INTERNATIONAL HONEY MARKET

by RON PHIPPS

Introduction

Some of the storms are over, and the turbulent tide is retreating. Beekeepers in America, Canada and Europe have reason to look for better days on the horizon.

There have been increased international efforts which hold the promise of greater effectiveness to overcome the actions of international cartels who have orchestrated multiple modern modes of adulteration (MMMA) which have collapsed prices, jeopardized the survival of beekeepers, and threatened ecological sustainability which depends upon diverse and vigorous populations of pollinators.

The seriousness of the stress on global pollinators was recognized by the United Nations Biodiversity Summit held in October 2024 in Colombia. The adequacy of the global honey supply cannot be abstracted from the authenticity of honey. A multi-dimensional approach can bring together beekeepers and retailers concerned with ecology and prevention of food fraud in its various manifestations.

There has been recent collaboration among governments, academic organizations and the growing alliances for authenticity. The ongoing reviews in the antidumping cases will be changing the playing field for honey exporters in countries subject to the rulings. New testing methodologies are being developed and implemented. When the tide returns, we anticipate it will bring with it progress in the quest for authenticity of honey.

Honey prices in summer 2024

The U.S. market average import honey price has declined by 20% as of August 2024, compared to 2023, and the import quantity for conventional honey was about 154,975,344 kgs (341,661,743 lbs.) at the end of August 2024. If import volumes continue at this rate, they will exceed the total volume for 2023 which was 187,182,552 kgs. (412,666,398 lbs.).

India has been the largest exporter to the U.S. in 2024 and 2023. The average price for Indian Extra Light Amber has been $0.79/lb. FOB in 2024. This value is below the Minimum Export Price which was established for Indian honey in early 2024 by the Indian government. The low Indian prices defy both 1) the enormous environmental stresses that have been suffered in Indian agriculture, and 2) the general food inflation that has plagued the U.S. and many other nations since COVID and the supply chain crisis.

Honey prices paid to U.S. beekeepers for Dakota White Clover in August 2024 were in the range of $1.75/lb. By September/October, after the completion of the U.S. and Canadian honey crops, premium Clover was being sold at a level of $1.61/lb. A year ago, beekeepers were achieving prices in the $2.00-$2.30/lb. range. Furthermore, beekeepers are being compelled to sell not just their crops, but for many, their bees. That includes major beekeepers. “Lack of funds is resulting in bad decisions” said one beekeeper, “everyone is angry at the prices.”

Dr. Stan Daberkow, emeritus economist at the USDA, has put the U.S. and imported prices into perspective, showing monthly and annual prices in Charts 2 and 3. The pattern of price declines which began in 2022 is continuing, a dreary picture.

The depths to which the Masters of Market Manipulation have driven the market, and the extraordinarily low

antidumping rates that have been achieved for the major sources of depressed honey prices, are startling. Low antidumping rates and the diversity of qualities coming from the Indian market have functioned as a dead weight, pulling the entire market down.

Prices paid to Canadian beekeepers for White and Extra Light were reported at US $1.35-1.43/lb. in September 2024 in the National Honey Report.

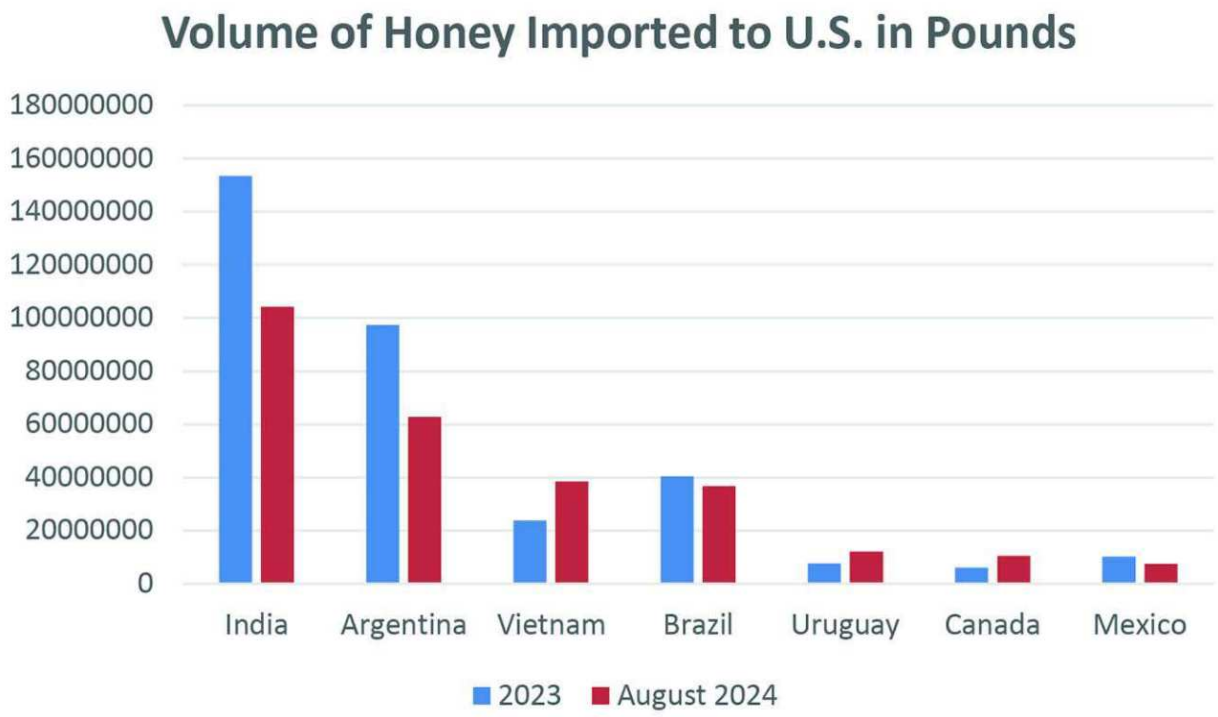


Chart 1

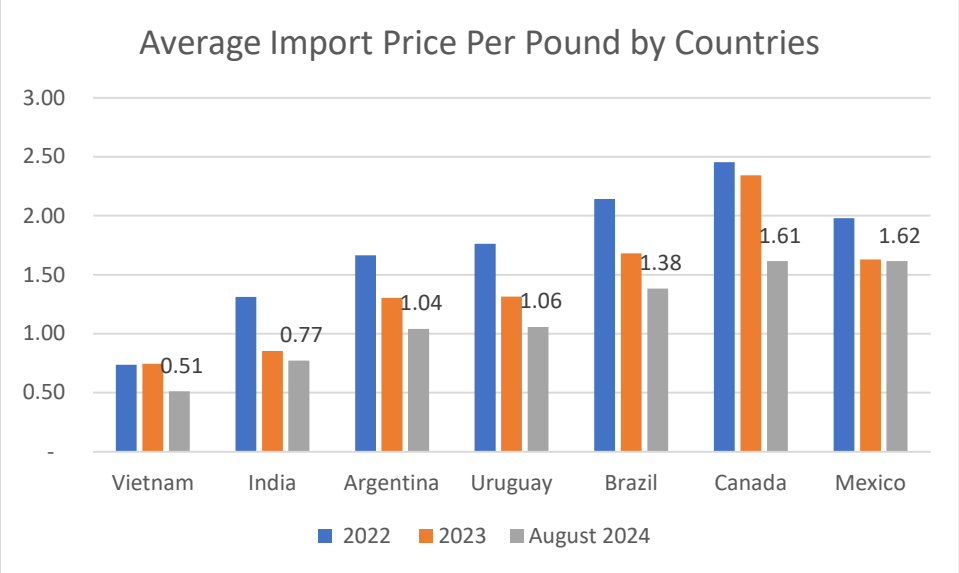
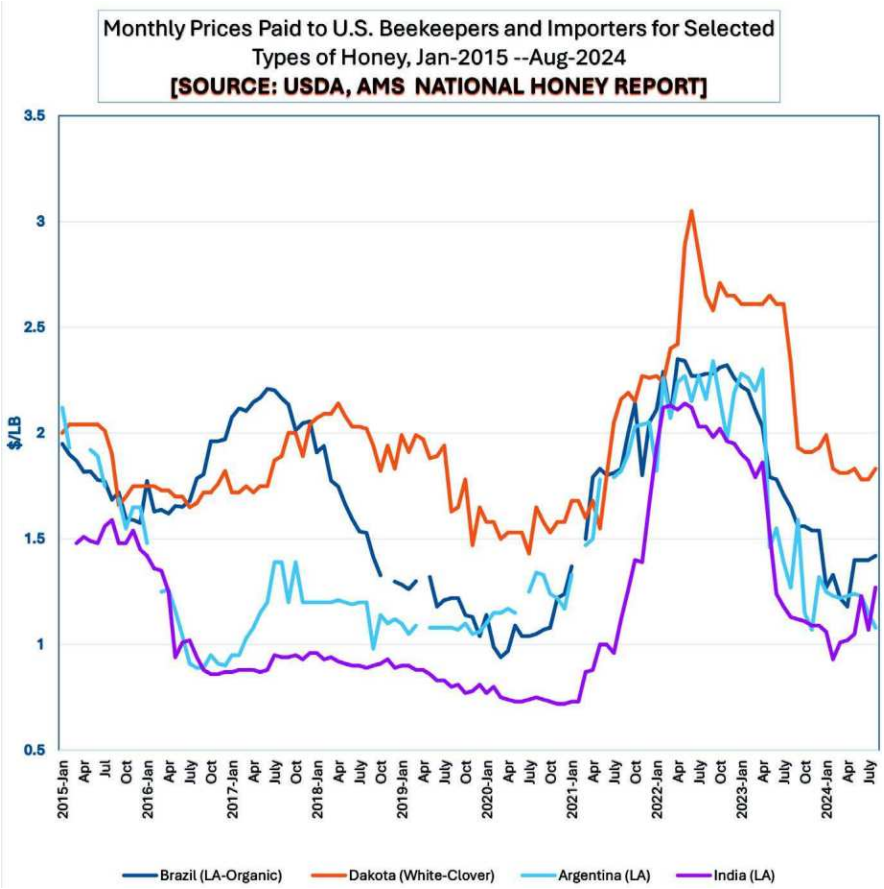
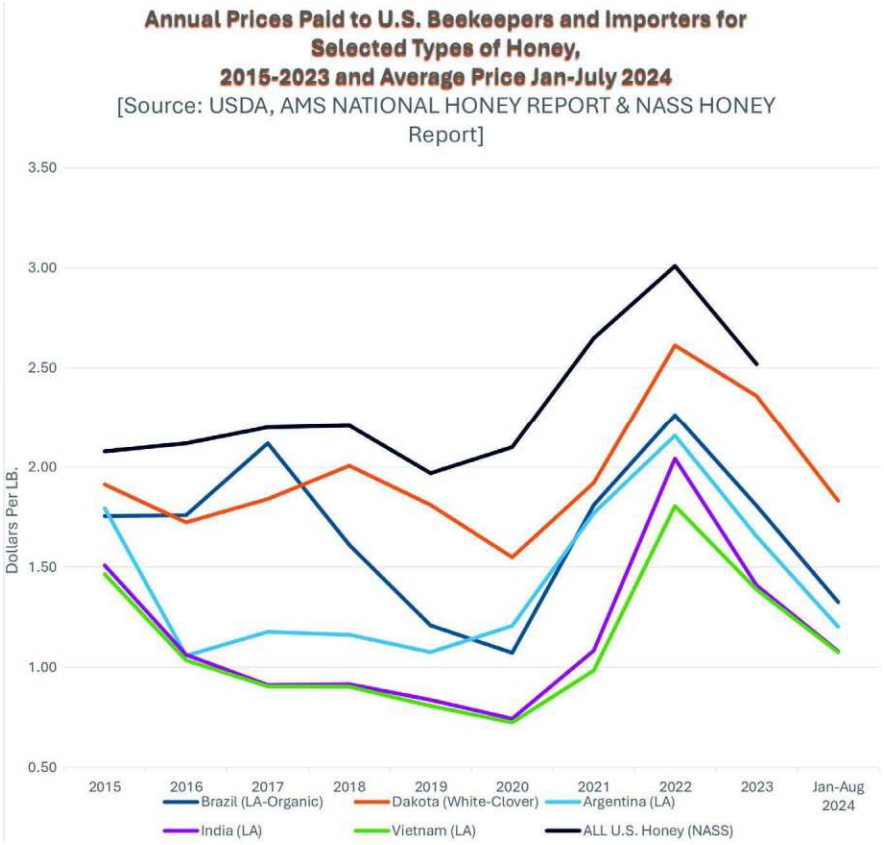


Chart 2

Chart 3 and 4


Monthly Prices Paid to U.S. Beekeepers and Importers for Selected Types of Honey, Jan-2015 --Aug-2024
[SOURCE: USDA, AMS NATIONAL HONEY REPORT]
$/LB
3.5
3
2.5
2
1.5
1
0.5
2015-Jan
Apr
Jul
Oct
2016-Jan
Apr
July
Oct
2017-Jan
Apr
July
Oct
2018-Jan
Apr
July
Oct
2019-Jan
Apr
July
Oct
2020-Jan
Apr
July
Oct
2021-Jan
Apr
July
Oct
2022-Jan
Apr
July
Oct
2023-Jan
Apr
July
Oct
2024-Jan
Apr
July
Brazil (LA-Organic)
Dakota (White-Clover)
Argentina (LA)
India (LA)


Annual Prices Paid to U.S. Beekeepers and Importers for Selected Types of Honey, 2015-2023 and Average Price Jan-July 2024
[Source: USDA, AMS NATIONAL HONEY REPORT & NASS HONEY Report]
Dollars Per LB.
3.50
3.00
2.50
2.00
1.50
1.00
0.50
2015
2016
2017
2018
2019
2020
2021
2022
2023
Jan-Aug 2024
Brazil (LA-Organic)
Dakota (White-Clover)
Argentina (LA)
India (LA)
Vietnam (LA)
ALL U.S. Honey (NASS)

Perspectives of beekeepers

Joël Schiro, President of the SPMF, the French beekeeper's institute, has said, "We can't compete with the packers serving the retail trade with foreign honey." French beekeepers are compelled to adopt methods of selling directly through various channels to consumers, marketing authentic honey from this or that geographic area and floral source. This trend is also developing elsewhere.

Among the most vehement, detailed and articulate protests against the adulteration of Indian honey is found in extensive reports from Indian beekeepers who cannot compete with the cartels selling adulterated honey within India. (Down to Earth magazine described and exposed the practices within India.) The leaders of the cartels — whatever product — sit in their mansions, drive fancy cars, and sip gin-and-tonics and martinis, while beekeepers are losing their businesses and homes, and eroding their life savings.

For five decades China has seduced American businesses to outsource manufacturing for a huge variety of products, to the detriment of the manufacturing companies in America, which have shrunk or disappeared. Around the world, the endless flood of cheap imported honey is causing domestic honey producers in France, the U.K., Estonia, Hungary, Canada and the U.S. to struggle for survival.

In a recent Bruker podcast, Robert Podolsky of Manitoba described the consequences of honey fraud for beekeepers in Canada who are struggling financially. Bee losses have contributed to reduced volumes of honey production in Canada, and the producers face problems selling authentic honey when they must compete with low-priced imports. Consumers are being offered cheap honey on grocery shelves. He uses nuclear magnetic resonance (NMR) testing in its full spectrum and expects that demand for authentic honey will come back after fake honey is detected through more comprehensive analysis. The website is: **https://www.bruker.com/en/products-and-solutions/**.

Honey antidumping order status

Preliminary antidumping rates as of July 2024 were announced for the period of review November 2021 to May 2023 (See Chart 4). These rates will serve as cash deposit rates until the publication of Final rates.

Three exporters from three different countries received zero preliminary antidumping duty rates for this period of review. However, these rates could still change, and the Department of Commerce (DOC) has delayed announcing Final rates for Period of Review 1, with results expected in early 2025. Most of the rates have changed significantly since the publication of the Honey Antidumping Order in 2021.

Importers are required to pay cash duties at the time of importation according to the prevailing duty rates. Importers from most exporters in Argentina and from all exporters in Vietnam must pay the 58% and 60% or higher duty rates, which makes doing business with most honey exporters in those countries very risky for the importer. The increased rates on Vietnamese and Argentine exporters may result in significant retroactive duties being imposed upon honey imported prior to the final and increased antidumping duty rates. We may note that the Indian government issued a minimum export price in early 2024, which was immediately ignored, as the prices from India have continued to drive the overall market down to absurd levels. The new antidumping rates for Indian honey are basically zero, so the American market is paying less than $1.00/lb., delivered into the U.S., for Indian honey. In August, the average import price for Indian honey was $0.77/lb. FOB (See Chart 5).

COUNTRY EXPORTER/PRODUCER	APRIL 2022	JULY 2024
Argentina		
Asociación De Cooperativas Argentinas Cooperativa Limitada	24.67%	58.34
NEXCO S.A.	9.17%	0.00
Industrias Haedo S.A.	49.44%	58.34
Compañía Inversora Platense S.A	49.44%	58.34
All Others	16.92%	58.34
Brazil		
Melbras Importadora E Exportadora Agroindustrial Ltda	7.89%	2.31
Apiário Diamante Comercial Exportadora Ltda [1]	83.72%	2.31
Apis Nativa		0.00
All Others	7.89%	2.31
India		
Allied Natural Product	6.24%	0.00
Ambrosia Natural Products (India) Private Limited / Ambrosia	5.52%	0.59
All Others	5.87%	0.59
Vietnam		
Ban Me Thuot Honeybee Joint Stock Company	61.27%	100.54
Daklak Honeybee Joint Stock Company	58.74%	154.47
Separate Rate Companies		120.92
Vietnam-Wide Entity	60.03%	60.03

Chart 5

The antidumping duty review process

American beekeepers are deeply frustrated by the fact that during the administrative review, those conducting the cost analysis visited Argentina and Brazil to investigate, but the DOC did not send officials to India for a deep and penetrating analysis of India's cost of honey production. The lawyers say this intrusive inspection should have happened by U.S. law, all the more so given the magnitude of the price disparity for Indian honey. The DOC used superficial data in determining India's antidumping rates. The key factor during antidumping regimes is comparative rates among exporters. The low rates for India are extremely impactful because the prevalence of the use of techniques for extraction of unripe honey (which Indian exporters have confirmed), and the use of resin technology, have allowed India to export honey in extremely large quantities at extraordinarily low prices, including White and Organic honey.

Speculation is that the geopolitical competition between India, which has the world's largest population, and China, bent upon acquisition and domination of strategic resources, may explain the sharp contrast between how China's earlier antidumping petition was treated vs. how India's has been treated. The sharp disparity may

reflect geopolitical and economic concerns. China's aggressive acquisitions of global strategic resources are attracting concern in Western countries and the Southern Hemisphere.

In the first antidumping case against Chinese honey, the duties were eventually set based on weight ($2.63/kg.), after it became apparent that the Chinese exporters were using customs valuations that were fraudulent and absurdly low. The high weight-based tariff rates succeeded in nearly eliminating Chinese honey from the U.S. market for two decades. Given the manipulation and falsification of import values which neutralizes the effect of antidumping duties, the evidence suggests that an antidumping duty based on weight, as was implemented in the China antidumping case, would be most effective in the honey antidumping case.

The fundamental landscape for antidumping laws is becoming a subject of political debate. U.S. Customs has indicated that they will not permit changes in corporate ownership to allow companies to evade retroactive duties. Furthermore, for countries like China, which is subject to many antidumping duties on a wide range of products, establishment of ownership of companies in third countries will not allow those companies to become exporters at the third country's duty rate. For example, China is building the world's largest auto factory in Mexico. The question is, will those inexpensive cars be exported under Mexico's USMCA duty rates or China's?

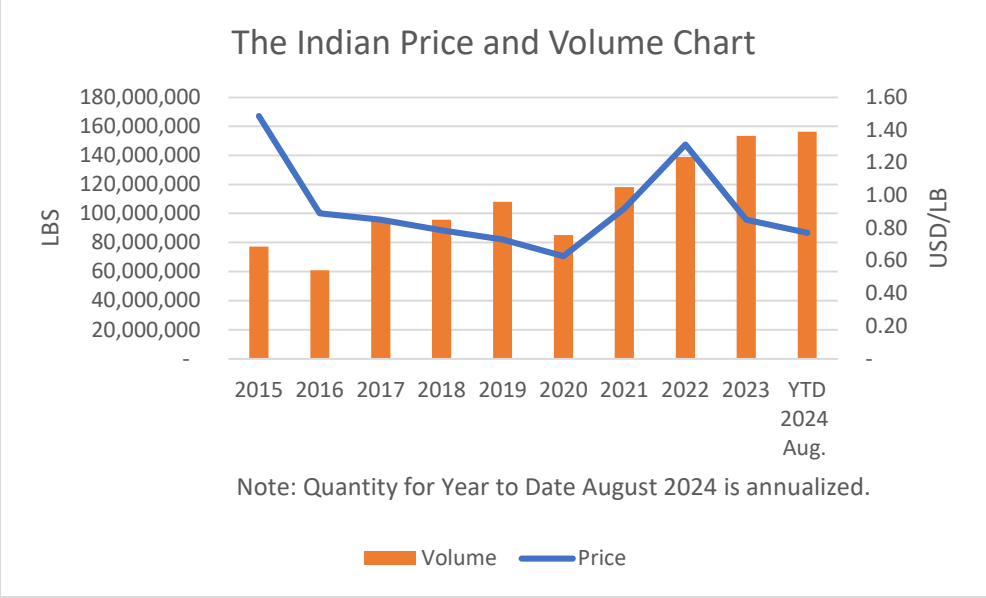


Chart 6

Imports of honey packaged for retail sale

The volume of imported honey packaged for retail sale in 2024 (Chart 7) is increasing, compared to 2023, and India is the main exporter by volume. The average price of Indian packaged honey in this category declined in the first 8 months of 2024, and the volume of Indian imports increased. Surging volumes and collapsing prices are the pattern by which Masters of Market Manipulation obtain market domination.

Importers, exporters and packers have colluded to produce ultrafiltered honey which can fraudulently enter the U.S. through a Customs category that circumvents the tariffs that should pertain to that honey. The forms of subterfuge are so clever and numerous that an absolutely multifaceted approach for adulteration detection is required to prevent destruction or domination of the domestic market.

Petitioners have pointed out that INDOCAN, an Indian honey exporter, claims to have honey filtered below 25 microns, and this would make it impossible to determine country of origin since pollen would be removed from (raw) honey. Such honey would be outside the scope of the antidumping order if packed in retail packaging and, therefore, not be subject to any antidumping duty.

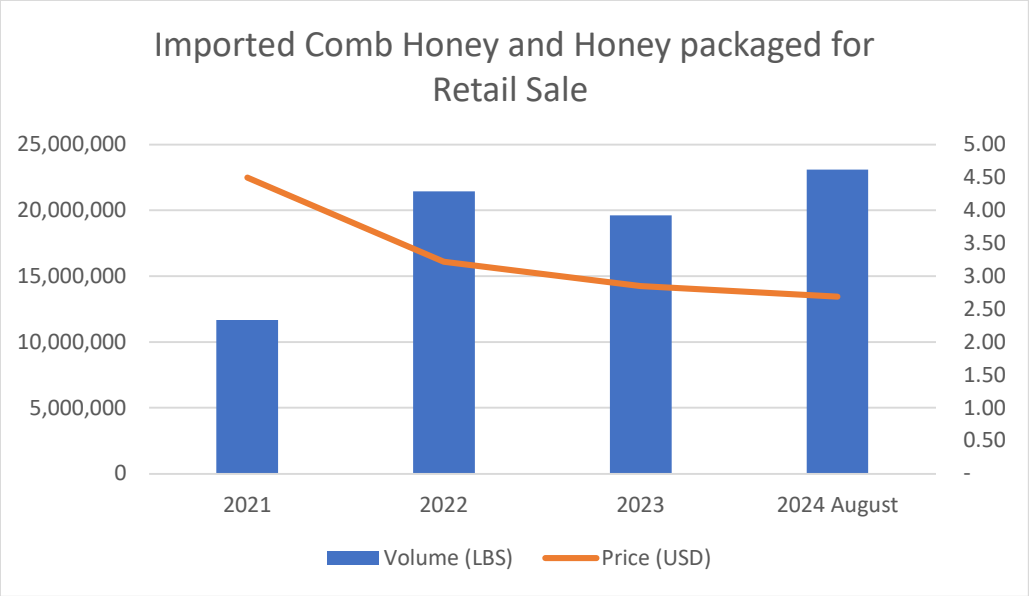


Chart 7

Honey adulteration testing news

In October 2024, a report cited a startling study that 80% of honey samples taken from Germany's retail shelves failed authenticity testing by DNA mass sequencing. This report received enormous media coverage. Consumers do not like to be cheated. This method of genetic analysis, another scientific tool in the toolbox for detecting adulteration, uses DNA profiles of authentic honey. The results were presented to authorities and retailers, who removed the failed honey from the market. The key fact is that if, and when, we have comprehensive honey profiles and we fully use those sophisticated scientific tools, the percentage of honey found to be adulterated is far beyond expectations.

The President of the European Professional Beekeepers Association, Bernard Heuvel, explained in a video press release that beekeepers are unable to sell their honey to European packers, and the prevalence of adulterated honey in the marketplace has created a sense of desperation among beekeepers producing authentic honey. These problems also imperil the bees' function in the food supply in respect to both the quantity and quality (health benefits) of foods consumed by the human family. The report can be viewed at **https://cleanupthehoneymarket.com/**.

In Estonia, Professor Dr. Kaarel Krjutskov is a leading researcher using meta-DNA analysis, and he has authored a publication for biorxiv.org. Information about the laboratory can be found on the webpage mda-test.com.

In addition to the recall of retail honey in Germany, there has been a recall in Lithuania. The Lithuanian Beekeepers' Union wrote to government authorities about a particular brand of honey in the Lidl grocery chain which had been tested to contain sugars atypical for honey. The Lithuanian authorities conducted an unplanned inspection and collected samples which were sent to German testing laboratories and failed testing by Bruker's NMR system. Lidl was required to remove the honey from the market (August 6, 2024 Delfi report).

Researchers at Cranfield University in the U.K., led by Dr. Maria Anastasiadi, announced two new methods to authenticate U.K. honey. The Spatial Offset Raman Spectroscopy (SORS) method, developed originally at the U.K.'s Science and Technology Facilities Council, has been shown to be highly accurate in identifying sugar syrups from various plant sources. This is a non-invasive technique, easy to implement. A paper describing the research was published in *Foods 2024, Vol. 13*.

The second method, used in a joint study between Cranfield University and the Queen's University of Belfast using DNA barcoding, was conducted using honey samples collected from beekeepers around the U.K., and was effective to detect syrups at the 1% adulteration level. The paper "Detection of sugar syrup adulteration in U.K.

honey using DNA barcoding" was published in Food Control, Vol. 167.

Lynne Ingram, a leader in British beekeeping organizations, is engaged in valiant efforts to combat honey fraud. She has written that there is "a lack of appropriate testing and enforcement in the U.K. Interestingly the lack of testing has led to a new category of honey being sold by Chinese factories — 'U.K. grade' — honey that would fail NMR testing, rather than 'NMR grade' which is designed to pass NMR tests. U.K. grade honey was being offered at the very cheapest price of $1260/metric ton, whilst NMR grade was offered at $1680/metric ton." She also informed us in October, "U.K. grade honey was on sale at 0.90 US$ /kg in Paris today. The price gets more and more ridiculous!" This is equivalent to $0.41/lb. for retail packed honey.

Chinese exporters describe their immature honey as "water honey." China remains the epicenter of the creation of modern modes of adulteration of honey; it continues, as the U.K. experience shows, to tweak those modes. Indian exporters have publicly said that 100% of their honey is extracted immaturely. Vietnamese exporters have said that producing mature honey would be more expensive than the buyers would accept Reports have been circulating regarding a new wave of efforts to sell a wide variety of bio-engineered syrups into the European market that can pass commonly used adulteration detection tests. Dr. Peter Awram of British Columbia is monitoring these activities. Sellers outside of China are offering the kinds of syrups that are seen on the Alibaba website at prices of $500-700/metric ton. It has been pointed out that in Eastern European countries, including Hungary, there are huge investments from China, and trafficking in adulterated products including honey. Hungarian beekeepers have petitioned their government to put antidumping duties on Chinese honey.

In Europe, honey adulteration is being viewed as a crime subject to penalties imposed by the judicial system. The utilization of genetic analysis as a potentially important tool in the identification of adulterated honey has also begun in the U.S. The laboratory Jonah Ventures, in Boulder, Colorado, conducted testing on samples from a North Carolina beekeeper and from Walmart. The Walmart sample had only one floral source, tobacco, which was deemed to be an indicator of fake or ultra-processed honey. The beekeeper's sample contained 14 floral sources, as the bees pollinate multiple floral sources.

There are growing opportunities to promote international collaboration in this important sphere. Government scientists and government laboratories are collaborating on an international basis to address the problem whose magnitude has become increasingly clear. The private and provincial interest of the cartels and the interest of the producers and consumers are in stark contrast.

Of course those countries from which MMMA has emanated are trying to subvert the fundamental Codex definition of honey as the byproduct of the completed "interaction of botanical and zoological life forms" in the production of honey. But it is clear that they just want to continue production of adulterated honey for whose price there is no floor and for whose quantity there is no ceiling. Hence, the global crisis.

In February of this year when we spoke to the Institute of French Beekeepers and to the European Commission and the Joint Research Center, we met the heroic beekeeper who played a pivotal role in the exposure of the modern modes of honey adulteration. I had heard the story indirectly. The French beekeepers invited a large delegation of Chinese honey exporters to France, where they met near the border of Spain and France by the Pyrenees mountains. The French beekeepers complained that they can't compete with the low prices and huge quantities of low priced Chinese honey flooding the European Union, which then included the UK market. The exporters responded, "We have no problem making huge quantities, selling at low prices and still making great profits. Your problem is that you don't produce honey in the modern way, which is to extract immature honey and dehydrate it in large vacuum chambers." Walter Haefeker has compared this technique of production to beer breweries. Of course those methodologies have been expanded to include blending of bioengineered sweeteners, use of resin technology, and other means that require appropriate scientific methodologies to detect. The analytical database for the sweeteners is basically frozen. The utilization of techniques of honey adulteration have been acknowledged in public settings. Beekeepers and honey experts have eye witnessed these methods of adulteration in practice. They are blatantly advertised on Chinese websites (such as Alibaba) as effective means of eluding detection by the U.S. FDA and Customs authorities.

In the past I worked with mathematicians and chemists of the U.S. FDA research sector. This led to the issuance of a Protocol for an "International Investigation into the Chemical Composition of Honey – Preliminary Collection Outline." It was realized that the database of honey used for the carbon SIRA adulteration test (Dr. Jonathan White) was too limited because only American honey samples were used.

In addition to establishing new honey origin label claims and composition requirements, Europe's Directive EU 2024/1438 calls for the creation of the Honey Platform to help the Commission develop harmonized traceability rules that enable honey to be tracked from harvest to retail (Food Safety Magazine, June 24, 2024).

A powerful new scientific approach: Synthetic Analysis

Multi-variable phenomena require multi-variable analyses. The contrast between authentic and adulterated honey requires analysis of 1) what is present but should not be there, and 2) what is absent but should be present. Purposeful abstraction from what is present or absent are modes of deception.

A fundamentally new approach which has become possible with the development of supercomputers and artificial intelligence is being proposed. This new approach takes into account the immense chemical diversity that naturally occurs in the production of authentic honey. Those variables depend upon the floral source, the elevation, the climatic conditions, the genetics of the bees, nutrients in the soil, the conditions of moisture reduction, the methods of extraction, storage and production. This new approach creates a more comprehensive and rational way to analyze authenticity. It involves the scientifically proper method of understanding all of the variables which contribute to the wide diversity of chemical and physical profiles found in the wide supply of honey. This exceeds blockchain analysis because it is not simply a matter of who owns honey at one stage or another, but more importantly looks at an enhanced traceability system and at the chemical profiles resulting from this or that complex of variables. Modern computerization can quickly scan diverse and complex and multi-dimensional profiles and see whether the honey conforms to or violates the profiles that are causatively generated by the conditions of production, extraction, storage and processing. Multivariable phenomena cannot be analyzed by a single variable. Further, the analysis cannot be conducted by one scientific tool. The multiplicity of variables and profiles inevitably requires a multiplicity of tools in the toolbox of advanced analytic techniques. This approach allows the creation of trends among sources of adulteration which can guide appropriate analysis.

The illusion of a single variable or a magic bullet was known by some scientists involved in honey analysis quite a while ago. Dr. Joseph Bowden served as the referee laboratory for the FDA when the Department of Agriculture was implementing a honey buy-back program for American beekeepers. Dr. White used the carbon isotope method and analyzed only 100 different U.S. samples of honey from many states and diverse floral sources. Underlying this research was the presumption that there would be different carbon isotope ratios for different adulterants, such as corn and cane syrup vs. honey. There was a surprising diversity in the range of carbon isotope ratios found among this rather limited sample base of merely 100 honeys. The second year the limited sampling was repeated and the results were substantially different and unexpected. Unfortunately, to our knowledge those results were never published. Dr. Bowden correlated those results with different climatic conditions. Specifically, one year was arid and sunny, another year rainy and cloudy during the production period. The biochemical and botanical biosynthetic processes are influenced by different environmental conditions under which photosynthetic processes occur. But the reality shows that the chemical profiles are results not only of floral source and region but also other environmental and climatic variables.

Given a complex domain like honey, which is produced from a great diversity of conditions, to assess which chemical profiles indicate adulteration and which authenticity, it is necessary to have a comprehensive traceability system articulating those conditions and the complex chemical profiles that result from that diversity and multiplicity of conditions. This approach is true of all kinds of domains including the study of domains of galaxies and elementary particles, the domains of botanical and zoological genera.

Already, in the past decade, the power of AI analysis has allowed medical diagnosis of illnesses that previously were hidden or impossible to cure. This approach is much more scientific than the primitive hypothesis of seeking the magic bullet, and conforms to general scientific principles. By creating and contrasting a wide and rich range of variables science can compare and contrast profiles of adulteration vs. authenticity, disease vs. health. This is not annihilation of previous approaches but is rather a synthesis and expansion of those analytic

tools. The difference is, a synthetic approach is infinitely more powerful and more accurate. It also underlies a position the author has been advocating and which has been embraced by independent academic associations and governmental authorities.

Private for-profit entities often compete with each other and in a context in which there are international cartels practicing systemic and clever modes of adulteration, there is illicit profit to be gathered by failing to investigate and identify all the variables and utilize all the analytic tools. No person facing a serious medical condition would choose not to use the most relevant advanced diagnostic tools, most sophisticated surgical tools and effective medicines to address the illness. This approach can help to identify the sources of honey adulteration and to establish the method and means of proper production of authentic honey.

There is an old book written by Darrell Huff called "How to Lie with Statistics." If we use a powerful tool but we use it looking for the wrong parameters and irrelevant profiles, the tool becomes an instrument of deception, masking rather than exposing the problems. Similarly, if we use a detection method based upon small and frozen databases, the use of that tool also may cover the deception.

Collaboration has commenced to create this synthetic, integrated approach. Universities in the U.S. West Coast, the Mountain states and the Ivy League are looking at issues of food fraud and the security and integrity of the global food supply. Scientists in various fields, including artificial intelligence, are cooperating to develop new perspectives. This type of collaboration is precisely what the European Directive is encouraging.

Geopolitical and macroeconomic context

The overall import climate has been drastically affected by COVID and the supply chain crisis, with greater volatility in the rates and availability of ocean shipping since 2020. With wars in the Middle East and Ukraine currently raging, movement of commodities has been put at risk. U.S. dependency upon external sources of essential products within the supply chain, including medicines and food, has caused alarm and a great deal of rethinking about the sources of these products.

In September 2024, there was a dock strike which lasted a day and was then postponed until January 2025. Just one day of a dock strike caused economic losses in the billions to the U.S. economy. Italy is experiencing, as I write, its first General Strike.

Not only is there increased global attention to the adulteration of honey, the dumping of honey, and antitrust violations regarding the honey industry, but also there are major lawsuits initiated by retailers against processing and packing companies for conspiring to limit supplies, artificially boosting their profits while causing other companies to lose money. A suit was filed in Brooklyn federal court by McDonald's against meat packers who manipulated the market and drove up industry prices. The suit alleges that this has been going on since 2015. It falls within the category of antitrust law violations. "Only colluding packers would expect to benefit because they would … know their conspiracy would shield them" (Reuters, 2024-10-07, McDonald's sues major beef producers).

As graphs previously provided by Dr. Daberkow have demonstrated, as prices paid to the beekeepers for authentic honey plummeted, the prices paid by the retailers went up. Price data has more recently been suppressed. The multidimensional manipulation of markets and violation of antitrust conspiracy laws is becoming increasing apparent within the Western legal systems. A parallel phenomenon is emerging in the realm of Food Fraud and Economically Motivated Adulteration. Beekeepers' opposition to price fixing, commercial disparagement, honey adulteration and the insanity of an industry policing itself in ways that restrict free and open trade has been made crystal clear. Legal experts believe that the interests of beekeepers, large retailers and consumers will inevitably come together.

Climate Concerns

Of all the sectors in complex modern economies, it is the agricultural sector and the farmers who must pay the most attention to the impact of changing weather patterns and changes, in both the short term and the long term. The world is witnessing continuous increases in the volatility, frequency and severity of weather disasters. The intensity, frequency and expanse of forest fires has been dramatic. Heat waves and droughts have been breaking historic records

(see Chart 8). In early October, Hurricane Helene and Hurricane Milton, with powerful typhoons in highly populated areas of Florida, created devastation in the southeast areas of the U.S. Comparable climate events have occurred in Asia and Europe.

In Europe, rivers have flooded populated areas. In contrast, the vast Amazon River and its tributaries have had huge declines in the water flow, falling to historical lows (*NY Times*, 10/7/2024). That river which links so many economic and ecological zones is needed to maintain transportation channels. The fish in many parts of the Amazon River have disappeared. All great rivers are confluences of many tributaries. The consequences of Global warming exist within integrated networks.

There are also clear contradictions between climate stresses in Asia and China's and India's huge volume of export of "honey" which can be explained only by the use of MMMA to produce honey. India and Vietnam, unfortunately, were tricked and guided by the international honey cartels to adopt the China Model of illicit honey production. Chinese scientists have predicted that in the next 50 years China's agricultural production will decline close to 30%. This potential result of climate change underlies China's drive to acquire farms, forests and fisheries in both hemispheres.

There is growing internal and external pressure upon China, India and Vietnam to reform their practices and join the movement for Authenticity. That pressure includes local concerns about Food Fraud and anti-trust behavior.

The NOAA's map of temperature anomalies shows that during September 2024, temperature records were broken all around the world (dark red shows regions where records were broken):

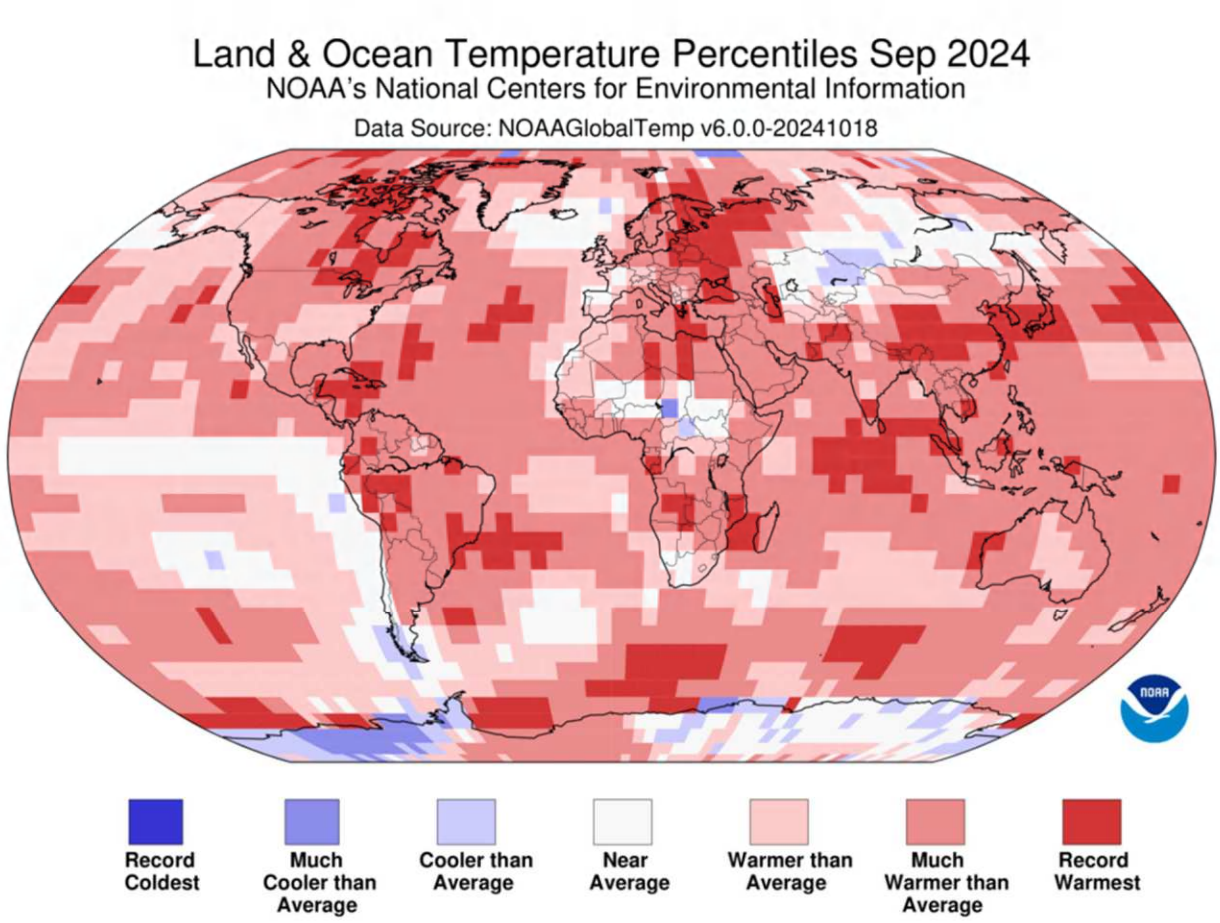


Chart 8

The insurance industry is also dramatically increasing rates and/or precluding coverage for weather damage in many regions of the country.

The warming of the atmosphere has a correlative warming of the vast global oceans. Evidence over the past 5 decades indicates that a turning point is approaching whereby the patterns of flow within the Oceans – as an example the Gulf Stream Currents and the Japanese Current – may change resulting in a deep cooling of the Northern Hemisphere. If that occurs humanity may see climate migration changing from "South to North" into "North to South." The mathematician and metaphysician Alfred North Whitehead taught: 1) every entity is in causal interaction with its environment and s) the Universe is embedded in a Perpetual Flux of Being. We ignore such macro changes at our peril.

The aurora borealis appeared in September in North America, providing amazing light displays further south than is typical. Friends in Canada shared the spectacular photo which follows.

Photo: Northern Lights at the Bee yard at Fort St. John, British Columbia (Courtesy of the Paradis family)

Conclusion

The trend toward collaboration increases as new data and perspectives make change imperative. Our work with the European Commission, the prestigious Joint Research Center, beekeeper friends from around the world, universities and scientists continues to advance.

In past articles and in speeches at Apimondia, Norberto Garcia, Richard Adee and I have shown graphs illustrating a severe anomaly of relatively stable global bee populations, huge increases in the exports of honey, and the sharp decline in honey yields per hive during the past decades. When we consider the anomalies, it is clear – as Shakespeare said – "Something is rotten in the State of Denmark." The causes of a persistent depressed honey market are clearer than ever before. The negative consequences have attained wide global attention. The imperative of eliminating honey fraud and protecting the global populations of pollinators serves global food security and global ecological sustainability, which needs to be restored within the global community of life.

We are trying to help advance the cause of authenticity as its absence has devastating consequences to beekeepers at home and abroad with growing dangers for global food security, ecological sustainability and economic integrity.

Every great river is a confluence of multiple tributaries. We have entered a stage in which a great river is emerging to defeat honey adulteration and achieve authenticity. These tributaries will become clearer as time goes on.

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