



INTERNATIONAL HONEY MARKET

by RON PHIPPS and NORBERTO GARCIA

Without understanding the causes of serious and deep problems it is impossible to craft the cures to prevent their recurrence. To protect the positive image of honey, it is imperative to remove adulterated or fake products from the marketplace.

Initial attempts at preventing circumvention, adulteration, food fraud and customs fraud by developing a preliminary and rudimentary traceability system were well intentioned. These initial attempts arose as the problem of circumvention and adulteration erupted, leading to arrests, fines and deferred prosecution, resulting in HoneyGate. Foxes entered the hen house, where cunning international conspiracies were hatched.

The inadequacy of initial attempts to solve the problem of an industry governed traceability system have become obvious: there is a plethora of adulterated and fake honey in the market, honey prices collapsed, and beekeepers around the world are de-incentivized. Concomitant problems include the failure to pursue a positive marketing program, which would increase prices, qualities, varieties, romance and place the health halo on honey. To achieve these goals the market must be dominated, not by fake honey, but authentic, pure, natural and correctly manufactured honey.

SHIFTING GLOBAL EXPORT PATTERNS

The EU Parliament has called for "Urgent Action needed to protect EU bee populations" in a report that points out that the European countries produce over 500,000,000 pounds per year and have over

600,000 beekeepers. This is one reason why European beekeepers and beekeeping associations, including the French and Hungarian associations, are so keen to protect their markets from fake honey that has been adulterated in various forms and disguised. The European consumers, and the retailers who serve those consumers, are strict and educated. The EU imports about 40% of the honey they consume.

We are preparing an article on shifting global export patterns for honey. Chart 1 illustrates the increases and decreases in export volumes by country over 10 years.

The greatest yearly average increases were from China, Ukraine, India, and Vietnam.

Chart 2 shows how honey exports from some European countries have had a dramatic increase, which directly correlates to their imports

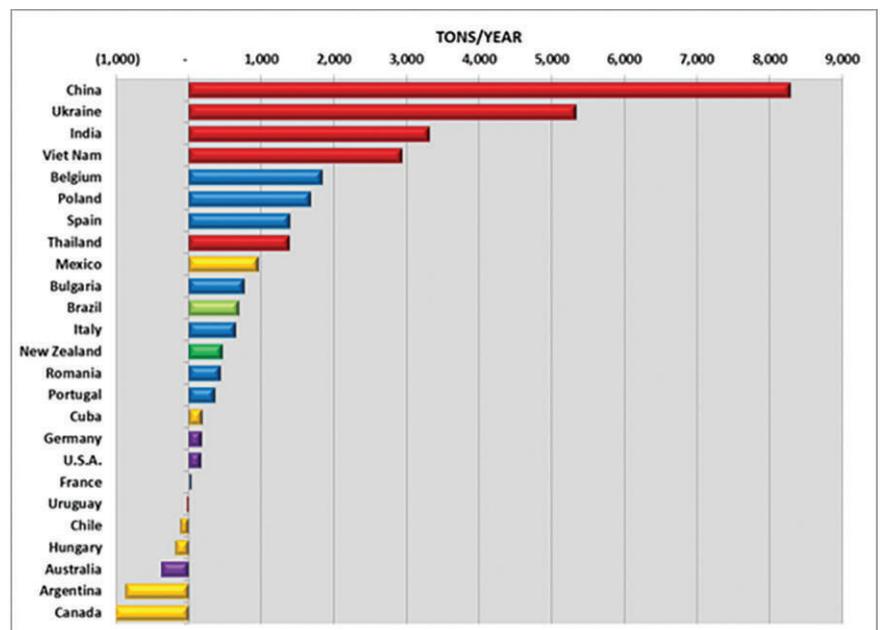


Chart 1. Average annual increase /decrease of world honey exports during the last 10 years by the main 25 honey export countries. Calculations based on data from ITC-UNCOMTRADE. (Prepared by Prof. Norberto Garcia)

from various Asian (Eastern) countries. This pattern parallels information we presented previously showing Thailand's honey imports from China to Myanmar were directly correlated with Thailand's exports to the U.S.

U.S. honey imports are in the range of 70-75% of U.S. total consumption. Since 2014, U.S. imports from North and South America have declined, while imports from Asia and Ukraine have increased (see

Chart 6, Growth of Eastern Imports, ABJ January 2018). Estimates for the 2017 U.S. honey crop are about 155-160 million pounds.

Chart 5 illustrates the growth in quantities of honey exports from India and Vietnam and the drastic decline in prices during the past 3 years.

The decline of imported honey prices from 2014-2015 to 2017 defies the fact that in many of the producing countries where the price declines

have been the steepest, inflation has been considerable. The U.S. dollar is declining in its value. These factors should have contributed to an escalation rather than a collapse in prices. The prevalence of the four modes of adulteration and market manipulations undoubtedly underlies this collapse, which has led many producing countries to repeatedly comment that the export prices are below their cost of production.

INTEGRATION OF MODES OF PRODUCTION, MODES OF ADULTERATION, MODES OF DETECTION

These dramatically shifting patterns of the past three years are directly correlated with different modes of production and different modes of adulteration. As has been pointed out before, there is a huge conundrum, which was referred to in the important article "NMR Profiling, A Defense Against Honey Adulteration" by Arne Dübecke and colleagues in the January issue of the ABJ. The six scientists pointed out the " 'conundrum' of a strong upward trend in the volume of global honey exports, despite an almost stagnating number of beehives and even a decreasing yield per colony. Something is fishy and not all honey imports are what they purport to be."

Given the increases in global honey exports, while global colony numbers remain stable, and the health and vigor of bee colonies continues to decline along with the productivity per hive in the advanced beekeeping communities of North and South America, the only explanation for dramatically increasing honey exports would be found in a dramatic increase in productivity in the Asian producers. However, productivity per hive is clearly directly correlated with the health of the natural environment, including that of the soil, atmosphere and water. Both India and China are suffering the worst environmental degradation of land, water and atmosphere of any nations in the history of human civilization. This is well-documented. Therefore, the increased production is believed to be correlated with different modes of production more than it is with any other factor.

We note that for all their good intentions, current traceability regimes have limitations. To address this persistent problem, we propose the integration of a more rigorous and comprehensive traceability regime with the modes of production.

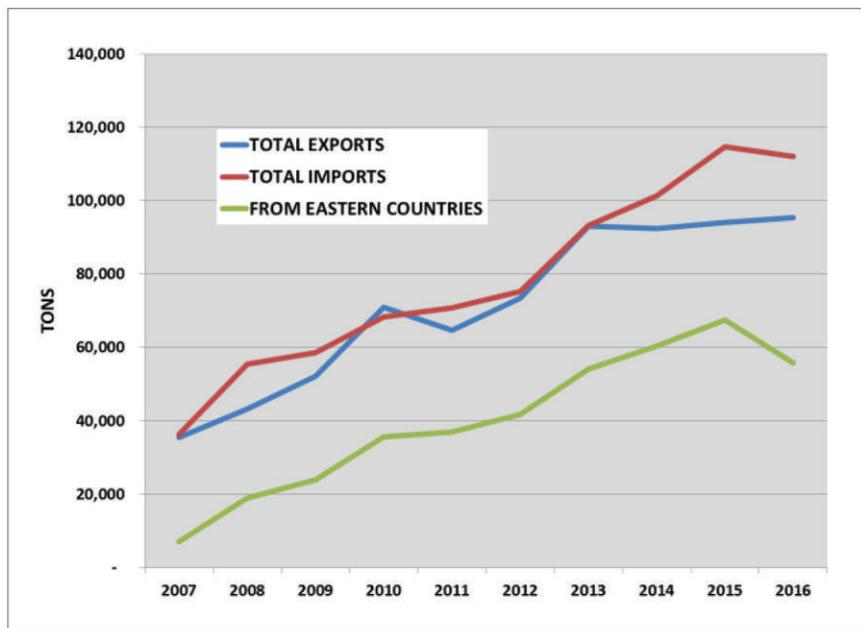


Chart 2. Honey exports from Belgium, Poland, Spain and others in Europe (blue line) and imports from Eastern countries (green line) and total imports (red line).

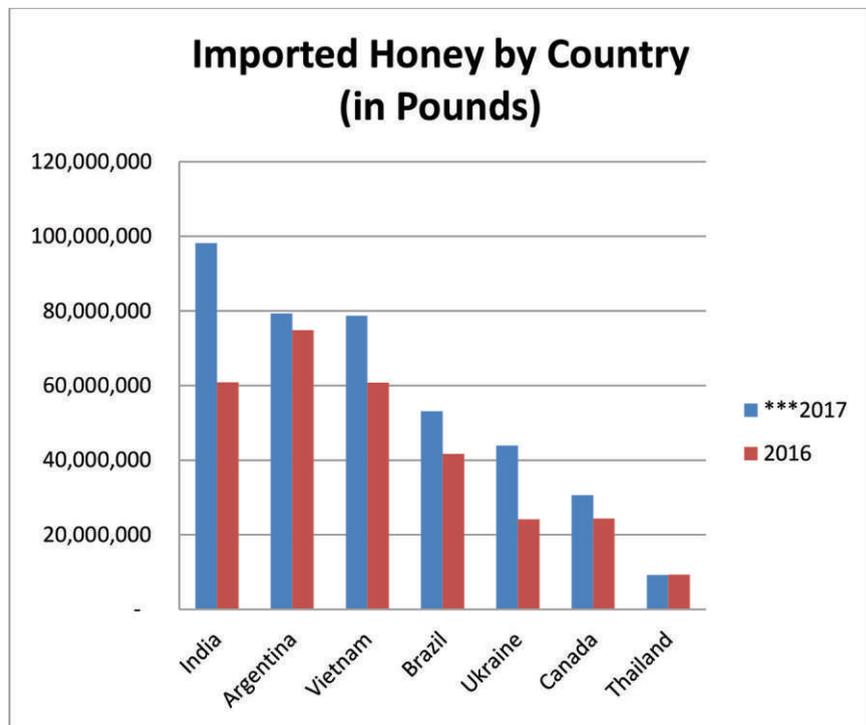


Chart 3. U.S. Imports by Country in 2017

An authentic and vigorous traceability system must go beyond documenting purchases of honey, prices and a small batch of tests, which are woefully inadequate to discern and expose the Modes of Adulteration. This adulteration damages and distorts the marketplace. Every beekeeper and exporter should be able to provide records and submit to inspections regarding the following modes of production: 1) floral nectar source; 2) time, weather and climate at time of production; 3) the use of pollen supplementation, 4) moisture levels at time of extraction, 5) methods, if any, of moisture reduction, 6) use of vacuum chambers or other techniques (ultra-filtration, partial filtration), 7) use of resin technology to remove antibiotics, color, undesirable flavors, chemical components, 8) facilities for blending extraneous sugars such as beet, rice, GMO sugar, etc.

Codex definition of honey:

Honey is the natural sweet substance produced by honey bees from the nectar of blossoms or from secretions of living parts of plants or excretions of plant sucking insects on the living parts of plants, which honey bees collect, transform and combine with specific substances of their own, store and leave in the honey comb to ripen and mature.

As the US FDA made clear, it is also the case that honey that has been subject to either resin technology or ultrafiltration cannot be labeled as honey. The recent documentary on Netflix on food fraud (Rotten) and the television program on Dr. Oz (February 2018), made it clear that all true honey is fully capped by the bees.

The definition of honey precludes addition or extraction of water. Resin technology used and exported from China is illegal for honey. Just as it is a crime to launder money, it is a crime to “launder honey.” All honey can have the moisture reduced by natural means, i.e. by the bees. In high humidity regions and seasons, the degree of reduction is less. By speeding up the time of production, the cost of production declines. This plagues Asian honey, and the growth in their volumes of export correlates with declines in prices. Asian honey exporters have affirmed that they can

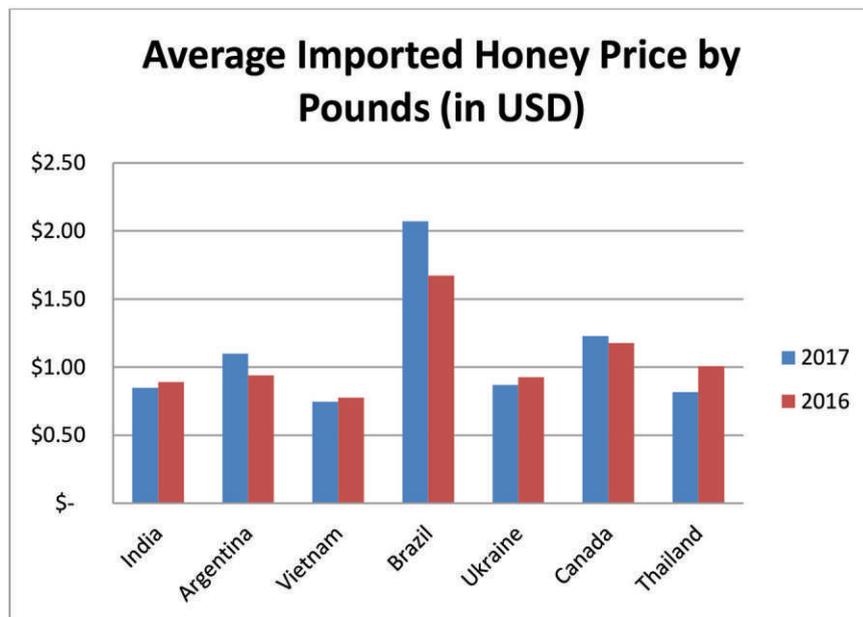


Chart 4. U.S. Honey Import Prices 2017

let the bees cap the honey, but then the time needed before extraction will greatly increase prices.

Representatives from one exporting country have said that 80% of the honey is extracted as unripened honey. Representatives from a second country have said that 100% of their honey is extracted as immature, unripened honey. By Codex standards and professional beekeeping practices, it is not honey. The methods of production, circumvention and transshipment, the use of various forms of “negative syrups”—all modes of adulteration—account for an otherwise inexplicable increase in “honey” exports. It is this issue that has aroused the attention of the international community of beekeepers in Europe, North America, South America and the Oceania countries. The scientific commission of Apimondia is addressing this concern in various international forums.

The industry needs to use NMR, the most powerful tool in the toolbox, as consumers are demanding an end

to food fraud. We note that the NMR database has reached over 13,000 samples of primary honey. That unprecedented base is growing; scientists need not re-invent the wheel.

We would like to see the development of NMR profiles of “blends” of honey. Packers and processors have a social responsibility to the retailers and consumers, who purchase the products they sell or manufacture. There should be an increased enforcement of label accuracy, so that they correctly reflect the product, the true country of origin, botanical source and quality.

Modern computerization allows the establishment of rich and detailed physical and chemical profiles both of primary sources and blended honey. We can test if what is stated on the label is true or if fraud has intervened. There are plenty of “economic” reasons for food adulteration. Food fraud creates fortunes for the few and harms the many.

The integration of modes of pro-

	YTD 2017 Annualized	YTD 2016	YTD 2015
Import Quantity			
India	98,180,262	60,842,250	77,131,181
Vietnam	78,716,206	60,768,322	70,655,388
Thailand	9,177,551	9,301,944	23,749,988
Average Price/LB	2017	2016	2015
India	0.85	0.89	1.49
Vietnam	0.75	0.77	1.31
Thailand	0.82	1.01	1.21

Chart 5. Volumes in Pounds and Prices 2015-2017 for 3 Countries

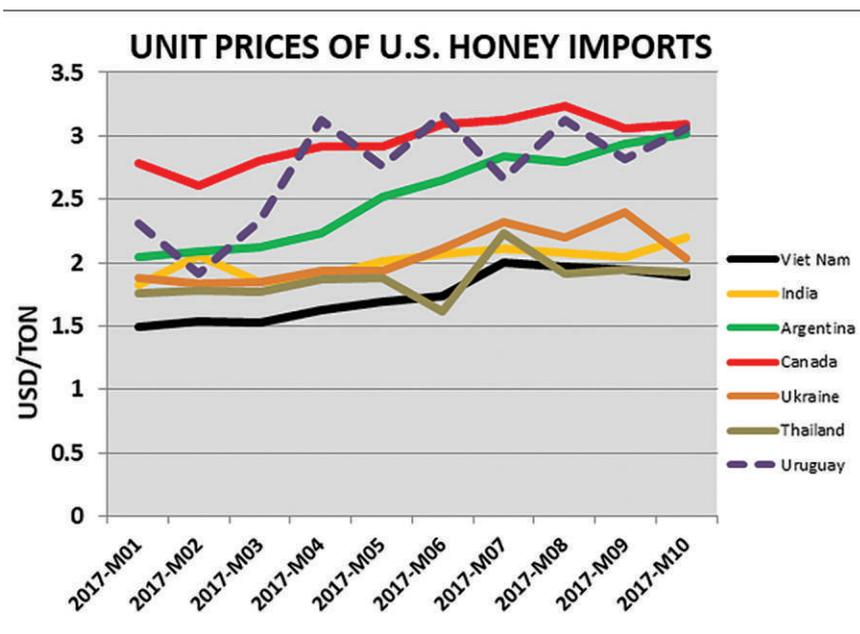


Chart 6. 2017 monthly price changes for U.S. honey imports

duction, modes of adulteration and modes of detection is being discussed in consultation with private labs, government labs, academic scientists and international leaders of all segments of the international honey industry.

Dr. Michael Roberts' excellent report has influenced the discussions, as has Dr. Stan Daberkow, leaders of the AHPA, and others. Dr. Roberts wrote that to break the incentive of food fraud we must mobilize the media. That has been done by the documentary appearing on Netflix, the Dr. Oz program, and articles from the *ABJ*, *The Atlantic Monthly*, *Stern*, the *Los Angeles Times* and others. The Netflix documentary on honey has been translated into 22 languages. Most importantly, packers are spreading this message not only to their suppliers, but to their partners in the retail trade, food manufacturers and food service. These are exciting positive advances that make us hopeful for the future of honey markets.

The USDA, the European Commission and various governments are waking up and engaging, actively attempting to do their part in eliminating food fraud and adulteration. The aim is to protect the image of honey and more importantly to develop a creative and positive marketing program, which will benefit all segments of the international honey industry. A strategic perspective and a comprehensive solution takes the inherent diversity of the global supply of honey into account. We must

balance the many variables of honey's unique chemistry, developing and refining guidelines with technological advances.

As was said at the opening of the Netflix series on food fraud, "It is fraud and it is a crime." There are some who were worried that this series could create a negative image of honey. But the real danger to the image of honey is an international honey market flooded with adulterated honey. The adulterators are cunning and have both ultra-filtered honey and access to resin technology to alter the quality of honey. Into such honey, pollens, enzymes and other constituents have been blended to try to mask the adulteration. The reality is food fraud has created fortunes and market dominance. Honest beekeepers, exporters, importers and packers cannot compete against crooks. That's one reason governmental authorities take this problem seriously.

There have been numerous reports from several sources that resins from the use of resin technology have been found in honey and beeswax. Resin technology has been found in factories in several honey exporting countries. Syrups that mimic the sugar content of honey have been found, as well as honey that has been extracted at high moisture and then had the moisture content mechanically reduced. There have also been observations in honey exporting factories of extraneous pollen being mixed in "honey" that has been treated by resin technology or is blended with syrups.

There have also been several cases in which honey from a country trying to circumvent regulations ships to a transshipping country, to which honey from a third country has been shipped. These are then blended together to further facilitate the disguise of the honey, whether fake or adulterated, subject to U.S. anti-dumping orders.

At least 15 years ago, discussions commenced with Dr. Joseph Bowden of the USDA, Dr. Page, and Dr. McLaughlin of the FDA on how to best utilize modern science, including advances in computing, to understand the diversity and charm of honey. In the current information age, and with enhanced traceability, characterizing that which we have known sensuously for years, but for which we lacked the scientific parameters is eminently possible. We've already established extensive global databases to take into account geographic origin for product groups such as wine, coffee and tea. The same is possible for the geographic origin and floral source of honey; it is the only viable path to protect against adulteration.

While developing an extensive database to prevent adulteration, it behooves us to simultaneously pursue a positive agenda for the creative marketing of honey. We should embrace advanced science to investigate and verify the health benefits of honey, thereby adding scientific substance to the health halo already enjoyed by honey.

ADVANCED HONEY TESTING

While there have been attempts to delay and disparage the database for NMR, which is the largest in the history of all protocols for testing honey, it should be remembered that Dr. White's carbon isotope test began with approximately 100 samples, none of which were authenticated, and 98% of which were American. As Dr. Joseph Bowden pointed out, there was a second year of testing, which yielded substantially contrary results that were never published. Another more recent testing methodology had a database far more limited than NMR's, half of whose samples were submitted by the Chinese government.

The German laboratory QSI, in their article published in the January *ABJ*, included a graph of the countries of origin of the samples in the NMR honey database, which is found in chart 7.

With scientific advances, profiles will emerge for blends of processed honey, and new parameters will inevitably come in to play.

While individual countries may seek to impose their own standards of identity for honey, the global struggle against food fraud requires responsible companies to apply the strictest and most rigorous standards to assess adulteration. Individual companies, including packers, may assure their customers that they apply the most rigorous and thorough standards to ensure the authenticity of their product.

That the world's beekeepers have taken on the task to bring attention to the importance of protecting the authenticity and purity of honey is appropriate, as beekeepers have the most direct and intimate knowledge of the skills needed to produce authentic honey. They also appreciate the importance of bees to the world's food supply and sustainable ecological systems. We must welcome and support the guardianship by the world's beekeepers of the world's international supply of honey.

2018 HONEY MARKET CONDITIONS

Argentina

The impact of the drought in Argentina is being expressed not merely in terms of honey, but in the huge soybean crop, which is in jeopardy, causing soybean prices to rise to a 7-month high in February, 2018. The new honey crop was delayed because of cold weather during November and the lack of rain in January and February. The cost of gas has increased which creates additional costs for transportation within Argentina. A recent decision by Brazil to allow imports of retail bottled honey from Argentina has provided a new export market. As the new year commenced, expectations were for a crop of about 130 million lbs. Increased demand for their pure honey is asserting itself in Europe, Japan and the Middle East.

Brazil

In the past 2 years, Brazil has seen an escalation of organic honey prices at the same time that prices for conventional honey were sharply declining. The gap between conventional and organic honey reached historic heights, then began to decline in the 2nd half of 2017 and has continued to

No. of Samples per Geographical Origin (2nd release)

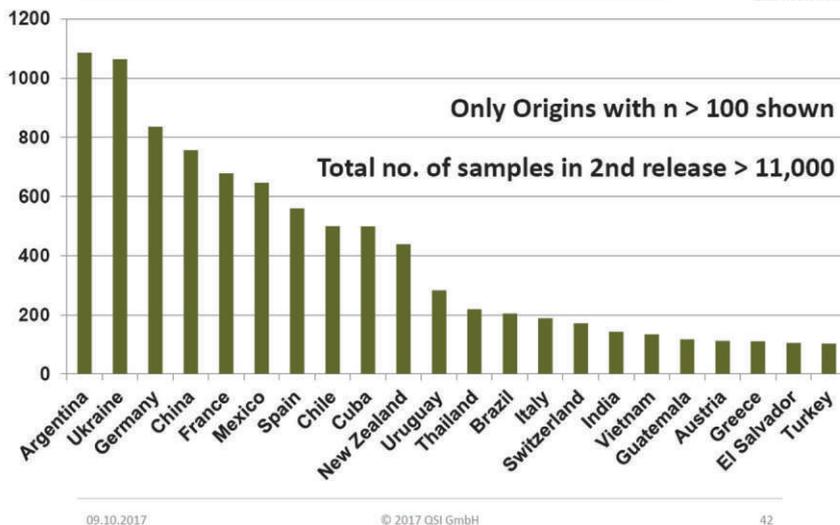


Chart 7. Honey Sample database for Bruker's Nuclear Magnetic Resonance Test (2017)

soften. The organic honey market is learning the the idea that there is no ceiling to prices is an illusion, just as it is an illusion that there is no bottom for authentic conventional honey.

The next main organic crops are Eucalyptus, Marmeleiro (white) and highland honey for Germany. The weather has been good so far and good crops are expected in March. In January about 4.4 million pounds were exported in total, about 77% to the U.S. and 23% to other countries. The demand from Europe is stable and will increase with the crops that are coming up.

The export prices to the U.S. have declined to a level that concerns the exporters, because of the current high costs to produce and export the honey in Brazil. The beekeepers are already complaining, since most are migratory beekeepers and fuel costs are high. Other than that, there are taxes, organic certification costs, high labor costs, etc. Prices going further down can discourage the beekeepers to produce and in the end it can depress organic honey production in Brazil, which is the main organic source in the world.

Mexico

Mexican organic honey is being sold to Europe at prices significantly over \$4,000 per ton. Sophisticated traceability and testing regimes are being discussed at the industry and governmental levels.

Uruguay

Reports indicate a probable 30% reduction in the current crop. U.S. import volumes in 2017 were nearly 7,000,000 lbs. as of November. Prices dropped about 27% over the past 2 years compared to \$1.55/lb. in 2015.

India

Import prices from India have declined 43% compared to the average import price of \$1.49/lb. in 2015. India reported as late as February that there was a large carryover from the 2017 crop and that the 2018 crop is much bigger than expected. These two factors are the reason they have so much honey and why prices declined in a very soft market. Some Indian exporters are hoping to reduce their dependency on the American market and open up the European market. While that is a strategically wise position, Indian exporters will have to be prepared to meet the more stringent and sophisticated demands of the European market where NMR is demanded by many major retailers.

Vietnam

The Vietnamese crop of December – February 2018 was diminished due to adverse weather. The early cashew crop was very poor. The Vietnamese honey industry reports that there are also far fewer beekeepers in Vietnam, due to the fact that prices collapsed through market manipulation to such an extent that some beekeepers have lost interest. We note that average

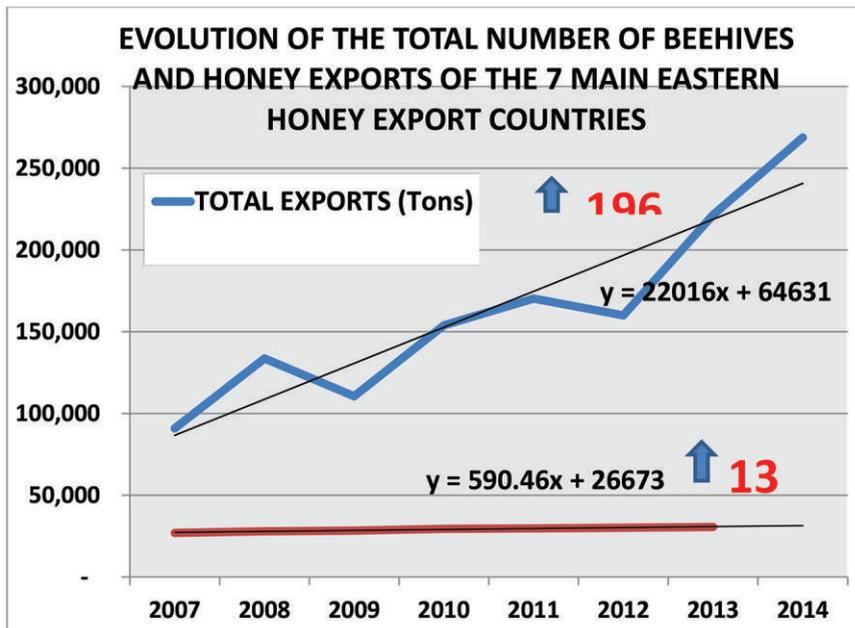


Chart 8. Honey Exports and Number of Beehives 2007 to 2014 in Asian Countries and Ukraine

import prices from Vietnam fell 43% in 2017 from the average price of \$1.31/lb. in 2015.

In addition to the Vietnamese Beekeeping Association, there is a new organization of honey exporters in formation. We expect that this organization will have a cordial relationship with Apimondia, the world honey congress.

U.S.-CHINA TRADE

U.S. China relations have reached a point of increasing tension, involving geo-political conflicts in the South China Sea and the Korean peninsula, but most striking are repeated threats of an escalating trade war. Already this year substantial anti-dumping duties were placed on imports of Chinese solar panels and refrigerators by the U.S. government. There is a large case pending that could result in high anti-dumping duties on imported steel. The steel case is of particular interest because Chinese companies have bought and built steel factories in various third countries to which Chinese steel is exported, marginally modified, and re-exported as product of those third countries. This type of collusion has been revealed in many industries in addition to steel and honey.

The U.S. government is also taking measures to curtail Chinese direct investment in various industries in the U.S. Of particular concern are industries of strategic value. Although the honey and beekeeping industries are comparatively small, beekeeping is of

strategic importance for food safety, food security and ecological sustainability. Specifically, private equity firms have been used to facilitate purchases of companies that provide investors with vertical and horizontal integration. The tremendous growth in the past decade of Chinese foreign investments in energy, agricultural resources, high tech factories and infrastructure has been so undisciplined that the Chinese government is now trying to control investments, especially in "trophy properties" like luxury hotels, etc., in the U.S. and elsewhere.

Chinese ownership of companies engaged in the honey industry in various countries around the world is well known.

Exports of honey to the world from Asia (and Ukraine) have risen steadily in the past 10 years by 196%, and the number of bee colonies increased 13%. See Chart 8.

When we view this graph, we should remember that the health of the soil is a major factor in the productivity of the hive. The largest Asian exporters of honey are China, Vietnam and India.

WEATHER IMPACTS ON HONEY YIELD

As we write this report, NBC is reporting that 30 million people in the Midwest are under flood watch, due to rains and melting snow.

This past year experienced the 3rd highest recorded temperature in history. The intensity, severity and volatility of weather events were trans-

parent to all. Preceding the AHPA's convention in San Diego, the terrible Thomas fires raged in the Santa Barbara area, only to be followed by the destructive Montecito mudslides. One friend described Montecito as a "war zone, in which they tasted the apocalypse."

Argentina has suffered terrible drought and their own wildfires. All this means that agricultural and honey production are vulnerable and unpredictable. The cumulative economic cost of such weather disasters is becoming clear to more and more people. According to an Argentine report: "the conditions were the worst in 10 years, (and) the agriculture exchange said the cultivated area for soybeans was cut to 18 million hectares from 18.5 million hectares six weeks earlier for the 2017/18 harvest.

CONCLUSION

The current international honey market is beset by the dichotomies between:

- 1) adulterated vs. authentic honey
- 2) fair prices vs. abysmally low prices which threaten the incentive to produce honey
- 3) a positive creative agenda vs. market manipulations which threaten the strategic interests of the industry.

The future of the honey industry will depend upon how these three deepening dichotomies are resolved.

Author Bios

Prof. Norberto García teaches Apiculture at the UNIVERSIDAD NACIONAL DEL SUR in Bahía Blanca, Argentina. He is also Senior Consultant of NEXCO S.A., the main Argentine honey exporter. He is the current president of the International Honey Exporters Organization (IHEO) and chairs the Working Group on Adulteration of Bee Products of APIMONDIA, working to create awareness on the problems of honey adulteration worldwide.

Mr. Phipps is President and founder of CPNA International, Ltd. He is a former member of the National Honey Board and Co-Chairman of the Committee for the Promotion of Honey and Health. He was a recipient of a National Science Foundation Fellowship in the Philosophy of Theoretical Physics. In 2017 he was appointed Vice President of the Apimondia Scientific Commission on Beekeeping Economy. He has worked with FDA to develop a research protocol for the global diversity of honey. e-mail: info@cpna-global.com