

Afterword

If this book is successful, then at this point, the path forward is completely logical... common sense... and so obvious that it is ridiculous that a book was even published on the topic.

A note to other professors and instructors: We are very happy to collaborate on projects or course development. Please contact us through social media.

Afterword: Food Fraud Compliance—A Roadmap Summary (Fig. 1) (MSU-FFI 2018):

Title: Review—Trade Journal Articles on Food Fraud Compliance Requirements for GFSI, FSMA, and Sarbanes-Oxley

By John Spink • February 23, 2017 • Blog

Are you compliant with the current and pending regulatory and standards requirements to address “all” types of food fraud and “all” products? Probably not... but there are fairly simple steps to get started. Our MSU FFI team just published two trade journal articles that summarize numerous peer-reviewed, refereed scholarly journal articles. MSU’s Dr. Doug Moyer is a co-author on both articles.

Overview

Food Fraud is beginning to be understood as a unique food risk. Industry is shifting focus to Food Fraud Vulnerability Assessments requirements and creating a Food Fraud Prevention Strategy. Full compliance requires addressing all types of Food Fraud (e.g., stolen goods and counterfeits) as well as all products, (e.g., incoming goods and outgoing or finished goods.) Also, the vulnerability assessment must cover all of your products, but not necessarily an individual assessment for “each” product.

It is important to realize that implementing separate plans for food safety, Food Fraud, and Food Defense plan does not triple the work—splitting up the tasks into three steps reduces the overall complexity.



Fig. 1 Blog post image. (Copyright Permission Granted)

Combining the key points from the series of articles:

- **7 Questions:** “Food Fraud Compliance Requirements — The general compliance requirements for Food Fraud prevention are:
 1. Conduct a Food Fraud Vulnerability Assessment
 2. Confirm it is written
 3. Implement a written Food Fraud Prevention Strategy
 4. Confirm it is written
 5. Minimally conduct an annual Food Fraud Incident Review
 6. Address all types of Food Fraud
 7. Address all products from both incoming goods (e.g., ingredients) and outgoing goods (e.g., finished goods) through to the consumer.”
 8. Plus: Who is “accountable” for Food Fraud compliance (or blamed if there is a fail)? Do they know they are accountable?
 9. Plus: Who is “responsible” for managing the Food Fraud strategy? Do they know they are responsible?”
- **2 Concepts:** “The first steps include:
 1. Convene a Food Fraud Task Force—this is the group to start the review and others may take over the ongoing management

2. Create an Enterprise-wide Food Fraud Policy/Mission Statement—also begin drafting a Food Fraud Prevention Strategy—the key is to “start,” not necessarily finish or wait for the final approval of the corporate level policy/mission”
- **7 Steps:** “for a Food Fraud Task Force project—developing the proposal for a strategy
 1. Convene a Food Fraud Task Force
 2. Create an Enterprise-wide Food Fraud Policy/Mission Statement and begin drafting a Food Fraud Prevention Strategy/ Plan
 3. Conduct the pre-filter Food Fraud Initial Screening (FFIS)
 4. Review additional needs including additional information or a more detailed Food Fraud Vulnerability Assessment (FFVA)
 5. Review specific Food Fraud vulnerabilities in an enterprise risk map (Enterprise Risk Management)
 6. Consider countermeasures and control systems to address the ‘very high’ and ‘high’ vulnerabilities
 7. Propose a Food Fraud Prevention Strategy including the calibration of the Food Fraud risks on the enterprise risk map”
 - **1 Decision: Decision, Approval, and Implementation:** The Food Fraud Task Force project proposal is intended to be a full and formal recommendation of the optimal Food Fraud Prevention Strategy for your enterprise:
 1. Formal Project request from an Executive sponsor
 2. Review by the Executive sponsor
 3. Decision by the Executive sponsor

At the end of this process, if there is either (1) no request for a formal proposal or (2) no approval of a new project or strategy, then the decision is to maintain the status quo. No decision is a decision.

Upon deeper review, the requirements are clear for the scope and timing of a Food Fraud Vulnerability Assessment and a Food Fraud Prevention Strategy. That said, there is a steep adoption curve that most companies are just now approaching. This may seem like a daunting and complex task, but fortunately, there are guidelines, summaries, research, and best practices to help the industry to navigate the various requirements and expectations in order to fully realize an effective Food Fraud Prevention Strategy.

Reference

MSU-FFI, Food Fraud Initiative. (2018). *Blog series, food fraud initiative*. Michigan State University, developed and presented by John Spink. URL: www.FoodFraud.msu.edu/Blog/

Glossary

- A detailed glossary of terms is constantly changing. It is recommended to see the latest Food Fraud Terminology Glossary on the Michigan State University Food Fraud Initiative Website at (MSU-FFI 2018): www.FoodFraudPrevention.com

Further Reading

This section provides recommendations for further reading that are not by the author of this book. These are also not focused on specifically food fraud or food authenticity.

Ten Recommended Readings: Reports by Government or Association

There are several key reports by governments or associations that provide foundational insight or shaped the early FF research:

1. OECD, organisation for Economic Co-operation and Development, *Estimating the magnitude of counterfeiting and piracy, in OECD, The Economic Impact of Counterfeiting and Piracy, OECD Publishing, Paris, URL (full text): <http://dx.doi.org.proxy2.cl.msu.edu/10.1787/9789264045521-5-en>*. 2007: OECD Publishing. (OECD 2007)
2. Clarke, Ronald, V and John E Eck, *Crime analysis for problem solvers in 60 Small Steps*. Washington, DC: Center for Problem Oriented Policing, 2005. (Clarke and Eck 2005)
3. FDA, Food and Drug Administration, *Combating Counterfeit Drugs*, U.S. Food and Drug Administration, Editor. 2004. (FDA 2004)
4. CRS, Congressional Research Service, *Food Fraud and Economically Motivated Adulteration*. 2014. (CRS 2014)
5. DEFRA, United Kingdom Department for Environment, Food & Rural Affairs, *Elliott review into the integrity and assurance of food supply networks, Independent report, Ref: PB14089, PDF, 539 KB, 84 pages, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/350726/elliott-review-final-report-july2014.pdf*. 2014. (DEFRA 2014)
6. EC, European Commission, *On the food crisis, fraud in the food chain and the control thereof*. 2014. (EC 2014)
7. GFSI, Global Food Safety Initiative, *Food Fraud Technical Document, Tackling Food Fraud through Food Safety Management Systems, May 9, 2018, URL: http://www.mygfsi.com/files/Technical_Documents/201805-food-fraud-technical-document-final.pdf*. 2018. & GFSI, Global Food Safety Initiative., *GFSI Position on Mitigating the Public Health Risk of Food Fraud*. 2014, Global Food Safety Initiative, Consumer Goods Forum. (GFSI 2014, 2018)

8. COSO, Committee of Sponsoring Organizations of the Treadway Commission, *Risk Assessment in Practice - Enterprise Risk Management*. 2012, Committee of Sponsoring Organizations of the Treadway Commission, COSO. (COSO 2012)
9. Dietrich, Ed, Erik Puskar, Andy Grace, Mary Ann Allen, and George Schmitt, *Considering RFID for Use in the Fight Against Counterfeiting*, in *Emerging Technology Overview, Presented by the CACP's Technology Task Force*. 2006, Coalition Against Counterfeiting and Piracy (CACP), U.S. Chamber of Commerce. (Dietrich et al. 2006)
10. DOJ, United States Department of Justice *Prosecuting Intellectual Property Crime*. CCIPS, Criminal Division, 2006. **2007**. & 12. DOJ, Department of Justice, *DOJ, Prosecuting Intellectual Property Crimes Manual 2013, Fourth Edition, Published by the Office of Legal Education Executive Office for United States Attorneys*, URL: https://www.justice.gov/sites/default/files/criminal-ccips/legacy/2015/03/26/prosecuting_ip_crimes_manual_2013.pdf. (DOJ 2006, 2013)

Ten Recommended Readings: Books Related to Product Fraud

There are several books that were key to shaping the thinking and direction in this book. The key books are listed here:

1. Naim, Moises, *Illicit: How Smugglers, Traffickers, and Copycats are Hijacking the Global Economy*. 2005, NY, NY: Doubleday. (Naim 2005)
2. Felson, M, *Crime and Everyday Life (3rd Edition)*. 2002: Thousand Oaks, CA: Sage Publications. (Felson 2002)
3. deKieffer, Donald, *Underground Economies and Illegal Imports: Business and Legal Strategies to Address Illegitimate Commerce*. 2010: Oxford University Press. (deKieffer 2010)
4. Hopkins, David M., Lewis T. Kontnik, and Mark T. Turnage, *Counterfeiting Exposed: How to Protect Your Brand and Market Share* 2003, Hoboken, New Jersey: John Wiley & Sons. 304. (Hopkins et al. 2003)
5. Phillips, Tim, *Knockoff: the deadly trade in counterfeit goods: the true story of the world's fastest growing crime wave*. 2005, London: Kogan Page. (Phillips 2005)
6. Fortin, Neal D., *Food regulation: law, science, policy, and practice*. 2009, Hoboken, NJ: Wiley. (Fortin 2009)
7. Wu, Yongning, Hong Miao, Bing Shao, Jing Zhang, J. Spink, and DC Moyer, *Food Fraud [Chinese Version]*, in *Food Safety in China - Past, Present, and Future: Science, Technology, Management and Regulation*, Joseph Jwu-shan Jen and Junshi Chen, Editors. 2016: Beijing. p. E. & Wu, Yongning, Miao Hong, Bing Shao, Jing Zhang, John Spink, and DC Moyer, *Chapter 15: Food Fraud [English Language]*, in *Food Safety in China - Past, Present, and Future:*,

- Science, Technology, Management and Regulation*, Joseph J Jen and Junshi Chen, Editors. 2017, Wiley-Blackwell Publishing. (Wu et al. 2016, 2017)
8. Eban, Katherine, *Dangerous Doses: How Counterfeiters are Contaminating America's Drug Supply*. 1st ed. 2005, NY, NY: Harcourt, Inc. (Eban 2005)
 9. Wilson, Bee, *Swindled: the dark history of food fraud, from poisoned candy to counterfeit coffee*. 2008: Princeton University Press. (Wilson 2008)
 10. Accum, Friedrich Christian A, *A treatise on adulterations of food, and culinary poisons*. 1820, London: Longman, Hurst, Rees, Orme, and Brown. (Accum 1820)

Ten Recommended Readings: Books Related to Business and Management

1. Porter, Michael E, *Competitive strategy: Techniques of industry and competitor analysis*. 1980, Free Press. (Porter 1980)
2. Porter, Michael E, *Competitive advantage: creating and sustaining superior performance*. 1985. 1985, New York: Free Press. (Porter 1985)
3. Kotler, Philip, *Kotler on marketing*. 2012: Simon and Schuster. (Kotler 2012)
4. Bowersox, Donald J, David J Closs, and Cooper MB, *Supply chain logistics management*. Vol. 2. 2002: McGraw-Hill New York, NY. (Bowersox et al. 2002)
5. Dye, Thomas R, *Understanding public policy (14th Edition)*. 2012: Prentice Hall Englewood Cliffs, NJ. (Dye 2012)
6. Stout, Martha, *The sociopath next door: the ruthless versus the rest of us*. 2005, New York: Broadway Books. (Stout 2005)
7. van Schendel, Willem and Itty Abraham, *Illicit Flows and Criminal Things: States, Borders, and the Other Side of Globalization*. 2005, Bloomington, IN.: Indiana University. (van Schendel and Abraham 2005)
8. Saviano, Roberto, *Gomorra: A Personal Journey into the Violent International Empire of Naples' Organized Crime System*, trans. Virginia Jewiss, New York: Farrar, Straus and Giroux, 2007. (Saviano 2007)
9. Freidman, Thomas, *The world is flat*. New York: Farrar, Straus and Giroux, 2005. 488. (Freidman 2005)
10. Peters, Tom, *Thriving on chaos*. Vol. 7. 1987: Alfred A. Knopf New York. (Peters 1987).

Recommended Readings: Key Journals Articles

1. Liang, Bryan A., *Fade to black: Importation and counterfeit drugs*. *American Journal of Law & Medicine*, 2006. **32**(2–3): p. 279–323. (Liang 2006)
2. deKieffer, Donald, *Trojan drugs: counterfeit and mislabeled pharmaceuticals in the legitimate market*. *American Journal of Law and Medicine*, 2006. **32**(2–3): p. 325–49. (deKieffer 2006)

3. Levi, Michael, *Organized fraud and organizing frauds: Unpacking research on networks and organization*. Criminology & Criminal Justice, 2008. **8**(4): p. 389–419. (Levi 2008)
4. Arrow, K. J., *Exposition of the theory of choice under uncertainty*. 1966, Springer. p. 253–269. (Arrow 1966)
5. Banaji, M. R., M. H. Bazerman, and D. Chugh, *How (un) ethical are you?* 2003. p. 56–65. (Banaji et al. 2003)
6. Green, Robert T. and Tasman Smith, *Executive Insights: Countering Brand Counterfeiters*, *Journal of International Marketing* v10 no4 p89-106 2002. *Journal of International Marketing* v10 no4 p89-106 2002, 2002. (Green and Smith 2002)
7. Cox, Anthony Louis, *What's Wrong with Risk Matrices?* 2008. p. 497–512. (Cox 2008)
8. Roth, Aleda V, Andy A Tsay, Madeleine E Pullman, and John V Gray, *Unraveling the Food Supply Chain: Strategic Insights from China and the 2007 Recalls*. *Journal of Supply Chain Management*, 2008. **44**(1): p. 22–40. (Roth et al. 2008)
9. Voss, M., D. Closs, R. Calantone, O. Helferich, and C. Speier, *The Role of Security in the Food Supplier Selection Decision*. *Journal of Business Logistics*, 2009. **30**(1): p. 127. (Voss et al. 2009)
10. Huisman, Wim, *Compliance and Corporate Crime Control*. *Encyclopedia of Criminology and Criminal Justice*, 2014: p. 488–496. (Huisman 2014)

References

- Accum, F., & Christian, A. (1820). *A treatise on adulterations of food, and culinary poisons*. London: Longman, Hurst, Rees, Orme, and Brown.
- Arrow, K. J. (1966). Exposition of the theory of choice under uncertainty, Springer. *Synthese*, *16*, 253–269.
- Banaji, M. R., Bazerman, M. H., & Chugh, D. (2003). How (un) ethical are you? *Harvard Business Review*, *81*, 56–65.
- Bowersox, D. J., Closs, D. J., & Cooper, M. B. (2002). *Supply chain logistics management*. New York, NY: McGraw-Hill.
- Clarke, R. V., & Eck, J. E. (2005). *Crime analysis for problem solvers in 60 Small Steps*. Washington, DC: Center for Problem Oriented Policing.
- COSO, Committee of Sponsoring Organizations of the Treadway Commission. (2012). *Risk assessment in practice - Enterprise risk management*. Committee of Sponsoring Organizations of the Treadway Commission, COSO.
- Cox, Anthony Louis (2008). What's wrong with risk matrices? *Risk Analysis*, *28*: 497–512.
- CRS, Congressional Research Service. (2014). *Food fraud and economically motivated adulteration*.
- DEFRA, United Kingdom Department for Environment, Food & Rural Affairs. (2014). *Elliott review into the integrity and assurance of food supply networks*. Independent report, Ref: PB14089, PDF, 539KB, 84 pages. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/350726/elliott-review-final-report-july2014.pdf

- deKieffer, D. (2006). Trojan drugs: Counterfeit and mislabeled pharmaceuticals in the legitimate market. *American Journal of Law and Medicine*, 32(2–3), 325–349.
- deKieffer, D. (2010). *Underground economies and illegal imports: Business and legal strategies to address illegitimate commerce*. Oxford Oxford, UK: University Press.
- Dietrich, E., Puskar, E., Grace, A., Ann Allen, M., & Schmitt, G. (2006). Considering RFID for Use in the Fight Against Counterfeiting. *Emerging Technology Overview, Presented by the CACP's Technology Task Force*. Coalition Against Counterfeiting and Piracy (CACP), U.S. Chamber of Commerce.
- DOJ, Department of Justice. (2013). *DOJ, Prosecuting Intellectual Property Crimes Manual 2013*, Fourth Edition. Published by the Office of Legal Education Executive Office for United States Attorney. URL: https://www.justice.gov/sites/default/files/criminal-ccips/legacy/2015/03/26/prosecuting_ip_crimes_manual_2013.pdf
- DOJ, United States Department of Justice. (2006). *Prosecuting Intellectual Property Crime CCIPS*. Criminal Division, 2007.
- Dye, T. R. (2012). *Understanding public policy* (14th ed.). Englewood Cliffs, NJ: Prentice Hall.
- Eban, K. (2005). *Dangerous doses: How counterfeiters are contaminating America's drug supply*. New York, NY: Harcourt, Inc.
- EC, European Commission. (2014). *On the food crisis, fraud in the food chain and the control thereof*.
- FDA, Food and Drug Administration. (2004). *Combating counterfeit drugs*. U.S. Food and Drug Administration.
- Felson, M. (2002). *Crime and everyday life* (3rd ed.). Thousand Oaks, CA: Sage Publications.
- Fortin, N. D. (2009). *Food regulation: Law, science, policy, and practice*. Hoboken, NJ: Wiley.
- Freidman, T. (2005). *The world is flat* (p. 488). New York: Farrar, Straus and Giroux.
- GFSI, Global Food Safety Initiative. (2018). *Food fraud technical document, tackling food fraud through food safety management systems*, May 9, 2018. URL: http://www.mygfsi.com/files/Technical_Documents/201805-food-fraud-technical-document-final.pdf
- GFSI, Global Food Safety Initiative. (2014). *GFSI position on mitigating the public health risk of food fraud*. Global Food Safety Initiative, Consumer Goods Forum.
- Green, R. T., & Smith, T. (2002). Executive insights: Countering brand counterfeiters. *Journal of International Marketing*, 10(4), 89–106.
- Hopkins, D. M., Kontnik, L. T., & Turnage, M. T. (2003). *Counterfeiting exposed: How to protect your brand and market share* Hoboken. New Jersey: Wiley.
- Huisman, W. (2014). Compliance and corporate crime control. In *Encyclopedia of criminology and criminal justice* (pp. 488–496). London: Springer.
- Kotler, P. (2012). *Kotler on marketing*. New York: Simon and Schuster.
- Levi, M. (2008). Organized fraud and organizing frauds: Unpacking research on networks and organization. *Criminology & Criminal Justice*, 8(4), 389–419.
- Liang, B. A. (2006). Fade to black: Importation and counterfeit drugs. *American Journal of Law & Medicine*, 32(2–3), 279–323.
- MSU-FFI, Food Fraud Initiative. (2018). *Food fraud and related terminology glossary*. Version 2, October 2018, Michigan State University, Food Fraud Initiative. URL: www.FoodFraud.msu.edu
- Naim, M. (2005). *Illicit: How smugglers, traffickers, and copycats are hijacking the global economy*. New York, NY: Doubleday.
- OECD, Organisation for Economic Co-operation and Development. (2007). *Estimating the magnitude of counterfeiting and piracy, in OECD*. The Economic Impact of Counterfeiting and Piracy, OECD Publishing, Paris. URL (full text): <http://dx.doi.org.proxy2.cl.msu.edu/10.1787/9789264045521-5-en>, OECD Publishing.
- Peters, T. (1987). *Thriving on chaos*. New York: Alfred A. Knopf.
- Phillips, T. (2005). *Knockoff: The deadly trade in counterfeit goods : The true story of the world's fastest growing crime wave*. London: Kogan Page.
- Porter, M. E. (1980). *Competitive strategy: Techniques of industry and competitor analysis*. New York: Free Press.

- Porter, M. E. (1985). *Competitive advantage: Creating and sustaining superior performance* (p. 1985). New York: Free Press.
- Roth, A. V., Tsay, A. A., Pullman, M. E., & Gray, J. V. (2008). Unraveling the food supply chain: Strategic insights from China and the 2007 recalls. *Journal of Supply Chain Management*, 44(1), 22–40.
- Saviano, R. (2007). *Gomorra: A personal journey into the violent international empire of Naples' organized crime system*, trans. Virginia Jewiss, New York: Farrar, Straus and Giroux.
- Stout, M. (2005). *The sociopath next door: The ruthless versus the rest of us*. New York: Broadway Books.
- van Schendel, W., & Abraham, I. (2005). *Illicit flows and criminal things: States, borders, and the other side of globalization*. Bloomington, IN: Indiana University.
- Voss, M. D., Closs, D. J., Calantone, R. J., Helferich, O. K., & Speier-Pero, C. (2009). The role of security in the food supplier selection decision. *Journal of Business Logistics*, 30(1), 127.
- Wilson, B. (2008). *Swindled: The dark history of food fraud, from poisoned candy to counterfeit coffee*. Princeton, NJ: Princeton University Press.
- Wu, Y., Hong, M., Shao, B., Zhang, J., Spink, J., & Moyer, D. C. (2017). Chapter 15: Food fraud [English Language]. In J. J. Jen & J. Chen (Eds.), *Food safety in China - Past, present, and future: Science, technology, management and regulation* (p. 1). New York: Wiley.
- Wu, Y., Miao, H., Shao, B., Zhang, J., Spink, J., & Moyer, D. C. (2016). Food fraud [Chinese Version]. In J. J.-S. Jen & J. Chen (Eds.), *Food safety in China - Past, present, and future: Science, technology, management and regulation*. Beijing: CSP Books.

Appendix

Appendix: Public Policy History and Status

Excerpt from food fraud public policy development article (Spink et al. 2019): This appendix is an expanded review of the key agenda setting activities or events that advanced the public policy-making. This is an expansion of the topics noted in the text above (for detailed citations of the quoted text, see the original publication (Spink et al. 2019)).

2009—USA—Defining Economically Motivated Adulteration: As mentioned earlier, in May 2009, the US Food and Drug Administration (FDA) conducted a Public Meeting on Economically Motivated Adulteration (EMA) that applied to all products they regulate including medicines, food, food ingredients, dietary supplements, medical devices, and others. Due to this broad scope, the FDA defined EMA addresses more than just food. At the same time, FDA’s EMA scope was narrowed to only a “substance” for “economic gain” and not the broader “Adulterated Foods” concept in the Food, Drug, and Cosmetics Act (21 USC §331 2008; FDA, 2009). The FDA meeting emphasized that beyond an adulterant-substance, the FD&C defines “Adulterated Foods” to include goods that are stolen, smuggled, genuine but expired, genuine but spoiled, or others. To note, the FDCA defines “Misbranded Foods” as a separate concept (21 U.S.C. 362 2011). Thus, there is confusion where an “Adulterated Food” may not include an *adulterant-substance* or may not be food fraud in the case of *genuine spoiled* goods. Other FDA groups, such as medicines, have had a more precise focus on product counterfeiting or stolen goods. The formal regulatory “Adulterated Products” definition is not common across all FDA products, so the concept could not be implemented uniformly across FDA. There were also other confusing points such as EMA being a common abbreviation in medicines regulation referring to the EU

European Medicines Agency. Using EMA for all products would be as confusing as the food industry using “FDA” as an abbreviation for an entity other than a food and drug administration. Regardless of the debates, EMA of food was explicitly defined by the GAO and CRS to be on the FDA public policy agenda.

2009—ISO—ISO Technical Committee 247 Fraud Countermeasures and Controls: Expanding from US standards that focused on anti-counterfeiting, the American National Standards Institute (ANSI) proposed and led the International Standards Organization (ISO) Technical Committee 247 Fraud Countermeasures and Controls (TC247). This focused on a range of counterfeiting for fraud including currency, tax stamps, identify documents, and product fraud including product counterfeiting. In 2015 TC247 was moved into the Technical Committee 292 Security Management and Resilience. The standards that have been adopted—or are in final approval stages—include interoperability of authentication features, analysis of product fraud incidents, and definitions.

2011—USA—Food Safety Modernization Act (FSMA) Law: This new statute has over 70 mentions of “prevent” or “prevention” and 11 mentions of “intentional adulteration” (FDA 2011). EMA was shifted from the FSMA Intentional Adulteration rule to the FSMA Preventive Controls rule (FSMA-PC, or PC). The Intentional Adulteration section (FSMA-IA or IA) was later defined to be only essentially “catastrophic events” such as terrorist attacks. This shift of the rule is consistent with the text of the original law published in the US Code. Regardless of the EMA or food fraud terms not specifically mentioned in FSMA, the law clearly states that FDA is expected to lead a prevention effort for all types of hazards even those that are “economically motivated.”

2012—USA—Food Safety Modernization Act, Intentional Adulteration Rule (IA): During rulemaking, the FDA interpreted the Congressional lawmakers’ intent of the IA section scope to only be “catastrophic events” such as terrorism. The text of “intentional adulteration, including acts of terrorism” (note the comma) to really mean “intentional adulteration acts of terrorism” (no comma). Considering a related concept, the IA section was also refined to not cover “disgruntled employees” or “malicious tampering.” Those two actions are illegal under FSMA but not addressed in a rule. The final IA rule stated that EMA would be addressed in the *Preventive Controls* section of FSMA. This rule was finalized in 2016.

2012—GFSI—Global Food Safety Initiative (GFSI) Addressing Food Fraud: The GFSI created a Food Fraud Think Tank to provide insight and guidance to the GFSI Board of Directors. The original title was Economic Adulteration Think Tank but shifted to food fraud. The goal was to review the food fraud issue, how it might be addressed under the GFSI type Food Safety Management

System principles, and if it was within the scope and mission of GFSI. GFSI solicited feedback from their broad membership, including in many public workshops and presentations. Thus, this activity raised the awareness that food fraud was *going to be* addressed. This became a requirement in February 2017 to be required in January 2018.

2013—UK—DEFRA Elliott Review of Food Crime: The UK Department for Environment, Food and Rural Affairs (DEFRA) and Department of Health co-funded the Elliott Review (led by Professor Christopher Elliott of Queen's University, Belfast) on food fraud which reviewed the issue and proposed countrywide countermeasures and programs. The very clear directives are being broadly implemented in what can be considered as world-leading efforts.

2012—Scotland—Food Standards Agency, Arrangements to secure food standards and safety in Scotland (The Scudamore Report): Scotland created a report that reviewed the options for managing all food standards and food safety (FSAS 2012). Scotland clearly defines food fraud (“Food fraud is committed when food is deliberately placed on the market, for financial gain, with the intention of deceiving the consumer.”). They also clearly define food fraud as a food agency issue (“The Food Standards Agency takes the issue of food fraud very seriously and... the Agency has a responsibility to protect the consumer.”). They also clearly assign responsibility for enforcement but not explicitly a countrywide prevention strategy (“In Scotland, the Incidents Team within the Enforcement Branch manages and co-ordinates the response to food fraud”).

2013—EC—European Commission Resolution on Food Fraud: The European Commission (EC)—the administrative branch of the European Union—published a draft resolution that defined food fraud and the focus on prevention in 2013 that was passed in 2014. The EC has proposed and is supporting that the European Member States also adopt this broad definition of food fraud and the focus on prevention.

2013—Ireland—Review of Food Standards Agency response to the incident of contamination of beef products with horse and pork meat and DNA, An Independent Report: Ireland conducted a review of the horsemeat incident that included recommendations for managing future related incidents (Food Safety Authority of Ireland 2013). The report stated, “The FSA should take the lead in building capability, but a collaborative approach will be essential.” It also recommended that “The arrangements for authenticity and in particular the management of incidents need to be clarified and placed on the FSA website.”

2014—EP—European Parliament Prioritizing Food Fraud: The European Parliament—the legislative branch of the European Union—food fraud was identified as a *top-5* policy issue, not just a *top-5* food issue but at *top-5* for all issues.

2014—GFSI—GFSI Food Fraud Position on Food Fraud Published: GFSI published their *Position Paper on Food Fraud* that defined food fraud would be included—and required—for companies to achieve future GFSI Certification. In 2014, GFSI even identified implementing food fraud to be a *top-5* priority for 2015. This certification is often a prerequisite to conduct business.

2014—UK—National Food Crime Unit (NFCU): In response to the recommendations in The Elliott Review, the UK government created the National Food Crime Unit (NFCU). Housed within in the UK Food Standards Agency, the NFCU is headed by a law enforcement director and operates across all agencies. The NFCU has been established as a coordinating body similar to INTERPOL but has more direct intelligence gathering powers. The initial funding was “minimal as the Unit initially evolved from a small but similar capability within the FSA.” The annual running cost was £580,000 (US\$725,000), and the final allocation is agreed to £1.2 million (US\$1,500,000) (Parliament 2016).

2015—USA—Food Safety Modernization Act, Preventive Controls, EMA: While not too many details are provided in the FSMA-PC Final Rule, it appears it covers an “agent” that causes a “hazard” that must be mitigated from an “economically motivated” act (MSU FFI 2018). FSMA-IA specifically mentions “stolen” goods to FSMA do cover all types of fraud or the traditional definition of “food fraud.” The prevention focus shifts the burden to the manufacturer. As with other FDA regulations such as for medicines and tampering, the responsibility shifts from a prescriptive approach (what you need to do) to performance (demonstrate a control measure is effective). A question becomes “why did you decide this was NOT a ‘hazard that required a preventive control’.” Many of the seven FSMA Final Rules reiterate that the Food, Drug, and Cosmetics Act is still in effect. For food fraud, the sections that are most applicable are “Adulterated Foods” and “Misbranded Foods.” This rule was finalized in 2015 and is a legal requirement starting in September 2016.

2015—BRC—Food Safety Management System Food Fraud Requirements Being Audited: In April 2015, the British Retail Consortium (BRC) Issue 7, a GFSI compliance standard, required a food fraud vulnerability assessment and mitigation plan. It was announced that BRC would be auditing against the food fraud concepts meaning that addressing food fraud would be a requirement to receive the certification. While the depth and breadth of implementation are currently undefined, there is a current, industry-wide, food fraud strategy in place.

2015—China—Chinese Food Law Addressing Nontraditional Food Threats: Public presentations by Chinese government food officials have revealed a root in criminal law and not just a regulation. Also, while the laws build upon *adulteration* and *counterfeiting*, the concepts are presented in a hierarchy or

continuum that emphasizes addressing all the risk together. The food fraud term has been explicitly defined as holistic, all-encompassing, and harmonized with the global government and industry scope.

2016—CODEX—Codex Alimentarius Draft Discussion Document on Food Authenticity and Food Integrity: CODEX included a food fraud agenda item in 2015 and 2016 until the draft documents were created.

2017—GFSI—GFSI Guidance Document Version 7: In February 2017, the new GFSI Guidance Document was published which defined the requirement for a (1) food fraud vulnerability assessment and (2) food fraud prevention strategy (GFSI 2017). The definition and scope of food fraud is “A collective term encompassing the deliberate and intentional substitution, addition, tampering or misrepresentation of food, food ingredients or food packaging, labeling, product information or false or misleading statements made about a product for economic gain that could impact consumer health.” To be compliant with GFSI, a company, standard, or auditor company must address all types of fraud (including stolen goods, tampering, and mislabeling) and all products (including raw materials through packaged goods in the marketplace). It is important to note that not every vulnerability is a hazard that would be identified as a risk—every vulnerability must be assessed, but a countermeasure is not always required. The formal compliance requirement is 1 year after publication.

2017—China—China FDA Request for Comments on “Fraud in Food Safety”: In March 2017, the China Food and Drug Administration (CFDA) published a public request for comments on addressing “Fraud in Food Safety.” This is in support of the Chinese Food Safety Law that was enacted in 2014 and is being updated (Wu et al. 2017a, b). The questions included a focus on investigation and prosecution with an emphasis on efficiency and prevention.

2017—CODEX—CCFICS EWG: Codex Alimentarius Committee on Food Import and Export Inspection and Certification Systems (CCFICS) reviewed a food fraud discussion draft paper at the May 2017 meeting. An Electronic Working Group (EWG) was formed to review the definitions of food fraud, food integrity, and food adulteration, as well as gaps in the current CODEX standards, with a focus on broad food fraud incidents and on prevention (MSU FFI 2017). While there are no final conclusions, the EWG is a first formal step in the development of a standard.

2017—ISO—ISO 22000 Update: In June 2017, the ISO 22000 standard is being reviewed for an update. There are specific sections that are proposed to deal separately with food fraud and also with food defense (ISO 2017b).

2019—Canada—Food Fraud Work Group (FFWG): Creating in December 2018, the Canadian government has undertaken a project to review the Food Fraud problem, the current state, and then to consider gaps and best practices for an optimal public-private partnership approach (Cadieux et al. 2019).

Appendix: Scholarly Works by the Author

Review of scholarly works by the author per Google Scholar as of January 10, COFS2:

	Title	Cited by	Year
1	<i>Development and application of a database of food ingredient fraud and economically motivated adulteration from 1980 to 2010</i>	376	2012
	JC Moore, J Spink, M Lipp		
	Journal of Food Science 77 (4), R118-R126		
2	<i>Defining the public health threat of food fraud</i>	315	2011
	J Spink, DC Moyer		
	Journal of Food Science 76 (9), R157-R163		
3	<i>Economically motivated adulteration (EMA) of food: Common characteristics of EMA incidents</i>	150	2013
	K Everstine, J Spink, S Kennedy		
	Journal of Food Protection 76 (4), 723–735		
4	<i>Understanding and combating food fraud</i>	45	2013
	J Spink, DC Moyer		
	Food technology 67 (1)		
5	<i>The economics of a food fraud incident—Case studies and examples including melamine in wheat gluten</i>	41	2017
	DC Moyer, JW DeVries, J Spink		
	Food Control 71, 358–364		
6	<i>Defining the public health threat of dietary supplement fraud</i>	36	2013
	VM Wheatley, J Spink		
	Comprehensive Reviews in Food Science and Food Safety 12 (6), 599–613		
7	<i>Defining the types of counterfeiters, counterfeiting, and offender organizations</i>	35	2013
	J Spink, DC Moyer, H Park, JA Heinonen		
	Crime Science 2 (1), 8		
8	<i>Review of package warning labels and their effect on consumer behaviour with insights to future anti-counterfeit strategy of label and communication systems</i>	39	2011
	J Spink, J Singh, SP Singh		
	Packaging Technology and Science 24 (8), 469–484		
9	<i>The challenge of intellectual property enforcement for agriculture technology transfers, additives, raw materials, and finished goods against product fraud and counterfeiters</i>	27	2011
	J Spink		
	NISCAIR-CSIR, India		
10	<i>Backgrounder: Defining the public health threat of food fraud</i>	26	2011
	J Spink, DC Moyer		
	Research Grants. National Center for Food Protection and Defense (NCFPD		
	...		

	Title	Cited by	Year
11	<i>Introducing the food fraud initial screening model (FFIS)</i> J Spink, DC Moyer, C Speier-Pero Food Control 69, 306–314	34	2016
12	<i>Introducing Food Fraud including translation and interpretation to Russian, Korean, and Chinese languages</i> J Spink, DC Moyer, H Park, Y Wu, V Fersht, B Shao, M Hong, SY Paek, ... Food chemistry 189, 102–107	21	2015
13	<i>A review of the economic impact of counterfeiting and piracy methodologies and assessment of currently utilized estimates</i> J Spink, Z Levente Fejes International Journal of Comparative and Applied Criminal Justice 36 (4 ...	20	2012
14	<i>Defining food fraud and the chemistry of the crime</i> J Spink Improving Import Food Safety, 195–216	16	2012
15	<i>Food fraud prevention shifts the food risk focus to vulnerability</i> J Spink, DL Ortega, C Chen, F Wu Trends in Food Science & Technology 62, 215–220	15	2017
16	<i>Combating the impact of product counterfeiting</i> J Spink, OK Helferich, JE Griggs Distribution Business Management journal 10 (6)	14	2010
17	<i>Food fraud prevention: Policy, strategy, and decision-making—implementation steps for a government agency or industry</i> J Spink, ND Fortin, DC Moyer, H Miao, Y Wu CHIMIA International Journal for Chemistry 70 (5), 320–328	12	2016
18	<i>Overview of the selection of strategic authentication and tracing programmes</i> J Spink Counterfeit Medicines: Policy, Economics and Countermeasures 1, 111	11	2012
19	<i>When crime events defy classification: The case of product counterfeiting as white-collar crime</i> JA Heinonen, J Spink, JM Wilson Security Journal 30 (2), 621–639	9	2017
20	<i>Development of a product-counterfeiting incident cluster tool</i> J Spink, DC Moyer, H Park, JA Heinonen Crime Science 3 (1), 3	9	2014
21	<i>The role of the public-private partnership in Food Fraud prevention—Includes implementing the strategy</i> J Spink, DC Moyer, P Whelan Current Opinion in Food Science 10, 68–75	8	2016
22	<i>Addressing the risk of product fraud: a case study of the Nigerian combating counterfeiting and sub-standard medicines initiatives</i> J Spink, DC Moyer, MR Rip Journal of Forensic Science & Criminology 4 (2), 1–13	5	2016

	Title	Cited by	Year
23	<i>The case for global standards</i> L Bix, R Clarke, H Lockhart, D Twede, J Spink The GS1 Global Healthcare Users Group	5	2007
24	<i>Global counterfeit food and beverage packaging: Impacts on food safety</i> J Spink Association of Food and Drug Officials (AFDO), Annual Conference. Available ...	5	2007
25	<i>Product counterfeiting in Michigan and the expectations and priorities for state and local law enforcement: Assessing the awareness of and response to the problem</i> J Spink, J Heinonen Anti-Counterfeiting and Product Protection Program Backgrounder Series. East ...	4	2012
26	<i>Food fraud</i> Y Wu, H Miao, B Shao, J Zhang, JW Spink, DC Moyer Food Safety in China: Science, Technology, Management and Regulation, 253–270	3	2017
27	<i>Food fraud and food fraud detection technologies</i> R Fenoff, J Spink The Routledge Handbook of Technology, Crime and Justice, 295	2	2017
28	<i>Safety of food and beverages: Risks of food adulteration</i> J Spink	2	2014
29	<i>Product fraud and product counterfeiting as a source of terrorist financing</i> J Spink Security Journal 30 (2), 640–645	1	2017
30	<i>Food fraud prevention</i> J Spink The International Union of Food Science and Technology (IUFoST) Scientific ...	1	2016
31	<i>Counterfeiting</i> R Fenoff, J Spink The Encyclopedia of Criminology and Criminal Justice, 1–3	1	2014
32	<i>Analysis of counterfeit risks and development of a counterfeit product risk model</i> JW Spink Michigan State University, Ph.D. Dissertation	1	2009
33	Food Counterfeiting: A Growing Concern J Spink Academic Press, Encyclopedia of Food Chemistry	0	2019
34	Food Fraud and Adulteration: Where We Stand Today J Spink Academic Press, Encyclopedia of Food Chemistry	0	2019

	Title	Cited by	Year
35	The application of public policy theory to the emerging food fraud risk: Next steps	0	2019
	J Spink, PV Hegarty, ND Fortin, CT Elliott, & DC Moyer		
	Trends in food science & Technology - Elsevier		
36	Introducing the Food Fraud Prevention Cycle (FFPC): A Dynamic Information Management and Strategic Roadmap	0	2019
	J Spink, W Chen, G Zhang, C Speier-Pero		
	Food Control, 2019 - Elsevier		
37	Gap analysis of the Canadian food fraud regulatory oversight and recommendations for improvement	0	2019
	B Cadieux, LD Goodridge, J Spink		
	Food control, 2019 - Elsevier		
38	Food fraud data collection needs survey	0	2019
	J Spink, C Elliott, M Dean, C Speier-Pero		
	npj Science of Food, nature.com		
39	The Current State of Food Fraud Prevention: Overview and Requirements to Address “How to Start?” and “How Much is Enough?”	0	2019
	J Spink -		
	Current Opinion in Food Science, 2019 - Elsevier		
40	Global perspectives on food fraud: results from a WHO survey of members of the International Food Safety Authorities Network (INFOSAN)	0	2019
	J Spink, P Ben Embarek, CJ Savelli & A Bradshaw		
	npj Science of Food, nature.com		

Index

A

Acceptable Level of Protection, 96
Accountability (ISO), 523
Accountable, 209, 425
Accountable party, 523
Accounting fraud, 205
Accredited Third-Party Final Rule (FSMA), 369
Accum, F.C.A., 28, 458
Accuracy, 520
Accuracy, precision and certainty, 180
Action research methodology, 234
Adaptation (criminology), 493
Adulteration (law), 53
Albanese, J., 232
American Botanical Council (ABC), 371
American Organization of Analytical Chemists (AOAC), 371
Analytical vs. numerical methods, 536
Anti-trust (Robinson-Pattman, Sherman Anti-Trust Act), 489
Arrow, K., 509
Arthur Anderson incorporated, 193
Asda incorporated, 449
Assessment criteria, 578
Asset misappropriation, 205
Authentication, 136, 393
Authentication element, 393
Authentication process, 393
Authentication tool, 136
Authentic good, 136
Authentic material good, 393

B

Bazerman, M.H., 206
Beef mislabeling incident, 455

Belling the Cat (Aesop's Fable), 583
Bell shaped curve, 547
Beverages (INTERPOL), 472
Bill of lading, 320
Bill of lading/uniform bill of lading), 319
Black market, 15
Black Swan blindness, 546
Black Swan ethical problem, 546
Black Swan event, 132, 542, 544, 546–552
Blunders
 formulation errors, data uncertainty, 536
Boost, 297
Boosting, *see* Organized Retail Theft (ORT)
Bradley, E., 419
Bradstreet, 104
Buyers (five forces), 481

C

California State Bill number 1476 (CA-SB-1476), 357–361
CARVER+Shock, 102
Catastrophic risk (Nader), 507
Certainty, 520
Certificate of analysis (C of A), 319
Certification bodies (CB), 374, 407
Certification Program Organizations (CPOs), 374, 407, 428
The Chinese National Center for Food Safety Risk Assessment (CFSA), 457
Clarke, R.V., 287
Class I recall (regulatory), 168
Class II recall (regulatory), 168
Class III recall (regulatory), 168
Codex Alimentarius (Codex), 386

- Codex Alimentarius Committee on Food Import and Export Inspection and Certification Systems (CCFICS), 376
- Comingle (comingled, uncomingled), 91
- Committee of the Organizing Committee of the Treadway Commission (COSO), 159
- Competence, 428
- Competitive Advantage* (Book), 198, 480, 491
- Competitive Strategy* (Book), 198, 480, 483
- Competitor Intelligence* (Book), 485, 488, 497
- Competitors analysis, 485
 - defense, 490
 - offense, 490
 - collaborate, 490
- Competitors (five forces), 482
- Confirmatory bias, 207, 546, 547
- Connect everything to everything, 194, 195, 381, 512, 579
- Consequence (ISO), 514
- Consumer behavior, 83
- Control, 416
- Control measure, 416
- Control point, 416
- Control system, 50
- Corkscrew, 182
- Corkscrew approach, 132
- Corporate risk map, 103, 106, 132, 150–152, 169, 176, 177, 181, 191, 196, 197, 200, 201, 328, 487, 579, 581, 589–595
 - risk map, heat map, 103
- Correction, 417
- Correction (regulatory), 169
- Corrective action, 416
- Corruption and bribery, 205
- Counterfeit (definition), 14, 22, 136
- Counterfeit food product (INTERPOL), 472
- Counterfeit good (definition), 120, 136
- Counterfeiting Exposed* (Book), 14
- Counterfeit Product Risk Model (CPRM), 535
- Countermeasure, 50
- Covert, 93
- Credence attributes, 320
- Credible threat, 420
- Credit rating, 104–105
- Crime analysis for problem-solvers, 287
- Crime science, 233
- Crime Triangle, 137, 224
- Crime Triangle (adapted, food fraud), 226
- Crime Triangle (original), 225
- Criminal Fines (regulatory), 169
- Criminal Justice, 233
- Criminal prosecution (regulatory), 169
- Criminology, 233
- Crisis management, 448
 - business continuity, business opportunity planning, 118
- Critical control point (CCP), 416
- Crosby quality management, 313
- Cumin-peanut allergen filler incident, 455
- D**
- Danger (in audits and to auditors), 85
- Daniels, W., 86
- Data input and uncertainty, 586
- Data set, 547, 548
- Data uncertainty, 536, 571, 586, 588
- Data veracity, 539
- Deceptive counterfeits, 574
- Deceptive products, 45
- Decision sciences, 512–513
- Defect (quality management), 314
- Define, measure, analyze, improve and control (DMAIC), 313
- De minimis non curat lex*, 275
- Demming quality management, 313
- Descriptive analytics
 - big data, data analytics, 538
- Detect, 47
 - detection, 47
- Deter, 48
 - deterrence, 47
- DeVries, J., 109
- Diagnosis-treatment-prognosis=decision (DTP), 119
- DiMeo, Silvio (INTERPOL), 301
- Discussion Paper on Food Integrity and Food Authenticity (food fraud), 386
- Disgruntled employees, 53, 419
- Dissipate, 491
- Dissipate (crime), 244
- Diversion (definition), 15, 22
- Diversion, illegal (definition), 15
- Do I need to act?, 4, 5, 121
- Do it right the first time, 594
- Dread and outrage (consumer behavior), 533
- Dun, 104
- E**
- Early adopter, 105, 351, 361, 567
- Early supplier involvement (ESI), 325
- Early warning system, 62, 100–103, 548
- Eck, J.E., 287
- E-commerce, 263, 322, 458, 485
- Economic adulteration, 10

- Economically motivated adulteration (EMA), 53, 514
- Edelev, D., 297
- Education as a weapon, 265
- E-fencing, 295, 297
- Einstein, A., 531
- Eklblom, P., 493
- Elliott, C., 122, 287, 447
- Elliott Review, 447
- Ellis, Michael (INTERPOL), 301
- Empty-suit problem, 547
- Enhanced traceability, 351–353, 355
- Enterprise risk management (ERM/COSO), 159, 172, 486
- Enterprise risk management (ERM) (definition), 138, 148, 190, 492, 542
- Enterprise-wide risk, 212
- Environmental criminology, 233
- EPCglobal (Electronic Product Code), 358
- EPCIS standard, 358
- Epistemic arrogance, 547
- Espinell, Victoria (IPEC), 572
- Establishing the context, 3, 4, 75, 172, 513, 517, 518
root cause, 517
- European Union Report – on the food crisis, 460
- Event, 505
- Everstine, K., 108
- Expanded product line, 18
- Experience vs. expertise, 546–552
- Extremely interdisciplinary, 148
- F**
- Failure modes and effects analysis (FMEA), 541
- Fast follower, 496
- Fear appeals/fear arousal (consumer behavior), 533
- Fejes, Z.L., 286
- Fencing, 297
- Fersht, V., 297
- Financial and healthcare fraud, 278
- First-sale doctrine, 15
- Five forces, 481
- Five-point scales (COSO), 571
- 5 P's of marketing, 480
- Flowcharting, 535
- Fonterra, 60
- Food authenticity (definition), 25
- Food fraud, 389
- Food Fraud Initial Screening Tool (FFIS), 166, 592
- Food Fraud Initiative (MSU-FFI), 462
- Food Fraud Prevention Cycle (FFPC), 100, 158
- Food fraud risk, 506
- Food Fraud Suspicious Activity Report method (FFSAR), 200
- Food Fraud Tabletop Exercise (FFTTX), 329–334
- Food fraud threat, 506
- Food fraud vulnerability, 506
- Food integrity (definition), 25, 454
- Food products (INTERPOL), 472
- Food protection (definition), 26
- The Food Related Emergency Exercise Bundle (FREE-B), 330
- Food Risk Matrix, 523
- Food Safety Management System (FSMS), 405, 411–415
- Food Safety Modernization Act (FSMA), 286
- Food Safety Modernization Act Intentional Adulteration Final Rule (FSMA-IA), 419
- Food security (definition), 25, 450, 453
- Food terrorism, 418
- Force majeure, 320
- Forensic, 93
- Forensic accounting, 83
- Foreseeable risk (Nader), 508
- Fraud, 137
- Fraud opportunity, 137
- Fraud Risk Management Principles (ERM/COSO), 125
- Fraud risk (Nader), 508
- Freedman, E., 69
- Freight bill, 319
- Freight on board (FOB), 320
- Frequency vs. probability (Taleb), 548
- Fundamental risks (Nader), 508
- G**
- Game theory, 488
- General equilibrium theory, 510
- Germanwings airplane crash, 549
- GFSI CPOs
FSSC 22000, BRC, IFS and others, 374
- GFSI position on mitigating the public health risk of food fraud, 413
- Global Food Safety Initiative (GFSI), 373
- Globalization, 321
- Global Trade Item Number (GTIN), 351
- Goldman-Sachs, 194
- Gray, J.I., 71
- Gray market (definition), 15
- Gray Swan, 547
- Gussow, K., 238

H

Hazard, 505
 Hazard analysis, 416
 Hazard analysis and critical control point (HACCP), 101, 314
 plan, 415, 416
 system, 416
 Heinonen, J.A., 68, 122, 269
 Heuristically-derived assumptions, 531
 Honey laundering, 294–295
 Horizon scanning (scanning), 162
 Horsemeat incident, 352–353, 412, 454
 Hot product, 223
 Hotspot, 223
 Hot spot analysis, 96, 109, 290
 How much is enough?, 4, 5, 129, 181, 197–200, 216
 How to measure success?, 213–216
 How to start?, 4, 5, 564
 Huff, Andrew (MSU), 419
 Huisman, W., 232

I

If one aspirin is good then is ten better, 381
 If there is no fraud opportunity then there is no fraud opportunity, 262
 Illegal diversion (stolen, de-coded, substandard), 16
 Implied excessive precision, 571
 Import and export documents, 320
 Impression of excessive precision, 537
 Inaccuracy
 bias, 520
 Incident, 505
 Industry or market (five forces), 481
 Inherent risk, 193, 328
 Injunction (regulatory), 168
 Inspection, 368
 Integrated framework, 193, 327
 Intellectual property rights, 376
 Intelligence analysis, 137
 Intelligence gathering, 448, 449
 Interdisciplinary, 70, 71, 84
 Interdisciplinary approach, 70, 83
 Interested party, 210, 395, 523
 Internal controls, 125, 193, 327
 International Aloe Science Council (IASC), 371
 International Food Safety Authorities Network (INFOSAN), 387
 International Life Sciences Institute (ILSI), 371
 Interoperability, 358
 Interoperable electronic system, 359
 Investigation, 368

Irresponsible defendants, 89, 138
 ISO 12931
 2012, 392
 ISO 16678
 2014, 392
 ISO 22380, 372
 2018, 392
 ISO 31000, 172, 313
 ISO 9000, 314
 ISO/TC 176 Quality management and quality assurance, 372
 ISO/TC 262 Risk management, 372

K

Kaizen quality management, 313
 Karpov, A., 298, 301
 Knockoff (knock off, knock-off), 22, 23
 Known-knowns, 545
 Koch, W., 277
 Kosycheva, M., 298
 Kotler, P., 480
 Kurniawan, R., 276

L

Laboratory analysis test results, 320
 Lack of awareness of ignorance (Taleb, Black Swan), 548
 Lack of historical data, 586
 Laws, 367
 Laycock, G., 230, 268
 Learning by Buyers (five forces), 483
 Legal (approach), 83
 Levi, M., 232, 261, 262
 Liability risk (Nader), 508
 Likelihood (ISO), 514
 Limitations on estimates of the economic impact of counterfeiting and piracy, 467
 Lipp, M., 108
 Logistics, 56, 309, 321–322
 Lord, N., 232, 261
 Low certainty and low robustness, 516
 Ludic fallacy, 547

M

Mace, R., 68, 122
 Management (defined), 316
 Mayorova, N., 298
 McDonald's, 60
 Meaningful differentiation (COSO), 571
 Melamine, 450–453
 The melting ice cube, 548, 549

- Mitigation, 506
 Model uncertainty, 586
 Momodu-Segiru, Momodu (NAFDAC), 301
 Money laundering, 205
 Monks, Brian (Underwriters Laboratory UL), 301
 Moral hazard, 509
 Morling, A., 238
 Multidisciplinary, 70, 84
 multi-disciplinary/plural-disciplinary, 71
- N**
 Narrative fallacy, 548
 National Center for Food Protection and Defense (NCFPD), 287
 National Sanitation Foundation (NSF), 371
 National security, 20, 278, 455
 Natural Products Association (NPA), 371
 Naughton, R., 238
 Negative list/black list, 458
 Nigeria, 248–250
 Non-deceptive products, 45
 Nongovernmental organizations (NGO's), 371
- O**
 Objective (defined), 317
 Operational action, 487
 Operational risks, 212
 Opportunities (COSO), 189
 Order notified export, 319
 The Organization, 125, 372, 426
 Organized crime, 143, 244–248, 261, 449
 Organized Retail Crime (ORC), 295
 Organized Retail Theft (ORT), 295
 Overcausation, 545
 Overconfidence (Taleb, Black Swan), 548
 Overproduction, 18
 Overrun (definition), 14, 18
 Overt, 93
- P**
 Packaging, 120
 Packaging science, 83
 Parallel imports, 15, 16
 Parallel trade (definition), *see* Parallel imports
 Park, H., 134, 268, 298
 Pease, K., 493
 Pedigree, 357, 358
 Perceived risks (consumer behavior), 532
 Perfect substitute, 574
 Person-to-person delivery (P2P), 591
 Plan-do-check-act (PDCA), 313
 Pliny the Elder, 59, 459
 Policy (defined), 317
 Port shopping, 54
 Porter, M., 198, 480, 483, 491, 493, 495
 Potential entrants (five forces), 481
 Precision, 520
 Predictive analytics
 big data, data analytics, 538
 Prerequisite program (PRP),
 416, 417
 Prescriptive analytics
 big data, data analytics, 538
 Prevent, 48
 prevention, 47
 Prevention, 506
 Prevention *vs.* mitigation, 514
 Preventive action, 416
 Primary market, 46
 Private or contract couriers, 591
 Probability *vs.* likelihood, 514
 Problem, 4, 505
 Problem of induction, 548
 Problem-oriented policing, 234
 Problem-Oriented Policing Center (POP Center), 232
 Procurement, 309, 314, 317–318
 Product fraud, 9
 Production after authorization ends, 18
 Product returns, 359
 Protected Geographic Origin (PDO), 454
 Public Available Standard 96 Food Defence (PAS 96:2010), 418
 Purchasing, 56, 73, 246, 309, 318–319,
 324–326, 438, 510, 532
 See also Procurement
 Pure risk (Nadar), 509
- Q**
 Quality assurance, 316
 Quality control, 316
 Quality (defined), 316
 Quality improvement, 316
 Quality objective, 315
 Quality planning, 315
 Quality policy, 315
- R**
 Radio-frequency identification device (RFID),
 351, 355–356, 358, 567
 Randomness as incomplete information, 548
 Rare occurrence, 420
 Rational choice theory, 234

- Reasonably foreseeable hazard, 135, 139, 420, 550, 589
- Reasonably likely to occur, 139, 550
- Recall (regulatory), 169
- Recalls, Class I, II/III, 165
- Regulations, 367
- Repackaging, 359
- Residual risk, 193
- Residual risk (ISO), 506
- Responsibilities
 responsible party, 210
- Responsible, 425
- Responsible party, 360, 523
- Retrospective distortion, 548
- Return fraud, 297
- Reverse-engineering problem, 548
- Rey, Y., 86, 412
- Risk, 505
- Risk acceptance (ISO), 506
- Risk aggregation, 327, 577, 579
- Risk aggregation (ISO), 507
- Risk analysis (ISO), 518
- Risk appetite, 194
- Risk appetite (ISO), 507
- Risk assessment process (COSO), 201
- Risk attitude (ISO), 507, 514
- Risk aversion (ISO), 507
- Risk (ERM/COSO), 310
- Risk evaluation (ISO), 518
- Risk identification (ISO), 518
- Risk (ISO), 514
- Risk of getting caught or the cost of conducting the crime, 491
- Risk owner (ISO), 523
- Risk priority number (RPN), 541
- Risk review (ISO), 507
- Risk source (ISO), 515
- Risk summing, *see* Risk aggregation
- Risk tolerance, 194
- Risk tolerance (ISO), 507
- Risk treatment (ISO), 518
- Robustness, 520
- Routine activities theory, 230
- S**
- Safe Secure and Affordable Food for Everyone (SSAFE) Organization, 411
- Sales of rejected/substandard production
 substandard, 18
- Sarbanes-Oxley Act, 328
- Scanning, analysis, response and assessment (SARA) method, 313
- Scheme, 415
- Scheme owner (GFSI), 415
- Scimeca, J., 108
- Scott, L. (Wal-mart), 318
- Secondary market, 46
- Seizure (regulatory), 168
- Serialization, 359
- Severity vs. consequence, 514
- Shadow economy, 16, *see* Black market
- Shipment manifest, 319
- Shoplifting, 214, 297
- Shrink, 297
- Signal Commitment to Defend, 492
- Significant figures, accuracy and precision, 536
- Significant vulnerability, 420
- Simulation (definition), 14, 22
- Situational crime prevention, 230, 234
- Six-Sigma, 172
- Six-Sigma quality management, 313, 355
- Smuggling, 6, 53
- Social choice theory, 510
- Social harmony, 446
- Social science, 167
- Social scientific conception, 261
- Sociopaths, 88, 89, 138, 253, 483
- Solution looking for a problem, 2, 66, 67, 84
- Song Dynasty, 451
- Source credibility/source dynamism
 (consumer behavior), 533
- Sowing the Seeds Report, 452
- Spencer, J., 232, 261
- Stakeholder, 523
- Standards and certifications, 368
- Strasburg, G., 292
- Strategic action, 487
- Strategy (defined), 317
- Substandard food product (INTERPOL), 472
- Sunflower oil diluted with mineral
 oil incident, 456
- Supplement Safety and Compliance Initiative (SSCI), 371
- Suppliers (five forces), 481
- Supply chain management (SCM), 83, 90–91, 307–334, 339–364
- Supply chain visibility, *see* Transparency
- Swindled* (Book), 458
- Swoffer, K.P., 122, 287
- System of systems, 158
- T**
- Tactical action, 487
- Taleb, N.N., 542
- Tamper (definition), 22, 92
- Tampering, 419

- Tamper-proof, 91
Taste of War (Book), 455
 Terrorism, 322
 Theft (FSMA), 420
 Thirteenth, 5-year Plan (2017), 457
 Threat, 505
 Threat Assessment and Critical Control Point plan (TACCP), 101, 313, 418
 Threshold of detection (TOD), 96
 Threshold of regulation (TOR), 96
 Tiered supplier structure—traditional many-to-one, 311
 To be wrong with infinite precision, 544
 Total quality management (TQM), 312, 412
 Traceability, 349, 351
 Traceability (GS1 references ISO 9001), 348
 Traceability (ISO), 347
 Trace (ISO), 347
 Trace/tracing (tracing back) (GS1), 348
 Track (ISO), 347
 Track/tracking (tracking forward) (GS1), 348
 Trade-Related Aspects of Intellectual Property Agreement (TRIPs), 573
 Traditional criminology, 233
 Translate and interpret, 299
 Transparency, 350
 Transparency (GS1), 348
 Trends in human activity patterns, 251
 Trinidad and Tobago, 394
 Trueness, *see* Accuracy
 Truncation vs. round-off errors, 536
 Trust and confidence (consumer behavior), 532
 Truth-bias, 207
 Twelfth, 5-year Plan (2012), 458
 Two-stage assessment method (COSO/ERM), 204, 561, 563
 Types of food fraud, 389
 Types of fraud, 137
 Types of risks, 507–511
 Types of theft, 412
- U**
- UK Food Standards Agency (UK FSA), 448
 Unauthorized refill, 92
 Uncertainty (ERM/COSO), 310
 Uncertainty of the deluded, 548
 Underground economy, *see* Black market
 Universal product codes (UPC), 351
 Unknown-knowns, 545
 Unknown-unknowns, 131, 132, 545
 Uplabeling, 93
 US Food and Drug Administration (FDA), 567
 US Pharmacopeia (USP), 287, 371
 US Prescription Drug Marketing Act of 1987 (PDMA), 567
 US Trademark Counterfeiting Act of 1984, 573
- V**
- Venture capitalists (VC/V.C.), 67
 Veterinary medicines, 453
 Violent crime, 278
 Vs of Big Data, 538, 540
 Vulnerability, 137, 505
 Vulnerability Assessment and Critical Control Point plan (VACCP), 101, 313, 422
 Vulnerability elimination, 244
 Vulnerable people, 279
- W**
- Walmart sustainability, 105, 318
 Warning letter (regulatory), 168
 Warranty fraud, 297
 What gets measured gets better, 317
 Whelan, P., 236
 White collar crime, 269
 White van deliveries, 591
 Who cares?, 6
 World Intellectual Property Organization (WIPO), 573
- Y**
- Yiannas, F., 412
- Z**
- Zero tolerance, 448, 517
 Zhou Dynasty, 451