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FOOD FRAUD IN THE EUROPEAN UNION

G.G. POPESCU

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Getty Gabriela POPESCU
Department of Administrative Sciences and Regional Studies,
Faculty of Law and Administrative Sciences, "Dunărea de Jos" University of Galati
E-mail: popescugettygabriela@yahoo.com
ORCID ID: https://orcid.org/0000-0001-6010-896x

Abstract

EU legislation does not provide a definition of fraud in the agri-food chain.

Commission Regulation (EU) 2019/1715 defines a "fraud notification" in IRASFF and therefore indicates the key elements to consider. In this sense, agri-food fraud is "a failure to comply with any suspected intentional action by businesses or natural persons, with the aim of deceiving buyers and obtaining an undue advantage from it, in violation of the rules referred to in Article 1 paragraph (2) of Regulation (EU) 2017/625".

Keywords*: prevention, counterfeiting risk, detection, prevention, organized crime*

INTRODUCTION

Today, most modern industrial societies do not care to know much about the natural world to survive, and most of the necessities of life depend on the advice of experts and the supply of merchants. The environment we live in shapes our knowledge, preferences, and diet. Therefore, the formation of dietary habits, on the one hand, involves receiving specific, consistent, and fact-based information when determining what foods to buy, and on the other hand, requires a wider information environment formed by cultural factors, such as advertising and other information media. Perhaps the most effective way to inform consumers and support them in making healthy decisions when purchasing food and beverages is through nutrition labeling.

While hunting and gathering in the past provided the ideal diet, which is not surprising given that humans have been fed for hundreds of thousands of years and the human body is well adapted to it, today humans are limited and often unbalanced. diet

Most of the calories that fed people today came from staple crops—wheat, potatoes, rice—that lacked essential vitamins, minerals, and other nutrients. The ancients of the peasantry could eat berries and mushrooms, berries, mushrooms and turtles for breakfast and roast rabbit with wild onions for dinner. The secret that kept them from malnutrition and provided them with all the nutrients they needed was a precise, natural and varied diet. In addition, they were less likely to suffer from a lack of a specific food source rather than becoming dependent on one type of food. Instead, agriculture is devastated by famine as droughts, fires, and earthquakes wipe out annual crops.

Although the media has been obsessed with food fraud, it would be a mistake to think that it only hit consumers a few years ago, because food fraud has been around since people started selling food. Legal texts originating in ancient Rome and Athens refer to wine being adulterated by flavor or color. According to a list of malpractices maintained by administrative officials in France between 1892 and 1917, the following types of fraud were recorded - adulterated milk including melted butter, artificially colored pasta, water, coffee; contains 14% residual, fake vinegar, fake pepper, added chickpeas and olive oil.

Frederick Accum, a German chemist living in London in the 19th century, was the first to point out food adulteration and several ways to detect it.

Already at that time, many harmful chemical compounds were added to food to make it more beautiful and tastier: for example, adding lead oxide to cheese or adding sulfuric acid to vinegar. Frederick Accum's goal was to educate consumers and give them the tools to detect adulteration with his 1820 book Treatise on Food Adulteration and Culinary Poisons.

I. OF FRAUDS

Based on the counterfeiters' interests, producing more and/or cheaper products, increasing profits, improving sales, avoiding losses, unfair competition by concealing defects, in addition to the consequences of their presence, it should be noted that they deceive consumers, financial losses, and perhaps the most important and Products associated with medium and long-term effects are indicated by the risks these products pose to the body. *(Wookjin Choi, Sadegh Riyahi, Seth J. Kligerman, Chia-Ju Liu, James G. Mechalakos, Wei Lu, 2018, p. 76).*

Broken down, fraud types fall into 6 categories:

1. to melt, thicken, mix, digest (milk, butter, fruit juice, wine)
2. Mask quality defects (synthetic flavors, sugar, glycerin)

3. concealing the technological treatment of the product (refining, genetic modification, freezing)

4. Substitution with inferior product or other type

5. wrong about product name, composition (origin, label, production).

6. Labeling (false characteristics, treatment requirements)

Fair markets, economic balance and social equity are dangerous frauds and food frauds, especially affecting consumers in search of "cheap" products. *(Evelyn Souto Martins, Fernando Kuschnaroff Contreras, 2014, p. 33*).

It is not possible to create a device that combats counterfeiting, fraud, or contraband, and that guarantees integrity and genuineness, as well as access to economically viable products for all. More than 2 billion consumers worldwide suffer from problems associated with "unsafe", "fake" or counterfeit products. Studies conducted in France - INCA 2, INCA 3 - show that price is the first criterion when choosing a food product at the time of purchase (48% of respondents), followed by consumption habits (43%), taste (38%) and finally the origin of the product (36%). %). Even if a product's composition, ingredients, or other information written on the package is not among the most frequently cited criteria for justifying a food product's choice, ask When faced with a choice between two similar products, 19% of respondents consistently chose the system that included nutrition or health-related information, while 44% said they only buy these products occasionally. *(Coff C, Kemp P., 2014, p. 9)*

But what do consumers expect today? Although there are different and often conflicting expectations, they confirm the trends:

- food purchasing and consumer behavior considers sociodemographic characteristics (household type, age, number of people living alone, geographic location, education level, income).

- urbanization and women's paid work led to a decrease in the time spent preparing food and a direct decrease in family opportunities that ensure the transfer of cooking knowledge to new generations, their acquisition of quickly prepared and eaten meals, habits of eating outside the home (restaurant, restaurant).

- with increasing urbanization and food chain complexity, consumers are moving further away from products and food chain participants.

- behavior develops over time and with age - if taste was preferred in the 2000s, novelty was important in 2007, and in 2015 it gained organic importance due to the increased desire to buy products from neighboring countries (value according to French statistics enterprises related to

organic production registered 8.3 billion euros in 2017, a 17% increase compared to 2016);

- changing expectations according to events or food crisis.

- emerging consumption opportunities - the division and simplification of meals, new

Access anywhere, compare prices, etc. via internet networks.

- economic constraints - consumers try to buy products at the lowest prices, which has become a priority and strategic direction of marketing and sales policies (throughout marketing campaigns and advertisements), so consumers develop strategies to take advantage of low prices. for products and services. *(Yao Taky Alvarez Kossonou, Alain Clément, Bouchta Sahraoui, Jérémie Zoueu, 2020, p.14).*

Three areas have been identified regarding social developments:

- search for natural, safe, and ethical products (no products)

- products guaranteeing nutritional requirements ("supplement") - new purchasing and consumption practices.

II. THE RISK OF COUNTERFEITING

In addition, consumers pay more attention to the origin and traceability of products, nutritional quality, production methods, breeding and slaughtering, processing methods and proximity to the place of production.

While consumer product safety is a major challenge for all stakeholders-government agencies, producer associations, and non-governmental organizations-the problem is that in recent years, many incidents of food fraud have contributed to the rapid pace growing consumer skepticism.

The risk of counterfeiting arises from the ability to deceive the consumer by copying the appearance and branding of a product in the same manner. At the industry level, this reported fraud is high and difficult to monitor. The number of deaths around the world is a reminder of this threat to public health and safety: in 2007, the World Health Organization confirmed that 40,000 people died in Russia after drinking counterfeit vodka bought at very low prices sold in popular brands. Controversy over the addition of melamine to powdered infant formula in China caused health problems for more than 290,000 children in 2008, including 860 hospitalizations and six deaths. In 2014, a restaurant owner in the UK offered a plate of chickpeas instead of almonds to a man with a peanut allergy who died of an allergic reaction. On the other hand, there are many other cases where Mexican pepper sold under the label "Made in Quebec" does not harm the health of the consumer.[1]

[1] United States Government Accountability Office. 2008. Federal Oversight of Food Safety: FDA Has Provided Few Details on the Resources and Strategies Needed to Implement its Food Protection Plan. GAO-08-909T. http://www.gao.gov/new.items/d08909t.pdf. Accessed October

However, it is increasingly recognized that food fraud is on the rise internationally; just remember the horsemeat scandal in Europe in the reports that about 70% of extra virgin olive oil is fake! Under these the concern of shoppers who don't know what's in their shopping cart or on menu they're ordering from is understandable. Among the frauds reported month within the European Union and worldwide are:

The production of buffalo mozzarella, which uses cow's milk and adds soda to cover the acidity and shelf life of the milk.

Selling non-halal butchered turkey, but signs indicate that it is halal butchered lamb.

Ive Olive Pomace Oil has been named Extra Virgin Olive Oil.

Use of synthetic dyes in the manufacture of flavored products.

Convention organic registration of traditional food products.

Therefore, no industry is exempt from the analysis of the reports published monthly by the European Commission, and that this accident affects all countries in the world. However, most of the consumers its security is called "fantasy," and the counterfeiter refuses to falsify it with eternal accusations of "social chaos."

Companies lose money and customers lose trust because of fraud. Food waste costs the global food industry between $30 billion and $40 billion annually. But in addition to the economic cost, food fraud can harm public health and damage brands. Globalization and increasingly complex supply chains create enormous opportunities and rewards for fraudsters. The collision of megatrends - especially climate change, resource scarcity, urbanization, and demographic change - increases vulnerability and simplifies profit from fraud. Today, even the most basic foods can be attended by many suppliers from around the world. It's no wonder then that food fraud is on the rise, especially since the risk of being caught for fraud is low compared to the profit. The Economic Impact of Global Food Fraud In 2010, association members in the United States estimated economic losses caused by food fraud at $10 -15 billion per year.

However, there are many cases where fraud cases do not pose a threat to consumers' health. A research team in the United States evaluated the financial gains made by fraudsters and the resulting losses to guilty consumers by analyzing a sample of cereal bars containing wheat gluten. Wheat gluten has value because of its protein content. If a batch of wheat gluten does not have a large amount of protein, the addition of melamine compensates for this deficiency. But melamine, a chemical compound that poses a health risk to consumers when taken in high doses, has been

reported in milk formulas in China. Plus, it's super cheap. Thus, in a cereal bar sold for USD 1.91 per kilogram, wheat gluten is allocated USD 0.25. Instead of eating 100% wheat gluten, cheaters can eat 50% wheat gluten and 50% melamine. The cost of fake wheat gluten is just $0.13 instead of $0.25, and a pound of corn is selling for $1.91 instead of $1,786. Thus, for each kilogram of cereal bars, the producer earns an additional $0.13. Benefits are created at the expense of the consumer. Counterfeiting is used in both expensive foods produced in small quantities and in products produced in large quantities (generally less profit is made per product sold).

A report published in 2013 showed that about 10% of the food sold in the world is adulterated. The spread of food fraud can be seen as an iceberg. The tip of the iceberg refers to fraud cases detected by the authorities, while the tip of the iceberg refers to fraud cases that are undetected and unmonitored.

Local, national, or international food fraud incidents are widely reported by the media. Thus, the consumer is informed of these threats and can take measures against fraud.

A Canadian study reveals consumer perceptions of food fraud. The report found that 63% of respondents were concerned about food fraud in general, 74% about imported products, and 57% about products produced or processed in their own countries. Most respondents (56.6%) said they trust the authorities to detect fraud, but only 28% trust the industry to prevent it. The general results given by the authors of the study: 51% will trust the list of ingredients presented, 41% will trust the specific geographical origin of each and only 29% will trust the visual information (e.g., bio). 37% of the population believe that the risk of food fraud is high or very high; and risk-taking increases with age and decreases with education and income.

III. FRAUD DETECTION

When discussing the available methods for detecting fraud, it should be noted that the choice varies depending on what you want to detect. What should I confirm as an example? The origin can be verified (is it from the country indicated on the label?), the composition can be tested (was it diluted with low-quality wine, and if so, what dangerous compounds were added?).

Each product or composition can contain multiple frauds and even multiple frauds at the same time. So, for every fraud there must be a method and some equipment. This is a major challenge for the agri-food industry to ensure that its products are not adulterated. As a result, scientists have developed several protocols to detect food fraud. A brief introduction of them is given below.

In the 19th century, the chemist Frederic Accum offered his readers an advantage in detecting certain defects: “This product is sometimes contaminated with lead, because the oil-producing fruit is subjected to the action of the press between the lead plates. Italian olive oil is usually free of this preservative. Also,

he suggested a method for detecting lead in olive oil: "The presence of lead is determined by shaking the suspected oil in a closed bottle with two or three parts of water. Hydrogen sulphide. This agent causes the oil to turn dark brown or black if the unhealthy metal is present. In addition, another technology in development is a glucometer modified from a device that measures blood sugar levels in people with diabetes, so they can detect melamine in milk.

It is important to understand the fraud detection needs of manufacturers and regulatory agencies, to link the correct detection method to the proposed test, and to obtain a method that is inexpensive and easy to use.

When it comes to the terminology of risk associated with eating counterfeit/fake foods, it is important to note that the risk has a dual nature. An actual risk defined by statisticians as the probability of an adverse effect on the health and safety of a consumer product. The second definition is related to subjectivity: risk is assessed not according to statistical tables, but according to the probability estimated by the subject according to his own criteria.

Therefore, a question arose: how can the food industry guarantee the authenticity of products intended for consumers? For a long time, food industry standards focused on issues related to food quality and safety.

Although the problem of food adulteration is huge, the necessary measures to combat it are within the power of any processor or distributor willing to provide their customers with what is written on their product packaging. By requiring companies to assess their vulnerability to food fraud and develop control plans to reduce their vulnerabilities, fraud mitigation will become an integral part of food safety management systems and enterprise risk management frameworks.

All actors in the chain faced with the threat of food fraud must take measures to reduce the risk and guarantee the authenticity of food products. In fact, the H.A.C.C.P vulnerability assessment system and critical control points provide guidelines for identifying and measuring the likelihood of fraud for each product. Food safety and quality systems typically prevent intentional contamination with known pathogens or substances. Fraud prevention requires a different approach: it must consider the fraudster's economic incentives and fraudulent behavior. *(Arlorio M, Coisson JD, Bordiga M, Travaglia F, Garino C, Zuidmeer L, Van Ree R, Giuffrida MG, Conti A, Martelli A. 2010, p. 22).*

Therefore, current food safety management systems are not designed to reduce food fraud, which requires a different attitude and skill set than food safety or security.

Authorities, consumers, and other stakeholders expect food companies to proactively reduce the risk of food fraud. For example, socioeconomic issues and incidents of food fraud are not included in food security assessments or food security risk assessments and are not usually part of a food security audit. Food fraud vulnerabilities can also occur outside of a company's normal operations. The risk to food security has never been greater. Although food fraud is not new, the reason counterfeit or fake food is on the rise for financial gain requires new solutions.

Although current food safety management systems are not always designed to detect or reduce fraud, new food safety guidelines require it. That's why we've created a free fraud vulnerability assessment tool that companies can use to identify threats to food fraud. This is an industry solution that can help meet new requirements to reduce food fraud. *(Borda D, Mihalache OA, Dumitraşcu L, Gafițianu D, Nicolau AI. 2021, p, 12)*

This tool is based on the study of criminal behavior and decision-making. It consists of two parts. The first one analyzes the influencing factors criminal behavior, and the second is a company and its external relationships and environment (such as customers). The assessment is user-friendly and can be applied to any part of the food supply chain, from animal feed and primary production to manufacturing and catering.

There are three key elements – opportunities, incentives, and lack of anti-fraud measures – that determine and are central to assessing a company's vulnerability to food fraud. "Capabilities" and "opportunities" are defined by the company's internal and external environment and are identified as potential fraud risk factors. The risk that can arise from these two elements can be mitigated by a third element, the 'anti-fraud measures' that companies use to detect or prevent fraud.

IV. PREVENTION OF FOOD FRAUD

The development and implementation of this science-based tool allows food companies to predict and mitigate vulnerabilities is expected to help.

In fact, food fraud exists primarily because of the difference between the potential for financial gain and the risk of being caught. Fraudsters are aware of the authorities' lack of knowledge and the lack of quick and effective methods of detecting fraud. In addition, they often change their business practices and avoid taxes. *.(Jeffrey C. Moore, John Spink, Markus Lipp, 2012, p. 44).*

The meat identification test market by markets and markets is expected to reach US$ 2.22 billion by 2022, at a CAGR of 8.2% by 2022. In fact, the increase in food adulteration and adulteration in this market is due to the strengthening of religion. beliefs, strengthening labeling laws, enforcing government regulations, and increasing consumer demand for certified products.

The European market has been the most important market to date due to stricter food safety regulations. The next regulation to open will be the Asia-Pacific market, which will see increased regulation. The more stringent and enforced the regulations, the stronger the market will be to detect food fraud.

Another Markets and Markets analysis of testing trends in the agricultural sector predicts the validity of testing for rapid detection of pathogens (7.9%) and pesticide residues in raw foods, as well as in processed foods such as baby formula. Allergen testing tops the list of the fastest growing markets in North America.

As part of the European Food Production Program, it was concluded that the industry needs portable and easily transportable methods to detect suspicious products in distributors and retailers.

Part of the challenge of food adulteration is the real need to develop more sophisticated, affordable, and portable methods that can be used with smartphone devices, require no sample preparation and are less sensitive. These devices should be aimed at preventing food fraud rather than detecting it, and the results should have a very high correlation with those obtained by laboratory methods. In this regard, more sophisticated technologies should continue to be used. used in various laboratories to enrich and better interpret databases. *(Ajzen, 1991, p. 3)*

Access to information to build international trust will allow for better validation of these technologies and international consensus for products in high demand.

Harmonization of regulatory methods and systems is essential in an international environment where the exchange of goods and food factors continues to flow more easily and rapidly. Thus, regulation is not a one-size-fits-all between the structures of various interests aimed at combating food fraud.

In a global approach, we must not forget that food fraud is not only a food problem, but primarily a fraud problem, and it is necessary to use different methods to change attitudes.

V. FOOD FRAUD AND ORGANIZED CRIME

Research on food fraud prevention often makes the connection between this area and cooperation and organized crime. Following the 2012 UK horse racing scandal, the following recommendations were made to prevent fraud:

- It is important to focus on the act itself and not on the group involved in the fraud.

Therefore, the focus should be on the weaknesses or vulnerabilities of the system rather than the culprits. In relation to horse racing fraud, this

would focus on where and how it might be possible, rather than on the fraudsters.

- To divide cooperation and criminal organization into separate types.

Fraud prevention should focus on specific types of fraud within a broader crime. In the case of horsemeat, there may be weaknesses in the documentation associated with these processes.

- Explore the diversity of partnerships and criminal organizations.

In the case of food fraud, this includes determining how common fraudulent practices are different. In horse racing, all the individual relationships and opportunities that led to each act of fraud can be considered.

- To consider the minimum level of complexity of the partnership because such action is rare.

To prevent food fraud, very simple vulnerabilities and simple measures should be considered first. In the case of horsemeat, this may mean informing suppliers that species testing will be carried out. The goal is not to detect food fraud, but to prevent it in the first place.

- Physical transactions, not money (financial benefits). *(Rosalba Giacco, Beatrice De Giulio, Marilena Vitale, Rosaria Cozzolino, 2013, p. 55).*

To prevent food fraud, it is important to remember that fraudulent activities are not the end goal. The goal is to make money from fraud. A disruption at the end of the supply chain can significantly increase the risk of being caught or the costs of committing a crime. Regarding fraud related to names, it may even sometimes be the organization that conducts the standard species identification tests.

- Don't look for deep secrets but look for obvious or nearly obvious secrets.

To prevent food fraud, it is effective to start with the most basic and obvious vulnerabilities. Fighting the simplest crimes can have an impact on more complex crimes, even though they may be more covert and sophisticated. This assumes that there is a clear statement for any fraudsters who may be lurking in the supply chain and, more importantly, that the authorities are focused on detecting and strengthening control of these activities.

- Interdependence of acts - dependence of one crime on another

Each scammer relies on a different system to achieve their specific goals. In the case of horsemeat, the meat supplier needed a team that would allow them to falsify documents, and the fake company in turn needed a customer who was unaware, unconcerned, or complicit in the fraud. Despite these aspects, compared to other forms of crime, food fraud appears relatively simple. *(Acheson, 2007, p. 23)*

- Determine how crime breaks down outside of legal and extraterritorial measures.

The most difficult obstacle to preventing food fraud is the ability to mix fake products with legitimate products. A fake supplier needs a customer for his product. The biggest opportunity lies with buyers in the legal supply chain. Then there is more opportunity in marginal activities where there may be little or no control.

- Interference with relevant sequences, customer access or operation.

Preventing food fraud involves identifying and implementing effective and efficient countermeasures or control systems that target vulnerable areas.

Conclusions

The studies concluded that a joint effort to create an accessible database of food fraud cases benefiting from transparency from all actors involved at European level would constitute a justified and necessary preventive measure to build consumer confidence in the chain food.

The global impact and complexity of the issue of food fraud and authenticity make information infrastructure a critical component. The lack of compilation or grouping of useful information directly related to food fraud and the authenticity of food products, determines that the process of searching, selecting data and how to use them becomes a difficult task both for regulatory authorities and for operators, NGOs, associations and consumers. Therefore, the harmonization and coordination of relevant databases is an important driving force in laying the foundation for transparency and increasing consumer trust in the food chain, as well as enabling the dissemination of relevant information and strengthening the capacities of the various actors involved.

Most of the studies on the causes of food fraud, the ways to prevent them, the effects they can have in the short, medium and long term on the health of the population support the need for real and periodic debates between leaders in the field of science and technology in the food industry and not only , brand representatives of central public administrations, representatives of consumer interest groups, academics to address food-related issues openly and in a neutral setting. These kinds of debates will allow the identification of possible approaches to food safety issues considering the complex interactions between industry, academia, regulatory agencies and consumers.

It is also necessary to emphasize the change of paradigm, namely the interdisciplinary approach to the problem of food fraud. The objective should be to explain the problems, not to solve them, such debates are not intended to draw conclusions or make recommendations, but to reflect the diversity of opinions expressed by the participants.

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