

Chapter 7

Criminology Theory (Part 1 of 2): Foundational Concepts



Summary

This chapter presents the criminology concepts that apply to not only catching bad guys but for preventing food fraud from occurring in the first place. Criminology addresses the root cause which is a human adversary who identifies a crime opportunity and is motivated to act. A key point for food fraud prevention is on guardianship which includes the monitoring the physical space of crime and putting hurdles in place that makes the act riskier or less profitable. Specifically, these crime prevention theories are based on Situational Crime Prevention, routine activities theory, and rational choice theory. The expansion to apply the social sciences and criminology theories is critical since the root cause is a human adversary.

The Key Learning Objectives for this chapter are:

- **(1) Introduction to Crime prevention theory overview:** Introduce the basic tenets of criminology and crime prevention.
- **(2) Examine the Crime Triangle and Situational Crime Prevention:** Several theories or applications are especially helpful when addressing food fraud prevention.
- **(3) Adapting the Criminology theory to Food Fraud prevention:** Finally, the theories are present in an application to food fraud prevention.

On the Food Fraud Prevention Cycle (FFPC), this chapter addresses the theoretical foundation concepts related to criminology and the fraudster “(A) Theoretical Foundation” (Fig. 7.1).

Introduction

The central and most important point is to understand the fraud opportunity before any countermeasure or control systems are evaluated. For food fraud prevention, the root cause is criminology theory and focused on the “fraud opportunity.” Without a

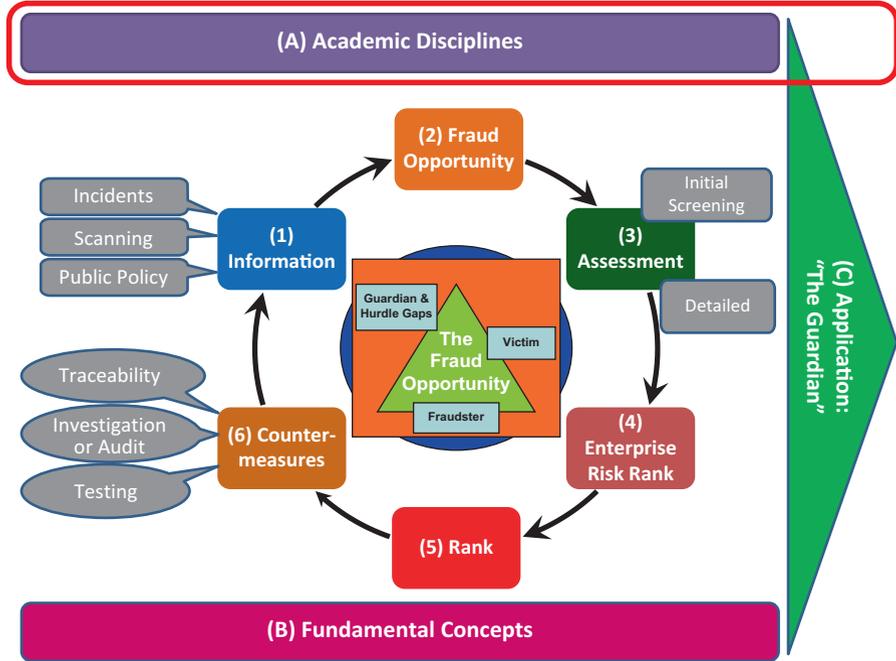


Fig. 7.1 Food Fraud Prevention Cycle—where this chapter applies to the overall concept: “(A) Academic Disciplines.” (Copyright Permission Granted) (Spink 2014; Spink et al. 2019)

clear understanding of the reason why a specific, individual, human adversary attacks the selection of a countermeasure or control system is a guess—an educated guess at best but still a guess. Fortunately the field of criminology—and specifically the crime prevention concepts including Situational Crime Prevention—provides a well-researched and developed theoretical foundation.

The general topic of “human situations and opportunities” was reported to be built upon a project led by Marcus Felson and Ron Clarke in 1973 during research on why some students ran away from reform schools and others did not. Later in 1976, “Crime as Opportunity” was published which expanded on the concepts. The core principles of Clarke, Felson, Eck, and others were based on the practical and pragmatic ideas (Clarke and Eck 2005):

- “Don’t get fancy.”
- “Don’t worry about academic theories. Just go out and gather facts about crime from nature itself (observation).”
- “Focus on very specific slices of crime, such as vandalism against telephones or soccer violence [or food fraud species swapping during transfer of ownership from supplier to the customer]. Even the crime ‘vandalism’ would be far too broad!”
- “Try to block [prevent] crime in as practical, natural, and simple way, at a low societal and economic cost.”

These concepts are the foundation for the study of “environmental criminology”—the physical space where a crime occurs not the environmental sustainability of the earth—started in the 1970s in part based on a foundation research paper “Social Change and Crime Rate Trends: A Routine Activity Approach” by Cohen and Felson (1979). The supporting literature and theories have been well researched with thousands of research projects. An August 2017 Google Scholar search resulted in over 10,000 documents with the phrase “Situational Crime Prevention.” The “environmental criminology” study of prevention and the space of crime concepts are a deviation from the “traditional criminology” which focuses on the criminal, courts, and the corrections system (Beirne and Messerschmidt 2005).

Situational Crime Prevention departs radically from most criminology in its orientation. Proceeding from an analysis of the circumstances giving rise to specific kinds of crime, it introduces discrete managerial and environmental [the physical space of crime] change to reduce the opportunities for those crimes to occur” (Clarke 1997a, b). The base theories and reports are often presented in very practical ways that can be easily and quickly implemented by practitioners. The underlying research is very scholarly, but the application is often referred to as practical or “down-to-earth. (Felson and Boba 2017)

Thus, [Situational Crime Prevention] is focused on [physical] settings for crime, rather than those committing those criminal acts. IT seeks to forestall the occurrence of crime, rather than to detect and sanction offenders. This seeks to eliminate the criminal or delinquent tendencies through improvement of society or its institutions and not merely to make the criminal activity less attractive to offenders. (Clarke 1997a, b)

These concepts are aligned with the objectives and needs of total quality management. These criminology theories are proactive and focused on what the enterprise can do and control rather than wait for outside entities to organize and respond.

Situational Crime Prevention focuses on the crime, not the criminal, and more specifically on “why crime occurs” (Clarke 1997a, b). Focusing on “why the crime occurs” is helpful for addressing food fraud since the focus of vulnerability shifts from “the suspect living beyond their means” to “identify a ‘fraud opportunity’.” For assessing a food fraud problem, a practical question is how would a risk assessor—probably a manufacturing quality control employee in a corporate office in a Western country—evaluate if a Bangladeshi farmer is living beyond their means? Would the supplier who owns two cows be equivalent to a Westerner owning a Ferrari? Also, if the fraudster were an intelligent adversary, they would not drive their Ferrari/second cow to the business where it could be viewed. Even if this was known, how would the risk assessor conduct an investigation into the lifestyle of the farmer?

If the fraud act is species swapping, then the vulnerability is a lack of specific tests conducted by the receiving company for the correct hot product and at the precise crime hot spot. There could be many species tests conducted but at the wrong spot and for the wrong product. That manufacturing quality control employee could recommend, and almost immediately implement, incoming goods testing for the correct hot product and at the hot spot. Regardless of whether the supplier is a criminal or not, the fraud opportunity would already be vastly reduced to the point that there may not be an opportunity to commit the act—that is, as long as the fraudster and all other suppliers know that new species tests are being conducted.

A focus on supply-side Situational Crime Prevention is very practical, can be quickly approved and implemented, and is easy to explain not just the features (what it does) but the benefits (how it specifically helps reduce the problem). The idea is so simple that it seems even intellectually offensive that “Reducing opportunities for crime can indeed bring a substantial net reduction in crime” (Clarke 1997a, b).

Key Learning Objective 1: Crime Prevention Theory

This section presents Key Learning Objective 1 which is to review crime prevention theory and specifically Situational Crime Prevention. The practical and applicable concepts are a natural fit to help implement food fraud prevention. The Crime Triangle is the start and center point for the Food Fraud Prevention Cycle (FFPC).

The Key Learning Objectives of this section are:

- (1) Fundamentals of Criminology and Crime Prevention
- (2) Review of Criminology, Crime Science, and Criminal Justice
- (3) Introduction to A range of Criminology Theories

Fundamentals of Criminology and Crime Prevention

Situational Crime Prevention is a structured and systematic approach to crime fighting. In the 1998 second edition of *Crime in Everyday Life*, the author Dr. Mark Felson stated that “[between 1994 and 1998] Criminology also changed in noteworthy fashion and more quickly than I would have dreamed in writing the first edition. We know much more about situational crime prevention. Also, those of us who study how everyday life produces or prevents crime have gathered more facts and ideas. We also are better able to tie together loose ends and to know what to study next.”

The “Crime Triangle” was presented in Felson and Clarke’s chapter “The Chemistry for Crime” in *Crime in Everyday Life* (Felson 2002). This built upon earlier work on Routine Activities Theory (Cohen and Felson 1979). The foundational concept is that “[Criminals] typically behave like criminals only in certain settings, that is, slices of time and space within which relevant people and things are assembled” (Felson 2002). The original Crime Triangle included:

1. “Suitable target”
2. “Likely offender”
3. “Capable guardian” (applied to food fraud this was later adjusted from Absence of a Capable Guardian (Felson 2002))

Before reviewing the Situational Crime Prevention application of the Crime Triangle, it is important to note that the use of a triangle to present a criminal or fraud opportunity is widely adopted for many different research questions. For example, “The Fraud Triangle Revisited” by Schuchter and Levi is based on earlier work by Cressey which focused on financial crimes such as embezzlement (Cressey 1950; Schuchter and Levi 2016). This has been a starting point and base for training for forensic accounting and fraud examiners. The “Fraud Triangle” considers motivation, opportunity, and rationalization which are similar to the suitable target, the absence of a capable guardian, and likely offender (Schuchter and Levi 2016). This “Fraud Triangle” was expanded to add the capability to a “Fraud Quadrangle” or “Fraud Diamond.” Schuster and Levi make the statement that:

We do not contest that all fire triangle elements are required for first (at least in the absence of severe rain) are sufficient to ignite. At this point, we strongly suggest that a distinction is made. Their conclusion by analogy misses the following point: the Fraud Triangle with its components can create a condition for fraud. As Romney, et al. (1980) note, all elements, even opportunity, are substitutable. (Schuchter and Levi 2016)

With this perspective, the Crime Triangle and the Fraud Opportunity is considered as a model that helps frame thinking, but it is not a rigid formula. As the food industry—and food authenticity and food science researchers—begin to consider food fraud as a unique and separate concept, the generalized Crime Triangle is helpful to understand the underlying elements that comprise a fraud opportunity (Lam and Spink 2018; Spink 2019).

An important aspect of crime prevention and Situational Crime Prevention is to provide a simple and obvious idea end method for practitioners rather a complex model for theorists. The focus is very practical and on implementation that considers a lack of time and competing for human resources to apply to the project. Also, there is an awareness and acceptance of a hierarchy of assessments that start with straightforward applications and then can become more complex and thorough (certainty, robustness, etc.) as needed or as is possible. Felson stated: “If anything, I have tried to get even more down-to-earth about crime as a tangible phenomenon” (Felson and Boba 2017).

The thought leaders of crime prevention have openness and drive to adapt their theories to new crime problems. This was an ideal starting point for food fraud prevention.

The original Situational Crime Prevention and Crime Triangle concepts were from the original publication by Cohen and Felson (1979). “In [Social Change and Crime Rate Trends: A Routine Activity Approach] we present a ‘routine activity approach’ for analyzing crime rate trends and cycles. Rather than emphasizing the characteristics of offenders, with this approach, we concentrate upon the circumstances in which they carry out predatory criminal acts. Most criminal acts require convergence in space and time of likely offenders, suitable targets and the absence of capable guardians against crime” (Cohen and Felson 1979).

This research was combined and presented the original Crime Triangle (Fig. 7.2) (Felson 2002).

Fig. 7.2 Original Crime Triangle. (Adapted from Felson (1998) or Cohen and Felson (1979))



Fig. 7.3 Adaptation of the Original Crime Triangle Components. (Adapted from Felson (1998) or Cohen and Felson (1979))



This was adapted from Food Fraud Crime Triangle (Fig. 7.3) (Spink and Moyer 2011).

The two were combined here to provide one visual (Fig. 7.4).

The three legs of the triangle must be present for a crime to occur. The important insight or contribution—which is direct, simple, logical, and immediately actionable—is that removing one of the three legs of the triangle removes the fraud opportunity. Reducing the length of a leg of the triangle reduces the “fraud opportunity.” They stated, “We further argue that the lack of any one of these elements is sufficient to prevent the successful completion of a direct-contact predatory crime...” (Cohen and Felson 1979).

Later a more sophisticated Crime Triangle was presented by Clarke and Eck (2005) and Felson (2002) (Fig. 7.5) (Felson 2002; Clarke and Eck 2005). This was adapted to consider that some of the factors actually apply all around the triangle rather than on a specific side. The original Crime Triangle has been efficient for the food fraud prevention needs and users.

Considering the emphasis and willingness to apply and adapt the core concepts to new problems, this was applied to food fraud prevention. Many different theories were evaluated and included in food fraud prevention.

While there have been further advances in a more complex criminology Crime Triangle, the adaptation of the original Crime Triangle has been efficient.

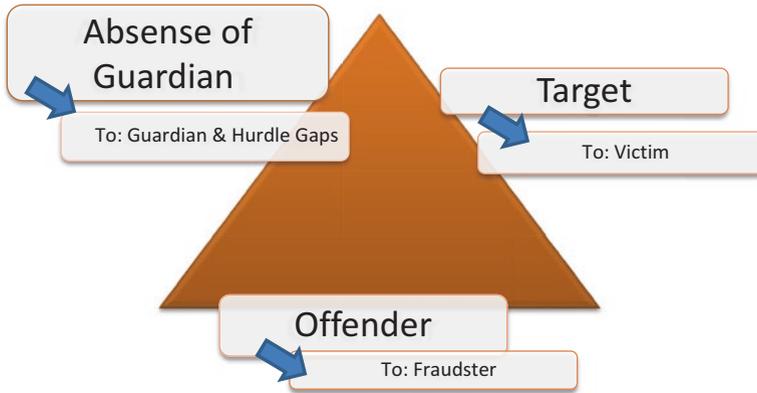


Fig. 7.4 Adaptation of the Crime Triangle to food fraud prevention. (Adapted from Cohen and Felson (1979) and Felson (2002) and published in Spink and Moyer (2011))

Fig. 7.5 Crime Triangle from Crime analysis for problem-solvers in 60 easy steps. (Copyright Permission Granted) (Clarke and Eck 2005)



Sidebar: Application—SSAFE Food Fraud Vulnerability Assessment Tool and Criminology

The Crime Triangle and the focus on the fraud vulnerability are crucial concepts in a Food Fraud Vulnerability Assessment (FFVA). One early presentation of this concept was by the GFSI Food Fraud Think Tank and published in the GFSI position paper on Food Fraud (Spink 2013; GFSI 2014). This was expanded upon by the SSAFE Organization-funded model developed with Wageningen University (Netherlands) which is as defined in van Ruth, Huisman, and Luning (2017). In “GFSI Position on Mitigating the Public Health Risk of Food Fraud,” the GFSI Board publically recognized and

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supported the SSAFE Food Fraud mitigation guidance that includes the FFVA (GFSI 2012). From the SSAFE report: “In accordance with the routine activity theory, food fraud vulnerability can be defined by the three elements: opportunities (suitable target), motivations (motivated offender) and control measures (guardianship) as presented in Fig. 1” (Fig. 7.6) (van Ruth et al. 2017). The three elements of the fraud opportunity are presented in a formula here and then later in a funnel and then spider diagram.

From the GFSI position paper on Food Fraud: “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 worked to have these guidelines available before the release of Version 7 of the GFSI Guidance Document so that companies and Certification Program Organizations (CPOs, they create the actual standards, formerly referred to as scheme owners) can prepare their organizations before the new requirements are effective” (Fig. 7.7) (SSAFE 2015).



Fig. 7.6 Schematic presentation of the food fraud vulnerability concept based on the routine activity theory—SSAFE Main Body or Report noted in Figure 1. (Copyright Permission Granted) (SSAFE 2015)

Fig. 7.7 Fraud vulnerability: the three elements affecting criminal behavior—SSAFE Appendix. (Copyright Permission Granted) (SSAFE 2015)

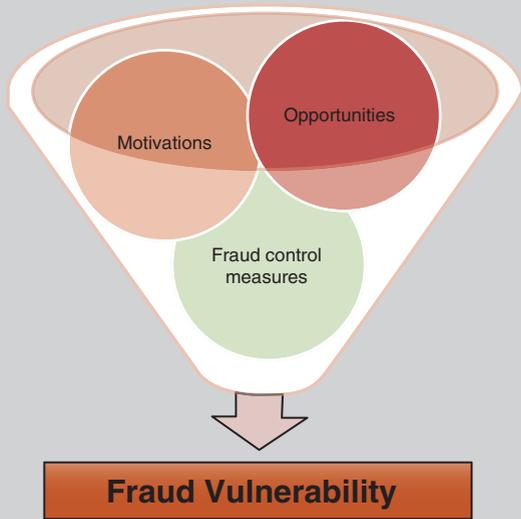




Fig. 7.8 The environment of the company and three elements of food fraud—SSAFE Appendix. (Copyright Permission Granted) (SSAFE 2015)

Then SSAFE presents the motivation, opportunities, and control measures on a spider diagram that is a variation of Crime Triangle factors (e.g., victim to opportunity, fraudster to motivations, and guardian and hurdle gaps to control measures) (Fig. 7.8). This figure presents the “company’s decreasing span of control” where there is more control within the company and then less and less control through the supply chain and into the open global market.

The core criminology theory that applies to food fraud prevention is Situational Crime Prevention. There is a simplicity, rationality, and pragmatism to focusing on the physical space of crime rather than concerns that include less direct control such as the mental state of potential fraudsters. Applying and adapting scholarly theories can be a delicate endeavor especially since there are many firmly held beliefs and sometimes a deep commitment to one theory or another.

Sidebar: The Incredible Value of the Peer Review Process—Peer Correction (MSU-FFI 2018):

Title: The Incredible Value of the Peer Review Process: Peer Correction

By John Spink • June 17, 2015 • Blog

To expand on the delicate nature of applying and adapting scholarly theories, a previous MSU FFI blog post presents some of the challenges and opportunities. This blog also provides insight into some of these activities.

From the blog post:

The peer review, scholarly journal process is long and tedious and absolutely critical to building a firm foundation for food fraud prevention. At least

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food fraud is now considered as a topic worthy for scholarly publication. There have now been more scholarly journal articles that include the words “food fraud” in the last 4 years than in the previous 100 years combined.

Sometimes – especially when dealing with interdisciplinary concepts – we focus so much on the process of writing that we do not step back to see how the foundational concepts have evolved. We recently had two key concepts clarified during the peer review process in our recently-submitted articles.

Article 1: Types of Counterfeiters – Remove “Ideological” Counterfeiter

A reviewer of our “Defining the Types of Counterfeiters, Counterfeiting, and Offender Organization” article questioned the inclusion of the “Ideological” type of counterfeiter in our list (published in *Crime Science* in 2014) (Spink et al. 2013). They argued that a terrorist would conduct a fraud act to make money. Making money is not an “ideological” act for the terrorist. The money they make could be used for a terrorist attack, which would be an “ideological” act. Considering the criminal motivation, the food fraud activity would probably fall under the “Opportunistic” type of counterfeiter.

The core research on defining the types of counterfeiting – or, more broadly, types of product fraud—for this article started during the several State of Michigan led food defense projects, so our initial focus was on terrorists. Through the evolution of the manuscript development, we shifted to economic crimes but did not entirely filter out the “Ideological” fraud motivation.

Removing the Ideological type was nuanced and not core to our hypothesis or discussion, but it was an excellent opportunity to get it right.

We are grateful to Editor Dr. Gloria Laycock (University College London) for organizing a reviewer team that is motivated and engaged enough to help us clarify this point.

Article 2: Situational Crime Prevention, Routine Activity Theory, or a Hybrid

We received comments from a reviewer for another article that was under review and is now published (Spink et al. 2014). The reviewer provided an incredibly thorough set of comments. The reviewer pointed out that we had not clearly explained our application of Situational Crime Prevention and Routine Activity Theory. These are two distinct theories but seem very similar to three core factors, often presented in a triangle, and often discussed together in the research.

- **Situational Crime Prevention:** This is a more overarching concept that includes “Environmental Criminology” (the space of crime not protecting nature), “Rational Choice Theory,” “Routine Activities Theory.” The theory is based on “victim,” “offender,” and “place” to create a “problem.”
- **Routine Activities Theory:** This is a more applied theory that focuses on everyday events in the life of criminals. The theory is based on a “suitable target,” “motivated offender,” and “absence of a capable guardian”

to create the “Criminal Event.” The entire system is often referred to as “The Chemistry for a Crime.”

Our research evolved while working with practitioners such as during our Executive Education/Short-Course programs. During that work, we move through the concepts of Situational Crime Prevention and then to Routine Activities Theory. We summarize the concepts into a single triangle figure that is fundamental to Routine Activities Theory titled “The Chemistry for a Crime.” Our first major article, “Defining the Public Health Threat of Food Fraud,” referred to this as “The Crime Triangle” and stated it was adapted from Felson’s Crime in Everyday Life (Spink and Moyer (2011) adapted from Felson (1998)). While there are many triangles applied to criminology theory, we utilize the Crime Triangle adapted from Felson’s model of the target (victim), offender (fraudster), and capable guardian (guardian and hurdle gaps). “These three elements produce the predatory crime triangle. [...] With a guardian present, the offender avoids attempting to carry out an offense in the first place. [...] Most offenders, however, have a pretty good idea of what they can get away with” (Felson 2002).

The clarification of Situational Crime Prevention and Routine Activities Theory was nuanced and not core to our hypothesis or discussion, but it was an excellent opportunity to help us clarify this point.

We are grateful for this editor for organizing a reviewer team that is motivated and engaged enough to help us clarify this point.

It is important that articles on food fraud be submitted, entered into the peer review process, and get such intense attention from reviewers. Food fraud is also becoming a topic for published articles.

Food fraud Topics are (Finally) Being Reviewed, Accepted, and Published

If a concept is not published in a scholarly journal, then academics seem to consider the concept does not exist. What is lost in the discussion in this blog post is a great accomplishment that food fraud articles are being reviewed, accepted, and published.

When we submitted our article “Defining the Public Health Threat of Food Fraud” – which was published in IFT’s ranked Journal of Food Science in 2011 – we had to persuade and defend that this was in the “aim and scope” of a food journal.

The Food Fraud Term in Scholarly Publication

A Google Scholar search on the topics:

Term	Google Scholar search results before 2011	Google Scholar search results from 2012 to 2017
Food fraud	247	394
Economically motivated adulteration	14	183

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To emphasize that point there have been more scholarly publications related to food fraud in the last 4 years as there had been in the previous history of publishing scholarly articles.

For emerging issues in food fraud and food safety, there has been an emphasis on a “science-based approach” that especially values the “peer reviewed” and “scholarly” publications. This emphasis is not to create a barrier to new ideas but to make sure the foundational concepts are well thought through and clear. This blog post provided two examples of the value of the peer review process. It is important for scholars and practitioners to pursue scholarly publications. Fortunately, food fraud is now defined as in the “aim and scope” of food journals. More articles are being submitted and published. With this success and momentum, more scholars will be more motivated to conduct food fraud research. Utilize these vast resources by reading these articles.

Personal Insight: Adapting Theories in New Disciplines: Discussion with Jay Albanese and Michael Levi

Further expanding on the challenges, there are also many examples of embracing the adaptations. I was fortunate to present on a panel at the 2015 American Society of Criminology (ASC) Annual Meeting in Washington, DC, with Nick Lord and Jon Spencer of the University of Manchester (UK) and Wim Huisman of the Vrije Universiteit Amsterdam (Netherlands). We presented a session on “Food Adulteration – The Organization of Food Crime.” After the session, we had the opportunity to talk with two highly published criminology thought leaders who are Jay Albanese and Michael Levi.

It was very encouraging to hear positive feedback on our approach and specifically how traditional criminology theories had been adapted for application to the food industry. Specifically, they were supportive of using the simplified Crime Triangle when introducing criminology theories to the food industry. They were supportive and cognizant of the challenges of introducing new theories to other non-criminology disciplines such as food science. Discussions like these have helped us be more creative when researching food fraud prevention.

Introduction to the Concepts of Crime Science, Criminology, and Criminal Justice

From the US Department of Justice/Office of Community Oriented Policing Services funded Problem-Oriented Policing Center (POP Center), “Most criminological theories focus on what makes people ‘criminal.’ They find causes in distant

factors, such as child-rearing practices, genetic makeup, and psychological or social processes. These theories are very difficult to test; are of varying and unknown scientific validity; and yield ambiguous policy implications that are mostly beyond the reach of police practice” (Clarke and Eck 2005).

Several key terms or concepts are criminology, crime science, criminal justice, traditional criminology, and environmental criminology.

Criminology (Traditional Criminology) “Most criminological theories [criminology] focus on what makes people ‘criminal.’ They find causes in distant factors, such as child-rearing practices, genetic makeup, and psychological or social processes. These theories are very difficult to test; are of varying and unknown scientific validity, and yield ambiguous policy implications that are mostly beyond the reach of police practice.”

- **Criminal Justice:** “Interdisciplinary academic study of the police, criminal courts, correctional institutions (e.g., prisons), and juvenile justice agencies, as well as of the agents who operate within these institutions. Criminal justice is distinct from criminal law, which defines the specific behaviors that are prohibited by and punishable under law, and from criminology, which is the scientific study of the non-legal aspects of crime and delinquency, including their causes, correction, and prevention. [...] The field of criminal justice emerged in the United States in the second half of the twentieth century. As the Supreme Court of the United States gradually expanded the rights of criminal defendants on the basis of the due process clause of the U.S. Constitution, the gap between the actual performance of criminal justice agencies and what was legally required and legitimately expected of them began to grow.”
- **Crime Science:** “takes a radically different approach. It focuses not on the reasons why criminals are born or made, but on the act of committing the crime. It seeks ways to reduce the opportunities and temptations for crime and increase the risks of detection. In doing so, it seeks contributions from a wide range of disciplines, including psychology, geography, medicine, to which it helps to reduce crime on our streets, and in our homes and businesses” (Romero and Atlas (2002) in Clarke and Eck (2005)).
- **Traditional Criminology:** “seeks to improve understanding of the psychological and social forces that cause people to become criminals in the hope of finding ways to change these causes” (Romero and Atlas (2002) in Clarke and Eck (2005)). “Traditional criminology seeks to improve understanding of the psychological and social forces that cause people to become criminals in the hope of finding ways to change these causes. [...] It seeks ways to reduce the opportunities and temptations for crime and increase the risks of detection.
- **Environmental Criminology:** “...The theories and concepts of environmental criminology (and of the new discipline of crime science) are very helpful in everyday police work. This is because they deal with the immediate situational causes of crime events, including temptations and opportunities and inadequate protection of targets. You will be a stronger member of the problem-oriented

team if you are familiar with these concepts. The problem analysis triangle (also known as the Crime Triangle) comes from one of the main theories of environmental criminology – routine activity theory. This theory, originally formulated by Lawrence Cohen and Marcus Felson, states that predatory crime occurs when a likely offender and suitable target come together in time and place, without a capable guardian present” (Clarke and Eck 2005).

Introduction to a Range of Criminology Theories

After considering the core concepts of Situational Crime Prevention and some of the challenges and opportunities of adapting theories, it is essential to provide a foundation that considers those other theories. Several basic criminology terms are the foundation of the discipline (Clarke 1997a, b).

- ***Situational Crime Prevention***: Reviewed throughout this chapter is “opportunity-reducing measures that (1) are directed at specific forms of crimes, (2) involve management, design, or manipulation of the immediate environment in as systematic and permanent way as possible, (3) make crime more difficult or risky, or less rewarding and excusable as judged by a wide range of offenders.”
- ***Rational Choice Theory***: Essentially those criminals believe they will not get caught and will benefit from an act.
- ***Routine Activities Theory***: Essentially those crime opportunities are most prevalent when and where perpetrators have access to or awareness of the victim or target.
- ***Action Research Methodology***: A model where “researchers and practitioners work together to analyze and define the problem, to identify and try out possible solutions, to evaluate the results, and, if necessary, repeat the cycle until it is achieved (Lewin 1947).”
- ***Problem-Oriented Policing***: This is based on “...operational effectiveness for the police was not through improvements in organization and management but through detailed analysis of everyday problems they handle and the devising of tailor-made solutions.” This process required “identifying these problems in more precise terms, researching each problem, documenting the nature of the current police response, assessing its adequacy and the adequacy of existing authority and resources, engaging in a broad exploration of alternatives to present responses, weight the merits of these alternatives, and choosing among them.”

These core concepts are often adapted or evolved to address the specific needs of the practitioners. A system that has been adopted is the Criminology SARA approach (Eck and Spelman 1987). This is similar to the ISO 31000 Risk Management and Six Sigma quality management concepts of plan-do-check-act (PDCA).

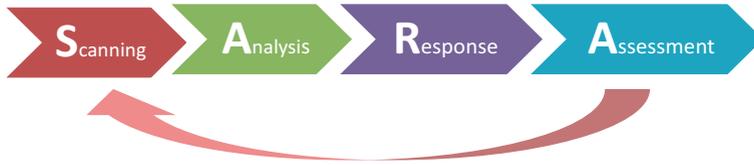


Fig. 7.9 Eck's SARA model for problem-oriented policing: scanning, analysis, response, assessment, and repeat. (Adapted from Eck and Spelman (1987))

Your work can help answer four fundamental questions. These questions correspond to the stages of the Scanning, Analysis, Response, Assessment (SARA) process (Fig. 7.9):

1. What is the nature of the problem? (Scanning)
2. What causes the problem? (Analysis)
3. What should be done about the problem? (Response)
4. Has the response brought about a reduction in the Problem? (Assessment)

The practical applications are relevant and apply to real-world needs and situations such as limited funding. The reality of limited and dwindling resources for law enforcement, investigation, and prosecution has been the subject of study. The insights from “Crime Analysis for Problem Solvers in 60 Small Steps” are so profound and applicable to food fraud prevention that many of the quotes are included here. From the report (Clarke and Eck 2005):

One of the primary concerns in policing in the United States today [published in 2005] – and for the foreseeable future – is the severe constraint on spending. The lion's share of police budgets is consumed in personnel costs. As a result, many police agencies are already operating significantly below their authorized strength. Funds to hire new officers to meet growing needs are hard to obtain. And, of special relevance here, traditional forms of policing, because they are so heavily dependent on personnel, are being curtailed. Calls cannot be handled as completely and quickly as in the past. Personnel cannot be as freely assigned to increasing the police presence on the streets in labor-intensive tactics, such as crack-downs, sweeps, and special task forces. ... And [the constrained resources lends fresh impetus to meeting a long-standing, neglected need – the need to equip the police with an institutionalized capacity to examine its work product; to routinely ask, before committing to more of the same, what it is that the police are expected to accomplish and how they can more effectively accomplish it. ... This is the essence of problem-oriented policing. (Clarke and Eck 2005)

There are more criminology theories, but these are several that have been applied to food fraud prevention.

Article Review – Create Investigation Networks that Mirror the Criminal Network (MSU-FFI 2018):

Title: Article Review – Create Investigation Networks that Mirror the Criminal Network

By John Spink • November 13, 2017 • Blog

Our article focused on a recommendation for how the Public-Private-Partnership – that is, governments working together with industry and others – could be optimized to reduce the “fraud opportunity.” One co-author was Peter Whelan, who is the head of food fraud prevention for the country of Ireland (Irish Food Safety Authority – FSAI) and also a member of the European Union Food Fraud Network and INTERPOL Operation Opson (food crime).

One key concept in the article is the creation of investigation networks that mirror the criminal organization structure. A typical food safety incident investigation team may not have the expertise to address food fraud incidents. For example, food fraud is detected or deterred by focusing on cyber-crime, tax avoidance smuggling, or trade-based money-laundering.

Recommendations from the journal articles (Wheatley and Spink 2013; Heinonen et al. 2014; Spink et al. 2016a, b):

1. **Create a unique and specialized team:** Treat a food fraud incident and investigation with a fundamentally different approach than for traditional food safety or food quality problems. Consider the attributes of the unique food fraud network and then gather the specific experts.
2. **Be realistic about resource allocation and practical impact:**
 - (a) **Law enforcement priority setting (what can food investigators expect from other agencies, prosecutors, the judiciary, and the legislators):** The priority that consumers expect are: public safety (drugs, guns, violence), public health (major harms), large scale economic crimes that disrupt governments or markets (government bribery, sub-prime mortgage lending crisis), large economic crimes than impact many (billions across a market), and then smaller economic crimes and that impact one or a few stakeholders. **Conclusion:** Most food fraud incidents would fall into the last category and lowest priority.
 - (b) **Investigation and prosecution methods for results (the goal is not to catch bad guys and bad product but prevent food fraud from occurring in the first place):** Product fraud and counterfeiting is considered a “hybrid” crime with aspects of “white collar” crime and “traditional” crime (Heinonen et al. 2014). The planning and reward is a typical “white collar crime” while the violation is “traditional crime” where a victim has physical contact and impact of the act. A “traditional” law enforcement investigation would focus on where the crime

is conducted to either produce the illicit good or to work with the victim. For product fraud, it is very complex, difficult or often approaching impossible to even find the origin of the product or the fraudster (Spink and Moyer 2011). Also, when considering some simple types of tampering instead of major production locations, there could be thousands of home-based fraudsters (Wheatley and Spink 2013). **Conclusion:** Traditional food safety investigation methods may be impractical or inefficient.

From the “The role of the public-private-partnership in food fraud prevention—includes implementing the strategy” (Spink et al. 2016a, b):

Scope of the Public-Private Partnership

- “The [Public Private Partnership] may be a unique collaboration with a non-traditional focus. Government agencies have been traditionally created and focused on compliance and enforcement. This contributes to prevention but is often through dis-connected, reactive detection and prosecution. If there is a focus on an overall Food Fraud Prevention Strategy, then the resources could be defined in terms of exactly how they coordinate to reduce the overall fraud opportunity.”
- “More arrests or more seizures do not necessarily mean that a problem is actually decreasing. More seizures could be due to more efficient detection methods or a focus on a specific product. Fewer arrests could result from an actual decrease in fraud or the fraudsters evolving to new types of crime or the lack of attention to food fraud detection and prevention.”
- “It is also most efficient to align countermeasures to the structure of the crime and the criminal networks:”

Example of Investigation Task Force Mirroring the Criminal Network

- **Caribbean On-Line Species Substitution:** For example, if the fraud opportunity is within the Caribbean region and involves online market-places as well as species substitution, then the task force would ideally be staffed with a Caribbean team with cyber-crime and species identification expertise.
- **International Broker Network for Spice Dilution:** If the fraud opportunity is ground spices through a broker network from India to South America through free trade zones, then the task force would ideally be staffed with an international trade team familiar with brokers.
- **European Wine Trade-Based Money-Laundering:** If the fraud opportunity is a trade-based money-laundering of premium wines within Europe, then the task force would be ideally staffed with a European team with smuggling and wine experience.

(continued)

- “The most effective and efficient government countermeasures are the combination of controls where there is a regulated change of product ownership such as import tariffs or sales tax. Governments have the most control of the food supply chain at border crossings and in regulating the point of consumer purchase. Industry has the most control at the ownership exchange when receiving materials and at the sale to consumers. For these reasons, food fraud prevention is most efficiently achieved for the country, market, and world at these exchange points through a public-private-partnership.”

The most important conclusion is that there are a growing awareness and literature on food fraud prevention, including the investigation and enforcement. The most inspiring realization is that many global law enforcement agencies – e.g., UK National Food Crime Unit (Andy Morling and team), Dutch Food Crime Unit (Karen Gussow), Scottish Food Crime Unit (Ron Naughton), etc. – are taking this novel and broad approach. We look forward to continuing to learn from these thought leaders. MSU-FFI.

Sidebar: Review of Food Integrity Handbook (EC Food Integrity Project)

One of the deliverables of the European Commission-funded EU Food Integrity Project was the publication of this comprehensive food authenticity testing handbook. This is one of the most—if not the most—comprehensive and helpful guides to food authenticity testing. Most practitioners will not need to seek any other resources other than when searching for methodology details or actual test results,

From the Foreword from Professor Christopher Elliott: “A major element in the fight against fraud is the development, validation, and implementation of novel methodologies that can detect and often quantify the level of cheating that has occurred.”

Regarding the scope “The prime focus of this Handbook is, of course, food authenticity and the analytical solutions available to address existing concerns.” The target audience was industry quality control managers who are starting to review food authenticity response and also “young scientists starting their career in food science and to students and researchers with little prior knowledge of the area.”

Definitions

The definition of food fraud that is based on the CEN Workshop (agreed by the attendees but not reviewed by the entire CEN) is:

- **Food fraud:** An activity “intentionally causing a mismatch between food product claims and actual food product characteristics, either by deliberately making claims known to be false or by deliberately omitting to make claims that should have been made.”

For the types of food fraud, the report referenced the GFSI Food Fraud Think Tank and the CODEX Food Fraud draft discussion paper.

To review the exact statement in the handbook, the report quoted the Codex EWG:

- “**Food fraud** is ‘any deliberate action of businesses or individuals to deceive others in regards to the integrity of food to gain undue advantage.’”
 - *For food fraud prevention:* Note—the action by the fraudster where the response would be food fraud prevention.
- “‘**Food authenticity**’ and ‘food integrity’: Both are a status of a food product, but the former is the state of being ‘not altered or modified with respect to expected characteristics including, safety, quality, and nutrition,’ while the latter is the state of being ‘genuine and undisputed in its nature, origin, identity, and claims, and to meet expected properties.’”
 - *For food fraud prevention:* Note—a state of being or status of the product where the response would be to confirm the claims.

In the same way, the definition of an “Authentic food product” given by the CWA is very close to that of food fraud:

- **Authentic food product:** “A food product where there is a match between the actual food product characteristics and the corresponding food product claims; when the food product actually is what the claim says that it is.”

The handbook specifically focuses on adulteration, stating “One of the most common frauds is adulteration.”

- **Adulteration:** “A type of food fraud which includes the intentional addition of a foreign or inferior substance or element; especially to prepare for sale by replacing more valuable with less valuable or inert ingredients.” This practice is sometimes referred to as Economically Motivated Adulteration (EMA). This term is defined in the *Codex Alimentarius* position paper. It is recognized as “a subset of food fraud.”

The handbook notes other types of food fraud that are outside the scope of the FIP Handbook:

- “**Grey market:** this term includes production, theft, and diversion involving unauthorized sales channels for products. An example of this is the sale of the

excess unreported product when there are production agreements or quotas for the product and the product in question is deliberately produced in excess of these. A fish product originating from illegal, unreported, and unregulated (IUU) fishing is another example. This term also applies when there is a geographical restriction on the sale and distribution of the product, and the product in question is deliberately sold or distributed in other areas; this is often referred to as ‘grey market’ sales.”

- “**Counterfeit:** is a case when where Intellectual Property Rights (IPR) infringement is in effect. This could include any or all aspects of the other product or packaging being fully replicated, for instance, the process of copying the brand name, packaging concept or processing method for economic gain. Imitation wines and spirits with fake labels of a popular brand is a classical example (see the chapter on Spirits).”
- “**Mislabelling:** is a special case of food fraud. It concerns the process of putting false claims on packaging for economic gain. Selling farmed salmon as wild salmon, or conventional fresh produce as organic are examples of this fraud. Expiry date modifications fall under this category. However, mislabelling may apply to all forms of food fraud: to be efficient, a fraudulent product must indeed be ‘misabeled’ to be purchased by a buyer. But the expression is mainly used to indicate distortion of the information provided on the label.”

Product Commodities Addressed

The handbook covers a wide range of product commodities that are generally understood to have a high fraud opportunity (Table 7.1). Each of the 20 product chapters includes a by-fraud-type review of the authenticity test methods. Examples of the sections from the milk and dairy chapter are authenticity issues, species substitution, geographical origin and rennet origin, technological processes (heat processing, freezing), and maturation. The types of authenticity issues for milk and dairy include undeclared addition of certain ingredients, adulteration with water, adulteration of nitrogen content, adulteration of the fat content, synthetic or reconstituted milk, and adulteration with preservatives. The handbook did include a mention of how this handbook contributed to the overall GFSI food fraud compliance requirements for all types of fraud and for all products.

Table 7.1 Product commodities covered in the *Food Integrity Handbook*

Milk and milk products	Eggs and egg products	Honey	Meat and meat products
Fish, seafood, and related products	Cereals and cereal-based products—wheat, rice	Species origin of gelatine in foods	Cocoa, cocoa preparation, chocolate, and chocolate-based confectionery
Spices	Saffron	Wine and must	Spirit drinks
Fruit juices	Vinegar	Coffee	Tea and flavored tea
Olive oil	Vegetable oils	Food flavorings	Nuts, nut products, and other seeds

Sidebar: Unique and Widely Adopted Concepts and Definitions—LEO or Gemini?

One challenge when conducting interdisciplinary research is understanding the general concepts, basic terminology, specific definitions, and “common sense.”

Leo or Gemini? Coming from a food science, food safety, and packaging background, originally there was little interaction with the law enforcement literature or community. Overheard while going through security screening into a US Government Building.

- Guest: “With the bad weather, did you have trouble commuting in here early to your security post?”
- Security Guard: “No, we got here before the snow started. Now, please put your bag on the conveyer belt and your keys in this bowl.”
- Guest: “Ok. I do not mind the snow since I just slow down and try to enjoy the trip. I guess I expect delays so if we get here quickly, then it is a nice surprise.”
- Security Guard: “Are you a Leo?”
- Guest: “No, I am a Gemini. So I am patient and didn’t mind the long commute.”
- Security Guard and a big group of colleagues: Outburst of laughter.
- They asked a security question of whether the guest was a “Law Enforcement Officer”—abbreviated “LEO”—they were not asking the guest’s astrological sign.

When addressing food fraud prevention, there should be an assumption that other disciplines have unique expertise and efficient practices and phrases.

Key Learning Objective 2: Situational Crime Prevention in Detail

This section reviews the criminology theory of Situational Crime Prevention in detail. Since the mid-1970s, there was an expansion of criminology theory to address questions such as the root causes related to the physical space and opportunities. The “environmental criminology” concepts provide an especially practical and pragmatic for food fraud prevention.

The Key Learning Objectives of this section are:

- (1) Review the Situational Crime Prevention fundamentals.
- (2) Apply the theory in relation to other crime-fighting objectives.
- (3) Then review application examples or case studies.

Situational Crime Prevention in Detail

The focus of Situational Crime Prevention is on “opportunity-reducing measures” (Clarke 1997a, b; Felson 2002). Situational Crime Prevention comprises opportunity-reducing measures that have a food fraud application (Clarke 1997a, b):

- “Situational crime prevention comprises opportunity-reducing measures that:
 - Are directed at highly specific forms of crime,
 - Involve management, design, or manipulation of the immediate environment in an as systematic and permanent way as possible,
 - Make crime more difficult or risky, or less rewarding and excusable as judged by a wide range of offenders.”

Four Components of Situational Crime Prevention are (Clarke 1997a, b):

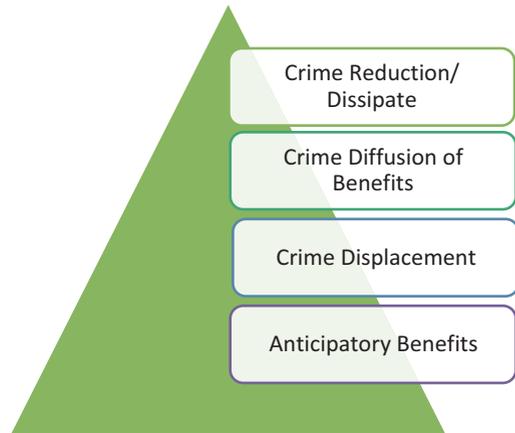
- “Four Components of Situational Crime Prevention
 - A theoretical foundation drawing principally upon routine activity and rational choice approaches,
 - A standard methodology based on the action research paradigm,
 - A set of opportunity-reducing techniques, and
 - A body of evaluated practice including studies of (crime) displacement.”

The criminology authors specifically and intentionally are general since “Situational crime prevention is assumed to apply to every kind of crime, not just to ‘opportunistic’ or acquisitive property offenses, but also to more calculated or deeply-motivated offenses”(Clarke 1997a, b). “This [value of the theory is that it] avoids speculation about the source of the offender’s motivation, which distinguishes it immediately from most other criminology theories” (Clarke 1997a, b). This is exactly why these vulnerability reducing crime prevention concepts simply and directly applied to food fraud prevention.

Review of Criminology Terms

The core criminology theories are the general models, and then there are specific terms used for aspects of the application. Regarding the goal of a crime prevention strategy, several fundamental concepts include anticipatory benefit, crime displacement (shift the target), diffusion of benefits (one activity will provide multiple benefits), and ultimate crime diffusion (there is no motivated offender), while the fourth goal of Situational Crime Prevention is “including studies of (crime) displacement” (Felson 1998). The ultimate goal here is to reduce the fraud opportunity to such a low level that the offenders are encouraged to attack elsewhere or give up on even trying to commit a crime—the ultimate goal is to reduce or eliminate the motivation to prevent the act from occurring in the first place (Fig. 7.10).

Fig. 7.10 Hierarchy of criminology terms



- **Anticipatory Benefits, Crime:** “Benefits from crime prevention that begin prior to initiation of crime prevention treatments” (Clarke and Eck 2014). Also, “... benefits were noted if a pre-initiative drop in a crime measure was observed” (Smith et al. 2002). The criminals reduce their activity in anticipation before the crime prevention countermeasures are implemented.
- **Displacement (Crime):** “is the relocation of crime from one place, time, target, offense, or tactic to another as a result of some crime prevention initiative” (Guerette 2009). Also, “Overall, displacement is viewed as a negative consequence of crime prevention efforts, but in some cases, it can still provide some benefit” (Guerette 2009):
 - Temporal—offenders change the time at which they commit a crime
 - Spatial—offenders switch from targets in one location to targets in another location
 - Target—offenders change from one type of target to another
 - Tactical—offenders alter the methods used to carry out crime
 - Offense—offenders switch from one form of crime to another.”
- **Diffusion of Benefits (Crime):** “...entails the reduction of crime (or other improvements) in areas or ways that are related to the targeted crime prevention efforts, but not targeted by the response itself. Though less recognized than displacement, diffusion is recorded in many research evaluations of crime prevention responses. Diffusion effects are referred to in a variety of ways including the “bonus effect,” the “halo effect,” the “free-rider effect,” and the “multiplier effect.” “The opposite of crime displacement is diffusion of crime control benefits. Crime diffusion entails the reduction of crime (or other improvements) in areas or ways that are related to the targeted crime prevention efforts, but not targeted by the response itself (Guerette 2009)”. The criminals decrease a wide range of their activities even beyond where the crime prevention countermeasures are implemented.

- **Prevention (Crime):** “Crime prevention is about reducing the risk of occurrence, and the potential seriousness, of crime and disorder events by intervening in their causes. This definition is deliberately inclusive—centering on no particular kinds of causes or theories of crime, and favoring no kinds of intervention over others” (Eckblom 2013).
- **Reduction (Crime):** “is simply about decreasing the frequency and seriousness of criminal events, by whatever (legitimate) means. Crime prevention is intervention in the causes of criminal and disorderly events to reduce the risk of their occurrence [prevention] and/or the potential seriousness of their consequences [mitigation]. Most reduction is delivered through prevention, although some involve intervening directly in unfolding events” (Eckblom 2013).
 - **Designing Out Crime** (Newman 1972). This is a similar concept within crime reduction and applies to food fraud due to the focus on opportunity elimination.

While it is not a criminology term, for food fraud prevention the idea of crime reduction, designing out crime or even a hybrid with crime displacement would be to eliminate the fraud opportunity and could a to “dissipate.”

- **Dissipate** (applied to crime): “to cause to disappear; to cause (members of a group) to move widely apart” (Merriam-Webster 2004)

An extension on these criminology concepts, in relation to the food fraud prevention, could be **vulnerability elimination** or the removal of a system weaknesses or attributes necessary for a crime to occur. Remember, the three legs of the Crime Triangle are required—in the presence of a “motivated offender”—for a crime even to be able to occur.

To note, there is a resistance for criminology theorists to even refer to “eliminate crime.” There is a general understanding that crime cannot be completely eliminated. For a specific type of crime such as food fraud, the environmental criminology focus would be on understanding the root cause, displacement to less dangerous problems, and then to shape the space to that the frequency and seriousness are reduced to an optimal or acceptable level.

Sidebar: The Ecosystem of Organized Crime (and How to Disrupt Food Fraud Vulnerabilities) (MSU-FFI 2018):

Title: The Ecosystem of Organized Crime (and how to disrupt food fraud vulnerabilities)

This is a summary of Markus Felson’s 2006 report and presentation on *The Ecosystem of Organized Crime* (Felson 2006). As consistent with his other works and Situational Crime Prevention in general, the most efficient focus is on how and why a crime opportunity exists which is more than just catching bad guys or bad product.

Before getting into the details of this report, it is important to take a moment to consider the concept of “organized crime,” “crime that is organized” and “criminal cooperation.” Felson often addresses the public perception where “The televised version of organized crime depicts highly organized people in business suits sitting around a table for meetings, with intricate coordination across a vast field, and a certain brilliance of mind.” Felson emphasizes that “Scholars have long told us that the televised version of organized crime is substantially wrong – that most organized crime is much smaller in scale and coordination.” From a personal communication with Marcus Felson (2018):

Sometimes organized crime is very organized, such as in places where the state is very weak. Sometimes it is more a network. Sometimes it is more rudimentary.

Felson provided a footnote in the report regarding the organized crime term that “Note 4: I use the term ‘criminal cooperation and organization’ because of my allergic reaction to the term ‘organized crime.’ The latter conveys a specific image popularized by television, one not substantiated by scholarship and experience. However, this [ecosystem] paper does not include all criminal cooperation, much of which is too rudimentary to fit under the rubric of ‘organized crime,’ rightly understood.”

The ecosystem in this reference is not the components of the crime opportunity (see the Crime Triangle including the victim, criminal/fraudster, and guardian) but the attributes or activities that feed an entire criminal organism. For a very simplistic example from nature, bugs are eaten by birds that are eaten by mammals that then decompose to be nutrients for the bugs.

To address the problem of criminal cooperation, Felson provides insight into the environment. For our observation of the problem and consideration of the more effective and efficient countermeasures, there is a need to be aware of how much that can be actually observed:

Semipublic and semi-private settings: “These are very important for crime to occur. The following scale helps us understand how cooperative crime surfaces and where it is most exposed to interference:”

1. “Public Settings – Minimal supervision, easy contact with strangers
2. Semipublic Settings – Transition and transfer settings seen by many, but not all
3. Semi-private Settings – Transition and transfer settings seen by a few
4. Private Settings – Limited access.”

Consistent from feedback in other investigations, it is that often the product fraud events are conducted in secret, in private settings, and by actors from within the legitimate supply chain. For food fraud prevention, the consideration of the crime settings provides insight into why food fraud acts are difficult to see or find since they would seem to occur mostly in the semi-private and private settings.

(continued)

Next, Felson presents the ecosystem of how the smaller crimes feed into bigger operations:

“The Web of Crime Cooperation: The interplay of many crimes produces a web of interdependence. [...] This web of crime cooperation exposes each crime to a larger environment, without which it cannot thrive. ([Felson has] explained elsewhere the multitude of interdependencies between illegal and legal activities.”

- “Small time thefts lead to fencing stolen goods,
- Providing thieves money,
- For purchasing small amounts of illegal drugs,
- Contributing to small-time drug dealing,
- Feeding into large-scale drug dealing.”

For food fraud prevention, there should be a consideration of why and how the first “small-time theft” opportunity is identified and the potential for that fraudster to advance from diluting a food to selling illegal drugs. The occupational type of criminal usually grows their operation within their current infrastructure which would be related to the legal sales of food... and with the exception of extreme and desperate situations, this would *not* be deciding to switch from selling diluted beverages to selling illegal narcotics.

So, considering the concept that crime is difficult to observe and there is a symbiotic relationship between hierarchies of crime actors, Felson builds upon other Situational Crime Prevention theories to present some – where Felson admittedly refers to them as “unusual” – guidelines to efficiently address a crime problem. To consider each idea in relation to food fraud prevention further discussion is provided here. The incident used for the example is the UK 2012 incident where lower cost horsemeat was illegally and fraudulently blended into the product that was presented as 100% beef.

“These ideas lead me towards an unusual set of recommendations for understanding organized crime in society, as well as reducing it:”

1. “Focus on the *acts*, not the group engaging in it.”
- (a) **For food fraud prevention**, focus on the vulnerability or system weakness, not the perpetrators. For horsemeat, this would be a focus on where and how the fraud was enabled to occur not on the specific fraudsters.
2. “Divide cooperative and organized crimes into *very* specific types.”
- (a) **For food fraud prevention**, focus on very specific types of fraud acts with the bigger crime. For horsemeat, this would be narrowing the focus to the documentation vulnerability.
3. “Study the *vast variation* in criminal cooperation and organization.”
- (a) **For food fraud prevention**, this would be to assess how the seemingly common fraud acts differ. For horsemeat, this would be to consider the specific relationships and capabilities that led to each fraud act, not the overall horsemeat vulnerability.
4. “Assume *minimal* levels of cooperative complexity, that such crime is seldom ingenious.”

- (a) **For food fraud prevention**, this is first to consider very simple vulnerabilities and straight-forward countermeasures. For horsemeat, this could be announcing to suppliers that species tests will be conducted. Remember, the goal is not to catch food fraud but to prevent it from occurring in the first place.
5. “Don’t follow the money; follow the *physical transactions*.”
- (a) **For food fraud prevention**, it is important to remember that the fraud acts are not the end objective but making money off the fraud is the goal. A disruption at the very end of the supply chain could vastly increase the risk of getting caught or the cost of conducting the crime. In Felon’s terms, the “Ecosystem” would be disrupted. For horsemeat, this could be an organization conducting even just a few, but routine, market species tests.
6. “Don’t look for deep secrets; look for the *obvious* and *almost obvious*.”
- (a) **For food fraud prevention**, building on item 4, it is efficient to start with the most basic and most obvious vulnerabilities. While there may be more clandestine and complex actions occurring, addressing the simplest crimes may create a ripple effect on all of the more complex crimes. If anything, there is a statement to the marketplace – and more importantly to any fraudster who may be lurking in the supply chain – that there is an increased focus and scrutiny. For horsemeat, this would build upon the discussion in item 4 to start with a focus on straightforward fraud acts.
7. “Find out how one crime *depends* on another.”
- (a) **For food fraud prevention**, this builds upon the previous items to consider the “Ecosystem” of the fraud act. Each criminal relies on another system to achieve specific goals. For horsemeat, a supplier of meat must have a group that enables the documentation to be forged, and the fraudulent company needs a customer who is not aware of the fraud act, doesn’t care, or is complicit. Compared to other types of crime, food fraud seems too often be very simple.
8. “Find out how crime *feeds off* legitimate and marginal activities.”
- (a) **For food fraud prevention**, the biggest opportunity is probably to co-mingle fraudulent and legitimate product. The fraudulent supplier needs a buyer for their product. The biggest opportunity is with buyers who are in the legitimate supply chain. After that, there are more opportunities in marginal activities that may have less oversight or controls. For horsemeat, this could be the series of digital brokers who consolidated and coordinated a series of bids that reduced transparency and highlighted the fraud opportunity.
9. “Tease out the *sequence* of events for ongoing criminal cooperation.”
- (a) **For food fraud prevention**, this is to consider the basic activities or components of the transactions including vulnerabilities or system weaknesses. It is critical to understand the specifics and nuance of specific fraud acts. This deeper focus helps define how a bad guy thought they were making a rational choice to conduct this act – the rational choice is that they can make a profit and get caught. For horsemeat, the understanding of the sequence of events could identify specific hotspots where even very simple countermeasure or control system could vastly reduce the fraud opportunity.
10. “*Interfere with that sequence*, access to the customer, or modus operandi.”
- (a) **For food fraud prevention**, this is to define and implement efficient and effective countermeasures or control systems that target very specific parts of the vulnerability and disrupt the ecosystem.

(continued)

Ultimately, while counterintuitive to many of the food fraud strategies, considering the crime ecosystem concept is very effective since it both identifies the overall system weaknesses and explains the simples and most obvious first steps. If you are investigating or analyzing a food fraud incident, there are many resources to provide you with insight including this report by Felson on “*The Ecosystem of Organized Crime*.” Do not reinvent the wheel. First, seek out previous works by experts and then adapt to your problem. MSU-FFI.

Examples of Situational Crime Prevention for Other Crimes

Sidebar: Simple Example—Caller ID Reduces Obscene Phone Calls

An example of the hierarchy of criminology terms is considering how telephone caller identification reduces the frequency of obscene phone calls. Some of the best examples or case studies are very obvious. For this discussion, just the title explains the application telephone automatic caller identification (caller ID) of Situational Crime Prevention. The introduction of “caller ID”—telephones providing the phone number and name of the caller to the called—fundamentally changed the fraud opportunity where the perpetrator was no longer anonymous (Clarke 1997a, b). Over time, some perpetrators may no longer commit the act (*prevent crime*); they may change their methods (*displacement*), or they may act less (*diffuse crime*).

A broad focus on the fraud opportunity would identify that “obscene phone calls” are a function of the use of the “phone.” The underlying act is “obscene” contact with a victim. Applying Situational Crime Prevention—and for food, a Food Fraud Prevention Strategy—the general vulnerability changes and was not eliminated. It would have been understood and logical that the perpetrators would shift to other methods of attack based on the underlying perpetrator motivation. The crime would evolve. Cyberstalking is an example of the evolution.

Sidebar:

Case Study of Applying Situational Crime Prevention—Nigeria

To provide an example of the theories and terms of applying this case study of the Nigerian combating, counterfeit medicine initiative is presented (Fig. 7.11). A case study of applying Situational Crime Prevention is in the article “Addressing the Risk of Product Fraud: A Case Study of the Nigerian Combating Counterfeiting and Sub-Standard Medicines Initiatives” (Spink et al. 2016a, b). Here the Crime Triangle is used to present seven specific countermeasures and control systems and how they reduce the “fraud opportunity.”

Case Study - Details

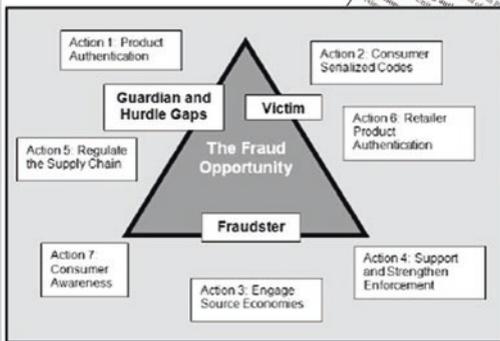


Figure 4: Application of the Crime Triangle to the Nigeria Anti-Counterfeit Initiatives—Identifying the Influence of each Action on the Fraud Opportunity

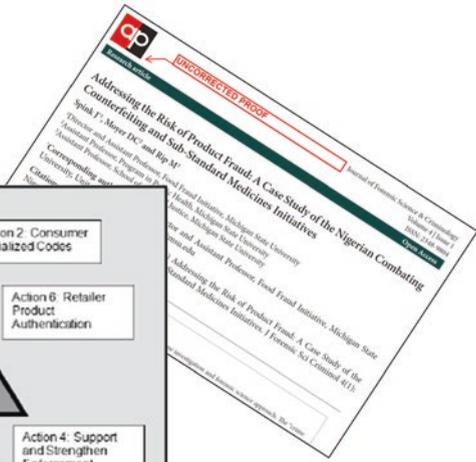


Fig. 7.11 Case study details of the review of the Nigerian fraud opportunity for *Counterfeit Medicines*. (Copyright Permission Granted) (Spink et al. 2016a, b)

The study is on counterfeit medicines in Nigeria, but the underlying concepts apply to all product fraud including food fraud. The Nigerian situation was a national public health crisis where in 2001 over 60% of their pharmaceutical market was counterfeit or substandard. The focused countermeasures and control systems led to a reduction identified in a World Health Organization survey and reported to 16% in 2004. Ongoing surveys found even further reductions in specific markets or sales channels.

From the article: “A methodology was developed to consider strategic countermeasures and control systems based on Situational Crime Prevention which includes the Routine Activities Theory and the Crime Triangle. The Nigerian SSFFC initiatives were used as a case study to apply this theory. The insights apply to reduce the public health risk of SSFFC in other countries. This article is a case study with an impact assessment that provides the foundation for application of a criminology theoretical perspective” (Spink et al. 2016a, b).

The holistic perspective on the entire countrywide fraud opportunity is important and effective when requesting—or defending—government resource allocation. “Each anti-counterfeiting countermeasure has a unique incremental benefit that, in combination, strengthens the entire system. The overall benefits include increased public health, a growing pharmaceutical manufacturing base, and reduced opportunity for crime. The development and

(continued)

presentation of the overall fraud opportunity—or a product fraud vulnerability assessment at the country-level—“...shifts the question from ‘which countermeasures to keep’ to a future review of ‘what additional countermeasures will further reduce the fraud opportunity’” (Spink et al. 2016a, b).”

For food fraud prevention, the insight is that a country-level assessment of the impact of the fraud opportunity *has* actually been completed and presented.

Key Learning Objective 3: Overview of the Crime Triangle

This section reviews the Crime Triangle and the related details from Situational Crime Prevention. The Crime Triangle has been one of the fundamental concepts to explain the food fraud “crime opportunity” or adapted to refer to the “fraud opportunity.”

The Key Learning Objectives of this section are:

- (1) From Crime Opportunity to Fraud Opportunity
- (2) Victims and Fraudsters
- (3) Guardians and Hurdle Gaps

From Crime Opportunity to Fraud Opportunity

Situational Crime Prevention is based on Routine Activities Theory which is presented visually in the “Crime Triangle.” Throughout the related research, there was a focus on “Action Research Method” being the engagement and interaction of the researcher with the practitioner. There are many reports and adaptations of the core concepts of new crime problems. Food fraud—and more broadly all product fraud—is a new crime problem where the crime prevention theories apply [...] with some innovations and adaptations.

For food fraud prevention, Situational Crime Prevention is a very effective and widely adopted process that has been adapted for use by the food industry for this new crime problem.

Sidebar: Is Product Fraud a Traditional or White-Collar Crime? Both

Food fraud is not a “traditional crime” or “white collar crime” so more of a “hybrid crime” (Heinonen et al. 2014).

We demonstrate that product counterfeiting incidents have properties both consistent and inconsistent with white-collar crime as traditionally defined, which sometimes occur concurrently. To advance criminal justice and security research and practice, we conclude that product counterfeiting defies broad classification and is

Table 7.2 Properties of White-Collar and Traditional Crime. (Adapted from Heinonen et al. (2014), #3816)

Offender status	Special social and occupational status	No special status
Offender technique	Trivial/nonphysical	Nontrivial/physical
Contact with victims	Separated	Not separated
Access to crime location	Specialized	Not specialized
Offender appearance	Superficially legitimate	Not legitimate

best considered a distinct crime event. Failure to embrace this broad classification can lead to ineffectively estimating its occurrence and its effects on the economy, public safety and health, and brand owners. (Heinonen et al. 2014)

There are several fundamental properties of “white-collar” crime that do not all always apply to product fraud incidents (Table 7.2).

The need to classify a crime into one category has been a challenge for getting priority for food fraud prevention research or enforcement.

Sidebar: Situational Crime Prevention—“Trends in Human Activity Patterns”

The concept of “**Trends in Human Activity Patterns**” by Cohen and Felson (1979) directly applies to the food industry and food fraud (Cohen and Felson 1979). Changes in the space of crime and global markets—“human activity patterns”—have changed the fraud opportunity and the public health and economic consequences of food fraud. Even before there was data empirically identifying the new crimes, the social anthropology insight would identify that there was an evolving vulnerability. An early understanding of the evolving vulnerability could lead to countermeasures and control systems that short-circuit the opportunity for new crimes to occur.

The discussion about the weaknesses in the criminal justice system “appeared so ineffective in exerting social control since 1960 [to the publication in 1979]” (Cohen and Felson 1979). “For example, it may be difficult for institutions seeking to increase the certainty, celerity [swiftness of movement] and severity of punishment to compete with structural changes resulting in vast increases in the certainty, celerity [swiftness of movement] and value of rewards to be gained from illegal predatory acts” (Cohen and Felson 1979). Essentially, in a traditional crime-fighting scenario, the fraudsters perceive such a high reward with such a low risk that they will accelerate their criminal activity. This is an essential theoretical foundation where a focus on new or evolving vulnerabilities can lead to proactive countermeasures and control systems even before an actual crime or incident is found.

The application for food fraud prevention is that being realistic about human and financial resource availability for crime fighting, the only way to get ahead is to focus on vulnerability and to reduce the “fraud opportunity.”

Victims and Fraudsters

The victim and fraudsters can be considered together because they are both human actors. The human actors have motivations and awareness and can be influenced.

A related concept is the “likely offender” compared to an “offender.” Many people are “likely offenders” but never actually get to the point that they decide to act or become “actual offenders” (Cornish and Clarke 1987). A focus on vulnerability allows for countermeasures and control systems that universally apply regardless of the mindset of the offenders.

Situational Crime Prevention theory identifies several victim related concepts (Felson 2002):

- ***Value of target to the likely offender:*** Some targets are preferred or many and sometimes complicated reasons. “For example, ATM robbers wait until after the victim takes out money.” The victim is a higher value target after they have money. For food fraud prevention, the value is when and what are the goods that are exchanged or sold.
- ***Inertia of target to the likely offender:*** There are some high-cost products that are actually not a frequent target for crimes (such as shoplifting of home appliances such as refrigerators). For food fraud prevention, inertia may be created by more very specific countermeasures and control systems.
- ***Visibility of target to the likely offender:*** There are situations where fraudsters clearly see the target and also a lack of guardianship. For food fraud prevention, the visibility is more focused on presenting countermeasures and control systems that could catch the fraud act.
- ***Access to the offender with a chance to exit easily:*** There are situations where fraudsters have easy access to, and exit from, the fraud act. For food fraud prevention, the access is conducting regular, legitimate business with the victim.

For the general “chemistry of the crime,” there are specific details that combine and react in the same ways. This is presented as “chemistry.” The chemistry concept is especially practical and useful for food fraud prevention since many in the food industry have a chemistry or related educational background (Felson 2002).

- “Figure out who and what must be present and absent for a crime to occur.”
- “Find out what slice of space and time (setting) makes this likely?”
- “Determine how many people move into and out of the setting when committing an offense.”

In the science of chemistry, “everything is connected to everything” with the equilibrium concept that “for every action, there is an equal and opposite reaction.” If you change different factors, the “chemistry” or “reaction” can be influenced—pressure, temperature, moisture amount of elements, new elements, or others. The same is true for crime and the fraud opportunity.

For food fraud prevention, a focus outward from the problem (the human adversary in relation to the attributes of the physical space of the crime) to the solution (the countermeasures and control systems or vulnerability reducing actions) can

create a simple and useable model. One model is the food fraud vulnerability assessment, Food Fraud Prevention Strategy, and that strategy as managed by the Food Fraud Prevention Cycle.

Guardian and Hurdle Gaps

One of the most important concepts is that “With a guardian present, the offender avoids attempting to carry out an offense in the first place” (Felson and Boba 2017). Several concepts are “**Defensible Space**” and “**Crime Prevention through Environmental Design**” (Felson 2002). The ideas are that intentional changes can reduce the fraud opportunity and crime.

The third leg of the triangle is the “guardian and hurdle gaps.” A “guardian” is someone monitoring the activity such as a forklift driver observing the incoming goods. A “hurdle” is an activity that makes the fraud act more difficult to conduct. This is similar to food industry “hurdle technology” that hinders the lifecycle of a pathogen. The guardian and hurdle gap leg is where a company or country can have the maximum impact on reducing the “fraud opportunity.”

The fraud opportunity is reduced by increasing the risk of getting caught or the cost of conducting a crime. Contrary to popular belief, the number 1 goal of a criminal is not to make money. The number 1 goal is not to get caught! This awareness leads to an efficient and primary food fraud prevention focus on “Guardian and Hurdle Gaps.”

There are 16 types of situational prevention attributes that consider the fraudster. Four general categories of TIGER are (Felson 2002):

- “T – Target’s rewards, reducing
- I – Inducement, temptation
- G – Guilt
- E – Effort, increasing
- R – Risk on the spot, of getting caught.”

First, guilt or empathy is inconsistent and difficult to control category. To review, the worst case—which should be the base case—is that the fraudsters are sociopaths not concerned with cheating others and criminals not concerned with breaking the law. Any appeal to empathy or social justice would not change the fraud opportunity—actually it might identify new fraud opportunities (see the book *Freakonomics* and *Think Like a Freak* (Levitt and Dubner 2005, 2014).

The other categories apply to both:

1. Increase the risk of getting caught.
2. Increase the cost of conducting the crime.

Increasing the risk of getting caught could be new detection and deterrent countermeasures and control systems. Increasing the cost of conducting the crime might be to force the fraudster to use higher cost or scarcer components or alternate distribution routes.

An aspect of Situational Crime Prevention that applies to guardianship is “How to Forecast Crime.” It is important to note that at this point the term “predict” is not used by the criminologists. The prediction has more complex actions that require more data, more complete data sets, many incidents, and further complex assessment. The focus of Situational Crime Prevention is on understanding how external factors influence the fraud opportunity or shifting vulnerabilities. “We must not let the offender stay two steps ahead. Not only do we now know much more about crime and its prevention, but we also know how to learn still more. We know what questions to ask about new products and settings” (Felson 2002).

This also shifts focus to the concept of “**Designing Out Crime.**” This “Defensive Space” concept is usually applied to spaces or locations such as banks, but a food supply chain is a discrete system and can be considered a “space” (Newman 1972).

The application to food fraud prevention is that there are three main factors that must be present for a crime to occur—whether a crime has or will occur these are factors that create a “fraud opportunity.” The most direct control is by the actions of increasing guardianship or increasing hurdles.

Conclusion

This criminology chapter addressed the foundational terms, concepts, and theories that apply to food fraud prevention. The next criminology chapter will expand to consider application both from the practitioner perspective but also as to how governments or agencies are addressing food fraud and related topics. *The first conclusion is* that criminology is a scholarly, academic field that has had an active focus on reducing the physical environment in a way that methodically reduces the fraud opportunity. The focus on pragmatic, practical, and often very low coast opportunity reducing actions can often be very quickly implemented, and the benefits immediately realized. If you lock the front door of your house, you have immediately reduced your vulnerability, *and* you can measure the success by just checking the door. *The second conclusion is* that the Social Sciences and Criminology theories are very simple and logical. After reviewing the root cause—the human adversary who perceives a system weakness—the Criminology focus is not only logical but completely obvious. The final conclusion is that although there are very detailed and complex research reports and systems, there is value in the beginning with simple concepts such as considering the fraud opportunity in tools such as the Crime Triangle. Crime prevention theory is not complex, but it is reinventing the wheel if you have never studied the field. An important linchpin to all strategies or countermeasures and control systems is that the human adversary can and often will directly respond to our actions...if they can see that we are acting.

There is a saying:

Warning—Counterfeiters Attend Anti-Counterfeit Conferences. Complaint about it or use it to your advantage.

Appendix: WIIFM Chapter on Criminology Foundation

This “What’s In It For Me” (WIIFM) section explains why this chapter is important to you.

Business functional group	Application of this chapter
WIIFM all	The field of criminology—and specifically situational crime prevention—has many very sound theories that have had a tremendous amount of research and very simple concepts that can immediately help reduce the fraud opportunity
Quality team	This was an overview of crime prevention theory to provide basic insights to understand how to dissuade this intelligence human adversary
Auditors	This provided some insight into the types of prevention strategies that will be utilized and that the decision is based on a wide body of scholarly literature
Management	Repeat after me, <i>social science is a real science</i> —the foundation of the root cause is the human adversary that can only really be understood and addressed by criminology
Corp. Decision-makers	The root cause is a human adversary, and even though these will probably be very novel to you, there are many criminology concepts that will be efficiently applied

Appendix: Study Questions

This section includes study questions based on the Key Learning Objectives in this chapter:

1. Discussion Question
 - (a) What is “traditional” and “environmental” criminology?
 - (b) Which type of criminology applies to food fraud prevention? Why?
 - (c) What is the role of criminology in food fraud prevention?
2. Key Learning Objective 1
 - (a) What is “Crime Prevention”?
 - (b) What is the difference between the original Crime Triangle and the updated version?
 - (c) How do Routine Activities Theory and rational choice theory apply to food fraud prevention?
3. Key Learning Objective 2
 - (a) What is Situational Crime Prevention?
 - (b) What are the three components of the Crime Triangle and Situational Crime Prevention?
 - (c) Where does food science and technology influence the fraud opportunity on the Crime Triangle?

4. Key Learning Objective 3

- (a) What is “designing out crime”?
- (b) Is Food Fraud a “white-collar” or “traditional” crime?
- (c) What are “guardian and hurdle gap”?

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