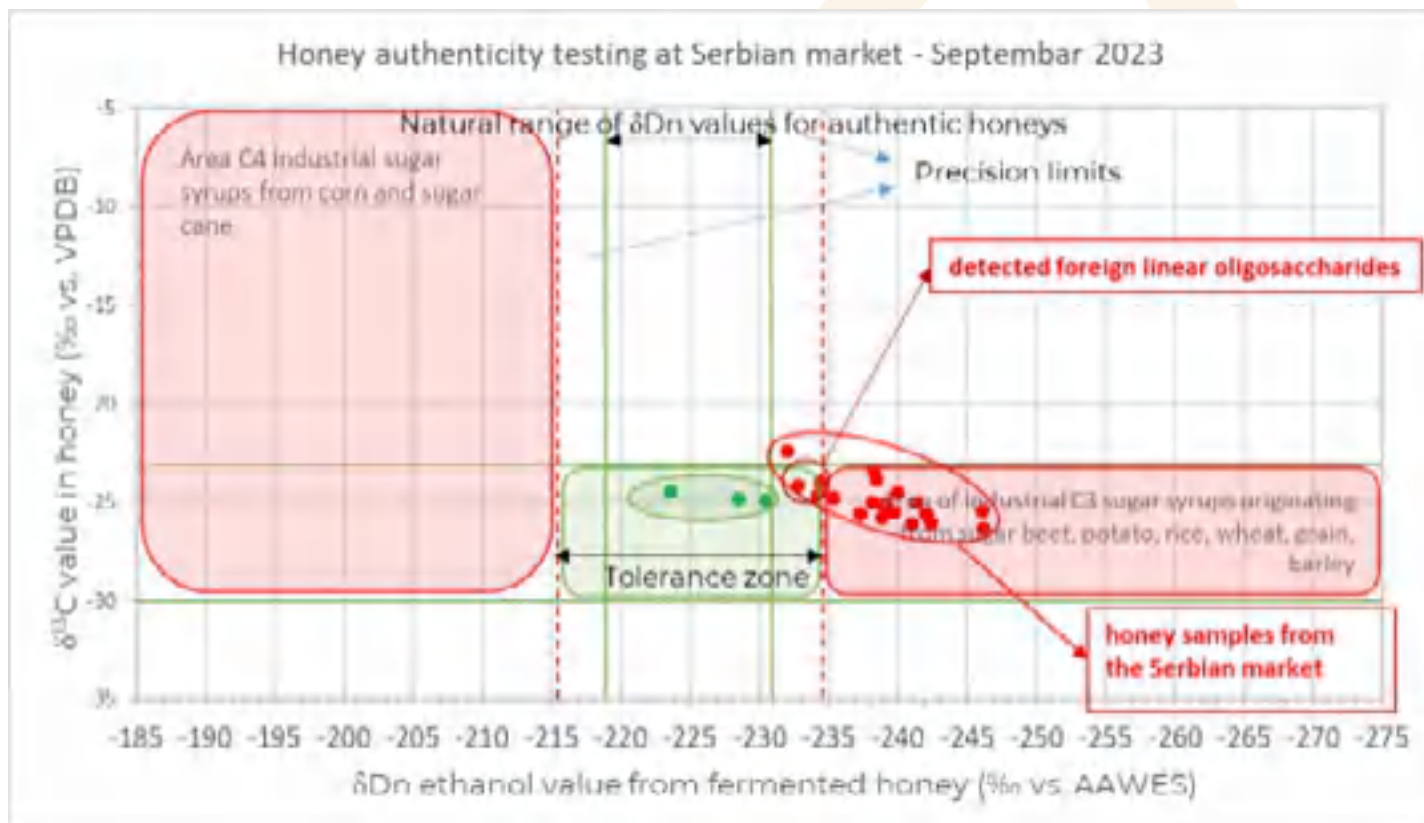


Figure 1: Honey authenticity testing at Serbian Market – September 2023

This year (2024), another consumer group, Consumer Protection, conducted a similar campaign. Among 29 honey samples tested from Serbian retail chains, 23 (79.31%) were found to be

adulterated, while only six passed the authenticity test. These findings highlight a persistently high rate of honey fraud in the Serbian market (Figures 2 and 3).

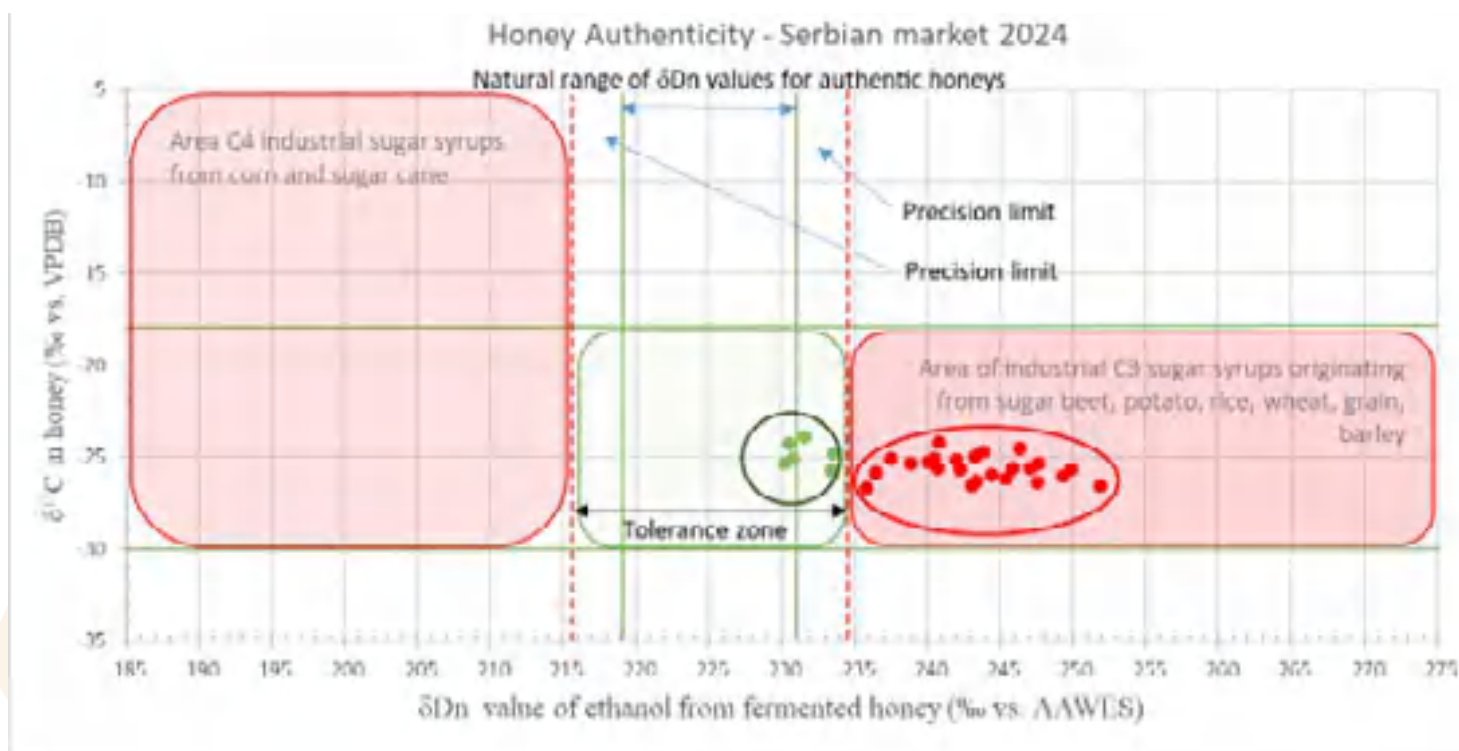


Figure 2: Honey authenticity testing at Serbian Market – 2024

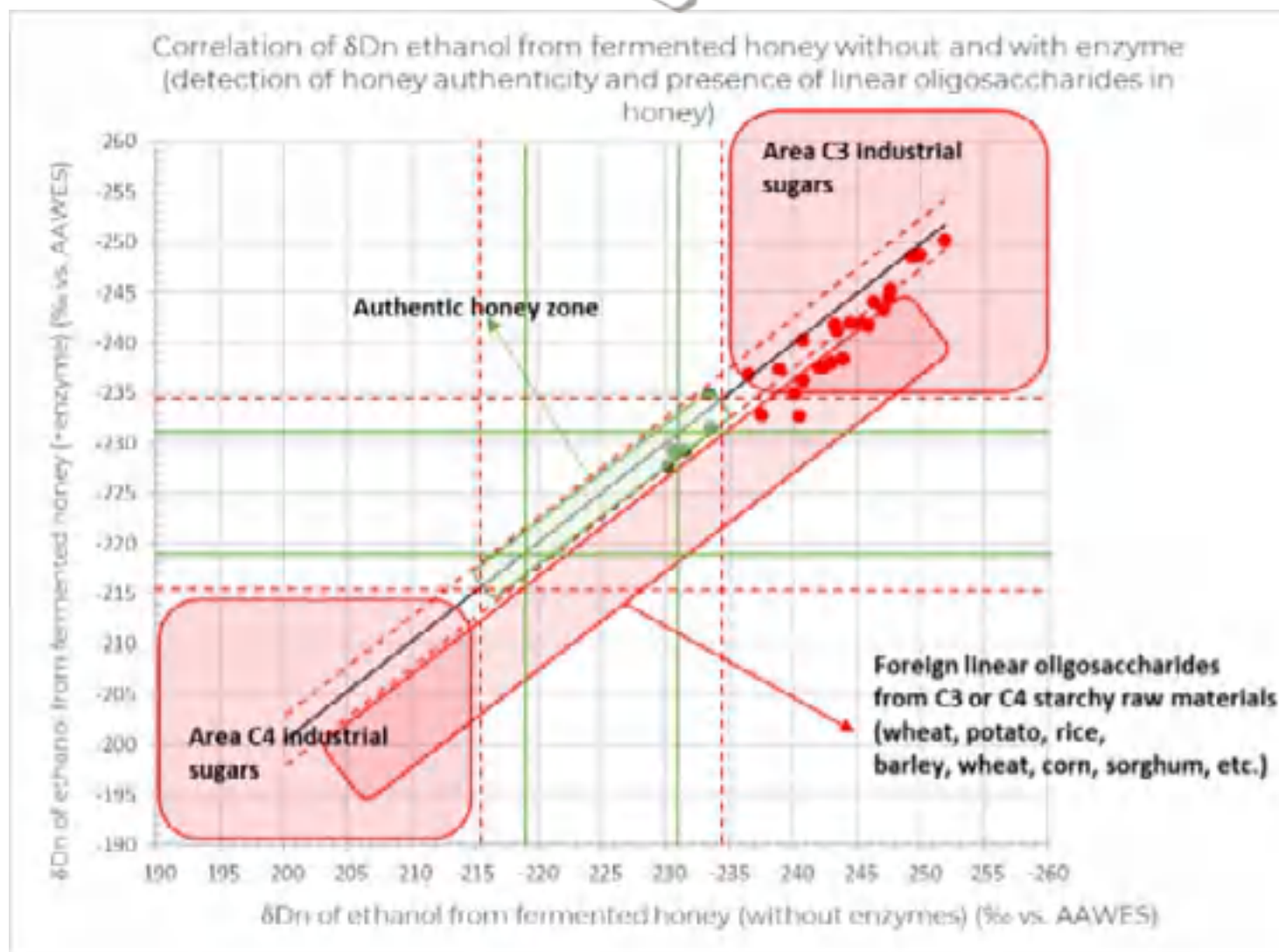


Figure 3: Honey authenticity testing at Serbian Market – 2024

The tests were conducted at ANA LAB DOO PANČEVO, an ISO/IEC 17025:2017-**accredited laboratory** specializing in isotopic analysis and food authenticity testing. **EIM-IRMS** (Ethanol Isotope Measurement – Isotope Ratio Mass Spectrometry), a key method within ANA LAB's accreditation scope, determines the botanical origin of ethanol and, by extension, the sugar in honey. This targeting method identifies the type of industrial sugar (C4 and/or C3 syrups) present in the sample. Notably, EIM-IRMS is the only method capable of detecting invert sugar syrup derived from sugar beet (C3 syrup), a particularly challenging adulterant to identify. Furthermore, EIM-IRMS has the possibility to detect the presence of foreign linear oligosaccharides and end dextrans originating from starch based plants in honey.

Unlike other analytical methods that rely on comparing results to reference databases or de-

tecting specific chemical markers, EIM-IRMS directly identifies sugar syrups regardless of purification or marker removal. This makes it uniquely robust in combating honey fraud, as advancements in sugar syrup refinement increasingly circumvent marker-based detection methods.

An intriguing case was recently highlighted by Estonian beekeepers at the International Honey Fair in Paris. In conversation with third parties, they disclosed how counterfeit honey could bypass authenticity tests in the UK and EU, including actual methods like NMR and HRMS. This raises serious concerns about fraudulent honey entering the European market, undercutting prices and causing significant issues for European beekeepers. Although the European Commission's Honey Platform working group has initiated efforts to address honey fraud, progress appears slow, and urgent action is needed to support beekeepers.



A recent comparative study by the Indian National Reference Laboratory for Honey Authentication evaluated various analytical methods against the accredited EA/LC-IRMS method.

As a participant in international proficiency testing (PT) schemes, ANA LAB contributed by analyzing 20 blind samples, sent by the Indian organizer, using EIM-IRMS and submitting results to the study. The comparison revealed the following concordance rates with EA/LC-IRMS:

NMR (n=15): **53%**
 HRMS (n=15): **80%**
 EIM-IRMS (n=20): **85%**
 LC-MSMS (n=98): **49%**
 ICP-MS (n=98): **40%**

These results underscore the high reliability of EIM-IRMS, further establishing its value as a cutting-edge tool in the fight against honey adulteration.



The Key People Behind The EIM-IRMS Testing

Ivan Smajlović, MSc

Innovator and Pioneer in Food Authenticity
Testing, CEO of ANA LAB DOO PANČEVO

Mr. Ivan Smajlović is a Serbian scientist, innovator, and entrepreneur whose work has significantly advanced the field of food authenticity testing. With a background in food technology and expertise in isotopic analysis, Ivan has played a pivotal role in the fight against food fraud, particularly in wine, spirits, honey, fruit juices and milk authentication. He is the founder and CEO of ANA LAB D.O.O. Pančevo, an ISO/IEC 17025:2017-accredited laboratory specializing in the isotopic determination of food and beverage authenticity. Additionally, he co-founded SG Isotech D.O.O. Pančevo, a company dedicated to the development of cutting-edge technologies and instruments for isotopic analysis.



Ivan Smajlović

Among his most notable achievements, Mr. Ivan Smajlović developed the EIM-IRMS®

method, a groundbreaking isotopic technique for identifying the botanical origin of ethanol and sugars, but also water origin in food products. This method has become a cornerstone in the detection of fraudulent practices in the production of wine, spirits, honey, fruit juices, milk, etc. His work on the EIM-IRMS® method earned global recognition, culminating in its acceptance by the International Organization for Vine and Wine (OIV). The method was approved by over 200 technical experts from 48 member countries and incorporated into the organization's "step-by-step" procedure for developing new draft of OIV Resolution.

Mr. Smajlović contributions to science and technology have been widely recognized. In 2017, he was awarded the prestigious WIPO (World Intellectual Patent Organization) Medal for Inventors for his invention of a method and apparatus for isotopic analysis of ethanol. Earlier, in 2015, he and his team secured a prize in Serbia's Best Technological Innovation Competition for their work on advanced analytical methods. Beyond these accolades, Ivan has served as a court expert in food technology for Serbia's Ministry of Justice and has been instrumental in projects such as the EU Twinning Project "Capacity Building for the Regulation of the Serbian Wine Sector", EU HORIZON Marie Skłodowska-Curie Actions project "SuchAQuality", IAEA project "Implementation of Nuclear Techniques for Authentication of Foods with High-Value Labelling Claims (INTACT Food)", etc.

His academic journey began at the Faculty of Agriculture, Belgrade University, where he earned an MSc in Food Technology. He has also completed PhD coursework at the Faculty of Chemistry, Belgrade University, and is awaiting approval of his thesis. Throughout his career, Mr Ivan Smajlović has maintained a strong commitment to continuous learning, including training in laboratory management under ISO/IEC 17025:2017.

Ivan's dedication to scientific advancement is evident in his prolific research output.

He has authored numerous publications and presented at prestigious international conferences, including the OIV Congress and the ALIMED Conference. His research has consistently focused on enhancing analytical methods

for food authenticity testing and combating global food fraud.

With exceptional leadership, organizational, and analytical skills, Mr. Ivan Smajlović has established himself as a global leader in the field of food authenticity. He excels in fostering cross-cultural collaborations and building meaningful partnerships. Ivan remains committed to advancing scientific innovation and protecting the integrity of global food markets through his groundbreaking contributions and unwavering dedication to excellence.

Dr. Margarita Smajlović (Zenina)

Expert in Isotopic Analysis and Food Authenticity, Senior Analytical Expert at ANA LAB DOO PANČEVO

Dr. Margarita Smajlović (Zenina) is a distinguished scientist with a profound impact on the fields of isotopic analysis and food authenticity. Originally from Russia and now based in Serbia, Dr. Smajlović has dedicated her career to advancing analytical techniques for evaluating the

quality and safety of food and beverages, particularly wines and alcoholic products.

Dr. Smajlović's academic journey began with her PhD in Technical Sciences from Moscow State University of Food Production. Her thesis focused on developing systems for assessing the geographical origin and quality of wines using isotopic analysis, a field in which she has become a recognized authority. Over the years, her expertise has been further honed through specialized training and collaborative projects in renowned institutions, including the Institut des Sciences de la Vigne et du Vin in Bordeaux, France, and the Federal Institute for Risk Assessment (BfR) in Berlin, Germany.

Currently, Dr. Smajlović serves as a Senior Analytical Expert at ANA LAB D.O.O. Pančevo, Serbia, where she plays a vital role in developing new laboratory methodologies and conducting isotopic testing of food products. In addition to her role at ANA LAB, she is an R&D Manager at SG Isotech D.O.O. Pančevo, contributing to the international Marie Skłodowska-Curie Actions project "SuChAQuality." Her responsibilities include overseeing research timelines, managing projects, and leading innovative studies on isotopic methodologies for food authentication.

Dr. Smajlović's career is marked by her diverse and impactful contributions. At the Peoples' Friendship University of Russia and Moscow State University of Food Production, she led pioneering research on stable isotopes in wine and other alcoholic beverages, contributing significantly to the scientific understanding of food authenticity. Her work includes mass-spectrometric studies of stable isotopes in the Black Sea and Caspian regions, enriching the global database for wine and spirit authentication.

With over 21 scientific publications and numerous presentations at international congresses and workshops, Dr. Smajlović is a prolific researcher and communicator. Her contributions have been featured in high-profile conferences such as the World Congress of Vine and Wine, where her studies on isotopic fractionation and NMR techniques have set new benchmarks in the field.

Dr. Smajlović's exceptional technical and organizational skills are evident in her ability to implement complex projects, manage



***Margarita Smajlović
(Zenina)***

interdisciplinary teams, and navigate the regulatory frameworks of food safety and quality.

A critical thinker and team player, Dr. Margarita Smajlović continues to push the boundaries of isotopic analysis, combining her extensive expertise with a passion for innovation. Through her leadership in both research and practical applications, she remains at the forefront of efforts to ensure the authenticity and safety of food products worldwide.

Additional Information for EIM-IRMS Testing

To conduct an EIM-IRMS analysis, a 100-gram sample of honey is required. ANA LAB issues a laboratory report within eight (8) days of receiving the sample. Along with the sample, clients must complete the "Request for Testing" form and send both to the following address:

ANA LAB DOO PANČEVO, Dositeja Obradovića 8K, Tamiš Kapija, 26000 Pančevo, Serbia

For more information, visit the ANA LAB website: <https://ana-lab.rs/en/home/> , or contact us

via email: office@ana-lab.rs, and we will respond promptly.



Ivan Smajlović

CEO of ANA LAB DOO PANČEVO

Republic of Serbia

Accredited laboratory in accordance with

ISO/IEC 17025: 2017.

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HONEY

PRODUCTION

You have an opportunity to peek into the reflections of Branislav Karleuša, the man who was the first in this area to dare say that a weak colony can produce honey as well. You can be certain that it is a privilege many beekeepers of the world would be envious of. The editor is kindly asking you to read the text at least twice, and then come to conclusions. Naturally, you should read the beekeeping elementary reader first.

Introduction

The planned actions we conduct with a previously determined goal are called methods. A series of interrelated actions a beekeeper applies in the work with a bee colony, aiming to obtain a honey crop higher than those the bees would make themselves, can be called the honey production methods.

In accordance with the knowledge about the nature of bee being, certain actions through history have gained, i.e. lost their popularity in the wide appliance in beekeeping practices. The creation and development of honey production methods, as well as basic ideas that lead the

beekeepers, will be addressed in the first part of this text.

Numerous experiences of peer beekeepers and my personal experience made me form a somewhat different way of thinking about the secret of honey production. I will be happy to share it with you in the last part of the text.

Methods of clear space in the brood super

The simple finding that more bees bring more honey, i.e. that good laying ability of the queen results in numerous stronger colony that will

Beekeeping Elementary Reader

Considered through history, honey is the strongest stimulus for man's interest in the honey bee. Due to the lack of basic knowledge about the bee being, over the long period of nearly 8,000 years, the procedure of honey production anticipated patient watching over bee colony work in its natural habitat or primitively made beehive and, usually brutal, taking away of the stored food. Not earlier than XIX century did the progress in natural sciences, bringing a series of discoveries about the way honey bees live in a community, and trade development, forcing the interest in bigger production of honey and wax, create the preconditions for a different attitude of man toward this unusual insect. In spite of all these strong encouragements, bees would probably remain the angry and hostile inhabitants of dark cavities, hadn't it been for the wisdom of a hobby beekeeper, Lorenzo Langstroth, who gave the world of beekeeping the precise measures of their habitat. The "discovery" of the, so-called, bee space and the make of beehives with removable comb that started then, enabled the large number of beekeepers become familiar with the life of bee colony through practice. The findings that certain actions can have effect on the way bees behave, and some of them contribute to the production of larger food storages, resulted in the creation of the first honey production methods. The findings of the Pole Dzierzon that bees fill a major part of the comb cells they occupy with honey in case, in the period of an abundant nectar flow, they are left without a queen, lead to the emerging of one of the first beekeeping "rules". Regardless the simplicity, the fact that the procedure was used upon a plan (in terms of time and goal), makes it a honey production method. Being such, it was quickly ac-

collect larger food reserves, completely changes the way of thinking of the beekeepers from the end of XIX century. In accordance with new opinions, the space of the beehive is expanded for several times, ways of rearing queens become more professional, and natural swarming gains the status of the unwanted urge of bees. New methods of honey production appear. Some of them, made by collecting the experiences of beekeepers of his time, were defined by Eduard Loyd Sechrist under the title of Clear Brood Nest Systems.

The successful management of a bee colony is generally based on the resolving of three problems: a) completely develop the colony before the beginning of the main nectar flow on the selected location; b) maintain the number of bees trough the whole period of nectar flow without letting the foraging stimulus be suppressed by the swarming urge; v) preserve the vigour of bees during all other parts of the season in a way that will allow the colony become strong again at the right moment for the nectar flow. Eduard Loyd Sechrist has found the solution for all the three problems in the undisturbed activity of the queen. Laying eggs, as one of the basic activities of the queen, will be supported by the bees as long as the colony has available sources of appropriate food and water. Under these conditions, only the swarming urge can affect the changes in behaviour of all the colony members toward this activity.

Behaviour of bees related to the storing of food is a stereotype. They will place the pollen as near as possible to the nest, and the unripe honey in every empty comb cell occupied by the colony, including those with open brood. The processing of pollen into stored pollen is performed in the cell where the storing started, while the unripe honey will be "rearranged" to the very edge of the nest. When the crop surpasses the free space for storing or when the ripe honey around the nest is capped, every new crop larger than daily needs of the colony will be stored in the nest itself. The lack of free cells for storing pollen or nectar, within the space occupied by the colony, has the inevitable consequence of "queen blockage".

The method of clear space in the brood super anticipates the beekeeping ways in which the queen always have available number of worker

cepted by the European beekeepers, and according to the available resources now (Srpski pčelar, 1896, volume 3), we come to the conclusion that the professor Jovan Živanović named it the “Diamond Bee-keeping Rule”.

In order to understand the big popularity that the Dzierzon’s method of honey production had in the beekeepers of our country, we need to, for a moment, go back to eighties of the nineteenth century, and remind of the used beehives. One of the most advertised in the magazines of that time was the “American” constructed by Aca Živanović. It had narrow and high frames 20x40 cm, warmly situated in relation to the entrance. Two models were made, with 12 and 16 frames.

The basic problem for beekeepers working with the hives of this kind of small volume was the fact that its space is almost entirely turned into the brood of an averagely fertile queen. Bees are left with only a few lines of top cells for storing honey, on which the “arches of honey” are formed and two to three frames on the side of beehive opposite to the entrance. By applying the “diamond rule” in working with this hive, the beekeeper changes the ratio between the size of the brood and honey super space. In a queenless colony, by the emerging of bees, the brood area becomes smaller and smaller, which increases the number of empty cells for storing honey. Bees are less active in collecting nectar, because there have no pheromone stimulus from the queen or open brood, but at the end of the forage, there is still more honey to be extracted.

Dzierzon’s method of honey production has experienced many modifications, thus it remained in use also after the beekeepers have increased the volume of beehives for several times. Some of the known methods, applied even today, are based on the Dzierzon’s way of thinking. As an example, I will mention the method of honey production presented by Belčić.

comb cells which allows her lay freely, undisturbedly, as long as it is useful for the beekeeper.

Applied in practice, this basic idea posts the requests for a space of specific size in which the queen – brood will remain during the entire season. It needs to contain a sufficient number of cells, so that the queen lays as many eggs as needed for a colony of a standard power to develop and reach the desirable honey-production strength at the moment of the beginning of the main nectar flow in early spring. On the other hand, the size of the brood super needs to be

such that, at the moment of the beginning of the nectar flow, the brood cells are arranged from one end of the super to the other, from the bottom bar to the top bar of the frame, thus they do not leave space in which bees would store ripe honey. For storing honey, the colony needs to have available honey super. Its position related to the brood needs to enable bees follow the natural urge for storing food above the top row of brood cells, and its size needs to be in accordance with the inflow of nectar. With the honey area created this way, the colony maintains the sufficient number of empty cells in the brood space during the entire nectar flow, and the queen lays eggs undisturbedly.

One very simple way of producing honey upon the method of clear space in brood area is using one super of the LR hive for the activity of the queen (where the queen either remains in it for the entire season, or the colony develops in two, and during the nectar flow in only one brood super). It is interesting to look at how bees in seemingly small space establish a balance between the brood and food. The central frames of the brood super are always “clear” for the queen activity, ending frames are full of pollen, and honey can be spotted only in the shape of drops of a fresh forage. The balance can only be disturbed by a strong forage from abundant pollen flow or unskilful intervention of the beekeeper. The replacement of any of the frames in the brood super carries the danger of “introducing” the colony into the swarming stage, unless you use the frame with a comb foundation.

If you do the beekeeping with some other type of beehive, the effect of clear space for queen activity can be reached with 18 frames of Farrar’s height, i.e. 9 DB frames.

Where is the solution

In order to have beehives full of bees for the forage, two or three weeks earlier, Josip Belčić builds the power of the colony by adding brood frames (in long hives up to eight, and in LR multiple-storey hives up to 12 frames). The frame on which he finds the queen is put in the section of 5 frames (i.e. the third super in multiple-storey hives). The newly formed brood area is divided from the rest of the brood frames with a queen excluder. The queen undisturbedly continues with laying eggs into the cells of the empty comb, while in the other part the brood matures. In the beginning of the forage, he installs a net and opens the entrance of the section the queen is in, in order to have all the foragers come back through the entrance to the newly made honey section. This method of honey production was very popular in our areas in the seventies of the last century. The reasons for that are possible to find in the simple ways of building colonies strong and relatively easy establishment of very favourable relation between the size of the brood and honey space. The main disadvantage of the method is the way of resolving the problem of the swarming urge. The swarming urge during the nectar flow produces at least two negative consequences: significant decline in the activity of bees in collecting and processing of nectar and the declined power of the colony after swarming. With this method, swarming is successfully prevented by removing the foragers from the brood section, but due to the lack of the pheromone of the queen and open brood, the honey crop is not proportional to the size of the colony. The authors' opinion that the bees in the honey section "feel" the queen through the wire net, is easily proved wrong if you add to this section a frame with comb foundation and larvae favourable for breeding queen cells.

It is interesting to analyse this method in line with the method of produc-

The comparative analyses of actions applied for the nectar flow sometimes seems confusing. From the above mentioned examples, we can spot a group of honey production methods relying on minimal laying performance or total removal of the queen and open brood during the forage, while the others insist on its fully intensive performance (in order to reveal the essence, we should not compare the methods upon their efficiency). Regardless recent researches showing that the intensity of inflow of nectar directly depends on the pheromone of the queen and the brood (according to V. I. Lebedev, immediately after the queen loss, the crop declines for 64.4% in the presence of open brood and without the queen is lower for 25.6%, while lacking both stimulus, the intensity of inflow is averagely lower for 40.7%), we have to accept that the authors have chosen that way of beekeeping in accordance with their personal belief about what brings the honey and that they have really produced in favourable quantities. Even bigger confusion in the attempt of analyses can be caused by certain actions within the methods themselves. As an example, we can mention that, immediately before the flow, a certain number of beekeepers intensively feed their colonies, while the others extract the honey completely. Even the opinion, a great number of beekeepers agree with, that only (!?) strong colonies bring honey seems to be a controversy. While Farrar measures bees from the colony of 6 kg 4% more productive than the ones from the colony of 4 kg, Bretscko measures 44,5% (5 kg versus 3 kg), Lebedev 33 % (4.4 kg compared to 3.5 kg), Lunder finds out a completely opposite result upon which a bee



ing honey by professor Jovan Živanović, with, as stated by the author, the reconstructed “American” beehive. After the initial overwhelming by the results of the “Dzierzon’s diamond rule”, irreconcilable about the practice of killing the queen before the forage, professor Jovan Živanović started with the reconstruction of his “American” having 16 frames of 27x26 cm warmly placed compared to the entrance. Instead of one frame, he installed a queen excluder into the hive and that way divided the space of five frames for honey storage. He opened a new entrance on the longer side of the hive opposite to the queen excluder, thus a part of bees entered into the part with brood, and partly in the “honey section”. During the period of the colony development, he added new and new empty frames into the queen section, and the laid ones transferred behind the excluder. With the beginning of the forage, he would stop doing this, thus (during the forage) the queen laid in accordance with the number of available cells. It is not a problem to develop a colony that will during the forage occupy the entire space of a beehive this small. The maintenance of the working mood during the forage is left to the temperament of the bees, but in line with this, we also need to consider that, in the time when professor Živanović did his beekeeping, bee swarming was not considered a bee urge that needs to be prevented. The relation between the size of the brood and honey space is very good for the nectar flow. If we compare the two, at first sight, very similar methods of honey production, we can notice that they differ in the basic idea they follow searching for big crops. Trying to improve the known ways of beekeeping, Josip Belčić firmly supported the Dzierzon’s theory that the activity of the queen during the forage needs to be reduced to the minimum. Contrary to him, professor Živanović with his opinion that the secret of honey production is hidden in the harmonized work of the queen and the bees, has stepped far ahead of his own time.

of a weaker colony of 3 kg is 20.3% more productive than her relative from the 6 kg colony. Without intending to question the results of the measurement, it is inevitable to ask the question whether the registered inflow requires a rational explanation (if considering the biological strength of individuals, or the number of foragers, the results of the measurement would have to be uniform even when including the race differences among bees). It seems that a strong colony keeps another secret. The only thing we can do is look closely into its habitat.

A bee colony reaches the peak development after seven weeks of maximal laying ability of the queen. In the first three weeks, areas under brood are becoming larger and larger. During the rest of the period, the size of the brood remains the same. The total comb area covered by bees (supposing that we always consider the same temperature) in the first three weeks is in accordance with the existing number of bees (either those which wintered, or those the number of which is the consequence of a slower dynamics of laying eggs by the queen). Three weeks after the queen entered the full laying ability, the comb area occupied by bees becomes larger and larger and reaches the maximum by the end of the seventh week. If we consider the relation between the occupied (by brood and pollen) and free (in which bees can place honey) comb cells covered by the colony, we can notice that, at this moment, it is the most favourable for the nectar flow.

Having this in mind, we can notice that what connects all the successful methods of honey production is basically the creation of favourable relation between the size of the brood and honey space occupied by bees. The secret of the diamond rule is not in “sparing” the bees from nursing brood and “saving” food. By removing the queen, Dzierzon has changed the number of occupied and free cells in his small-in-size, beehive. By simulating the relation between the space in extremely strong natural bee colony (2:1 to the benefit of honey), professor Jovan Živanović, with a colony of 20-40 thousand bees provided the possibility of collecting 16 kg of honey. The result worth the Masters of beekeeping.

At first sight, methods of clear space in brood super make impression of a harder way of pro-



ducing honey, but uniform dynamics of laying eggs by the queen itself resolves the major part of the problem in practice. A strong colony of uniform age structure easily winters and develops quickly, and in the early season, the queen completely fills the brood super by brood. Its uniform laying ability during the nectar flow leaves always the same number of open brood cells which will serve the bees to put a part of daily crop in. With the queen's laying ability of about 1,200 eggs (a day), the brood super is a temporary storage of about 1 kg of unripe honey. At the end of the forage, event the last drop of ripe honey is placed in the honey super. The power of the colony is not crucial for the forage success even in these methods. Bees can bring as much unripe honey as can fit into free comb cells occupied by their colony, while the intensity of their work will be in accordance with the condition of individuals and encouragement of the colony. Tomorrow, when the researches offer us an ampoule of synthetic queen pheromone, open brood, pollen, we will count out a wanted number of bees from hives for reproduction and place them on a virgin comb aiming to get the biggest possible yield. Till then,

let us rely on bee instincts and habits and natural sources of, for us (being insufficiently sensitive), mystical substances controlling their world.

Written as a token of gratitude to professor Jovan Živanović for the inspiration, and to numerous friends, who have, through conversations about bees, contributed to this way of thinking about honey production.



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BEEKEEPING AS A SHIELD FOR THE PLANET AND THE FOOD CHAIN



bees, particularly the species *Apis mellifera*, play a crucial role—not only for ecosystem survival but also for the food security of humankind. Beekeepers, by caring for and transporting bee colonies, significantly contribute to the survival of bees and, consequently, to the preservation of life.

After Natural Disasters: The Importance of Bee Relocation

The history of humanity is filled with stories of individuals who, in pursuit of wealth and fame, have brought the planet to its current, unfavorable state. Environmental degradation, pollution, overexploitation of natural resources, and excessive use of chemical products seriously affect ecosystems and biodiversity. In this context,

The relocation of *Apis mellifera* bees is especially critical following natural disasters, such as floods, storms, or fires. When ecosystems are struck, many natural pollinators—such as wild bees, wasps, and other insects—face severe risks. Many of these pollinators nest in the ground, making them particularly vulnerable to disasters like floods, which can destroy their nests and drastically reduce their populations.

In these critical times, beekeepers take on a vital role by relocating *Apis mellifera* colonies to

affected areas, providing on-demand pollinators. This effort is invaluable, as the bees transported by beekeepers can help replenish the pollination force lost due to the disaster. This practice is not only effective but often the only sustainable solution to support local agriculture and natural ecosystems dependent on pollination to recover.

Beekeeping as a Resilience Strategy for Agriculture and Ecosystems

Beekeeping offers a unique opportunity to restore ecological balance in affected areas. Pollination is essential for many crops and for the natural regeneration of wild vegetation, which in turn supports many animal and insect species. Through the relocation of hives, beekeepers enable bees to fulfill their crucial role as pollinators, even in regions impacted by extreme weather events. In this way, they enhance the resilience of agricultural and natural systems, which depend on pollination for renewal and productivity.

Beekeeping as a Guarantee for Biodiversity Conservation

In addition to supporting agricultural production, beekeeping also helps to strengthen biodiversity. In cases of natural disasters, transported bees not only impact food production but also wild vegetation, supporting the regeneration and stability of ecosystems. Thus, bees and beekeepers contribute indirectly to reducing the impacts of climate change by reinforcing natural ecosystems.

Integration into the EU's Common Agricultural Policy

Incorporating beekeeping into the EU's Common Agricultural Policy (CAP) for pollination would secure funding and protection for this crucial practice, offering incentives for the development and maintenance of beekeeping activities. Furthermore, including *Apis mellifera* in the CAP for pollination would enhance financial



support for beekeepers, providing them with the means to maintain healthy colonies, protect bees from diseases and environmental threats, and ensure sufficient pollination for crops. This would promote sustainable agricultural production, enhance the agricultural sector's resilience to climate crises, and support biodiversity.

Including *Apis mellifera* in the CAP for pollination is essential not only during natural disasters but also in normal conditions, as bees' presence has been shown to significantly increase crop yields.

Apis mellifera bees are valuable pollinators for many crops, such as fruits, vegetables, and nuts, contributing to both increased quantity and improved quality of products. All studies show that bee-pollinated crops demonstrate higher productivity and greater resilience to environmental stresses.

CAP support could facilitate this collaboration between farmers and beekeepers, encouraging the reduction of spraying when bees are present in crops, allowing bees to complete the natural pollination process without interference. In this framework, farmers would be able to maximize the productive potential of their lands, while beekeepers could maintain healthy colonies. With CAP support, the presence of *Apis mellifera* could boost food production, reduce dependence on chemicals, and promote sustainable, nature-friendly farming, enhancing self-sufficiency and the economic robustness of agricultural production.

The Role of Farmers

The inclusion of *Apis mellifera* in the EU's CAP should be accompanied by substantial collaboration with farmers, who will need to adapt their practices to support bees.

Specifically, they should reduce or even suspend pesticide spraying during the period when bees are in their fields for pollination. This cooperation is essential, as many pesticides are toxic to bees and can lead to mass deaths and colony collapses, harming not only beekeeping but agricultural production itself.

Reducing pesticide use when bees are present can fit within a broader framework of "bee-friendly" agricultural practices, which could be promoted and subsidized by the CAP. Through this collaboration, farmers and beekeepers can achieve a common goal: the preservation of pollination, which is crucial for food production and biodiversity.

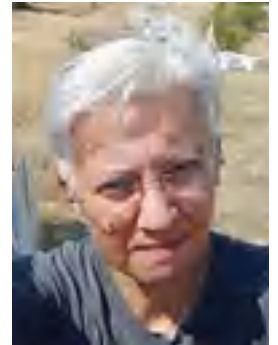
Thus, the CAP can act as an institutional lever that encourages sustainable practices in agriculture, strengthening both the resilience of rural ecosystems and the stability of bee populations.

Conclusion: Beekeeping as a Vital Solution for the Planet's Future

The work of beekeepers and the management of *Apis mellifera* colonies are more than a professional or amateur activity; they form a critical pillar for ecological and economic stability. By offering on-demand pollinators, beekeepers become essential for ecosystem restoration after natural disasters, where other pollinators are lost, as well as for increasing the quantity and quality of food intended for human consumption. The survival of bees is not merely an environmental necessity but a guarantee for the continuous functioning of the food chain and the protection of life on Earth.

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BOOSTING DIRECT-TO-CONSUMER SALES FOR BEEKEEPERS

Honey has been a staple in the human diet for centuries, valued as much as foundational foods like wheat, milk, and fruit. Yet, unlike many other agricultural products, honey production faces uniquely intense pressures. Climate change, bee diseases, honey adulteration, and volatile market dynamics have placed honey producers – especially those on European continent – under unprecedented strain. These challenges demand resilience and adaptability from beekeepers as they work to sustain their businesses and ensure the integrity of their product. In this

landscape, agility is essential. European honey producers must innovate and adapt quickly to secure their place in the market and continue delivering one of nature's oldest and most cherished foods.

Given Europe's rich diversity in climates, landscapes, and market conditions, there is no single formula for a financially successful beekeeping operation across the continent. What works well in one region may not apply in another, as factors like climate, local consumer preferences, and market regulations vary widely.

This article offers general guidance rather than prescriptive solutions, encouraging each beekeeper to adapt the strategies to their unique context. While some ideas may seem abstract or high-level, they are meant to inspire flexibility and creativity – qualities that are essential for navigating the complex challenges facing the honey industry today. By considering these insights and tailoring them to your specific region, you can develop a resilient and adaptive approach that supports the long-term success of your beekeeping business.

With consumer interest in local and artisanal products on the rise, beekeepers have a unique opportunity to expand their direct-to-consumer sales. This article draws on global case studies, consumer behaviour trends, and innovative marketing strategies to help beekeepers connect with customers in meaningful ways. By adopting these approaches, beekeepers can strengthen their businesses, support sustainable practices,

and ensure their long-term success in a competitive market.

1. Consumer Behavior Changes Post-COVID-19

The COVID-19 pandemic has significantly reshaped consumer behaviour, particularly around food sourcing and purchasing habits. People are increasingly focused on buying locally, with a heightened awareness of food origins and producer transparency. This shift has fueled demand for direct-to-consumer channels, where buyers can connect directly with producers and gain assurance about the quality and origins of their purchases.

For beekeepers, these trends present an opportunity to meet demand for local honey by selling through farmers' markets, farm stores, and e-commerce platforms. Post-pandemic con-



sumers are also prioritising convenience, leading many to order directly from local businesses online. Establishing direct channels, such as online stores or social media sales, helps beekeepers

cheeses and other regional delicacies. This cross-industry collaboration brings beekeepers access to a new market of food lovers and tourists.

- **Japan:** In Japan, honey producers have introduced QR codes on honey jars that link to videos and additional information about the honey's source and production. This digital approach, popular with younger customers, provides transparency and enhances the customer's understanding of the honey's journey from hive to jar.

- **Spain and Cooperative Models:** Spanish beekeepers and artisan producers often collaborate through cooperatives, which enable small-scale producers to share resources for production, marketing, and distribution. For instance, Spanish honey cooperatives have leveraged collective branding to create strong, regionally recognized labels that promote authenticity and tradition. This model has proven effective in reducing costs while expanding market reach, particularly when targeting health-conscious consumers through organic certifications and transparent production processes.

- **Sweden-Japan Partnership:** The Swedish Bee Company found success by targeting Japan's high-end, quality-focused market. Founder Mats Olofsson emphasized the value of culturally sensitive branding and the appeal of unique, sustainably produced "slow honey." By positioning their honey as a luxury, artisanal product with distinct seasonal flavours, they aligned with Japanese consumer values for natural, organic



capture this demand and foster customer loyalty. The growing interest in local and sustainably produced goods is an ideal match for small and medium-sized beekeeping operations that emphasise quality over quantity.

2. International Case Studies from Beekeeping and Related Sectors

In various countries, beekeepers have pioneered creative ways to reach their customers directly, often inspired by broader artisanal food and wellness markets. Here are a few notable examples:

- **Greece:** Greek honey producers have turned to social media platforms like Instagram to create connections with consumers through storytelling. By sharing images and videos of the harvest process and stories behind each product, they've succeeded in building loyal followings and showcasing their practices.

- **Hungary:** Hungarian beekeepers have collaborated with local artisans, such as cheese makers, to create unique gourmet gift baskets that feature honey alongside local



goods. Key tactics included premium packaging and patient brand-building through strong partnerships with Japanese distributors, effectively addressing cultural and language barriers. This case highlights the importance of adapting packaging and brand messages to meet local consumer expectations and aesthetics.

Related Sectors: Lessons from Cheese and Essential Oil Producers

Producers in similar sectors, like artisan cheese and essential oils, offer successful models for direct-to-consumer sales. Many small-scale cheese makers engage in community-supported agriculture (CSA) programs, which connect consumers with local producers for regular deliveries. Subscription models provide a steady income stream, foster loyalty, and could easily be adapted by beekeepers to provide a mix of honey varieties and other hive-based products.

Essential oil and skincare producers emphasise natural and sustainable ingredients, tapping into health-conscious and environmentally aware consumer bases. By focusing on the purity and health benefits of honey, as well as bee-derived products like propolis and royal jelly, beekeepers can reach wellness-focused consumers who already value artisanal products with transparent sourcing.

In Greece, artisan producers of essential oils and honey have successfully combined traditional branding with a strong focus on eco-tourism. Many Greek beekeepers invite visitors to their farms, offer workshops, and sell products directly on-site and through online platforms. This approach not only strengthens local sales but also attracts global consumers drawn to the authenticity and environmental sustainability of Greek

artisanal goods. By intertwining cultural elements with sustainable practices, Greek producers offer consumers an experience, not just a product, fostering loyalty and making their goods memorable.

3. Digital and Direct-to-Consumer Marketing Innovations in Global Contexts

Building a strong brand identity is essential for beekeepers looking to connect with consumers in a meaningful way. A well-defined brand not only communicates the quality and values of a beekeeper's products but also establishes trust and loyalty among customers who are increasingly discerning about their purchases. This can include elements like a memorable logo, consistent packaging, and a clear message about sustainability or local roots.



Digital marketing offers powerful tools to develop and share a unique brand story:

- **Storytelling and Content Marketing:** Platforms like Instagram, Facebook, and YouTube are valuable for sharing the beekeeping journey, from hive maintenance to honey extraction. Visual storytelling, especially through video,



allows customers to see the process and understand the care behind each product. By conveying the brand's story authentically, beekeepers can build emotional connections that foster trust and loyalty.

- **Influencer Collaborations:** Working with influencers who align with the brand's values, especially those focused on sustainability and wellness, can enhance brand visibility and credibility. Influencers can communicate the uniqueness of the beekeeper's offerings and the values of supporting local, sustainable honey production.

- **Search Engine Optimization (SEO):** A well-optimised website ensures that potential customers can find local honey producers easily. Emphasising the brand's commitment to quality and environmental stewardship in website content can help attract the target audience. Additionally, using local SEO strategies helps beekeepers reach consumers who are actively searching for honey or related products in their area.

- **Leveraging Food Delivery Services:** The rise of food delivery services across Europe presents a valuable distribution channel for beekeepers. By partnering with local delivery platforms, beekeepers can offer their products directly to consumers' doorsteps, reaching a broader audience and catering to the growing demand for convenience. This channel not only enhances accessibility but also allows beekeepers to promote seasonal or specialty products in a dynamic way.



4. Product Diversification and Packaging Trends Globally

Product diversification and thoughtful packaging are powerful ways for beekeepers to attract



a wider customer base and stand out in the market. Here are some effective approaches:

Professional Labels and Packaging

Investing in high-quality, professional packaging can enhance the perceived value of honey products. Labels should be informative and visually appealing, ideally highlighting the honey's origin, floral variety, and any certifications (such as organic or fair-trade). Clear, well-designed labels give customers confidence in the product's quality and authenticity, while reinforcing the brand's identity.



Here are some examples of brands that utilise professional labels and packaging in the honey industry. These brands highlight quality,

story, and sustainability, appealing to consumers who value aesthetics and information in their product choices:

1. Savannah Bee Company

Packaging: Savannah Bee Company uses elegant glass jars with detailed labels that highlight the unique origin of their honey and its flavour profile. The labels are visually appealing and informative, providing consumers with information about the honey's floral source and tasting notes.

Professionalism: Their packaging reflects a premium product, reinforcing the brand's commitment to quality and the artisan nature of their honey. This approach attracts consumers looking for gourmet honey options.

2. Bee Raw

Packaging: Bee Raw offers honey in simple yet sophisticated glass jars with minimalist labels. Each jar is labelled with the floral source of the honey and features unique artwork that reflects the regional origin.

Professionalism: This attention to detail and focus on the artisanal aspect of honey production convey authenticity and quality, appealing to eco-conscious and gourmet consumers.

3. Honey Pacifica

Packaging: Honey Pacifica utilises eye-catching, colourful packaging with clear labelling that details the floral sources and geographic origins of their honey. They often include a honey dipper attached to the jar, enhancing the consumer experience.

Professionalism: Their packaging emphasises freshness and quality while educating consumers about the various types of honey, creating an inviting shelf presence that stands out in retail.

4. Wildflower Honey from Beekeeper's Naturals

Packaging: Beekeeper's Naturals uses vibrant, modern packaging with clear labelling that

highlights the health benefits of their honey products. Their labels often include icons indicating specific features like "raw," "non-GMO," and "eco-friendly."

Professionalism: This transparency and focus on health appeal to wellness-oriented consumers, positioning their products as trustworthy and premium.

5. Local Honey from Harvest Lane Honey

Packaging: Harvest Lane Honey offers honey in traditional mason jars, which evoke a homemade feel, but they use professional, informative labels that include details about the honey's floral variety and local sourcing.

Professionalism: This blend of rustic charm and professionalism helps position their honey as both authentic and high-quality, appealing to consumers interested in supporting local producers.

6. Rowse Honey

Packaging: Rowse Honey, a leading brand in the UK, uses bright, eye-catching labels with

clear product information and a distinctive logo. Their honey bottles are designed with a unique squeeze top for easy pouring, enhancing usability.

Professionalism: The branding and packaging convey a sense of reliability and quality, making it a recognizable choice for consumers in supermarkets and stores.

7. Pine Valley Honey

Packaging: Pine Valley Honey features elegant, simple packaging with labels that detail the health benefits of honey, as well as its local sourcing. The use of muted colours and nature-inspired designs creates an organic feel.

Professionalism: Their branding reflects a commitment to sustainability and quality, appealing to health-conscious consumers who appreciate natural products.

8. Chateau De Puy (France)

Packaging: This French brand focuses on artisanal honeys packaged in beautifully designed jars with intricate labels that tell the story of their floral sources and production methods.

Professionalism: The packaging aligns with gourmet food marketing, appealing to high-end consumers and making it suitable for gifting or special occasions.

9. Honey Tree

Packaging: Honey Tree's use of whimsical illustrations and clear product information on their labels helps convey the brand's fun personality while ensuring consumers understand the product's quality and origin.

Professionalism: This approach balances playful design with professionalism, making their products appealing to families and children.

10. Nectar of the Gods Honey

Packaging: This brand uses modern packaging styles, including sleek glass bottles and vibrant labelling that showcases the unique aspects of their honey, including flavor profiles and production practices.



Professionalism: The contemporary design appeals to a younger demographic interested in gourmet and artisanal food products.

These examples illustrate how professional labels and packaging can enhance the perceived value of honey products. By providing essential information, appealing visuals, and aligning with consumer values like quality and sustainability, beekeepers can effectively market their products and attract a diverse customer base.

Adding Personal Touches

Small, personalised touches create memorable customer experiences that encourage repeat purchases. For example, including a handwritten thank-you note, a card with bee facts, or a quick recipe featuring honey can make products feel special and personal. Such details show that the beekeeper cares about each customer, enhancing loyalty and positive word-of-mouth.

Here are some examples of how beekeepers and honey producers incorporate personal touches into their products and marketing to enhance customer experience and build loyalty:

1. Bee Harmony

Personal Touch: Bee Harmony includes handwritten thank-you notes with each order. These notes express gratitude for the customer's support and share a brief story about the beekeepers and their sustainable practices.

Impact: This personal touch fosters a sense of connection and appreciation, making customers feel valued and more likely to return for future purchases.

2. Savannah Bee Company

Personal Touch: In addition to their high-quality honey, Savannah Bee Company often includes a small recipe card with suggestions for using their honey in cooking and baking. They may also share fun facts about bees or honey with customers.

Impact: By providing recipes, the company enhances the consumer experience, encouraging them to use their products creatively while

educating them about the versatility of honey.

3. Honey Pacifica

Personal Touch: Honey Pacifica packages their honey in jars that feature stories about the regions where the honey is sourced, along with details about the local flora and fauna. Each jar includes a QR code that leads to a page with more in-depth information about the specific floral source and its benefits.

Impact: This storytelling approach creates a personal connection between the consumer and the product, allowing customers to feel more engaged with the source of their honey.

4. Rowse Honey

Personal Touch: Rowse often features customer stories on their website and social media,



showcasing how people use their honey in everyday life. They may also run contests where customers share their favourite honey recipes.

Impact: Highlighting customer experiences encourages community engagement and builds a sense of belonging among consumers, reinforcing brand loyalty.

5. Beekeeper's Naturals

Personal Touch: Beekeeper's Naturals provides informational pamphlets with their products, detailing the benefits of bee products and suggestions for use. They also share the story of their founder and the mission behind the brand, focusing on health and sustainability.

Impact: This transparency and personal narrative make customers feel more connected to the brand and its values, enhancing trust and loyalty.

6. Bee Raw

Personal Touch: Bee Raw emphasises the local bee population and the different types of honey they produce. They often include small cards with each jar that describe the unique characteristics of the honey, including the floral sources and the specific beekeepers who produced it.

Impact: By introducing customers to the individual beekeepers, Bee Raw personalises the

buying experience and deepens the appreciation for the product.

7. Manuka Health

Personal Touch: Manuka Health often includes a personal message or a card detailing the health benefits of their Manuka honey, as well as suggestions for how to incorporate it into daily wellness routines.

Impact: Providing useful information alongside the product makes customers feel supported in their health journey and reinforces the brand's commitment to wellness.

8. Local Honey Company

Personal Touch: Many local honey producers create customised labels for special occasions, such as weddings or corporate events, including the couple's names or company logo on the jars.

Impact: This level of customization creates memorable experiences for customers and makes the honey a unique gift option.

9. Happy Honey Bee Farm

Personal Touch: Happy Honey Bee Farm includes fun bee facts and tips for supporting local bee populations on their product labels and marketing materials. They also engage customers through social media by encouraging them to share their own bee-friendly gardening tips.

Impact: This approach not only educates consumers but also builds a community around the brand, creating a shared sense of purpose and connection.

10. Honey Tree

Personal Touch: Honey Tree creates seasonal gift sets that include a variety of their honey products alongside homemade baked goods or local artisanal items. Each gift set comes with a handwritten card that explains the items and suggests pairing ideas.

Impact: This thoughtful presentation enhances the gifting experience and shows customers that the brand values quality and creativity.





These examples illustrate how adding personal touches can enhance the consumer experience, build brand loyalty, and create a memorable connection between beekeepers and their customers.

Functional and Infused Honey

Health-conscious consumers increasingly favour honey infused with herbs, superfoods, and adaptogens, such as turmeric, elderberry, or even mushroom extracts. This aligns with the broader trend toward functional foods, where honey becomes not only a sweetener but also a wellness product. Beekeepers can explore this avenue by experimenting with unique infusions, offering products that cater to various health benefits while appealing to a market that values natural remedies.



Examples of functional and infused honey products that showcase these trends include:

1. Bee Keeper's Naturals

Product: Bee Keeper's Naturals offers a variety of honey infused with different superfoods, such as their Propolis Spray and their B. Immune Honey, which combines raw honey with propolis, elderberry, and royal jelly.

Health Benefits: These products are marketed for their immune-boosting properties, ap-

pealing to health-conscious consumers looking for natural remedies.

2. Zia's Raw Honey with Ginger

Product: This product features raw honey infused with ginger, which is known for its anti-inflammatory and digestive benefits. The packaging highlights the health properties of both the honey and ginger.

Health Benefits: This combination appeals to consumers interested in wellness products and natural remedies.

3. Miel de Montagne (Mountain Honey)

Product: This artisanal honey features infusions of herbs and flowers native to the region, creating unique flavour profiles and health benefits.

Health Benefits: By incorporating local flora, the product promotes local agriculture while offering consumers a taste of the region's biodiversity.

4. Turmeric Infused Honey

Product: Many brands are creating turmeric-infused honey, marketed as a natural remedy for inflammation and digestive health.

Health Benefits: This product caters to the growing trend of turmeric as a superfood, appealing to consumers looking for holistic health solutions.

5. Elderberry Honey

Product: Elderberry-infused honey combines the health benefits of honey with the immune-supportive properties of elderberry.

Health Benefits: This infusion targets consumers seeking natural immune support, especially during cold and flu seasons.

6. BeeRaw's Infused Honey

Product: BeeRaw offers various infused honeys, including those with lavender, cinnamon,

and chilli, emphasising both flavour and health benefits.

Health Benefits: These creative infusions cater to culinary enthusiasts while also promoting the health properties of the ingredients used.

7. Manuka Honey with CBD

Product: Some producers are combining the benefits of Manuka honey with CBD oil, targeting consumers interested in natural stress relief and wellness.

Health Benefits: This innovative blend appeals to a market looking for natural solutions to manage stress and anxiety.

Health Benefits: This caters to consumers looking for gourmet food experiences while offering potential digestive benefits.

10. Bee Pollen Honey

Product: Honey infused with bee pollen combines the sweetness of honey with the nutritional benefits of bee pollen, including protein and vitamins.

Health Benefits: This infusion appeals to health-conscious consumers interested in boosting their nutritional intake through natural products.



Manuka
Ivan Brndušić

8. Honey with Ashwagandha

Product: Ashwagandha-infused honey is gaining popularity as consumers seek natural adaptogens to support stress management and wellness.

Health Benefits: This product positions honey as a functional food that promotes overall health and well-being.

9. Spicy Honey

Product: Honey infused with hot peppers or spices caters to those who enjoy unique flavour profiles and may also promote digestion.

These examples demonstrate how beekeepers can capitalise on the trend of functional foods by diversifying their offerings with infused honey products, appealing to health-conscious consumers looking for natural remedies and innovative flavours.

5. Innovations in Packaging and Sustainability

Sustainability is now a core value for many consumers, and beekeepers are adopting eco-friendly practices to meet this expectation. Several packaging trends support sustainability and differentiate small-scale producers:

Biodegradable and Recycled Packaging

Sustainable packaging materials such as recycled glass, compostable paper, and biodegradable containers are becoming standard among eco-conscious producers. These materials appeal to customers looking to minimise their environmental impact.

Labelling Transparency

Detailed labelling is an effective way to educate consumers about the sustainable practices behind each jar of honey. Some producers are including QR codes that offer insights into their beekeeping practices and supply chains, adding transparency and trust.

Sustainable Production Practices

Emphasising ethical and sustainable practices, such as organic certification or bee-friendly beekeeping methods, helps distinguish honey producers in a crowded market. By sharing these

practices, beekeepers not only appeal to eco-conscious buyers but also educate the public on the importance of protecting bee populations and the ecosystem.

6. Educational Content and Experiences

Educating customers and offering engaging experiences can significantly strengthen relationships and foster loyalty. By helping customers understand the value of honey and beekeeping, beekeepers can position themselves as trusted sources of quality products and knowledge.

Hosting Tours and Workshops

Inviting customers to the apiary for hands-on workshops, honey tasting events, or guided tours allows them to see the process up close. Such experiences build trust and brand loyalty, as customers appreciate the opportunity to learn about the hard work and dedication that go into beekeeping. These events can also generate positive word-of-mouth and make the brand memorable.



Educational Content

Sharing useful information, such as recipes, cooking tips, and the health benefits of honey, positions the beekeeper as an expert in honey and its uses. Additionally, providing articles on pollinator health or the role of bees in ecosystems can help raise awareness about the importance of beekeeping. This not only builds credibility but also aligns the brand with environmental stewardship, which resonates with many consumers.

Here are some examples of how beekeepers and honey producers create educational content and experiences to engage consumers and build loyalty:

1. Beehive Tours and Workshops

Example: Savannah Bee Company offers beehive tours at their locations where visitors can learn about beekeeping practices, the importance of bees to ecosystems, and how honey is produced. They also provide hands-on workshops where participants can try their hand at extracting honey and making beeswax candles.

Impact: These experiences help educate the public about the significance of bees while fostering a personal connection to the product.



2. Online Beekeeping Classes

Example: Beekeeping for Beginners is an online course offered by various beekeeping associations that covers the basics of beekeeping, including hive management, bee biology, and honey harvesting. Many of these courses also provide downloadable resources and video tutorials.

Impact: By providing accessible education, these courses encourage people to take up beekeeping as a hobby, which can lead to increased demand for bee-related products.

3. Recipe Blogs and Cooking Classes

Example: Bee & You publishes a blog featuring recipes that incorporate their honey products. They may also host cooking classes where participants learn to use honey in various dishes, from glazes to desserts.

Impact: This not only showcases the versatility of honey but also encourages customers to purchase honey for culinary use, thus expanding its market.

4. Informational Workshops on Pollinator Health

Example: The Honeybee Conservancy offers workshops and events focused on pollinator health and environmental sustainability. These sessions often cover topics such as the impact of pesticides on bee populations and how individuals can help protect pollinators.

Impact: By educating consumers on broader ecological issues, these events foster a sense of community and responsibility, strengthening customer loyalty to the brand.

5. Educational Content on Packaging

Example: Honey Pacifica incorporates educational content directly onto their product labels. For instance, they include information about the health benefits of their honey varieties and tips on how to use them effectively.

Impact: This not only informs consumers at the point of purchase but also enhances the overall value of the product, making it more appealing.

6. Social Media Engagement

Example: Beekeeper's Naturals actively engages with their audience on social media platforms by sharing educational posts about bee health, sustainable practices, and the benefits of

their products. They often run Q&A sessions and live videos discussing beekeeping topics.

Impact: This approach helps build an online community of followers who are informed and engaged, increasing brand loyalty and awareness.

7. School and Community Outreach Programs

Example: The Honeybee Sanctuary in the UK runs educational programs for schools where children learn about beekeeping, pollination, and the importance of bees in agriculture. They may also provide interactive displays and opportunities for students to observe bees in action.

Impact: These outreach efforts foster a positive relationship with the younger generation, encouraging future consumers to support local beekeeping efforts.

8. Newsletters and Educational Emails

Example: Bee Raw sends out regular newsletters that include not only product promotions but also educational articles about different honey varieties, the benefits of raw honey, and beekeeping tips.

Impact: Providing valuable content keeps customers engaged and informed, reinforcing their connection to the brand.

9. Interactive Website Content

Example: Burt's Bees has an interactive section on their website that educates consumers about the different products they offer, including honey-based items. They often include videos and infographics that explain the benefits of each product and their sustainable sourcing practices.

Impact: Engaging website content helps attract visitors and encourages them to explore and purchase products.

10. Collaborations with Local Chefs or Influencers

Example: Local Honey Co. collaborates with chefs and food influencers to create video content that showcases how to use their honey in

gourmet recipes. These videos are shared on social media and YouTube.

Impact: By aligning with culinary experts, they provide a trustworthy endorsement of their products while educating consumers on innovative uses for honey.

These examples demonstrate how educational content and experiences can enhance customer engagement, foster loyalty, and create a deeper understanding of the value of honey and beekeeping.

7. Collaboration with Government

The "Slovenian Breakfast" initiative is a notable example of collaboration between beekeepers and government institutions in Slovenia, aimed at promoting the consumption of local food products, including honey. Here are some details about the initiative:

Slovenian Breakfast Initiative

- **Objective:** The main goal of the Slovenian Breakfast initiative is to educate children about the importance of local food, health, and nutrition, while also raising awareness about the role of bees in the ecosystem.

- **Implementation:**

- o Each year, schools across Slovenia participate in the Slovenian Breakfast event, typically held in November. During this event, children are served a traditional Slovenian breakfast that includes honey, bread, milk, and apple juice.

- o Local beekeepers are often invited to talk to the students about beekeeping, the importance of bees for pollination, and the benefits of honey as a natural food source.

- **Promotion of Local Products:** The initiative emphasises the use of locally sourced ingredients, encouraging schools to work with local farmers and producers. This helps support local agriculture and strengthens community ties.

- **Educational Component:**

- o The program includes educational materials provided to teachers, covering topics such as the importance of nutrition, the role of bees in food production, and sustainable farming practices.

Traditional Slovenian Breakfast

o Activities may also include crafts or projects related to bees and honey, making the learning experience engaging for children.

Impact

The initiative has helped to increase awareness of the significance of beekeeping and honey production in Slovenia, while also promoting healthier eating habits among children. It has fostered a greater appreciation for local produce and has encouraged students and their families to incorporate more local products into their diets.

Support and Collaboration

The initiative is supported by various governmental institutions, including the Ministry of Agriculture, Forestry and Food, as well as local beekeeping associations. This collaboration highlights the importance of bees and beekeeping in Slovenian culture and economy. This initiative serves as an excellent model of how beekeepers can engage with local communities and government to promote their products while also educating future generations about the importance of bees and sustainable practices.

Beekeepers must take a proactive approach in collaborating with government institutions to ensure their needs and challenges are adequately addressed. Initiatives like the "Slovenian Breakfast" demonstrate the positive impact of

partnerships between beekeepers and schools, promoting local honey consumption and educating future generations about the importance of bees. However, to create a more supportive environment for beekeeping, it is crucial for bee-



keepers to actively engage with policymakers and advocate for policies that accommodate their interests.

This advocacy can include pushing for initiatives that support sustainable beekeeping practices, funding for research on bee health, and educational programs that highlight the importance of pollinators in agriculture. By fostering open communication with government officials and participating in discussions on agricultural policy, beekeepers can help shape regulations that promote the health of bee populations and, in turn, the viability of their businesses.

Moreover, beekeepers should encourage government support for marketing initiatives that raise awareness of local honey and other bee products. This not only benefits individual beekeepers but also enhances the overall perception of the beekeeping industry within the community. By working together, beekeepers and government entities can create a more favorable landscape that not only sustains the beekeeping profession but also contributes to environmental conservation and food security.

Conclusion

For beekeepers, adapting to evolving consumer preferences is essential for business survival and growth. While these strategies may require additional investment and effort, they align with modern consumer values of quality, sustainability, and local sourcing. By embracing direct-to-consumer sales, sustainable packaging, and digital marketing, beekeepers can build a loyal customer base and thrive in today's market.

In today's rapidly evolving landscape, beekeepers – both individually and through local and national associations – must adopt a more agile and resilient approach to their market strategies. The challenges posed by climate change, market fluctuations, and the threat of honey adulteration

require a shift in mindset: beekeeping is no longer simply about caring for bees; it's equally about understanding and nurturing the market that supports them.

To thrive in this competitive environment, beekeepers must actively engage with consumers, utilize digital marketing strategies, and explore diverse distribution channels. By embracing innovation and adapting to changing consumer preferences, they can effectively showcase the quality and value of their products. Furthermore, collaboration with governmental bodies is essential; beekeepers need to advocate for policies that support sustainable practices and promote the economic viability of the beekeeping industry.

Ultimately, the success of beekeepers hinges on their ability to balance the care of their bees with a keen awareness of market dynamics. By becoming proactive, resilient, and market-oriented, beekeepers can secure a sustainable future for their craft, ensuring that the importance of bees is recognized and valued in society.



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RECORDS ON THE MATING OF THE QUEEN



WITH DRONES IN THE AIR IN THE YEARS 1763 - 1776 FROM SLOVENIA

Introduction

Mating means the sexual union of the queen and drones during a mating flight. Many researchers have studied the mating of queens and often concluded that this happens in the hive when the drone touches the queen. No one saw the mating. In Janša's book "Abhandlung vom Schwärmen der Bienen" (1771), special attention was paid to the description of queens mating with drones in the air (see § 63). This record in his book was even considered a mistake, and in order to prove it, they announced a prize of 20

oz. 30 ducats to the one who will confirm that the queen is already mated in the hive. Even before Janša, mating of queens with drones in the air, (which is an original Slovene discovery), were known to Gorenjska (Carniolan) beekeepers and other Slovene beekeepers who wrote about it. In the essay we will present this chronologically with the records known so far (manuscripts and publications) in the years 1763 - 1776 from Slovenia.

Records:

1. Scopoli: The first on mating of a queen with a drones in the air – 1763

Scopoli (1763), published the book *Entomologia Carniolica* in latin. *Apis Mellifica* (honeybee) is described under number 811 (pages 303-304). Scopoli wrote about the queen: "... it is surrounded by several drones; she flies away, flying in the air she becomes fertilized...". This is the first record in the world that drones in the air mate a queen.

2. Glavar: Vorschlag Beantwortung zur Verbesserung der Bienenzucht in den Kaysl. Königl. Erbländern - "Answer" – 1. 7. 1768

Peter Pavel Glavar (1768) wrote manuscript: *Vorschlag Beantwortung zur Verbesserung der Bienenzucht in den Kaysl. Königl. Erbländern* in german (Proposal Reply for the improvement of beekeeping in the Kaysl. Royal Hereditary Lands), short "Answer", which is the first professional description of beekeeping in Carniola. He also mentions that queens are mated outside the hive in the air.

30. Chapter: Young queens fly out for pollination: *"It should be noted that the young queen of those hives which have swarmed, as well as of the second and third swarms, will fly out for pollination in a few days between 12 noon and 2 pm"*.

3. Furlan: Practische Binen Oeconomie - 1768/1771 (?)

The Archives of the Republic of Slovenia contain an extensive manuscript in Gothic and German (65 pages) with beekeeping content - title: *Praktische Binenoeconomie...* (Practical Beekeeping...). The author of the manuscript is probably beekeeper priest Matej Furlan.

Chapter Six: On the Fertilization and Multiplication of Bees: "... Here, however, I intend to talk about the queen in the second or third swarm, which is by no means yet fertile, and

therefore incapable of laying eggs. After we put it in the hive with a swarm, such a queen flies out of the hive on the third day and drones after it. However, as it rises into the air, also drones rise behind it, attacking the queen and performing fertilization. Due to the mating instinct, a ball is made and it often happens that they all fall to the ground together with the queen, whereby the most skillful drone gets the game, which I once saw to my great surprise".

4. Humel: Queen mating with drone in the air - 1769, 1771, 1773

Humel informed in writing (1771) the Carniolan Agricultural Society about his observations (1769). Slovenian beekeepers Matej Furlan and Peter Pavel Glavar have been asked for an assessment and opinion. Later the Carniolan Agricultural Society acquainted Hummel's record with the Beekeeping society in Oberlausitz (Upper Lusatia), attached a positive assessment of Glavar and Furlan, and emphasized that these new findings about queen mating were worthy of attention. The Society first reported on Humel's observation of queen bees in 1769 with a short note in 1772 and 1773, mentioning "Peter Paul Glovar and Matthai Furlani." The Huml's whole article was published by the Beekeeping Society in Upper Lusatia in 1773 with the title: "Physische Erfahrung, dass der Weisel wirklich von den Drohnen ausser den Bienenstock befruchtet werde, von Anton Humel, Stadtchirurg in Laybach im Herzogthum Crayn, der Societät gesandt" (Physical experience that the queen bee is really fertilised by the drones outside the hive, sent to the Society by Anton Humel, town surgeon in Laybach in the Caniola). At that time there was still speculation about the method of fertilization of the queen. This article was a big surprise for the world beekeeping professional public.

4.1. Huml's letter – 25. 9. 1771

Summary:

»...Humel, a city surgeon from Ljubljana and an amateur beekeeper, explains in the introduction that it is still unresolved whether the drones fertilize the queen or not. Because of this he paid particular attention to bees' behavior at his apiary. In June 1769, he noticed in the second swarm the next day that the bees were agitated, that the queen was on the alighting board and then the queen flew into the air. She returned half an hour



later and immediately entered the hive, where about 40 bees followed her. He saw this for the first time after five years of beekeeping, and asked experienced beekeepers, of whom there are many here in the country. They said that they had known this for a long time. It was always a good sign if the queen flew out so early and came home with a white sign on its abdomen. Humel noticed this in the new second swarm and even more so in subsequent swarms and subsequent years. The priest Matej Furlan, who was an experienced and famous beekeeper, explained to him that his observations are not new because he has noticed this many times during his twenty-two years of beekeeping. He also recounted that he saw two times a ball of drones falling in front of the apiary to the ground, and when he examined it, he always found in the middle a queen that was joined to the drone. Humel concludes that it is now explained that the queen is mated with drones in the air and encourages other beekeepers to pay attention to this phenomenon to make themselves sure. He especially advises those who have doubts about this..."

4.2. Glavar's assessment of Huml's letter – 25. 11. 1771

Summary:

»... Glavar says from the very beginning that Huml's work deserves all the recognition, because experienced beekeepers from Gorenjska also told him about the queen's flying with drones in the air and that he saw it several times. Therefore, there can be no more doubt about that. After

laying, the queen no longer allows reunion with drones and, except with the swarm, no longer flies out of the hive and remains fertile for the whole life. At the end, he concludes with a recommendation to the agricultural company that, if it deems it worthwhile, he should send this letter to the beekeeping society in Oberlausitz with a recommendation to publish Huml's record in his beekeeping publication..."

4.3. Schirach, III. Queen mating with drones in the hive - 1773

Summary:

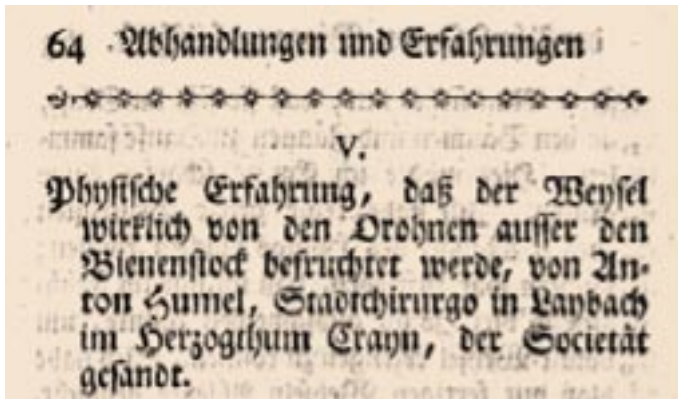
"...Reaumur has never seen mating a queen with drones in a hive. Perhaps now in this unexplained matter three Austrian connoisseurs of bees are discovering a new view.

The Carniolan Imperial Royal Society for Agriculture and Useful Skills communicated these new findings to us as worthy of attention. Mr. Glovar and Mr. Furlang (Furlan), both venerable priests from Carniola, and Mr. Humel, a city surgeon from Ljubljana confirmed for many years about the mating of the queen outside the hive during the so-called noon fertilization dance. This was most clearly confirmed during the swarming. The queens returned with a white thread on their abdomen and the drones were found free around the young queen or in the grass. We welcomed this report. "

4.4. Humel Publication: Physische Erfahrung, dass der Weyssel wirklich von den Drohnen ausser den Bienenstock befruchtet werde (1773).

**BEES
LIFE**





Title of the publication of Huml's essay – *Gemeinnützige Arbeiten...*, 1773, p. 64

Title translation:

"Physical experience that the queen is really fertilised by the drones outside the hive; from Anton Humel, a city surgeon in Ljubljana in Carniola, who sent it to the Society."

5. Publication in the *Wochentliches Kundschaftblatt des Herzogthum Krain* – 1775

The publication of the abbreviated article "Praktische Eröffnung eines Binnen Liebhabers, dass Weiser wirklich von Drohnen ausser den Binnenstock befruchtet werde. (Practical revelation of an inland lover that queen is really fertilised by drones except the inland hive)" - is without mentioning the author in the *Wochentliches Kundschaftblatt des Herzogthum Krain* (1775).

Title translation:

A message from practice that the queen is mated by drones out of the hive.

6. Scopoli: *Dissertatio de Apibus* - 1770

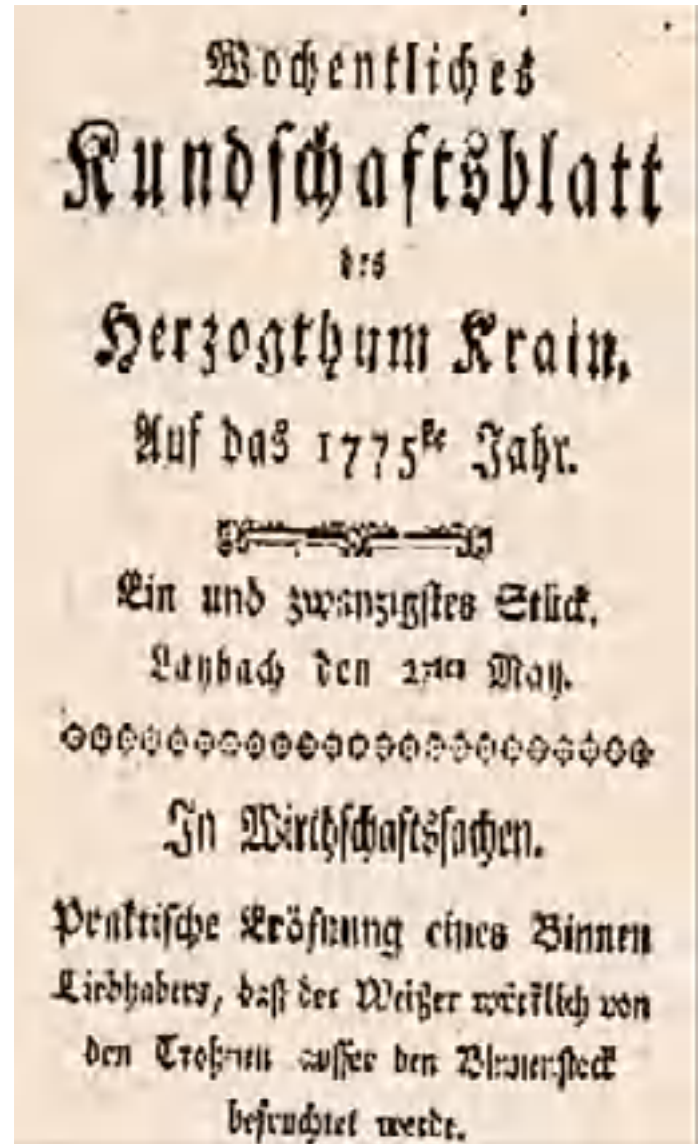
In 1770, in the *Annus historico naturalis*, Scopoli included in the first chapter the work *Dissertatio de Apibus* (Dissertation on Bees) written in Latin.

The tenth observation states:

"...The purpose of the swarming out is considered by some people as a mating, while others argue that asexuals (worker bees) do not build honeycombs before the queen has brought some thin thread into the hive."

7. Janša: *Abhandlung vom Schwärmen der Bienen* - 1771 and *Vollständige Lehre von der Bienenzucht* – 1775.

- General information about the queen's mating with drones in the air in Janša's time.



Wochentliches Kundschaftsblatt des Herzogtum Krain, 1775, p. 321

In Janša's time, there was still speculation about the queen's mating. Most thought it was happening in the hive but no one had seen it yet. Janša's publication in both books, and especially in the first, that the queen is mated with drones in the air, aroused much interest and opposition among beekeeping experts. Most mistakenly attributed to Janša that this was his discovery. However, it is not. Even before the publication of Janša's first book in 1771, in the beekeeping literature, where Carniolan (Slovenian) beekeeping is described or presented, this is written in the publications: Scopoli (1763) and (1770), Glavar (1768), Humel (1771) and Furlan (1768-1771 (?)). Here are also described the signs of fertilization of the queen, which are visible at her return

- a white thread on her backside. Janša's discovery related to the queen's flying in the air is that several drones fertilize the queen. There is also a living oral testimony that Gorenjska (Carniolan) beekeepers knew from their many years of beekeeping experience that the drones fertilize the queen in the air.

7.1. Janša's first book: Treatise on the Swarming of Bees – 1771. & 63 (page 85)

"...Mating flight of the queen depends on the weather and honey flow... on the third or fourth day after birth... On a beautiful day, between nine in the morning and three or four in the afternoon, the queen arrives with accompanied of bees and drones from the hive. On the alighting board it is looking in all directions for a while to remember the hive; then rises into the air. It flies in circles in front of the hive for a while and then rises into the air. When it returns from the mating flight, it does not enter immediately the hive, but flies some time in front of it. On this occasion, attention should be paid to the following signs, by which we recognize that the queen has pollinated. If the back of the queen where the bees have a sting, is open or if something white, similar to a thin thread, hangs from the back and looks as if the back is broken, then the queen has certainly been mated..."

7.2. Janša's second book: Complete Teaching of Beekeeping - 1775 & 8 (page 8)

"...Drones are male; their only task is to mate the queen. At the time of swarming, on a beautiful, warm day, each unfertilized queen is accompanied by many drones and bees into the air, where the drones fertilize her..."

IX. Chapter: On Queen mating (pages 51 – 55)

& 51: Mating time; & 52: Fertilization; & 53: Mating signs; & 54: The benefit of cognition;

& 55: Age of the queen for mating.

8. Peter Pavel Glavar: Pogovor o čebelnih rojev (A Conversation on Bee Swarms) – 1776

Glavar (1776) writes about the mating of queens in XXXI. and XXXII. chapter - paragraphs 349-361.

357 paragraph (page 53):

"When the queen flew in the company of some bees and drones from the hive, drones descend from the hive behind her one after the other and a few shots far from the apiary fly to-

gether over a beautiful plain and there in the air they fly here and there with a great murmur. The drones are pressing harder and harder against the queen, taking it in the middle and sticking together, so that they fall to the ground several times in the form of a ball... «

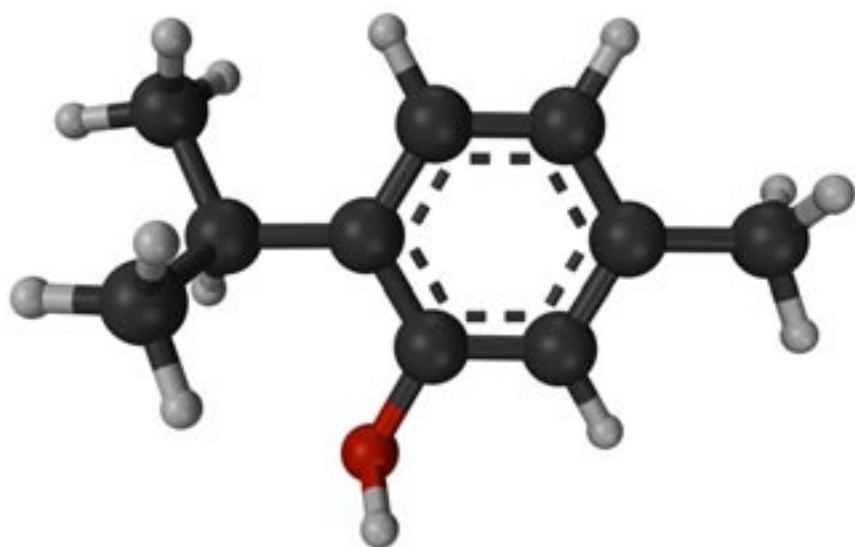
Conclusions

The presented records on the mating of queens with drones in the air testify that these are original Slovenian contributions to the biology of the honey bee. Undoubtedly, Scopoli, who learned this from the stories of old Gorenjska beekeepers, was the first in the world to write about it in the Carniolan entomology (1763). The famous beekeeper Huber discovered this in 1788. It took quite a few decades for this to be accepted even by the greatest skeptics.

Professor Emeritus **Dr. Andrej Šalehar**,
University of Ljubljana, Biotechnical Faculty
and **Franc Šivic, B.Sc.**

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CANDY BOARD FORTE

Biocidal action of thymol



Despite a good beekeeping season in terms of honey harvest, the onset of the 2024-2025 beekeeping season has brought new challenges for beekeepers in Romania. The varroa mite is once again confirming its "destroyer" nickname. Although bee families did not have very high infestations, the mite, foraging and nutritional deficiencies weakened the immunity of the families. Against this background, the viruses spread, decimating many of the hives in Romania. The mechanisms are simple: protein deficiencies due to the drought at the end of the summer and prolonged brood brood have contributed to the bees' fat body fat and immunosuppression. On top of this, the varroa mite's dual action of immunosuppressing and promoting the spread of viruses. Foraging and the actions of pests such as wasps also favored the spread of viruses.

The Research & Development team at Dulcofruct Bee Nutrition Science recommends the use of Candy Forte candies for the fall-winter season. Their action is aimed at restoring the nutritional balance of the bee family, removing the effects of viruses and bacteria through the biocidal action of thymol. Evaluations by the Re-


search & Development team predict a possible stronger nosema infestation in the spring of 2025, as a result of a decrease in the immune system and immunosuppression of the bee family caused by the quality of the food and the action of viruses. At the moment, we consider thymol one of the most important phytochemicals in the fight against nosema. Also, to reduce the resistance to other drugs (e.g. treatments for brood brood) we recommend feeding bee families with Candy Forte thymol containing candies. Last but not least, the thymol in Candy Forte candies acts as an adjuvant to control varroa mites. Thanks to its slightly repellent action

due to the thymol content and the solid formula, Candy Forte cakes do not favor the foraging.

By Dulcofruct Bee Nutrition Science



SUPER PROTEIN PATTIE



BENEFITS:

- **Quality of the drones**
- **Reduces Varroa population**
- **Explosive development of bee colonies**
- **Increases bee immunity and longevity**
- **Increases the number of excellent performances of foragers**

EUROPEAN MEAD MAKERS CONFERENCE:

A GATHERING OF MEAD
ENTHUSIASTS
AND HONEY
PRODUCERS



Kings of Mead, in collaboration with the European Mead Makers Association (EMMA) and pitnemiody.pl, are delighted to announce the **European Mead Makers Conference**. This event is set to become a cornerstone for both professional and home mead makers across Europe and the globe.

Event Details:

- Date: [27.02.2024 – 01.03.2024]
- Location: [Krakow, Poland]

Event Overview

The European Mead Makers Conference offers a unique platform for mead enthusiasts to enhance their knowledge, network with fellow aficionados, and partake in enriching activities. The conference will feature a series of lectures and presentations delivered by industry experts, designed to provide valuable insights and foster the exchange of ideas and experiences.

Key Highlights:

1. **Educational Sessions:** Attendees will have the opportunity to attend a variety of lectures and presentations that cover a broad range of topics related to mead making. These sessions are

tailored to benefit both novices and seasoned mead makers, ensuring a comprehensive learning experience for all.

2. **Networking Opportunities:** The conference is an excellent occasion to meet fellow mead makers, exchange contacts, and forge new partnerships. The informal meetings in local restaurants will include mead tasting sessions, where participants can share their creations and receive feedback from peers.

3. **Mead Tasting Sessions:** These sessions offer a relaxed environment for attendees to showcase their own mead. Participants are encouraged to bring their mead, allowing others to sample and discuss the nuances of each brew.

4. **Honey Madness Cup:** Having its premiere in 2024, a competition exclusively for beekeepers and apiary owners who produce their own honey. This competition is an extension of the renowned Mead Madness Cup, organized in collaboration with bee honey sommelier Olga Gavrylik. Unlike traditional competitions, honeys in the Honey Madness Cup will be judged on organoleptic qualities by honey sommeliers from the Italian organization Alba del Miel.

European Beekeeping Association (EBA) as Patron

This year, we are honoured to have the European Beekeeping Association (EBA) as a patron of the European Mead Makers Conference. The EBA is committed to three primary goals:

- **Combating Counterfeit Honey:** Addressing the influx of counterfeit honey in the European market to protect the integrity of genuine honey products.
- **Advocating for Special Subsidies:** Promoting the introduction of subsidies per beehive, acknowledging the crucial role bees play in pollination and ecological improvement.
- **Fighting Against Toxic Pesticides:** Working to prevent the improper use of pesticides that are harmful to bee populations.

The EBA's involvement underscores our shared commitment to quality, authenticity, and the well-being of the bee-keeping community. Their support enhances the conference's focus on sustainable practices and the promotion of genuine honey and mead products.



Testimonials

"We are thrilled to expand our horizons with the Honey Madness Cup, offering a new dimension to our beloved Mead Madness Cup. This initiative underscores our commitment to promoting quality and excellence in both mead and honey production." - Olga Gavrylik, Honey Sommelier

Conclusion

The European Mead Makers Conference promises to be an event filled with learning, networking, and celebration of mead and honey craftsmanship. Whether you are a professional mead maker, a hobbyist, or a honey producer, this conference provides an unparalleled opportunity to connect, learn, and grow within the community.

For more information and to register, please visit [Event Website].

We look forward to welcoming you to an unforgettable experience at the European Mead Makers Conference.





OBSERVATION AND FORECASTING SERVICE OF NECTARING IN SLOVENIA

Slovenia with its 20,251 square kilometres of land is one of the smaller countries in the world. Regardless of its size, it has a very diverse climate and flora, which allows for the production of many varieties of honey, among which the highly regarded dark forest honey stands out with its premium quality. In Slovenia, around 440,000 ha or 58.2% of the total area of the country is covered with forests. Different conifers, such as spruce, fir and pine, can be found in most of them.

IN THE PAST

As early as 1901, the beekeepers recognized these natural riches and, under the guidance of

the inventor of the AŽ hive Anton Žnideršič, the inventor of the AŽ-beehive. He oversaw the work of the service until his death in 1947. The work of the service has been supervised by many acknowledged Slovenian experts. One of the most distinguished was Jože Rihar. A network of measuring stations monitoring the daily yield of honey was set up on different altitudes all over Slovenia.

The service operated uninterruptedly from 1901 to the beginning of World War II, and, with minor interruptions during the war as well. The data on nectar and honey dew flow was sent every 3 days via special postcards, and, where possible, phone or telegraph reporting was introduced.



Cinara pilicornis Htg. on spruce

TODAY

Today, the nectar flow monitoring service (NFMS) plays an important role in terms of bee transport and other beekeeping activities. An analysis of the condition of the nectaring agents on tree species takes place throughout the year with different assessment methods. In the autumn, it monitors the number of eggs or larvae, which are prepared for the winter hibernation and in the spring time, it analyses their wintering success. At a later stage, when the agents are already active, it again monitors their number and the intensity of nectar secretion as well as determines the degree of the nectar's ripeness.


Measuring stations are very helpful for nectar monitoring, as they help us oversee daily returns in a particular area.

Service has identified the following objectives:

- Control of all important bee pasture resources,
- Produce a forecast of each nectar and honeydew pasture separately
- Beekeepers daily informed on yields
- Training of beekeepers regarding bee pastures, both theoretically and practically
- Keeping the land register of bee pastures
- Assisting beekeeping associations in the preparation of pasturing schedules

A network of measuring stations operates all over Slovenia. It includes 57 digital and 4 manual scales and 55 field observers are assigned to monitor the natural vegetation.

In addition to informing beekeepers on precise daily yields of honey, the NFMS also provides them with forecasts for future bee pastures and offers technology advice on the maintenance of bee colonies.



The most important producer of honeydew
(*Physokermes Piceae*) on spruce (*Picea*
Abies) in Slovenia

MONITORING STATIONS

The measuring station is a little house in which a hive is installed and underneath it an automatic electronic scale is placed. Every evening, this scale provides us with information regarding the honey yield, that is accurate to the decagram. In addition, we also record the air temperature and humidity of the surrounding area. In

the evening, all of the measuring data is published online and on an app. This way, beekeepers are informed in a timely manner about positive and negative yields in individual areas.

The Observation and forecasting service is an important service for beekeepers, as it informs them about daily yields and prospects for future grazing and provides technological advice regarding the care of bee families according to the conditions in nature.



The measuring station

IN THE FUTURE

In the future, we want to improve forecasting methods that they will be more accurate. We would like to include into the forecast also others detail about weather. We want to create a computer application that would be helpful in predicting the nectar flow. We want to determine what is critical or when comes the moment when the bees start to bring nectar into the hives. Since all data recorded on each day on the computer, we also want this information to statistically process.

Aleš Bozovičar
Slovenia
+386 41/644-217



OUR EXPERIENCE

WITH THE TRADITIONAL SLOVENIAN BREAKFAST

The Traditional Slovenian Breakfast initiative, which first took place on November 18, 2011, has become a symbol of Slovenia's commitment to healthy eating, sustainable food production, and the preservation of traditional values. The meal consists of locally sourced bread, butter, honey, milk, and apples or other slovenian fruits, emphasizing the importance of domestic produce and the cultural significance of food. This project has grown into a nationwide movement, connecting children, educators, and producers in a collaborative effort to promote local agriculture, especially Slovenia's cherished beekeeping tradition.

In its first year, the project delivered more than 19,000 kilograms of bread, 2,600 kilograms

of butter, 53,600 liters of milk, 3,220 kilograms of honey, and 32,000 kilograms of apples to schools and kindergartens. Approximately 268,074 children, teachers, and educators across 1,535 locations—828 schools and 707 kindergartens—participated. The scale of this event demonstrates the extensive involvement of Slovenia's agricultural and food sectors, from local farmers and beekeepers to food processing companies and cooperatives.

The initiative was spearheaded by the Slovenian Beekeepers' Association, known for its prior success with the educational campaign “One day for breakfast with honey from Slovenian Beekeepers.” This campaign, initiated five years earlier, focused on educating young children about

the role of bees and bee products. Recognizing the campaign's impact, the association sought to expand it, inviting other producers of Slovenian food to join. The Ministry of Agriculture, Forestry and Food (Ministrstvo za kmetijstvo, gozdarstvo in prehrano), along with the Ministry of Education and Sports (Ministrstvo za šolstvo in šport) and the Ministry of Health (Ministrstvo za zdravje), supported the project, which soon gained governmental backing.

The project aims to educate children and the broader public about the significance of breakfast in promoting healthy eating habits. It also emphasizes the benefits of locally produced food, the crucial role of agriculture and beekeeping in sustaining the environment and economy, and the importance of waste reduction and proper recycling practices. Beyond food, the project advocates for a healthy lifestyle that includes physical activity and environmental stewardship.

One of the core messages of the Traditional Slovenian Breakfast is the interdependence between agriculture and beekeeping. Bees, through their essential pollination services, support the production of food and the maintenance of biodiversity. As such, the project highlights the importance of preserving bee populations and supporting local farmers and beekeepers.

Today, the project involves various stakeholders, including government ministries, educa-

tional institutions, agricultural organizations, and food industry representatives. These partnerships underscore the interconnectedness of sectors like agriculture, health, education, and the environment, making the Traditional Slovenian Breakfast a model of collaboration and sustainability.

For Slovenia's beekeepers, this initiative represents an opportunity to raise awareness about the indispensable role of bees in food production and ecosystem health. By promoting the consumption of local food, the Traditional Slovenian Breakfast encourages a deeper understanding of the importance of sustainable agriculture and environmental conservation.

As the project continues to grow, its long-term impact is clear: more people are enjoying locally sourced food, schools are integrating lessons on agriculture and beekeeping into their curricula, and a new generation is learning the value of healthy eating and environmental care. Slovenia's beekeepers remain committed to contributing to this initiative, ensuring that the next generation understands the vital relationship between bees, agriculture, and a sustainable future.

Mojca Pibernik

Consultant
for beekeeping economics



**BEES
LIFE**



OPENING OF THE 15TH THESSALONIKI HONEY FESTIVAL

Honorary Tribute to Emeritus Professor of Apiculture at Aristotle University of Thessaloniki, Andreas Thrasyvoulou, at the Opening of the 15th Honey Festival

The opening night of the 15th Thessaloniki Honey Festival was memorable for the beekeeping community. The Thessaloniki Beekeeping Association honored Aristotle University's Emeritus Professor Andreas Thrasyvoulou for his valuable contribution to the Thessaloniki Beekeepers Association, where he served as a founding member, as well as for his lifelong dedication to

beekeeping. The association surprised him by organizing a special evening, setting it up so that Professor Thrasyvoulou would deliver the opening speech, ensuring he would be present. This sweet conspiracy involved friends and colleagues from across Greece, association members, and the university's apiculture lab scientists, all of whom contributed to making the evening a beautiful success.

The event began with a letter of greeting from Mr. Nikos Pappas, who, due to health issues, could not attend. In his letter, Mr Pappas high-



lighted Professor Thrasyvoulou's decades of research on Greek pine honey and his efforts to validate it as an equal to other types of honey, ultimately leading to its official recognition. He also spoke about Thrasyvoulou's foundational role in creating the university's apiculture lab and the support and guidance he offered to young scientists and beekeepers. The first award was presented by the association's founding members who shared memories and experiences from their journey alongside Professor Thrasyvoulou.

But this was only part of the tribute. With over four decades of contributions to apiculture, Professor Thrasyvoulou's tireless dedication and love for bees and the art of beekeeping have made him a revered figure nationwide. His work has been crucial to advancing scientific knowledge and innovative practices in beekeeping. He is among the few who successfully bridged the gap between academic knowledge and practical application, guiding countless beekeepers toward sustainable and efficient practices that ensure bee health and honey quality. His impact has been instrumental in improving the quality and productivity of Greek beekeeping while respecting environmental sustainability and natural resource preservation.

For these reasons, the Thessaloniki Beekeeping Association presented an honorary award to Professor Thrasyvoulou for his lifelong

service to apiculture. The award was presented by Mr. Alexandros Gousiaris, who traveled from Karditsa on the same day for the event. In his greeting, Mr. Gousiaris remarked, "Andreas Thrasyvoulou does not make a living from beekeeping but he lives with beekeeping. He is one of those rare individuals whose dedication inspires deep respect."

Professor Thrasyvoulou expressed his gratitude to his colleagues, saying, "*No one can achieve anything alone. We contributed as a team, with the help of scientists and beekeepers, their questions, their passion, and the support they gave me. So this award is not just for me; it belongs to the entire team that worked and continues to work. It is for the 20,000 beekeepers who stay in the field despite all the challenges, the disappointments, the decreasing yields, the issues with imported honey, and all other problems; they remain dedicated to serving the bees. This honor is for all of them.*"

Photographs from Professor Thrasyvoulou's beekeeping journey were displayed throughout the ceremony, adding a personal touch to this special tribute.

Alexandra Sotiraki

President of the
Thessaloniki Beekeepers Association

ZZZAGIMED 2024

SENSORY ANALYSIS



This year sensory analysis of honey for Zzza-gimed did not fail to surprise. Sensory or organoleptic testing of honey refers to the evaluation of its sensory attributes, such as appearance, aroma, taste, texture, and sound, using human senses. This type of testing is essential in assessing honey's quality, authenticity, and classification. Previously to sensory analysis, chemical

analysis was conducted. At the chemical testing water content, HMF content and conductivity were measured and the samples were given scores according to those parameters. On 11th of November, at 8:15 am six sensory experts gathered under the guidance of Prof. dr.sc. Dragan Bubalo from the Faculty of Agriculture, University of Zagreb to conduct a sensory analysis.



It was early morning of the sixth of November at laboratories of the Faculty of Food Technology and Biotechnology of the University of Zagreb. Six booths were set for the purposes of testing and students of the Faculty were there to assist with the testing. Every booth had a supply of water, white bread and slices of apples, to help the testers palette cleanse and soak up the honey which they will consume in the hours to come. In the booths there were also plastic spoons to be used for testing and a tablet that had access to Zzzagimed competition application where they can enter the scores for each sample. The sensory experts only had the coding number that was assigned to each sample earlier in the process and the type of honey declared by the beekeeper, in that way anonymity of the samples was preserved. Sensory experts would first look at the colour of honey, then smell the honey and lastly taste the honey. Between the samples they would drink a sip of water and eat a bit of bread or a slice of apple if necessary.

The honey samples were split in three groups for purposes of testing:

1. Acacia honey
2. Floral honeys (including some rare ones like ivy, buckwheat and wild cherry)
2. Meadow honeys and honeypot

The testing was done in one group at the time. Each sample would be assessed by three sensory experts, so basically there were two groups of three experts and each group would test just over 90 samples of honey. The testing starts with milder types of honey and moves on towards more intense ones, so the sensory experts don't get overwhelmed with taste from the start.

Poliform honeys were given scores from 1 to 5 in following categories: purity, clarity/crystallisation, taste and aroma. Uniform honeys had an additional category in which they were graded, and that was colour. If there is a difference of more than 20% between scores given by the sensory experts the grading was repeated.

If the sensory analysts would conclude that the sample was of a different sort than the one that was declared by the beekeeper, they would assign it a different sort. There were several honeys categorised as heather honey and sensory analysts commented that is rare in Croatia, it is often confused with Winter Ivory which is more commonly extracted honey.

One of the biggest surprises was a sample originally declared as an acacia honey which sensory analysts found was actually a Tree of Heaven honey. The Tree of Heaven is not native to Croatia but is an invasive species that started spreading in the 18th century, so it is easily overlooked. This is the first time we have had Tree of Heaven honey in the Zzzagimed competition, as well as the first time we had Ivy honey in the competition.

Floral honeys included a lot of chestnut honey samples. As it is heavier honey and soaks up a bit more water in the stomach, it doesn't go down as easily as some of the others. As we were approaching 11 am the sensory analysts were finishing their grading and had some observations. The overall conclusion was that floral honey was of outstanding quality this year. The sensory experts noted how they might find it useful to have information of the general area where a sample is from in the future competitions. There was also a small discussion about the possibility of a honey categorisation workshop for the beekeepers which might be useful.

And so the testing has come to a close, there were some exciting honeys in the competition



and we identified some avenues for the Beekeeping society to offer something more in the future and how to improve the competition. Gold, Silver and Bronze diplomas will be given for each sample. And each sort of honey will have a champion: floral, honeypot, chestnut, acacia, meadow, linden tree. Sorts that had less than five samples sent are in the separate category and there is a category for best international honey. Now we

eagerly await the thirtieth of November, when the diplomas will be handed to the beekeepers and we will celebrate another successful beekeeping year.

Nina Rac

Member of Pčelarsko društvo Zagreb
(Beekeeper Society Zagreb)





A new book

ABSTRACTS OF THE INTERNATIONAL CONFERENCE APITHERAPY FOR CHILDREN

Conference proceedings a.k.a. books of abstracts and full papers are very useful for a variety of reasons, both for researchers, experts, and the wider community. Here are some key reasons why these proceedings are important:

1. Increasing access to new knowledge: Proceedings contain abstracts or full papers presented by researchers and experts at conferences. This allows for wider access to discoveries, theories, methodologies, and practices before they are published in scientific journals or other formal publications.

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3. Rapid dissemination of innovation and novelty: Proceedings enable the rapid publication of new research, especially in fields where developments are happening quickly, such as technology, medicine, or the natural sciences. A conference can be a "first contact" with new ideas or discoveries.

4. Documentation and archiving of research: Proceedings document the events and research that took place at a conference. This means that

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5. Increase in author visibility: Authors whose papers are published in proceedings often gain greater visibility in the scientific community. Proceedings allow their work to be more widely recognized, which can lead to increased citations of their research or new opportunities for collaboration.

6. Enhancement of professional exchange and development: Proceedings encourage exchanging ideas across disciplines and professional fields. Researchers participating in conferences can contribute to the further development of their fields through the exchange of opinions and discussions, which allows for faster progress.

7. Helps improve research or expand good practices: Presenting research at conferences and publishing in proceedings provides immediate feedback from other experts. This can help improve or build on research work and contribute to its greater impact.

In general, conference proceedings are key to disseminating knowledge, developing profes-



sional networks, and accelerating research and good practice progress.

In the following collection, we dive into the world of bees, apitherapy, and pedagogy. These e-books bring together the contributions of world-renowned experts who presented their scientific and professional work in the field of Apipedagogy and apitherapy for children.

As for the international conference on apitherapy for children, it is a special honor for us that with the conference we proved and demonstrated effective professionalism and integration in the sense of collegial integration and cooperation of various disciplines. Apitherapy is an interdisciplinary and complementary science that touches different sciences differently. We are proud that the conference, with the support of professional authorities, made it possible to obtain points for participation in the conference for both doctors (Slovenia and Croatia), pharmacists (Bosnia and Herzegovina), and educators (Slovenia and Croatia).

As for the first international Api Pedagogy Conference 2022 it is a special honor for us that it was held in collaboration between the Institute for the Development of Empathy and Creativity Eneja, Municipality of Ljubljana and the Ministry of Education, Science and Sport of the Republic of Slovenia. The support of the local community and the highest professional authority demonstrates the quality of the presented content.

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Nina Ilič

apitherapist

Coordinator of the network
of API kindergartens and schools
APIS RETIS



APIS Slovenia I Europe is one of the largest European beekeeping events, which promises great innovation as it expands its mission. The fair has a more than 45-year-long tradition and takes place at the Celje Showground in Slovenia. It is a part of the March Fairs, which attract nearly 20,000 visitors every year.

Join us at the next fair in Celje (Slovenia) on 15 and 16 March 2025. This year we are expanding the fair to the European level with European exhibitors and have therefore renamed it APIS Slovenija I Europe. This groundbreaking transformation will help us attract even more exhibitors and visitors from all over Europe and create the largest European event in the field of beekeeping.

The international sales exhibition and the accompanying two-day beekeeping conference are used by beekeepers from Slovenia and abroad to exchange experiences and knowledge on the most current topics in the field of beekeeping. The central topic of Saturday's 48th national beekeeping conference will be devoted to honey and varroa, while the professional topic on Sunday will be devoted to good beekeeping practices.

Conference programme

Saturday, 15th March 2025

- 10.00 – Fair opening speeches
- 10.30 – **Assoc. Prof. Dr. Dražen Lušić:** Experiences in the Struggle for Real Honey
- 11.15 – **Prof. Dr. Aslı Özkırım:** Double Fight Against Varroa: Dropping and Wound Healing by Chitosan
- 12.00 – **Dr. Marco Pietropaoli:** Integrated Varroa Management - New practical approaches
- 12.45 – Round table with representatives of the EBA Scientific Committees on current challenges in European Beekeeping

Sunday, 16th March 2025

- 10.00 – **dr. Lucija Žvokelj (VF-NVI):** The Effect of High Outdoor Temperatures on Bee Health and Care
- 10.45 – **Mitja Smrdel:** Preparation of Bee Colonies for the First Pastures - Comparison of Different Locations
- 11.30 – **Aljaž Debelak:** Ensuring Safe and High-Quality Crops when Preparing Bee Colonies for the First Pastures
- 12.30 – Announcement of winners for the best technological solution in beekeeping, best photo, best article...



**SERBIAN FEDERATION OF
BEEKEEPING ORGANIZATION'S**

**XVI STATE
BEEKEEPING FAIR**

February 8-9, 2025

Hall 2 of the BELGRADE FAIR

Additional information on the website:

<https://spos.info/konacni-program-xvi-drzavnog-pcelarskog-sajma/>

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Ulster
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ANNUAL CONFERENCE

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Dan Basterfield – BBKA Master Beekeeper

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Ruth Wilson – AIPP Farmland Pollinator Officer

Dr Rowena Jenkins – Microbiologist, Swansea University

Ass. Prof Dalial Freitak – University of Graz, Austria

Richard Noel – Brittany Bee Farmer

Prof Robert Paxton – Martin Luther University, Germany

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BOOKING OPENS ON 1st OCTOBER 2024 ON-LINE AT:
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For more information contact: Brian Grzymek – Conference Organiser

Email: bgrzymek@icloud.com **or Visit our Website:** www.ubka.org



Content Creation



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