

# *Food Fraud Vulnerability Assessment and Mitigation*

Are you doing enough  
to prevent food fraud?



***Food safety and quality management systems have traditionally focused on preventing unintentional contamination with known pathogens or substances. Food fraud prevention requires a different approach: it must take into account economic incentives and deceptive criminal behaviour.***



# Are you doing enough to prevent food fraud?

*Food fraud is simply defined as intentional deception using food for economic gain.<sup>1</sup>*

Recent food fraud scandals from around the world have highlighted the need to strengthen food fraud prevention measures across the entire supply chain. Not only is this necessary to protect the health of consumers, but corporations and regulators both know that trust is the foundation upon which efficient, functioning markets are built.

Current food safety and quality management systems, however, were not originally designed to prevent fraud. Food fraud prevention requires a different approach: it must take into account economic incentives and deceptive criminal behaviour.

Recognising this, the Global Food Safety Initiative (GFSI) will soon require companies to conduct a food fraud vulnerability assessment and to prepare a food fraud mitigation plan.<sup>2</sup>

Consumer safety is the most important objective of food fraud prevention, but there is also a financial impact. Food fraud costs the global food industry an estimated US\$40 billion each year.<sup>3</sup> A single incident can permanently destroy a valuable brand, cause long-term industry-wide losses, close off export markets and damage trust in public institutions.

PwC has the expertise in risk assessment, forensic services, supplier management and internal controls required to help companies assess their vulnerability to food fraud, then design and implement measures to mitigate food fraud risk.

***GFSI compliance will soon require a food fraud vulnerability assessment and food fraud mitigation plan.***

1 Michigan State University (MSU) Food Fraud Reference Sheet

2 New requirements for a documented food fraud vulnerability assessment and a food fraud mitigation plan will be included in the GFSI Guidance Document Version 7, to be released in 2016

3 Professor John Spink, Director of the Food Fraud Initiative MSU

# A few things you may want to know

## Money, money, money motivates fraudsters

*Food may be about taste and nutrition for most of us, but for fraudsters it's always about using food as a pawn to make easy money to maximise gains and minimise losses.*

In essence, food fraud is the **intentional deception using food for economic gain**, which includes substitution, addition, dilution, tampering or misrepresentation of food, food ingredients or food packaging; and includes false or misleading statements made about a product.

In the graph below are many ways fraud is committed in the market place today.



### Dilution

Mixing a liquid ingredient of high value with a liquid of lower value.



### Substitution

Replacing an ingredient, or part of the product, of high value with another ingredient, or part of the product, of lower value.



### Concealment

Hiding the low quality of food ingredients or product.



### Mislabelling

Placing false claims on packaging for economic gain.



### Unapproved enhancement

Adding unknown and undeclared materials to food products to enhance the quality attributes.



### Counterfeiting

Copying the brand name, packaging concept, recipe, processing method etc. of food products for economic gain.



### Grey market production/theft/diversion

Sale of excess unreported product.

Note that 'grey market production/theft/diversion' is out of the scope for this assessment tool (but may be picked up anyway).

# ***Food fraud and food safety: What is the connection?***

***Acts of food fraud create a vulnerability that dangerous adulterant-substances have been added or that the product has been mishandled and become dangerous.<sup>4</sup>***

Food safety management systems generally focus on the unintentional contamination of food by known ingredients, pathogens, mishandling, or processing. Food fraud, however, is an intentional act perpetrated for economic gain.

The criminal's fraudulent ingredients and/or modifications are specifically engineered to evade the purchasers' quality assurance and quality control systems.

Only the criminal knows which adulterant-substance has been added, or which food ingredient has been manipulated and how.<sup>5</sup>

Moreover, the adulterants introduced by food fraud are often unconventional substances that are not anticipated by food safety management systems, and only become known after they are well into the supply chain.<sup>6</sup>

Unfortunately, criminals usually lack the motivation and expertise to determine whether or not their actions will result in hygienic or toxicological risks to eventual consumers.

While the vast majority of reported food fraud cases do not result in a threat to human health, acts of food fraud create a vulnerability that dangerous adulterant-substances have been added or that the product has been mishandled and become dangerous.<sup>7</sup>

***A different approach is required to prevent intentional adulteration that is specifically devised to evade detection.***

4, 7 Spink, Fortin, Moyer, Niao and Wu. Food Fraud Prevention: Policy, Strategy and Decision-Making – Implementation Steps for a Government Agency or Industry

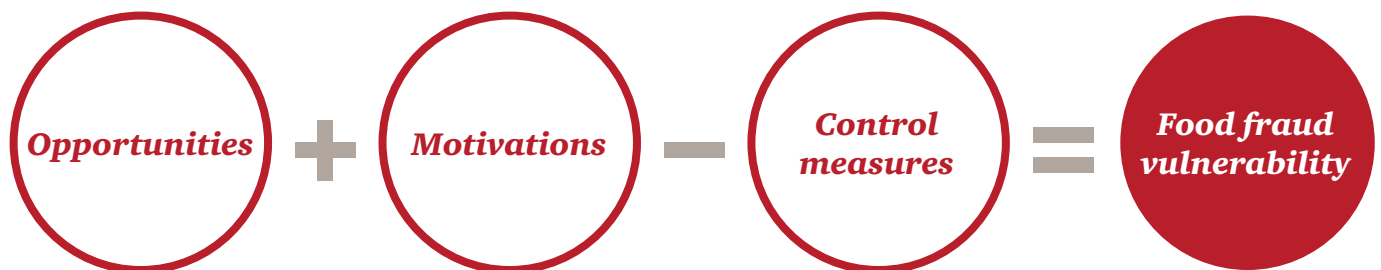
5, 6 Moore, Spink, Lipp; Development and Application of a Database of Food Ingredient Fraud and Economically Motivated Adulteration from 1980 to 2010, Journal of Food Science Vol 77 Nr 4, 2012

# A science-based framework for understanding food fraud risk<sup>8</sup>

*“Food fraud generally occurs where the potential for and the temptation of food fraud are high and the risk of getting caught and sanctions are low.”*

Fraud is economically-motivated criminal activity, so we must understand criminal behaviour and decision-making in order to assess and mitigate the risks of food fraud. In contemporary criminology, economically motivated crimes result from the combination of opportunities, motivations and inadequate control measures. By analysing these three aspects, we can estimate the food fraud vulnerability for any food product or ingredient.

Figure 1: Food fraud vulnerability assessment framework



<sup>8</sup> Professor Chris Elliot of the Institute for Global Food Security as quoted by the Financial Times, “The fight against food fraud”, 26 Mar 2016

## Opportunities

For any given food product or ingredient, the nature of its composition, qualities, production process, and supply chain, as well as its geographic origins determine the opportunity for fraud.<sup>9</sup> For example, food fraud is generally easier for liquids than solids, and complex foods with multiple ingredients generally offer greater fraud opportunity than simple, single-ingredient foods.

Longer supply chains result in higher food fraud risk. Every time there is a transaction involving food, the buyer depends on the seller to present truthful information about the product. In the words of Professor Chris Elliot, “Every time you have a transaction, there’s another opportunity to cheat.”<sup>10</sup>

This applies to globally traded bulk food commodities as well as primary agricultural products that make their way from small household farms to nearby urban consumers via layers of wholesalers, distributors and retailers.

Specific factors can include:<sup>11</sup>

- Physical characteristics and composition
- Availability of adulteration technology/knowledge
- Technical simplicity or complexity of adulteration
- Accessibility to processing lines
- Complexity and transparency of the supply chain
- Detectability of fraud

Figure 2: Physical qualities and the composition of food products or ingredients are determinants of the fraud opportunity



**“Every time you have a transaction, there’s another opportunity to cheat.”<sup>12</sup>**

9, 10, 11, 12 Wageningen UR

***“Where there is money, there’s crime; where there is big money, there’s big crime.”***

## **Motivations**

Basic economic motivation can take two different forms: revenue maximisation or cost minimisation. The market conditions for each food product and ingredient determine the level of economic motivation to commit fraud. The more competitive the market, the more incentive there is to use lower cost ingredients as substitutes. High priced food items or items for which subtle characteristics account for significant price differences can present lucrative opportunities for fraudsters. In the words of Andy Morling of the UK Food Standards Agency’s National Crime Unit, “Where there is money, there is crime; where there is big money, there’s big crime.”

Motivation is also affected by cultural and behavioural factors. The economic motivation to commit fraud is bound to be lower when the seller and buyer have a long-term relationship and history of conducting mutually beneficial transactions. Motivation is increased by personal or commercial desperation. A business that is protecting a valuable brand will be less motivated to commit fraud than a trader of fungible commodities.<sup>13</sup>

### **Economic and market factors<sup>14</sup>**

- Special attributes that determine value
- Financial strains
- Level of competition
- Supply/demand and pricing
- Competitive strategy
- Economic health or conditions

### **Cultural and behavioural factors<sup>15</sup>**

- Personal gains or desperation
- Ethical business culture
- Corruption level
- Victimisation
- Competitive strategy
- Blackmail

13 Andy Morling, Chief Executive of the UK Food Standards Agency’s National Food Crime Unit, as quoted by the Financial Times, “The fight against food fraud”, 26 Mar 2016

14, 15 Wageningen UR





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## Control measures

A food company's primary fraud prevention measures are its food safety management and quality control systems, as well as food quality and safety managers and staff. External controls include food safety agencies, anti-fraud regulations, and law enforcement agencies. Employees, suppliers and customers also play important roles in reducing the risk of food fraud.

### Specific controls include:<sup>16</sup>

- Information systems (e.g. traceability, mass balance)
- Fraud monitoring and verification systems
- Whistleblowing guidelines and protections
- Ethical codes of conduct
- Legal framework and enforcement
- Social control chain network
- Contractual requirements
- Employee integrity screening

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<sup>16</sup> Wageningen UR



# The war on food fraud

**Free online tool helps food companies fight fraud to protect consumers.**

As outlined in the preceding pages, food fraud is a growing concern. Recent food fraud incidents have increased the need to protect consumers by strengthening the food industry's ability to detect and combat fraud across supply chains.

The risks have never been higher. While food fraud is not new, the motivation to adulterate or counterfeit food for financial gain is growing and a new solution is needed. Current food safety management systems are not always designed for fraud detection or mitigation, but new food safety guidelines require it.

That is why SSAFE has collaborated with PwC to create a food fraud vulnerability assessment that you can use free-of-charge to help identify your vulnerabilities to food fraud threats.

This is an industry-led solution that supports the Consumer Goods Forum's Global Food Safety Initiative (GFSI) requirements. SSAFE developed the assessment with PwC, Wageningen University, Vrije Universiteit Amsterdam and in consultation with food industry leaders around the world to help put you in a stronger position to fight fraud.

**Want to assess your vulnerability to food fraud?**

Go to [ffv.pwc.com](http://ffv.pwc.com) to use the online assessment or download it on the Apple App Store or Google Play, available on iPads and tablets. For more information, visit our website at [www.pwc.com/foodfraud](http://www.pwc.com/foodfraud).

The assessment is also available on the Apple app store and Google Play.





## *Ready to get started? A few things you should know*

The tool is free-to-use for any company. Go online at [ffv.pwc.com](https://ffv.pwc.com), or download the app to complete the assessment.

You can use the tool to assess your vulnerability to fraud at an ingredient, product, brand, facility, country or company-wide level. If you want help deciding on where to apply the tool in your organisation, complete the decision tree.

The online tool is easy to use and you have the option to delegate responsibility for completing specific questions to different colleagues and departments to ensure its smooth completion by the right people, no matter how big or small your organisation.

Once completed, and depending on how you decided to apply the tool, the assessment will give you a profile of your company's potential food fraud vulnerability, which can form the basis for the development of interventions to mitigate identified vulnerabilities, as well as assessing potential risk to the enterprise.

The assessment doesn't give specific recommendations for mitigation techniques, but it does provide links to useful guidance on how and where to find solutions. It is not designed to detect fraud or predict future food fraud incidents. Yet by addressing identified vulnerabilities, fraudulent activities may be identified and give you the opportunity to stop criminal activity. You can use this tool as part of your food safety management system – remember fraud vulnerabilities change over time, so use it regularly.

At the end of the assessment you'll get a report that can be added to your food safety documentation, which includes spider web graphics that illustrate and identify potentially high-risk areas of vulnerability. The outputs will enable you to prepare mitigation strategies and techniques, including the introduction of additional controls for reducing your food fraud risks.

Responses to the assessment remain confidential to the company carrying out the assessment. It is important to note that respondents and their organisations are not identifiable from the online information recorded. All identifiable data is deleted at the end of your assessment, and all remaining data is aggregated to support general benchmarking and research to continue to improve the tool and provide additional feedback to the industry.

*You can use the tool to assess your vulnerability to fraud at an ingredient, product, brand, facility, country or company-wide level.*

# Food fraud challenges

## Industry-wide challenges

The challenges of combatting food fraud are complicated by the many opportunities for adulteration and deception, as well as the growing complexity and geographic reach of today's multi-tiered production and supply chains. Some industry-wide challenges include:



### *Difficulty in detecting food fraud*

Detecting food fraud is difficult because deception is a primary objective of the fraudster. Testing is not only expensive, but most testing methods are designed for a specific known adulterant-substance. Criminals will always be searching for new substances or methods that are not targeted or detectable by current systems. Effective anti-fraud testing programs require continuous monitoring of incidents and market conditions to target the current, most likely adulterant-substances.



### *Lack of upstream supply chain visibility*

Regulations in major markets such as China, the US and the EU generally require one-up one-down traceability. Sourcing practices of tier 1 suppliers are not always assessed or understood and visibility to tier 2 suppliers is often limited.



### *Under-investment in supply chain risk management*

There are clear financial incentives to optimise supply chains for cost efficiency and to minimise working capital. But with shareholders focused on short-term results, it is difficult to quantify the financial benefits of time and money spent on risk management. Effective supply chain risk management requires significant investment in planning, analysis and management information systems.



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# ***New GFSI food fraud requirements***

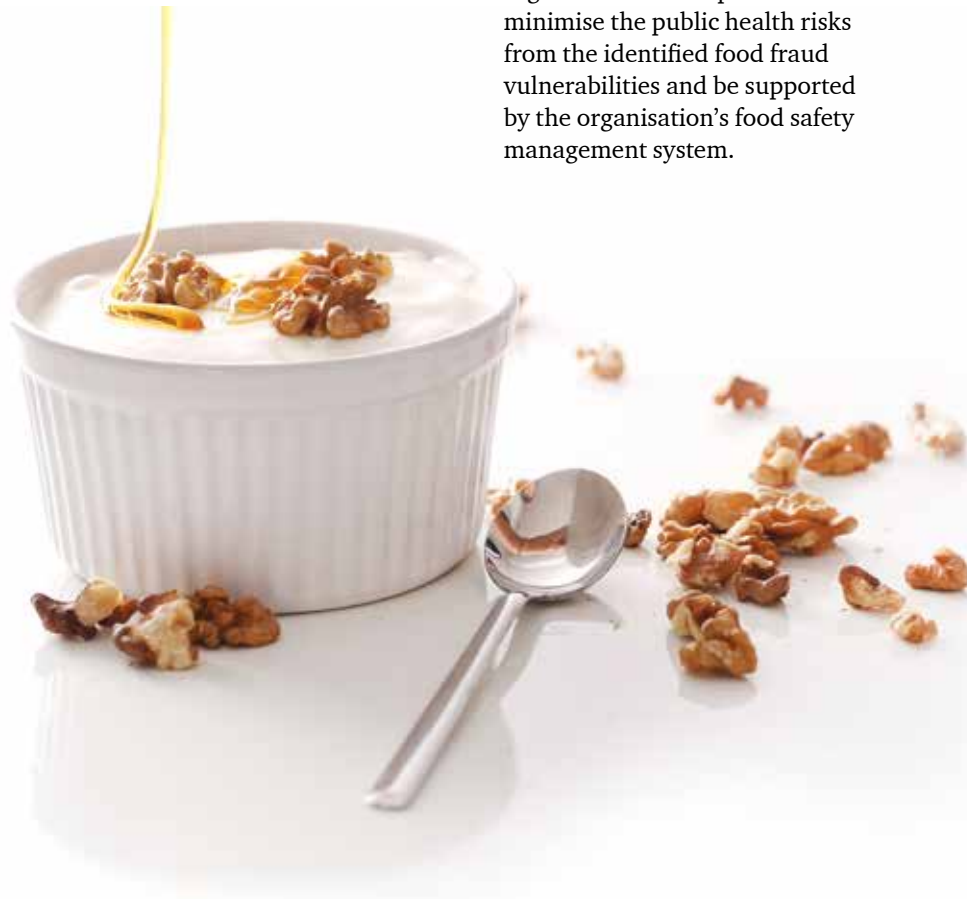
***GFSI compliance will soon require companies to conduct a food fraud vulnerability assessment and to prepare a food fraud mitigation plan.***

The GFSI vision is that the mitigation of food fraud and its potential impact on consumers' health will become an integral part of a company's food safety management system.

The GFSI Guidance Document Version 7 will require companies to

- Perform a food fraud vulnerability assessment to identify potential vulnerabilities and prioritise food fraud measures.
- Have a food fraud vulnerability control plan in place that specifies the control measures the organisation has implemented to minimise the public health risks from the identified food fraud vulnerabilities and be supported by the organisation's food safety management system.

During a food safety certification audit, conducted against GFSI recognised schemes, the auditor will review the documentation related to the vulnerability assessment process and confirm that a comprehensive control plan has been developed and implemented by the company.



# ***GFSI currently recognises the following schemes:***

- BAP Seafood Processing Standard
- BRC Global Standard for Food Safety
- BRC Global Standard for Storage and Distribution
- BRC-IOP Global Standard for Packaging and Packaging Materials
- CanadaGAP
- China HACCP
- FSSC 22000
- Global Aquaculture Alliance Seafood
- GlobalG.A.P Harmonized Produce Safety Standard
- GlobalG.A.P. Integrated Farm Assurance Scheme
- GlobalG.A.P. Produce Safety Standard
- Global Red Meat Standard
- IFS Food Standard
- IFS Logistics
- IFS PACsecure
- PrimusGFS Standard
- SQF Code

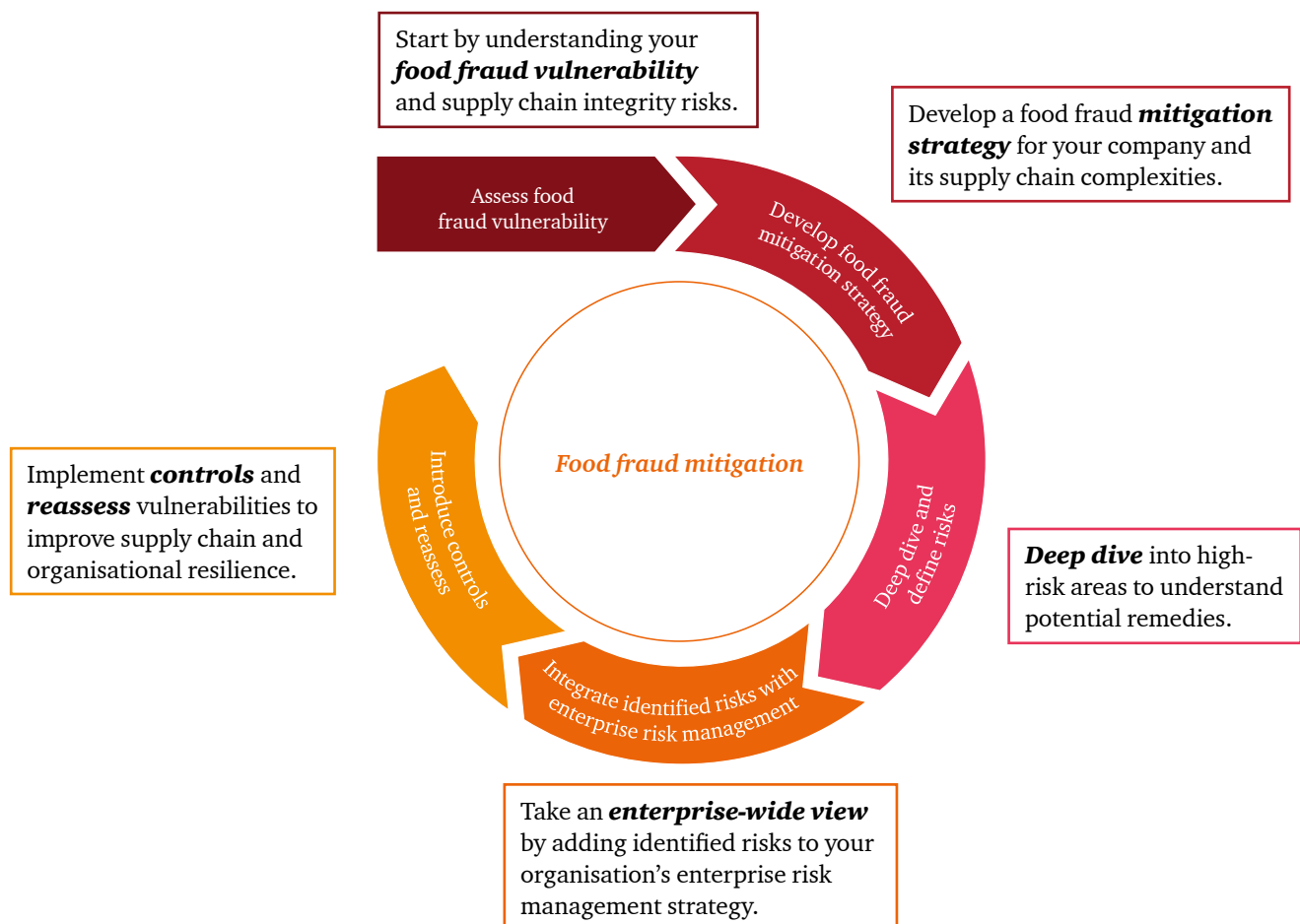
In 2015, China HACCP became the first government-owned scheme to be recognised by GFSI.

***Beyond the food safety vulnerabilities, food fraud creates tremendous economic harm and undermines the trust in the food supply chain. Food fraud undermines the consumer trust of industries, companies, and even public institutions. Addressing and preventing food fraud is important to sustain economic growth, to maintain the flow of food across longer supply chains, to increase consumer trust in the economy, and to maintain social harmony.***

# We can provide greater insight and management of fraud risk

Completion of the food fraud vulnerability self-assessment is only the first step in understanding your food fraud risks. With our food supply and integrity risk expertise we can help you assess your food fraud vulnerability and develop mitigation strategies focused on building supply chain integrity, transparency and trust.

## Food fraud mitigation framework



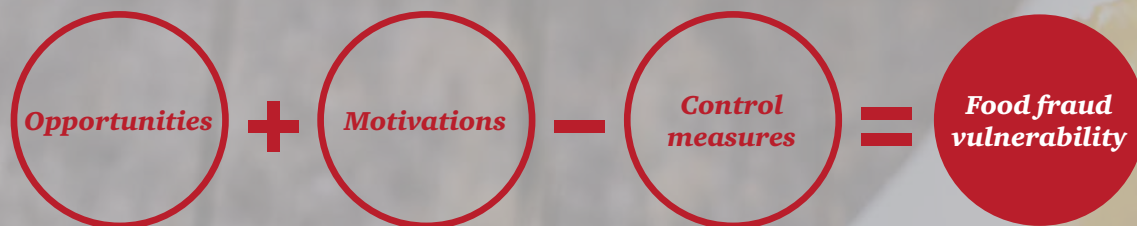
*Our framework helps you be compliant with requirements to assess and mitigate food fraud*

## **Food fraud vulnerability assessment**

To support compliance with new GFSI guidelines, we can deploy our risk analysis expertise to conduct a thorough food fraud vulnerability assessment of both your company and its suppliers. We employ the food fraud vulnerability assessment framework that is based on the study of criminal behaviour and decision making, and applies fraud theory to support the identification of potential vulnerabilities.

The assessment framework can be applied anywhere in the food supply chain, from animal feed and primary production to manufacturing and catering. It is most useful when conducted on individual ingredients, products, geographical units or facilities or production lines. The units on which the assessment is conducted can be prioritised by economic value, or by the potential for fraud-related safety risks, brand damage or financial loss.

The assessment consists of 50 questions that cover the three main elements of food fraud vulnerability.



### **Opportunities**

The Opportunities section looks at vulnerability to criminal activity. It includes eleven questions related to ingredients, product and process characteristics, features of the chain/industry network, and historical evidence of fraud with particular food products and ingredients.

### **Motivations**

This section assesses the types of motivations individuals may have to commit fraud for a particular ingredient or food product. This section includes twenty questions that cover pricing and market characteristics, history of fraud and other criminal offences for the industry and individual parties in the supply chain, as well as the economic challenges for the company, suppliers and the industry.

### **Control measures**

The Control measures section assesses the measures currently in place to help prevent fraud. This section consists of nineteen questions about mitigation and contingency measures, including internal hard controls, internal soft controls, and external controls of suppliers/customers and the wider sector environment.





## Food fraud mitigation

GFSI compliance will require a documented food fraud mitigation plan. The plan must be designed to address the risk factors identified in the food fraud vulnerability assessment. It will be different for every company depending on the types of risks identified, as well as the nature of the companies' ingredients, products, and geographic presence.

PwC can help you design and implement a food fraud risk mitigation plan, employing our extensive experience in risk assessment, internal controls and supplier management. A food fraud mitigation plan will address areas such as governance processes, company ethics, workplace culture, sourcing and supplier management, and controls over processing and distributing food to consumers.

***With extensive experience and expertise in risk assessment, supplier management and internal controls, PwC's Food Supply and Integrity Services team can help you conduct a thorough food fraud risk assessment, followed by the design and implementation of a tailored food fraud risk mitigation plan.***

# Meet the team

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***[pwc.com/foodfraud](http://pwc.com/foodfraud)***

Information mentioned in footnotes are based on internal and external documents, research and insights conducted by PwC.

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