

Policies to Proactively Address the Threat of Food Fraud**

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Summary

Food fraud presents a threat to the health of American consumers. Food fraud is the intentional misrepresentation of food products or ingredients for economic gain. Although not intended to cause illness, food fraud incidents have resulted in consumer illnesses and deaths. Furthermore, they cause considerable economic losses to industry, and the public health response requires substantial resource allocation by regulatory and public health agencies. The true scope of food fraud is not known, but it is known that it has occurred in a variety of ways and in a wide array of food products. Due to the intentional nature of food fraud, the threat will not be adequately addressed through strategies designed to control unintentional food contamination. The increased risks created by an increasingly globalized food supply require policies that foster innovative and multidisciplinary solutions for food protection. The threat of food fraud will require innovative approaches to risk assessment and the use of methods and data from a variety of disciplines. Strategic collaborations and information sharing among regulatory agencies, the food industry, academic organizations, and nonprofit groups are necessary for constructing a holistic solution to the problem of food fraud. Ultimately, food fraud prevention efforts must be industry-driven, but these efforts must be based on collaborative research and development.

Current realities

Food fraud can occur through a variety of methods, including substitution of one ingredient for another (e.g., fish species swapping); dilution of products such as oils or juices with cheaper ingredients; fraudulent identification of country-of-origin, harvesting, or processing techniques; or artificial enhancement with unapproved substances (see Figure 1). Food fraud presents a real threat to the American food supply. Multiple large-scale food fraud incidents over the past 10 years in products as diverse as oils, fish, infant formula, and ground beef have illustrated that we cannot assume that any of our food supply chains are completely protected. Food fraud perpetrators have proven to be knowledgeable about food safety and quality systems, and adept at evading those systems. Therefore, prevention strategies that are designed along the lines of traditional food safety practices will not effectively address the threat of food fraud.

We do not know the true scope of food fraud. It is very likely that documented incidents are merely the tip of the iceberg, and that most incidents are undetected or unreported. If fraudulent practices are identified within a food company's supply chain before a product goes to market, they are usually addressed through the contractual relationship between the supplier and buyer, and not addressed through regulatory channels. Most food fraud incidents do not cause illnesses or deaths in consumers since the intent of the perpetrators is to evade detection and continue the fraudulent practice. However, perpetrators sometimes make mistakes. In 1981 in Spain, 20,000 illnesses and more than 300 deaths were attributed to the fraudulent sale of olive oil that was actually industrial rapeseed oil denatured with the chemical aniline. In 2008, adulteration of milk supplies in China led to 300,000 illnesses and at least six deaths in infants in China.

Since the vast majority of incidents do not result in immediate public health consequences, from a regulatory perspective, food fraud is generally considered less of a priority than food safety (i.e., prevention of unintentional contamination of foods and ingredients with pathogens or allergens). Given regulatory agency resource constraints and a focus on public health protection by those agencies, this prioritization appears reasonable. However, the increasing globalization of the food

supply is arguably increasing all risks to food protection, including unintentional contamination, intentional contamination for ideological reasons, and intentional adulteration for economic gain.

Large-scale food fraud incidents that do not cause consumer illnesses nonetheless result in serious financial losses to industry and substantial resource expenditures by regulatory agencies. The horsemeat adulteration incident of 2013 in the European Union (E.U.) affected hundreds of companies and resulted in recalls of more than 40 products. Recalls related to a 2005 incident of adulteration of chili powder with an industrial dye in Europe cost the food industry in the United States (U.S.) an estimated \$145 million. Finally, although there were no reported illnesses in American consumers related to melamine adulteration of milk in China, resource expenditures related to investigation of the incident, product trace-back investigations, recalls, and risk assessments were extensive.

Scientific opportunities and challenges

Food Safety and Modernization Act (FSMA) legislation mandated that the Food and Drug Administration (FDA) issue regulations to prevent intentional adulteration of food. The FDA has addressed food fraud (what they call “economically motivated adulteration” or EMA) in two of the proposed rules subsequently issued as a result of FSMA legislation. The tentative conclusion by the FDA as of the writing of this paper is that food fraud would be most appropriately addressed in “Current Good Manufacturing Practice and Hazard Analysis and Risk-Based Preventive Controls for Human Food” (hereafter, the “PC rule”). Therefore, food fraud regulations would be included with the rule that primarily addresses traditional food safety threats instead of the rule focused on intentional adulteration of foods. The FDA tentatively concluded to include EMA provisions in the PC rule because the adulterants used “could be viewed as reasonably likely to occur” given a historical pattern of use.

One of the main challenges with food fraud historically has been the use of new or unexpected adulterants or fraud practices. At the time of melamine adulteration of milk in China, melamine was not considered to be an expected adulterant with a historical pattern of use. While the FDA’s approach may prevent certain types of food fraud, it is not likely to detect new adulteration methods. Therefore, many food industry stakeholders may find it necessary to implement food fraud prevention strategies above and beyond those mandated by the FDA. The food industry has a vested interest in preventing food fraud. Food fraud incidents can result in widespread recalls, economic losses, and brand damage, even when there are no consumer illnesses. Multiple industry groups are currently pursuing food fraud initiatives, most notably the Global Food Safety Initiative (GFSI). However, specific guidance and recommendations for reducing the risk of fraud in food supply chains are still in development.

Many food fraud incidents result in short-term increases in targeted adulterant testing within the supply chain. While this is one important component of a holistic food fraud prevention strategy, increased testing is not a practical solution to the larger challenge of food fraud. Food safety risk assessments consider environmental factors that lead to contamination. In the case of food fraud, these “environmental” factors include the drivers behind incentive and opportunity. Some of these drivers may include the cost and availability of ingredients and adulterants, supply chain control and oversight, and the political climate. Development of an efficient, comprehensive, and holistic food fraud prevention strategy requires a multidisciplinary approach that includes a consideration of these factors.

Policy issues

A holistic and efficient strategy for prevention and control of food fraud will take advantage of the most appropriate roles and resources among federal agencies, the food industry, and academic

and nonprofit organizations.

- Implementation of food fraud prevention and control strategies must be led by industry since industry has primary visibility into and oversight of the supply chains for their food products.
- Federal agencies must provide broad regulatory guidelines that empower food companies to tailor these strategies to their supply chains. Federal agencies must fund the appropriate research to inform and develop food fraud prevention and control methodologies, and foster information sharing among stakeholders in government, industry, and academia.
- Academic researchers must form multidisciplinary teams for developing and testing food fraud vulnerability and risk assessment methodologies. Academic or nonprofit institutions also may serve as third-party facilitators of information sharing between federal agencies and the food industry.

Grant opportunities targeted at food fraud (or “EMA”) have been limited. Agencies that fund food protection research and development must include food fraud as a priority area of interest.

- Given the intentional nature of food fraud, federal funding opportunities should encourage innovative approaches to risk analysis. This will likely include the incorporation of “non-scientific” or “non-traditional” data sources, such as economic drivers.
- Funding opportunities must prioritize the formation of multidisciplinary research and development teams that include academic, government, and industry partners.

Information sharing is critical for early identification of food fraud incidents, or increased potential for food fraud in particular food products or ingredients.

- Regulations and policies must remove barriers to information sharing between government and industry.
- Actionable information sharing will require a protected environment with legal and IT resources dedicated to protecting confidentiality, data security, and information vetting.

References

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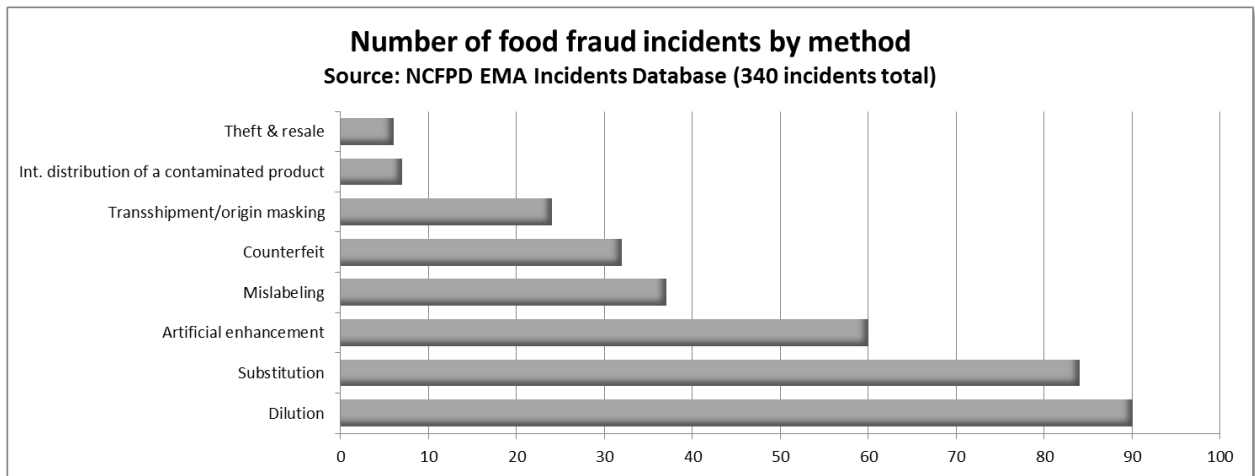


Figure 1. Documented food fraud incidents by food product category and by method, 1980 - present. Source: National Center for Food Protection and Defense EMA Incidents Database (<http://www.foodfraudresources.com/ema-incidents>).