

ADDRESSING THE EMERGING FOOD FRAUD THREAT

2018.9

Pushing for Global Consensus





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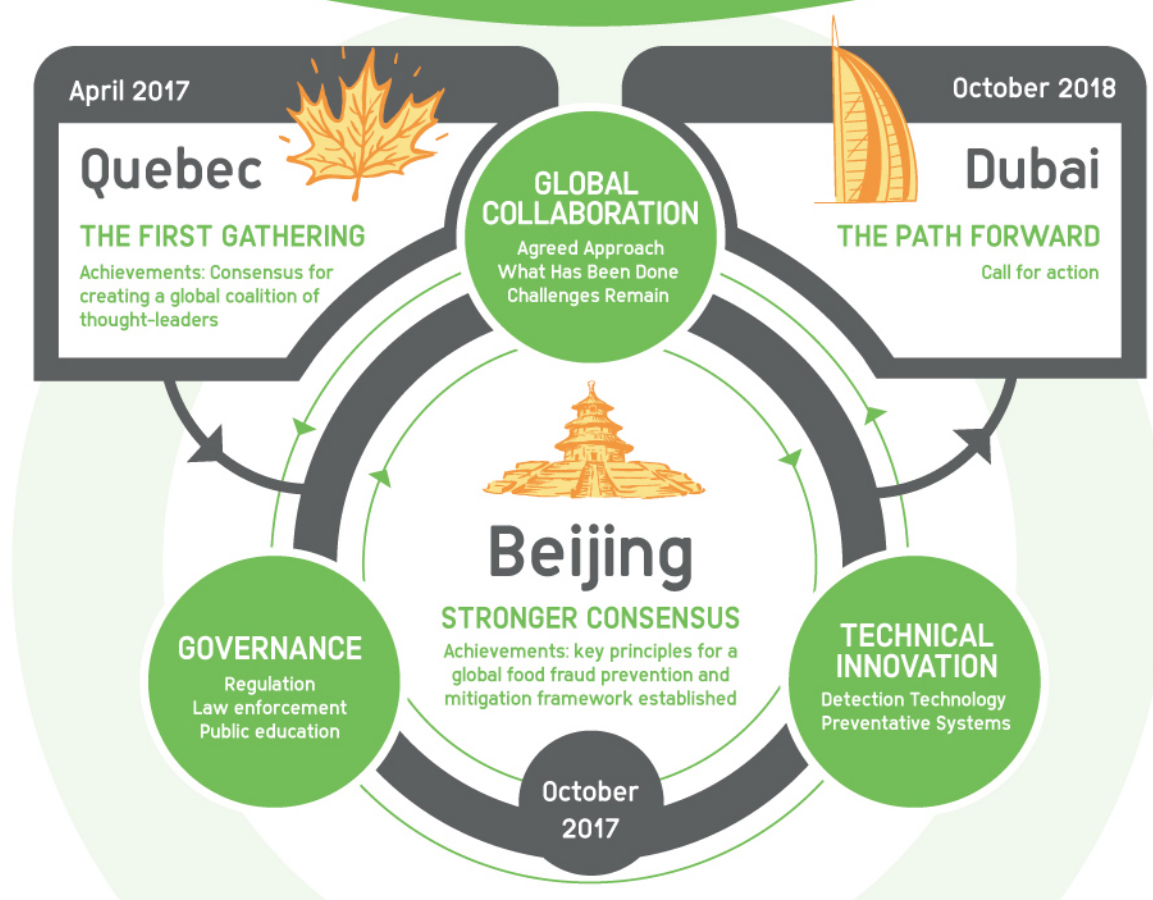
Food fraud isn't a new phenomenon. Over the years, it has hit the food industry many times and caused significant public health hazards and economic losses. Today, however, food fraud has evolved into a growing global threat –to the food industry, to public health, and it threatens access to sufficient, safe and nutritious foods also known as food security. That's why representatives from government, academia and industry around the world now embrace the need for collective action.

This report chronicles the rise of this new international movement – an emerging global consensus – over the past year. Our document is broken into three key parts:

- 1) Relevant background, helping drive understanding of the origins of this international movement, including the first gathering of key players, in April 2017, in Quebec.
- 2) Valuable insights and opinions from the crucial second stage: the October 2017 conference in Beijing, co-organized and co-hosted by Mars Global Food Safety Center (GFSC), the Department of Food Science at Université Laval Québec, Food Safety@Danone, and the Institute for Global Food Security of Queen's University (QUB). This brought together a group of international experts, to share their views from the front-lines of food fraud prevention and mitigation.
- 3) The path forward, as momentum builds toward our third global meeting: October, 2018, in Dubai.

FOOD FRAUD

-A GROWING GLOBAL THREAT



The growing global risk of food fraud, also known as Economically Motivated Adulteration, typically refers to illicit efforts to dilute, conceal, mislabel, or deliberately substitute key ingredients. While the perpetrators are motivated by greater profits, this should concern us all: food fraud threatens the integrity of the food supply chain, introduces significant risks to public health, and inflicts great costs on the food industry. In just one example from China in 2008, the melamine adulteration of milk powder sickened an estimated 54,000 children – and cost the affected companies up to US\$10 billion.

While that scandal garnered media headlines a decade ago, threats have continued to multiply, exacerbated by emerging challenges: the rise of e-commerce, the surging globalization of the food supply, and the increasing scale and sophistication of food fraud. This means we need new approaches – bringing together key representatives of all the key areas – to tackle this threat, reduce the risk, and help ensure food safety.

To keep food supply chains and consumers safe, a preventative strategy is urgently needed. That's why the Mars Global Food Safety Center (GFSC) joined the forces with other global partners: the Department of Food Science at Université Laval Québec, Food Safety@Danone, and the Institute for Global Food Security of Queen's University (QUB), in early 2017 to schedule a series of food fraud symposia. The objective was to gather world-leading food safety experts from academia, government regulators, NGOs, and industry, to discuss this critical issue, and drive consensus on what is needed to create a global food fraud prevention framework.

This aim was to provide a blueprint that could be used to assist with the development of international guidance linked with the Codex Alimentarius Commission (CAC).

The first symposium was held in April 2017 in Quebec, Canada, where more than 70 participants from 24 organizations including 7 universities and 14 research institutes discussed the issues and challenges surrounding prevention and mitigation of food fraud. The event gathered senior regulatory officials from around the world, including the U.S. Food and Drug Administration (FDA); leaders of major international organizations, including the Food and Agriculture Organization of the United Nations (FAO), World Health Organization (WHO), as well as representatives of various academic institutions, non-governmental organizations and the food-manufacturing industry. By the end of this first conference, participants were united in their call for global coalition of thought-leaders aimed attacking food fraud across the supply chain, on a global scale.

The first meeting took place at a time when the Codex Alimentarius Commission (CAC) was considering new work on food fraud, attempting to define the issue and with the purpose to review current Codex text in relation with prevention and management of food fraud to support

further work, if deemed relevant. In July 2017, the CAC supported the creation of an electronic Working Group under the Codex Committee on Food Inspection and certification Systems (CCFICS) to undertake this initial work.

Riding on this momentum, the second international symposium was held in Beijing from 30-31 October 2017, entitled “Global Understanding of Food Fraud – Towards Global Action for Prevention and Mitigation”. The two-day event attracted 115 participants, and the discussions spanned a range of issues including: standards and policies; tools and laboratory methods; and public perceptions and awareness of Food Fraud. The meeting then outlined the key principles of a global framework for food-fraud prevention. Among world-leading experts who attended were: Tom Heilandt, Secretary of the FAO/WHO CAC; Dr. Stephen Ostroff, M.D., Deputy Commissioner of Food and Veterinary Medicine, US FDA; Dr. Peter K. Ben Embarek, Program Manager of the Department of Food Safety and Zoonoses, WHO; and Dr. Junshi Chen, Chief Adviser of the China National Center for Food Safety Risk Assessment (CFSA). Also in attendance were representatives from industry, including Alibaba, Amazon and Walmart.

This report shares highlights and insights captured during the Beijing meeting. These highlights aim, not only to shed light on the pressing issues explored, but also serve to provide relevant context leading up to the third and final international gathering. Planned for October 29-30th, in Dubai, its title is: The 12th Dubai International Food Safety Conference-DIFSC.

Reaching global consensus on the food fraud challenge requires joint efforts

Dr. Junshi CHEN

World-renowned food safety and nutrition expert, engaged in food safety research for more than 50 years, serves as senior advisor of China National Center of Food Safety Risk Assessment

Food adulteration is known internationally as food fraud – a name that better reflects the nature of the matter. Food supply chains across the globe are facing significant challenges in this regard. Food fraud carries a variety of dangers. The most immediate risks are harm to economic interests, and endangering of public health. However, food fraud also causes issues for the food service industry. Within today's complex food supply chains, if a certain link goes wrong, innocent downstream companies will be greatly affected, what's more, continuing food fraud scandals will compromise public confidence in the food supply system and the credibility of government regulation will crumble.

In recent years, incidents such as fraudulent meat, olive oil fraud, and honey adulteration have hit the headlines and the impact has far surpassed a single nation or area. With the evolution of the food industry which now encompasses international logistics, and e-commerce, food fraud brings ever-growing challenges to the world. Under these circumstances, all leading global regulatory agencies, experts and academia, industry representatives and international non-governmental organizations (IGOs) realize that something must be done. To push forward the joint action based on scientific consensus, Queen's University of Belfast, Canadian Laval University, the Mars Global Food Safety Center and Danone came together to schedule series of food fraud symposia through 2017-2018.

70 representatives attended the first symposium in Quebec, Canada in April 2017, where they agreed to combat food fraud through creation of a global cooperation platform. To implement solid actions and tackle challenges together, the group reunited in Beijing in October 2017 for the second round of talks including discussion on test methods, regulations and standards for recognizing food fraud, and

global actions against food fraud. A new consensus was reached across these fields.

I. Strengthening global cooperation and integrating the allocation of resources

At the national level, a number of regulatory agencies have struck up extensive cooperation with universities, industry players, and non-governmental organizations in the fight against food fraud. Some institutions and organizations such as United States Pharmacopoeia (USP), Global Food Safety Partnership (GFSP) and Global Food Safety Initiative (GFSI) have built up a transnational cooperative network, but that is not enough. Global coordination and cooperation need a wider, higher-level consortium in which interested parties are more likely to participate.

Food supply chains are extremely complex and a multi-department, multi-industry, and multi-discipline approach is required to combat food fraud. Unparalleled resources must be invested to combat this threat. Thus, it is necessary to strengthen integration at the international level, especially in terms of creating information sharing mechanisms, removing barriers to sharing data amongst the laboratory network, supervising networks and food supply chains. These moves will be effective for reducing repetitive actions and improving the efficiency of resource usage.

For instance, institutions such as United States Pharmacopoeia (USP) are setting up an international database for food fraud. Industry leaders have formed reference templates to assess vulnerabilities. The World Health Organization's International Food Safety Authorities Network (INFOSAN) has abundant practical experience in the aspects of information networks and the operation and maintenance of government regulation. I hope that these resources and data will be integrated with the premise of increased information security, and effective resource sharing.

II. Strengthening and promoting technical innovation within the industry

Preventing and eliminating food fraud is far more complex

than simply identifying counterfeiters by means of detection. However, detection is one of the most effective weapons in the fight, and is an important requirement of a standardized working framework. The arising of food fraud suggests that more scientific research resources will be put into detection techniques. Some of the current ground-breaking techniques may become routinely used in the future, such as Omics technology, isotope ratio detection, DNA fingerprinting, and chemometrics modeling.

While the development of detection technology flourishes, its application in the food industry is lagging. Whether rapid qualitative detection or precise quantitative identification, targeted or non-targeted detection, all of them need to be standardized and normalized to establish a unified database for use across the global food supply chain. This will only be possible with the participation of institutions such as CODEX, International Organization for Standardization (ISO), and Association of Official Analytical Chemists (AOAC).

In addition information technology developments will be crucial in the fight against food fraud. This is something to be eagerly anticipated. For instance, we are likely to see the utilization of block-chain technology to improve transparency and traceability within food supply chains; we can use Big Data and artificial intelligence to identify abnormal signals among mass data, and build mathematical models aimed at improving detection.

Conclusion

Over the past decade, China has made great efforts to address food fraud. To a certain extent we have managed to deter criminal food adulteration through amending the Food Safety Law, enhancing its links with penal law, and establishing a “blacklist system”. However, we cannot underestimate the situation or be overly optimistic.

At present, China does not have an explicit definition of food fraud. Some people equate it with food safety, and there are certain similarities between them but they are not one and the same. If we think about the

III. Calling for a multi-governance approach across authorities, law enforcement departments and the general public

The root of food fraud is economically motivated criminality. That’s why it’s so difficult to observe and predict. It’s far from enough to depend on traditional food safety supervision and management processes. This requires cooperation between public security departments and judicial bodies. The governments of United Kingdom and the Netherlands have established technical food crime investigation departments, in which the police help to trace and investigate breaches. Their mechanisms, means, and abilities to allocate resources are all far beyond the conventional role of a food regulatory department. Their work has provided helpful experiences for all countries around the world.

However, it is true that food fraud is not only a problem of supervision. There are more underlying factors, such as supply-demand relationships, industrial patterns, resource allocation, and the sustainable development of the economy and the environment. Solving this challenge cannot rely solely on technological solutions. It also requires knowledge from the social sciences, such as criminal psychology, consumer behavior, risk perception, and consumer education.

This all proves the necessity of furthering cooperation and dialogue. The Beijing symposium provided a cross-boundary, cross-disciplinary, and cross-industry platform for collaboration and exchange. I hope that more stakeholders will participate in the future, sharing valuable experience and offering their wisdom.

management of food safety only on the basis of risk analysis, we will not solve the problem. We must clarify and reach consensus on this matter as soon as possible.

I firmly believe that new progress can be made through working with regulatory agencies, scientific and technological networks, and business circles both in China and around the world. After the two rounds of dialogue in Quebec and Beijing, we will meet again in Dubai in October 2018. I’m looking forward to seeing more substantial progress in the future.

Strengthening global cooperation and integrating the allocation of resources

Food fraud spreads across the world through supply chains, and booming international trade exacerbates the challenge of tackling food fraud globally. No single entity can resolve the challenge – a collaborative, integrated, and multi-dimensional approach is required.

What has been done in global cooperation?



Tom Heilandt / Secretary, FAO/WHO Codex Alimentarius Commission (CAC)

Food Fraud is in the mandate of the CAC as it can compromise safety and is an unfair practice. The difference between fraud and misleading claims can be narrow and Codex has established a system of guidance for claims and food labelling to ensure truthful information for the consumer. A working group under the Codex Committee on Food Import and Export Inspection and Certification Systems examines what Codex could do to further assist preventing food fraud. Results are expected in autumn 2018.



James Donarski / Head of Food Authenticity, FERA Science Ltd, UK

A five-year EU-funded program was launched in 2014. A total of 60 agencies are participating in the program, it will develop a lasting global network of experts in the area of food fraud prevention, a repository for methods of analytical detection of adulteration and involves specific research into olive oil, functional beverages, seafood, pizza and other specific commodities, along with detection methods, early warning systems, and traceability technologies.



Lystar N. Antoine / CEO, Global Food Safety Partnership (GFSP), USA

The GFSP is focusing on mobilizing resources to build food safety capacity in low and middle income countries. Today, food fraud, in addition to quality concerns, threatens to increase food safety concerns for consumers. It will take both the public and private sectors working together to address food safety and food fraud issues, which cross borders easily. In support of the World Bank's twin goals of eliminating extreme poverty and boosting shared prosperity, the GFSP calls for more investments for capacity building in low and middle income countries to address food safety and food fraud.



Wu Yongning / Chief Scientist, National Center for Food Safety Risk Assessment (CFSA), China

China government strengthened Sino-EU cooperation through the “Horizon 2020” project, to jointly tackle the challenges.

Although many global projects had been initiated, what challenges still remain?



Stephen Ostroff / Deputy Commissioner, Food and Veterinary Medicine,
US Food and Drug Administration (FDA)

Among the biggest challenges for regulators is to anticipate the ways economic adulteration can occur within complex supply chains and to target our limited resources in a preventive fashion. To meet this challenge, regulators require the joint support of industry, academia, law enforcement, consumers, and other stakeholders to rapidly identify and respond to high-risk market activities.



Peter K. Ben Embarek / Program manager, International Food Safety Authorities Network (INFOSAN) management, Department of Food Safety and Zoonoses, World Health Organization, Switzerland

The traceability capacity of the INFOSAN network has been greatly challenged due to the internationalization of food trade. Many governments and agencies find it difficult to regain consumers' trust following food fraud incidents.

From the perspective of regulatory cost control and improving resource utilization, the global integration and sharing of resources must be set as the future direction. The attendees at the conference believe that resources available to help global regulatory agencies in combatting food fraud are very limited. Duplication and dispersion may result in wastage. Therefore, they have pointed out that the integration of resources from all sectors will not only promote the coherence and consistency of anti-food fraud action, but will also improve the efficiency of the government's regulatory work.

Experts at the conference also suggested that a neutral, international inter-governmental organization identified to deal promptly with the emergence of new problems, particularly in the face of developments in food fraud technology and formation in the international context. The role of this organization to help reach consensus, come up with effective tools and guidelines for regulatory sectors in all countries, and to allocate and optimize resources.

Strengthening and promoting technical innovation within the industry

The prevention of food fraud requires advanced technology. Detection is certainly one of the most effective methods, but due to the complexity of adulterated materials matrices, traditional technology is not sufficient. Experts across the globe continue to explore more reliable and advanced detection methods.

What cutting edge detection methods introduced during the meeting?



Chris Elliott / Vice Pro-chancellor, Faculty of Medicine, Health and Life Science, Queen's University Belfast, UK

A new technology developed by Queen's University Belfast, known as “Rapid Evaporative Ionisation Mass Spectrometry (REIMS)”, was originally used for rapid pathological examination in clinical surgeries. This technique can be used for the detection of fish fraud, and other research institutes around the world have been making similar attempt.



Emiliano De Dominicis / R&D manager, MÉRIEUX NutriSciences, Italy

Food fraud can be detected by analyzing the ingredients and characteristics of their metabolites. This molecular fingerprinting and profiling technology requires a full understanding of the ingredients of a product for the accurate detection to be possible

The importance of combating food fraud has become a worldwide consensus. However, it is not possible to address food fraud by detection alone. In a sense, detection can only trigger reaction after a food fraud issue has happened. A transformative approach is needed in order to proactively prevent an issue from happening in the first place.

Calling for a multi-governance approach across authorities, law enforcement departments and the general public

Food fraud is criminally motivated and cannot be easily observed and predicted through traditional food safety supervision only. With that, experts called for a multi-governance approach across authorities, law enforcement departments and the general public.

How to prevent food fraud in a proactive way?

Experts at the conference believe that regulatory agencies require not only traditional laboratory detection methods, but also a preventive vulnerability assessment system. The CAC has developed guiding principles for food safety management, such as Vulnerability Assessment and Critical Control Point (VACCP), Hazard Analysis and Critical Control Points (HACCP), and Threat Assessment and Critical Control Point (TACCP). VACCP was specially designed to prevent food fraud, and contains a monitoring strategy, source/label verification, specification management, supplier audit, analyzing test strategy, and anti-counterfeiting technology. It aims to guide users through an assessment of the possibility of food fraud considering aspects such as the supply chain, socioeconomic concerns, behavioral science, geopolitics, and historic precedents. For instance, from the perspective of supply chain management, regulatory agencies should pay attention to the level of integrity of all participants and keep it on record. This will have a beneficial effect on the prevention and control of food fraud.

Experts also agreed that given the complexity of food supply chains, food fraud will be countered through a combination of technical means. For example, all players in the global food supply chain can enhance the traceability of the food supply chain through the use of Block Chain technology, and can detect and identify abnormal data through the use of “Big Data” and artificial intelligence (AI) technologies.

What efforts have been made from governance authorities?



Stephen Ostroff / Deputy Commissioner, Food and Veterinary Medicine,
US Food and Drug Administration (FDA)

To combat food fraud that is hazardous to health, the US FDA has established a series of regulatory measures that require adoption of risk-based preventive controls by manufacturers and verification of foreign supplier controls by importers. US FDA scientists are also researching detection methods to identify fraudulent and counterfeit products.”



Chen Junshi / Senior Advisor, National Center for Food Safety Risk Assessment (CFSA), China

Since 2008, China has published a "blacklist" of "illegal additives", which tells food producers which substances can be added to food and which are strictly prohibited, which has been relatively effective at curbing food fraud issue in recent years.



Wu Yongning / Chief Scientist, National Center for Food Safety Risk Assessment (CFSA), China

In China, the Supreme People's Court and the Supreme People's Procuratorate have promulgated the Interpretation on "Several Issues Concerning the Application of Laws Applicable to Criminal Cases that Endanger Food Safety" to combat illegal additives more successfully.

How to tackle food fraud from the law enforcement perspective?



Andy Morling / Head of the Food Crime Unit, Food Standards Agency (FSA), UK

Supplementing and deriving meaning from information collected from multiple sources will provide a sound strategic steer in tackling both threats and vulnerabilities. Bringing together regulatory resources around the world to develop a cohesive law enforcement led approach will be our next goal in the fight against food fraud.

What level of awareness does the general public have about it?



Marc Hamilton / CEO, Environex, Quebec, Canada

52% of Quebec residents indicated that they did not have a comprehensive understanding of the issue, 78% expressed a desire to access information about food quality, sources, and ingredients, and to know what the regulatory sector is doing to combat food fraud.



John Spink / Director, Food Fraud Initiative,
Michigan State University, USA

It is imperative to build a cross-professional and cross-regional exchange platform and to conduct comprehensive education and training on the basis of exchange and cooperation.

Building on the foundations set during the Quebec conference, the Beijing event built a strong consensus for the way ahead. The experiences and cases that have been shared here will reap mutual benefits. In subsequent the 12th Dubai International food Safety Conference in Dubai UAE, discussion topics will focus on: harmonization of food fraud regulatory policies; accessible and validated preventive measures for the food industry; risk communication, information sharing and capacity building. Experts worldwide will continue to review and build the body of knowledge that exists, to mobilize the necessary resources to combat Food Fraud, and keep the momentum going for collective action, globally.

To learn more about the 12th Dubai International food Safety Conference-DIFSC:

<http://www.foodsafetydubai.com>

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“Global Understanding of Food Fraud – Towards Global Action for
Prevention and Mitigation” , held in Beijing on October 30 and 31, 2017,
preparing the way for the final event in this symposium series,
to be held in Dubai, October 2018.

