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Commentary

Food fraud vulnerability and its key factors

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ABSTRACT

Background: Food fraud prevention and fraud vulnerability reduction are the first steps to combat food fraud and require a recurrent effort throughout the food supply chain. Due to the intentional nature of fraud, it requires different tactics than the common food safety approaches. However, knowledge on what determines food fraud vulnerability is limited.

Scope and approach: In the current study a new food fraud vulnerability concept is explored. The concept is based on the criminological routine activity theory and key food fraud vulnerability factors are subsequently extracted and identified.

Key findings and conclusions: Opportunities, motivations and control measures are defined in this concept as the three main elements of food fraud vulnerability. They can be subdivided into technical opportunities, opportunities in time and place, economic drivers, culture and behavior, as well as technical and managerial control measures. They are further detailed in 31 fraud vulnerability factors. Food fraud vulnerability threats may originate from both the external and the internal environment of a business which means that several vulnerability factors need to be considered at multiple environmental levels, i.e. the level of the business itself, its suppliers, its customers, the wider chain and at the (inter) national level. The concept was further developed into a practical food fraud vulnerability self-assessment tool with 50 questions and answering grids. This will be a valuable first step towards fraud prevention and will assist in the global combat on food fraud.

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1. Food fraud

Food fraud, food adulteration, counterfeiting and food crime are terms that resurface in the press frequently. Most organizations in this area, such as the Global Food Safety Initiative (GFSI), the Grocery Manufacturers Association (GMA) in the United States (US), the US Pharmacopoeia (USP) and reports of the European Parliament consider food fraud as an intentional, deceptive misrepresentation of foods for financial gain (Spink, Ortega, Chen, & Wu, 2017). Food fraud is broader than (economically motivated) adulteration only. Food fraud usually comprises misrepresentation (e.g. counterfeiting) as well as adulteration and in some definitions also theft, tampering, diversion, tax evasion, grey market and overrun. In the current study we will focus on the food fraud aspects related to adulteration and misrepresentation only, which is in line with the

commonly used working definitions of food fraud in the EU (EU, 2014).

Recent food fraud scandals have further increased the need to combat fraud across supply chains (Manning & Soon, 2014). However, current food safety management systems are not specifically designed for fraud control or mitigation. Due to the intentional nature of fraud, it requires an approach that differs from the common safety ploys (Spink et al., 2017). In the usual current food management approaches honesty is presumed. This presumption makes us generally vulnerable to deception (Levine, 2014), but in addition we have to consider that food fraudsters will put all efforts on disguising their illegal activities. Therefore, in order to tackle food fraud we need to shift from the safety-based approach to the fraud prevention and vulnerability reduction approach and take into account these deliberate and disguising aspects. Fraud vulnerability can be defined as a weakness or flaw that creates opportunities for undesirable events related to the system (Spink et al., 2017). However, so far little has been reported on which aspects impact on food fraud vulnerability. In the current study, we aim to unravel these aspects by framing food fraud vulnerability

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with a criminological theory and by identifying key factors that add to the vulnerability (susceptibility) to fraud. Since knowledge on what is driving potential food fraudsters is merely lacking, some factors are extrapolated from research on other (corporate) crimes.

2. The routine activity theory and main food fraud vulnerability concept

Fraud is a form of criminal behavior in any definition of crime. Two types of definitions of crime exist: the legal (acts forbidden by law) and the non-legal definition. Although these two do not fully overlap, they share crucial defining elements: i.e. criminal behavior is harmful and morally reprehensible (Passas, 2005). Food fraud will qualify for both.

A criminological theory that has integrated the relevant variables for explaining crime and that has gained great popularity in criminology and received much validation is the routine activity theory of Cohen and Felson (1979). The routine activity theory sees crime as the outcome of the convergence in time and place of (1) motivated offenders and (2) suitable targets in (3) the absence of capable guardians. A routine activity approach seems particularly appropriate for the study of corporate crime, as it is committed at the workplace and thus directly arises out of the routines of everyday life. Furthermore, because of their job and position many white-collar offenders have a specialized access to their targets (Felson & Boba, 2010). Corporate crime involves illegal acts committed by or on behalf of corporations, which operate in legitimate branches of industry (Clinard & Yeager, 1980). For them this is, so to say, criminal business on the side. Since the majority of food fraud occurs in the regular supply chain, food fraud shows similarities with other corporate crimes (Lord, Flores Elizondo, & Spencer, 2017). Therefore, the routine activity theory principles are fairly suitable to describe the concept of food fraud vulnerability in order to get insights into the ‘what’ and the ‘who’, but also especially the ‘why’ of food fraud.

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. The opportunities point out why offenders are able to commit fraud and motivations detail why offenders would want to commit fraud (Coleman, 1987). The control measures in place may counteract the vulnerability resulting from opportunities and motivations.

3. Food fraud vulnerability elements and detailed factors

The three elements opportunities, motivations and control measures can be subdivided into six groups. These six groups comprise (1) technical opportunities, (2) opportunities in time and place; (3) economic drivers, (4) culture and behavior, (5) technical control measures and (6) managerial control measures. Each group is composed of a number of fraud factors and will be described and explained in the following paragraphs (Fig. 2).

Research has established that people have the psychological tendency to place threats of crime outside the social group or the organization they belong to (‘the alien conspiracy’). However, offenders are employees in most cases in which companies are

victimized by fraud (Holtfreter, 2014). Therefore, food fraud vulnerability threats from both the external and the internal environment of a business should be considered, which means that one needs to be receptive to external threats as well as to the dark side of the own organization. The external environmental dimension consists of different layers, i.e. (A) the direct suppliers and customers, (B) the wider chain/industry network and (C) the (inter) national environment. Along this dimension of environmental layers, the span of control of a company decreases as well as its ability to obtain reliable data.

3.1. Opportunities

3.1.1. Technical opportunities

The ease of adulteration/counterfeiting of certain types of products and the general availability of knowledge and technology to adulterate in a particular chain will increase the vulnerability to fraud. For instance products in a specific physical state, e.g. liquids, are more susceptible to fraud than others (Jack, 2015). The availability or absence of detection methods affects the general fraud vulnerability as well. Fraudulent products may not be visually recognizable or detected with simple methods (Tähkää, Majjala, Korkeala, & Nevas, 2015). With more advanced analytical characterization being needed for certain aspects and product groups, the susceptibility to fraud increases. Complexity of the foods or raw material and natural variability of the composition of products adds to the analytical testing complexity (Moyer, DeVries, & Spink, 2017; Pustjens, Weesepeel, & van Ruth, 2015).

3.1.2. Opportunities in time and place

Fraud opportunities increase when potential fraudsters have legitimate access to the location in which the fraud can be committed, i.e. access to the product, processing lines, etc. (Benson & Simpson, 2009). Similar to food defense, access of unauthorized personnel and lack of physical safeguards will increase opportunity (Buckhoff, 2002). Furthermore, opportunities increase when the offender is spatially separated from the victim (Benson & Simpson, 2009). Thus increase of the complexity and of a supply chain network will enhance fraud vulnerability, since it usually decreases the transparency of the network (Sarpong, 2014).

3.2. Motivations

3.2.1. Economic drivers

Supply and pricing, product attributes resulting in added value, differences in pricing due to regulatory diversity in countries, economic health of businesses, level of competition and financial strains imposed on suppliers are economic aspects that affect fraud vulnerability.

3.2.1.1. *Supply and pricing.* Since food fraud always involves the substitution of a higher value product with one or more of less expensive or lower quality alternative(s), a high value per kilogram product will add temptation to fraudsters (Johnson, 2014). When gaps exist between physical product availability and market demand (Manning & Soon, 2014) and prices shift due to regional or global supply shortages (Moyer et al., 2017) fraud vulnerability will

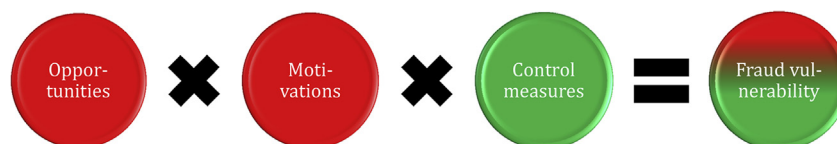


Fig. 1. Schematic presentation of the food fraud vulnerability concept based on the routine activity theory.

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