FFI Report

The Role of Enterprise Risk Management in Food Fraud Prevention

By John Spink, PhD

March 23, 2017

Executive Summary: An enterprise-wide risk perspective such as *Enterprise Risk Management (ERM)* provides a widely-adopted and structured approach for managing *Food Fraud prevention*. ERM supports resource-allocation decision-making through plotting the *Food Fraud Vulnerability Assessment* on a *Corporate Risk Map*.

Food Fraud – deception for economic gain using food – is a unique risk to brand equity, sales, incident cost, consumer satisfaction, and social harmony. Board of Directors and C-Suite leaders know they are criminally liable under the Park Doctrine and Sarbanes-Oxley. Recently, the US DOJ emphasized that individual employees are liable for a wide-range of criminal felony charges for even knowledge – "willful blindness" – of ongoing Food Fraud regardless of whether there was a hazard or death. Addressing Food Fraud is a requirement for the Food Safety Modernization Act, the Chinese Food Safety Laws, and the industry-led Global Food Safety Initiative (GFSI). GFSI has been leading this through specifying a (1) Food Fraud Vulnerability Assessment (FFVA) that covers all products and an (2) enterprise-wide Food Fraud Prevention Plan (FFPP). GFSI stated their support for the SSAFE guidance on Food Fraud Vulnerably Assessment (FFVA). The SSAFE FFVA is automated and made public by PwC. While there are immense and intense penalties, there are some very basic and fairly simple steps to address Food Fraud. A missing link in Food Fraud prevention was an enterprise-wide correlation of the risk to all other portfolio risks. An enterprise could be a private company, a government owned company, or a government. Fortunately most companies have already implemented COSO based Enterprise Risk Management (ERM) type systems for securities or financial audit compliance.

Video Presentation of this Report at: YouTube: https://youtu.be/Cg8T9C8nURs

This project funded through a generous gift from an anonymous corporation

Contact
Dr. John Spink
517-381-4491
FoodFraudPrevention.com

© 2017

Before starting it is critical to clarify that addressing Food Fraud does NOT create NEW risks. Addressing Food Fraud proactively identifies a COSO-defined 'inherent risk' that is already present – which, regardless of knowledge, the Board and C-Suite are accountable for – so they can be prevented or mitigated. The options are to (1) ignore the risk and hope for the best or to (2) implement Food Fraud Prevention Strategy. Not being proactive can destroy a company and be a felony crime.

1. Introduction

Food Fraud *– deception for economic gain using food – is an important food industry issue that is urgently being addressed* [1]. There are new compliance requirements for government regulations and industry standards including the ***Food Safety Modernization Act*** (FSMA), the new ***Chinese Food Safety Law***, and the industry-led ***Global Food Safety Initiative*** (GFSI). There are new risk assessment methods since traditional Food Safety or Food Defense assessments are ill-fitting tools and often only address human hazard issues and based on risks that have already occurred. There are a variety of activities or products that address one or several parts of Food Fraud prevention but there was a missing link to an enterprise-wide, resource-allocation decision-making assessment system. Current risk- or vulnerability-assessments result in a conclusion (e.g., "high") that is not correlated to any other portfolio-wide risks (e.g., is this "high" equal to another "high" risk?). The Council of Sponsoring Organizations of the Treadway Commission (COSO) developed Enterprise Risk Management (ERM) which is applicable as a risk management tool since it is already developed, widely implemented, and provides a method to assess Food Fraud holistically against other vulnerabilities [2].

2. Introduction/ research justification

Specifically the *research justification* was to present an overview and foundation for applying business decision-making and business risk assessment to Food Fraud prevention. There was a need to create a central document to explain the risk of Food Fraud and how the Food Fraud Vulnerability Assessment (FFVA) and Food Fraud Prevention Strategy (FFPS) were strengthened by applying Enterprise Risk Management.

3. Enterprise Risk Management (ERM/COSO)

For Food Fraud resource-allocation decision-making a specialized enterprise-wide assessment method is needed rather than traditional financial account practices such as "return-on-investment" (ROI). While fraud or risk reducing activities are expected to benefit the business, ROI is an ill-fitting tool to conduct the assessment. Technically, ROI -- also referred to in accounting textbooks as "rate-of-return" -- is *earnings* divided by the *investment*. Since a risk reducing activity helps sustain or grow a business this technically generates zero *earnings*. Risks such as Food Fraud can be evaluated and managed across the enterprise by the widely adopted COSO concept of Enterprise Risk Management (ERM).

3.1. COSO Overview

COSO – the Committee of Sponsoring Organizations of the Treadway Commission – was organized in 1985 by five major accounting and auditing professional associations to address the increasingly complex regulatory and financial reporting requirements [2]. COSO focuses on three interrelated subjects of enterprise risk management (ERM), internal control, and fraud deterrence. In 1992 COSO published the ***Internal Control–Integrated Framework*** and then in 2004 issued ***Enterprise Risk Management–Integrated Framework***. The 2013 *Internal Control–Integrated Framework* update was led for COSO by PwC [3, 4].

© 2017

The COSO *Internal Control–Integrated Framework* is currently being updated for:

(i) clarifying requirements for effective internal control,
(ii) addressing changes in business (e.g., globalization, use and dependence on technology, complexity) that introduce or elevate risk of achieving entity objectives, and
(iii) encouraging users to apply internal control to additional entity objectives (such as regulatory reporting, operations and compliance) [5].

One major focus of COSO and ERM is to support the Securities Industry's regulatory compliance requirements (e.g. US Securities and Exchange Commission or SEC) and more specifically the Sarbanes-Oxley (SOX) Act Section 404 [6, 7]. As background, in 2002, President George W. Bush signed the SOX into law. SOX "mandated a number of reforms to enhance corporate responsibility, enhance financial disclosures and combat corporate and accounting fraud, and also created the 'Public Company Accounting Oversight Board' (PCAOB)"[7]. This is often also applied to private companies where investors often require SOX-type reporting. COSO created the internal controls framework to provide a method, structure, and a harmonized approach to this type of compliance. The SEC has made statements that the COSO framework "…satisfies the SEC's requirement to use a suitable, recognized framework" [8].

3.2. ERM Overview

Enterprise Risk Management (ERM) is a process to assist resource-allocation decision-making "…designed to identify potential events that may affect the entity, and manage risk to be within the risk appetite, to provide reasonable assurance regarding the achievement of entity objectives." [3] An ***enterprise*** can be a company or a country. The concept of "risk appetite" applies – but in often very different application – to industry, government-owned companies, and to governments (see Figure1). This also applies differently to government agencies and the government legislative branch. Each has its own set of criteria that define the goals of the enterprise including the acceptable level of risk.

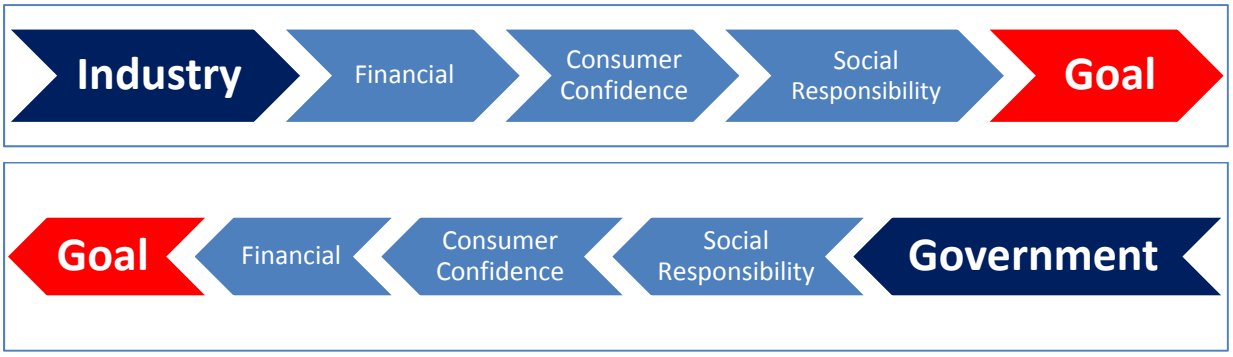


Figure 1: Hierarchy of Objectives for Industry and Government

© 2017

The ***COSO Cube*** is an effective visual to demonstrate how the breadth and organization of the activities (see Figure 2). The COSO cube presents many ***principles*** that are needed for assessing enterprise-wide Food Fraud vulnerabilities such that a ***Risk Assessment*** across the entry-level, division, business unit, and function. This provides a method and structure for Food Fraud assessments including the control activities, risk assessment, information communication, monitoring activities, and reporting.

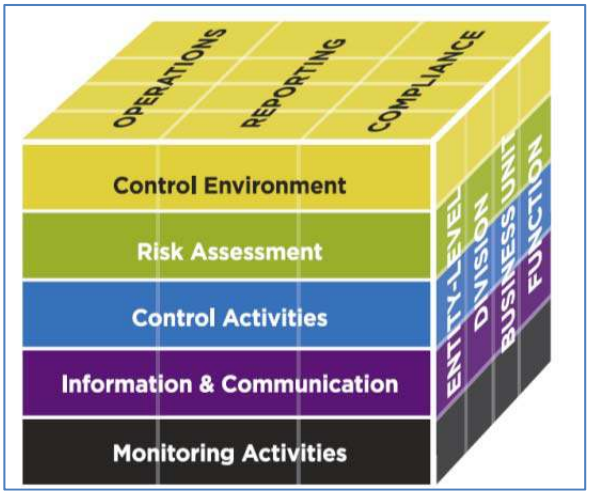
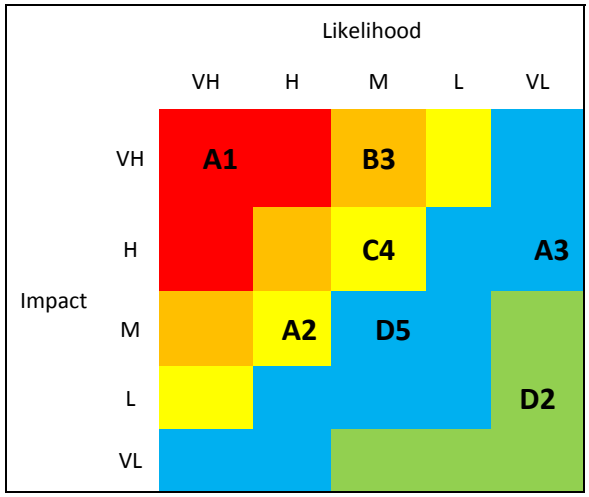


Figure 2: The COSO Internal Control – Integrated Framework Demonstrating the Relationship of the Fundamental Concepts ("the COSO Cube")

3.3. Risk Appetite Overview

In ***Understanding Risk Appetite,*** COSO defines the ***risk appetite*** as "the amount of risk, on a broad level, an organization is willing to accept in pursuit of value" [9]. There is no "right" assessment and enterprises "…must make choices in setting risk appetite, understanding the trade-offs involved in having higher or lower risk appetites" [9]. The *risk appetite* will adapt to market and business model changes in relation to the goals and objectives of the Board of Directors.

To review, the Board of Directors represents the investors in the company. The investors have expectation for the principle they have invested (***principle at risk***). E.g., investing in a start-up company has very different expectations for risk and reward than investing in a Fortune 500 company.



Risk Appetite – presented on a ***Corporate Risk Map*** (see Figure 3) – is the linchpin for *Enterprise Risk Management*. Aggregation of risk into one matrix provides an enterprise-wide view of the overall risk portfolio. All enterprise-wide risks are reviewed in a *portfolio manner* allowing the review and balance of risks to meet the overall objectives. While there may not initially be an analytical or quantitative determination of an emerging or new risk, ERM provides a method to assess the considerations affecting the *risk appetite*. Optimizing the *risk appetite* – as executed by ERM – optimizes the business performance and expectation of the Board of Directors by balancing risk and rewards "in a more integrated and dynamic fashion." Key benefits that apply to Food Fraud prevention are that is it an "integrated" and "dynamic" process.

Figure 3: Corporate Risk Map Plotting Food Fraud Initial Screening Risk Assessments [10]

© 2017

Directly applying ERM to the ***Food Fraud Prevention Strategy*** creates a formal process of communicating and coordinating activities from the front-line activities with the Board-level goals. This is especially valuable since a 2011 COSO survey found that over half the respondents did not have a formal process for communicating risk appetite [11].

4. Food Fraud Overview

Food Fraud – including the US FDA defined ***Economically Motivated Adulteration*** (EMA), which covers only adulterant-substances – is "deception for economic gain using food" [1, 12-15]. All types of Food Fraud can lead to a recall, human health hazard and for a loss of consumer brand confidence. Food Fraud is a type of risk that applies to the ever more scrutinized securities or financial reporting regulatory requirement such as Sarbanes-Oxley [6]. Types of Food Fraud include adulterant-substances, theft, tampering, smuggling/ diversion, simulation, and intellectual property rights violations or counterfeiting [1, 12-15].

Food Fraud is a unique type of incident that occurs due to the motivation for a human perpetrator to avoid detection (specifically arrest or seizure of the product) and achieve financial gain. This unique motivation has different attributes than the traditional approach to assess Food Quality (unintentional, no health hazard), Food Safety (unintentional, health hazard), or Food Defense (intentional, intent to harm or cause terror) (see Figure 4).

Food Quality	**Food Fraud[1]**	Motivation: Economic Gain
Food Safety	**Food Defense[2]**	Motivation: Health Hazard, Economic Harm, or Terror
Unintentional	Intentional	

Figure 4: Food Risk Matrix [1]

Due to the different attributes than for other food risks, Food Fraud prevention requires a fundamentally different approach for prevention. It is true that for only analyzing food safety hazards – as has been argued by US FDA and others – that Food Fraud does not need a fundamentally different approach but that is only for assessing food safety health hazard. The goal of Food Fraud prevention is to reduce the fraud opportunity not just identify ***economically motivated food safety hazards***.

The core focus of Food Fraud prevention is on reducing the ***fraud opportunity***. Since the perpetrator is a human the fraud opportunity is understood by utilizing Social Science, Behavioral Sciences, and Criminology.[1] It is especially efficient to focus on prevention by understanding and adapting the *space*

[1] This includes adulterant-substances that would be defined by the US FDA in 2009 as economically motivated adulteration (FDA FRN 2009). Later in the FSMA Preventative Controls Rule, FDA narrowed their focus to incidents that only had a health hazard and expanded their "economically motivated" acts to include all types of fraud including stolen goods (see the FSMA Preventative Controls and the Intentional Adulteration Final Rules). Food Fraud acts that have only an economic threat would appear to be shifted by FDA to the Department of Justice and Federal Bureau of Investigation (FBI).

[2] The US FDA narrowed their focus in the FSMA Intentional Adulteration rule to only "wide spread [human] health hazards] and not include economic impacts or psychological terror. The overall terrorist countermeasures would appear be shifted from FDA to be under the US Department of Homeland Security and the US Department of Justice/ Federal Bureau of Investigations (FBI).

© 2017

of the crime to reduce the motivation. This crime prevention theory is based on ***Situational Crime Prevention***, ***Routine Activities Theory***, and ***Rational Choice Theory*** [1, 16-20].

Sidebar: The Role of the "Brand Protection Manager" in Food Fraud Prevention

Food Fraud sounds like a responsibility for food scientists or purchasing agents. Brand Protection mangers – usually focused on finished goods activities such as diversion, illegal re-packaging, expired or sub-standard product, and counterfeiting – often are not responsible for ingredients or more operational problems. Due to the nature of fraud that does not include ingredients or adulterant-substance, in many cases, the Brand Protection manger may be the first one to identify the threat as *product fraud*. They will probably be the first to recognize *preventative controls* that should be applied. Brand Protection managers have a unique skillset and experience that is critical to identifying, describing, and to help prevent or mitigate Food Fraud. Beyond FSMA, FDA has an expanding scope that covers cosmetics, personal care products, pet and animal food, tobacco, and alcohol so many "consumer products" Brand Protection managers are accountable for Food Fraud… *whether they know it or like it*.

5. ERM Into the Food Fraud Prevention

A Food Fraud prevention strategy involves an interdisciplinary approach that assesses the marketplace (Intelligence Analysis), considers the characteristics of the fraud opportunity (Criminology), assesses vulnerabilities, includes a monitoring system (Six Sigma, SARA process), as well as leverages a resource-allocation decision-making method such as Enterprise Risk Management (ERM) (see **Error! Reference source not found.**).

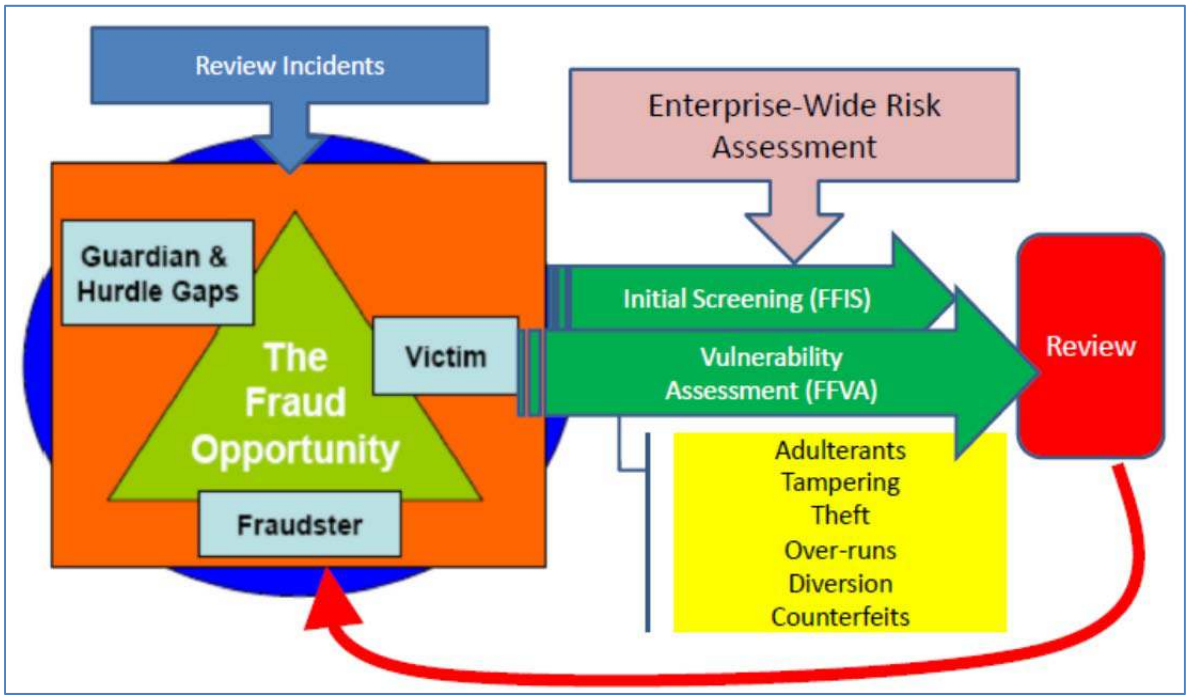


Figure 5: Food Fraud Prevention Strategy System [10]

© 2017

Without any of the steps in this process there is only a static assessment and no dynamic, self-correcting system. The *fraud opportunity* is based on Criminology theory where the goal is to reduce the factors that make a crime likely. The Food Fraud Initial Screening (FFIS) and Food Fraud Vulnerability Assessment (FFVA) – discussed in more detail later -- are based on risk science and more specifically COSO/ ERM [10, 13, 21, 22]. The overall systems-approach is consistent with ERM and quality management principles including root cause analysis [2, 23]. The overall enterprise-wide risk is summarized in a Corporate Risk Map (see Figure 5).

6. Criminal, Regulatory, and Civil Liability

Criminal federal felony charges are becoming more common for company leaders but also are being applied to all employees. Before getting into the regulatory or industry standard compliance issues it is important to clarify the criminal liability for company leaders and employees. In the food industry, this includes the recent application of the ***Park Doctrine*** within the ***Food, Drug & Cosmetics Act of 1938*** (FDCA) especially when there is illness and death. This is well-known especially considering Federal felony indictments and prison sentences for the leaders of the Peanut Corporation of America – federal felony prison sentence ranged from 5 to 28 years), and the owners of Jensen Farms (pleaded guilty to Federal felony charges), and the US Department of Justice statements of the focus on food crimes.

Less well-known are the wide-range of criminal laws that apply to incidents that do not need to include illness, death, or even a health hazard. There is a wide range of commercial or securities (financial) laws that apply when there is only knowledge of a crime. For example, 18 USC 545 for Smuggling includes a maximum of a felony 20-year sentence for each count. One smuggling incident could include 10 or more transactions that could be considered as 10 counts. ***Willful blindness***[3] – and even ignoring "*red flags*" can prove "*knowledge"* – and could lead to prosecution. Other related laws include conspiracy, mail and wire fraud, aiding and abetting, and others [24].

7. Laws, Regulations, Certifications, and Standards

Many countries strive for ***equivalency*** – where similar laws and regulations can lead to preferred trade and commerce status – with the US food laws. The core US food law is still the ***Food, Drug &Cosmetics Act of 1938*** (FDCA). The FDCA addresses all types of Food Fraud under the ***Adulterated Foods*** and ***Misbranded Foods*** sections. All types of Food Fraud – including products with no health hazard or no adulterant-substance – could be a violation, would be deemed unfit for commerce, and would require a recall. More recently, the US food law has expanded with the ***Food Safety Modernization Act of 2011*** (FSMA). The last of the seven final rules was published in May 2016. Food Fraud is addressed under the ***Economically Motivated Food Safety Hazards*** section of the ***Preventative Controls Rule*** (FSMA-PC). A health hazard is required for there to be a violation of FSMA. For example, the UK horsemeat Food Fraud did not have a health hazard so would not be a violation of FSMA. This product would still be illegal, unfit for commerce, and recalled under the FDCA *Adulterated Foods* section. Beyond the US food laws, there are other US government laws that are compliance requirements such as smuggling and truth-in-labelling. An ERM-type method could include all these compliance requirements in a Food Fraud Vulnerability Assessment and Food Fraud Prevention Plan (see Figure 6).

[3] From the National Association of Criminal Defense Lawyers: "Willful blindness, also known as conscious avoidance, is a judicially-made doctrine that expands the definition of knowledge to include closing one's eyes to the high probability a fact exists."

© 2017

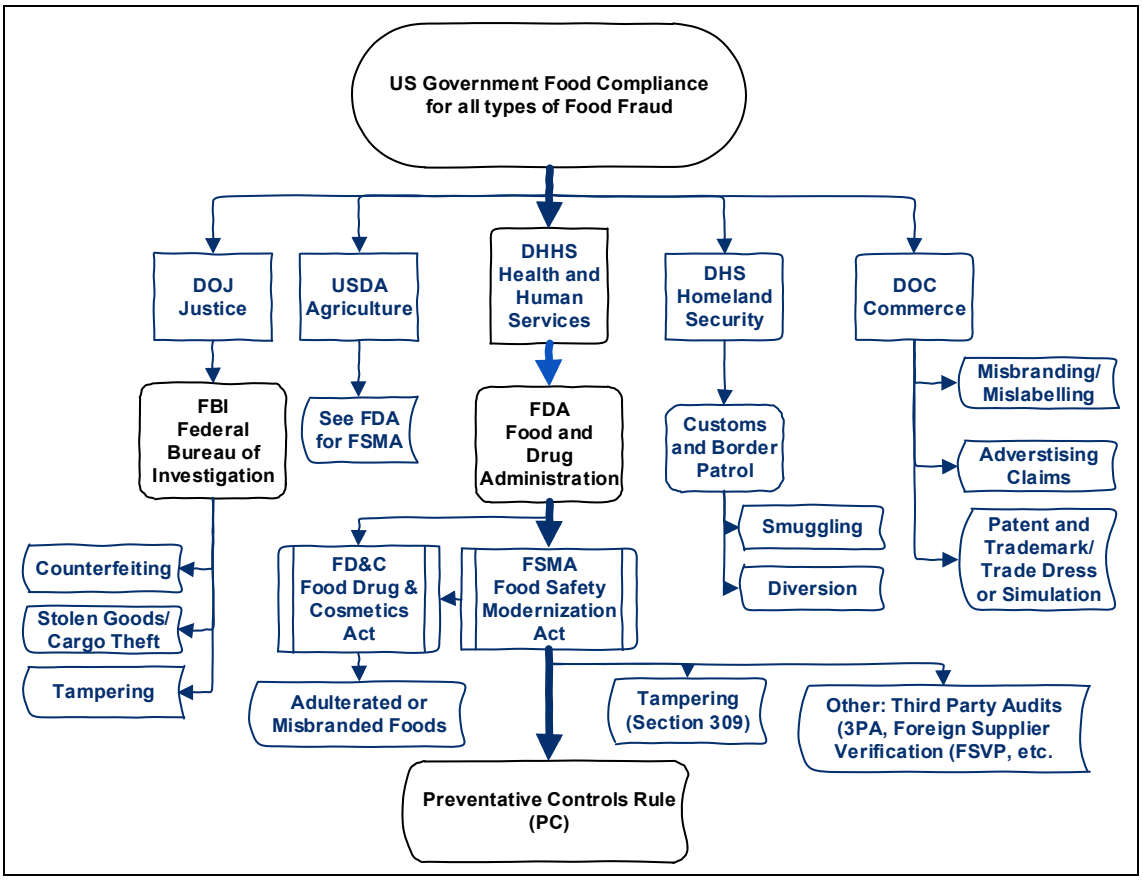


Figure 6: US Government Law Hierarchy of Compliance [25]

Addressing Food Fraud, with the necessary focus on prevention, is extremely challenging for government agencies that have been created and supported to focus on investigation, compliance, enforcement and prosecution. Several new or adjusted global Food Safety laws that address Food Fraud are very efficient for the government since they require *preventative controls* for <u>all</u> health hazards regardless of the source. By a government requiring "a" process – not prescribing a specific type of vulnerability assessment or risk treatment – the industry will be further encouraged to adopt common practices such as those suggested by GFSI. Just requiring "a" process will protect the supply chain, reinforce prevention, and also require fewer government resources.

8. Industry Certifications and Standards

8.1. GFSI Overview

Global Food Safety Initiative* (GFSI) *Food Safety Management System (FSMS) certification is widely adopted and essentially a prerequisite to conduct global business. The ***Consumer Goods Forum*** was created by the CEOs of consumer products companies. The food industry members created the *Global Food Safety Initiative* (GFSI) to create a centralized and harmonized *Food Safety Management System* (FSMS). Originally there were many similar – but different – food compliance requirements for many different countries. The food companies were required to conduct many repetitive and duplicative audits and certifications. The FSMS was intended to be one framework that provided equivalency for programs and audits that met a similar set of requirements.

© 2017

The GFSI is aware of, and is addressing, many challenges such as strengthening the value of the certification, expanding and training the auditors, communicating and educating small and micro producers, and considering new innovations such as addressing Food Fraud.

8.2. Food Fraud Implementation

In July 2012 the GFSI Board of Directors created a Food Fraud Think Tank to review this emerging risk and consider its application to the FSMS [13]. The final proposal noted that Food Fraud could cause a food safety hazard, and reducing food safety hazards was a core mission of GFSI. The scope covered all types of Food Fraud (e.g., beyond just adulterant-substances) and to vulnerabilities not just risks (e.g., situations that have the potential to cause a hazard not only known incidents). It is a key advance that GFSI addresses vulnerabilities since this emphasizes a proactive, quality management approach that seeks prevention (to eliminate root causes) not just mitigation (reduce the consequences of an incident). This differentiation between prevention and mitigation is consistent with control systems such as the International Standards Organization work on product fraud and corporate security [26, 27]. In January 2014 GFSI published the Food Fraud Position Paper [13]. In February 2016 the final draft of the GFSI requirements--Issue 7 was distributed for review [28]. The final version is due to publish in October 2016 and required to be required for full compliance one year later. The new GFSI Food Fraud requirements include:

- Conduct a Food Fraud Vulnerability Assessment for all types of fraud and for all ingredients and finished goods
- Develop a Food Fraud Prevention Plan including an update process covering the entire company

8.3. GFSI Certification Progress including BRC and SSAFE

After GFSI published the ***Food Fraud Position Paper***, but before the first draft of the GFSI Issue 7 was published, scheme owners and others released Food Fraud related documents. For example, BRC – a scheme owner or standards creating body – created their own Issue 7 that expanded to cover the GFSI Food Fraud scope. Also, the SSAFE Organization (formerly known as Safe Supply of Affordable Food Everywhere), which includes five board member companies who are also GFSI Board members, created *Food Fraud Vulnerability Assessment* (FFVA) guidance. The tool was automated and provided for free by the PwC consultancy [29]. SSAFE and GFSI are closely tied and the GFSI Position paper stated:

> "The GFSI Board will support SSAFE's initiative which aims to develop and publish practical guidelines for companies on 'how' to assess and control food fraud vulnerabilities within their organizations and supply chains. SSAFE is working to have these guidelines available before the release of Version 7 of the Guidance Document, so that companies and scheme owners can prepare their organisations before the new requirements are effective"[13].

Considering COSO or ERM terminology, the first of the two stage process is an initial screening (FFIS) which is "…followed by a more quantitative analysis of the most important risks [30]. In support of the FFVA work, we published in Food Control Journal the ***Introducing the Food Fraud Initial Screening Tool*** (FFIS) article [10].

GFSI certification is so widely required that it is essentially required for the food industry to conduct global business. Addressing Food Fraud is a requirement of GFSI certification. The GFSI has provided guidance through their *Food Fraud Position Paper* and the SSAFE *Food Fraud Vulnerability Assessment*.

© 2017

9. Call to Action

There are many ways that a new, emerging, or evolving risk can be identified and added to the Enterprise Risk Management system. Food Fraud is an emerging risk that is often overlooked since it does not fit specifically into current programs or processes. This report presented an overview of how different business functions can and should communicate the risk.

It is critical that suspicious Food Fraud activity – whether health hazards or commercial fraud – be addressed within a company. It is critical that the risk or vulnerability be communicated internally and that countermeasures or control systems be put in place.

The figure below identifies that each and every employee of a company has valid and critical role in identifying and communicating the risk (see **Figure 7**). ERM is at the center since it provides for a system to report concerns with the goal of a routine process and to rely less on a *whistle-blower* system. Once identified and elevated into the ERM system, the enterprise can determine the optimal, unique countermeasures and control systems. Each *Food Fraud Prevention Strategy* will be unique for each enterprise since there is a unique *fraud opportunity* and unique *risk appetite*.

Figure 7: Connections of Business Functions to Enterprise Risk Management

. This report identifies and defines the importance of a system to proactively seek out and address Food Fraud vulnerabilities. Regardless of whether the initial identification of a risk comes from a front-line food safety employee or a CFO, there is a method to systematically implement the resource-allocation decision-making process.

© 2017

10. Next Step

Food Fraud is a regulatory or standards compliance requirement for health hazards and securities reporting. Not addressing Food Fraud can lead to costly recalls, drastic losses in consumer confidence, or even federal felony criminal liability for company leaders and for employees. In 2016, the US Department of Justice has publically stated many times their emphasis and focus on food crimes. Beyond intentional deceit, it has been proven that "willful blindness" or even ignorance is not a defense. Food Fraud is a known risk and vulnerability. It is expected that enterprises have knowledge of, and address, Food Fraud issues.

The Next Steps or Call to Action is (Figure 8):

1. ***Develop a corporate-level policy*** to address Food Fraud compliance with food and commerce laws as well as industry standards.
2. ***Create and implement a Food Fraud Vulnerably Assessment*** that is integrated with resource-allocation decision-making systems such as Enterprise Risk Management.
3. ***Create and Implement Food Fraud Prevention Strategy***
4. ***Support with a Food Fraud Management System*** that utilizes a wide-range of current or new company intelligence to understand and monitor the evolving fraud opportunity.
5. ***Integrate with current enterprise-wide fraud surveillance*** processes that enlists all employees, regardless of their job function or level, to identify new or evolving fraud opportunities. This reporting system should reinforce action, include an assessment or filtering system, and connect ERM to Food Fraud prevention plan.

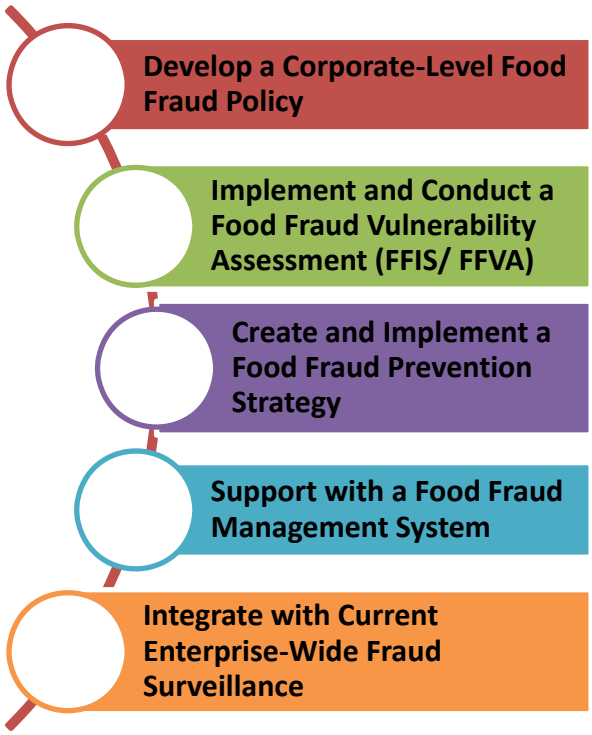


Figure 8: Call to Action for Initiating, Implementing, and Managing a Food Fraud Prevention Strategy

This report was created to give each and every employee – regardless job function or level – the confidence to report suspicious activity. The goal was also to provide the awareness of how the front-line fraud opportunities connect all the way up to Board level ERM… and to give C-Suite leaders the method for ERM-type insights to be applied all the way to the front-line.

11. ACKNOWLEDGMENTS

This research was made possible through a generous gift sponsorship from an anonymous corporation.

12. About the Author

This report was led by Director & Assistant Professor Dr. John Spink (www.FoodFraudPrevention.com). Note: Our team conducts a wide range of teaching, research and outreach projects. The Food Fraud Insight Report series ("FFI Report" or FFIR) series was created to review specific emerging topics or recent laws, regulations, certifications, standards, or best practices. The summary and insight is not legal advice and is not intended to replace the counsel of a food law expert.

© 2017

13. REFERENCE

1. Spink, J. and D.C. Moyer, *Defining the Public Health Threat of Food Fraud.* Journal of Food Science, 2011. **76**(9): p. R157-162.
2. COSO, . Committee of Sponsoring Organizations of the Treadway Commission. *Home Page*. 2014 [cited 2014 September 5]; Available from: http://coso.org/.
3. COSO, Committee of Sponsoring Organizations of the Treadway Commission, *Internal Controls – Integrated Framework, URL: http://www.coso.org/documents/990025P_Executive_Summary_final_may20_e.pdf.* 2013.
4. COSO, Committee of Sponsoring Organizations of the Treadway Commission, *COSO Enterprise Risk Management-Integrated Framework Update, URL: http://www.coso.org/ermupdate.html.* 2014.
5. PwC, PriceWaterhouseCoopers, *Committee of Sponsoring Organizations of the Treadway Commission (COSO), Key developments within the COSO Framework, URL: http://www.pwc.com/us/en/cfodirect/standard-setters/coso.html.* 2014.
6. McNally, J.S., *The 2013 COSO Framework & SOX Compliance, Strategic Finance, June 2013, pages 1-8, URL: http://www.coso.org/documents/coso%20mcnallytransition%20article-final%20coso%20version%20proof_5-31-13.pdf.* 2013.
7. SEC, US Securities and Exchange Commission, *The Laws That Govern the Securities Industry, URL: https://www.sec.gov/about/laws.shtml.* 2013.
8. PwC, PriceWaterhouseCoopers, *COSO Principles – a deeper dive, January 14, 2014, quoting "Center for Audit Quality's SEC Regulations Committee".* 2014.
9. COSO, Committee of Sponsoring Organizations of the Treadway Commission, *Understanding and Communicating Risk Appetite, Edited by :Larry Rittenberg and Frank Martens, January 2012.* 2012.
10. Spink, J., D.C. Moyer, and C. Speier-Pero, *Introducing the Food Fraud Initial Screening model (FFIS).* Food Control, 2016. **69**: p. 306-314.
11. Towers, Watson and Willis LP, *2011 Risk and Finance Manager Survey, Full Report, .* 2011.
12. EC, European Commissino, *On the food crisis, fraud in the food chain and the control thereof*. 2014.
13. GFSI, Global Food Safety Initiative, *GFSI Position on Mitigating the Public Health Risk of Food Fraud*. 2014, Global Food Safety Initiative, Consumer Goods Forum.
14. Chen, J., *Strategies for Ensuring Food Safety of Chinese Products -- Fight Against Food Fraud, Chinese National Center for Food Safety Risk Assessment (CFSA),* , in *Annual Conference*. 2015, Institute of Food Technologists (IFT).
15. Wu, Y., *China Regulation and Perspectives to Address Food Fraud and Non-Food Ingredient Adulterants, Chinese National Center for Food Safety Risk Assessment (CFSA)*, in *Annual Conference*. 2015, Food Safety Summit: Baltimore, Maryland, USA.
16. Felson, M. and R. Boba, *Crime and Everyday Life, 4th edn Sage Publications.* 2010.
17. Cohen, L.E. and M. Felson, *Social change and crime rate trends: A routine activity approach*. 1979, American Sociological Association. p. 588-608.
18. Clarke, R.V. and J.E. Eck, *Crime analysis for problem solvers.* Washington, DC: Center for Problem Oriented Policing, 2005.
19. Clarke, R.V., *Situational Crime Prevention, Chapter 1. Introduction*, in *Situational Crime Prevention*, Ronald V. Clarke, Editor. 1997, Harrow and Heston Publishers: Guilderland, NY.

© 2017

20. Huisman, W. and J. van Erp, *Opportunities for Environmental Crime A Test of Situational Crime Prevention Theory.* British Journal of Criminology, 2013: p. azt036.
21. SSAFE Organization, *Food Fraud Vulnerability Assessment Tool, (formerly : Safe Secure and Affordable Food For Everyone organization), December 16 2015, URL: http://www.ssafe-food.org/.* 2015.
22. PwC, PriceWaterhouseCoopers, *Food fraud vulnerability assessment, Online Tool, Produced with SSAFE Organization, http://www.pwc.com/gx/en/food-supply-integrity-services/publications/food-fraud-vulnerability-assessment.pdf.* 2016.
23. Lipscomb, B. and A. Lewis, *The Principles of Six Sigma: Building a Quality Claims Management Program.* Risk Management, 2004. **51**(2): p. 30.
24. NACDL, National Association of Criminal Defense Lawyers, *Willfull Blindness Homepage (Additional Resources), URL: https://www.nacdl.org/criminaldefense.aspx?id=21211.* 2016.
25. Spink, J., D. Moyer, N. Fortin, Y. Wu, and J. Yang, *(IN PRESS) Food Fraud Prevention, Policy, Strategy, and Decision-Making with a Recommendation for a Government Agency, CHIMIA International Journal for Chemistry, Volume 00, Number 00, Page 00-00. (ISI NA; JCR Impact Factor 1.349) [Invited, Accepted Minor Revisions, January 2016, In Press April 2016].* 2016.
26. ISO, International Standards Organization, (2011). *ISO 12931 - Performance criteria for authentication solutions for anti-counterfeiting in the field of material goods*. 2011 [cited 2012; Available from: http://www.iso.org/iso/catalogue_detail.htm?csnumber=52210.
27. ISO, International Standards Organization (2009). ISO/TC247/US TAG, *Notes from ISO/TC247-US TAG meeting 8/19/2009*, John Spink, Editor. 2009: Denver, Colorado.
28. GFSI, Global Food Safety Initiative, *Issue 7 - Final Draft for Comments, GFSI, www.myGFSI.org.* 2016.
29. PwC, PriceWaterhouseCoopers, *Food Fraud Home Page, http://www.pwc.com/gx/en/services/food-supply-integrity-services/publications/food-fraud.html.* 2016.
30. COSO, Committee of Sponsoring Organizations of the Treadway Commission, *Risk Assessment in Practice*. 2012, Committee of Sponsoring Organizations of the Treadway Commission, COSO.

© 2017