SETTING A NEW INTERDISCIPLINARY RESEARCH AGENDA: AGRI-FORENSIC ACCOUNTING CAN PREVENT FOOD FRAUD



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Abstract:

Food fraud is a new discipline but the problem is not. The control of food fraud requires interdisciplinary approach. However, many singular disciplines have worked on post-fraud measures like identification and deterrence after the damages have already been done to consumers. Whereas, forensic accounting has potential to counter food fraud before damage is done. Therefore, an interdisciplinary approach is required to address this global issue. Hence, to find a holistic solution, the agenda necessitates a researcher to possess a diverse academic background primarily in agriculture plus forensic accounting (agri-forensic accounting) or a team of researchers with aforementioned area of expertise. The work is topical, futuristic and holds relevance to every consumer in the food system. This interdisciplinary endeavor would contribute to laying foundation of food fraud prevention discipline and would advance the agenda for future research. The topic fits well into interpretivism paradigm and would use mix of quantitative and qualitative approach in data collection. The large data set on food fraud like the EU's Food Fraud Network (FNN) would be required. The Data analytics tools including sophisticated software like SPSS and IDEA are worth considering.

Keywords: Food Fraud, Interdisciplinary, Forensic Accounting, Fraud Prevention, Agri-Forensic Accounting

1. Introduction:

The forensic accounting discipline can be used for detecting vulnerabilities in the food system and can prevent food fraud before it happens. The discipline enables identification of the risk areas in firms' accounting systems liable to exploitation and determines anomalies in those systems (Spink et al., 2019). The range of strategies in forensic accounting includes identifying out how and where fraudsters may be operating and what they may be aiming for in the future. This type of warning system tends to look at where economic incentives exist to deceive people (Bouzembrak, Y. & Marvin, H.J.P. 2016). The early warning system thinks like fraudsters and identifies which supply chains may potentially be abused (Addy, R., 2015). For example, the EU developed Food Fraud Network (FFN) in 2014 as a response to the horsemeat scandal (Montanari et al., 2016) and emphasized development of new discipline of food fraud (European

Commission, 2013). In addition to these measures initiated in Europe, other countries including the United States and China (especially after melamine scandal in 2008) have also put in place various programs directly to tackle the problem of food fraud (Spink et al., 2016).

Moreover, Dr Donarski, coordinator of 'FoodIntegrity' (a food fraud solutions project in EU) explained that in an attempt to detect odd financial signs such as unusual prices and amounts, the project examined a wide variety of variables like data from over 5,000 internationally traded goods in over 200 countries. The model was tested against documented cases of food fraud reported to the EU's special warning system. **It was reassuring to find that 80 per cent of food and drink scams were correctly predicted by the system** (Addy, R., 2015). Due to such reasons, food fraud got prime importance in food safety management system too (ISO 22000) as illustrated in the fig 1.



Fig 1: Food Safety Management System (ISO 22000)

Food fraud is not a recent phenomenon but it has a long history as reference to food adulteration can be found in documents from the days of the Roman Empire (CAFIA, 2015; Shears, 2010; Lotta & Bogue, 2015). However, it has recently come under major limelight as demonstrated in the number of scientific publications on the subject (Huck et al., 2016). It led to take several initiatives by public and private organization to prevent food fraud globally. Since the increasing globalized food supply chain suggests that repercussions of food fraud may have far-reaching implications beyond the borders (Spink, J. et al., 2017). Therefore concerns have been raised that food fraud threats could be more serious than typical food safety risks because food security systems are not equipped to prevent the potentially infinite number of fraudulent activities (Spink & Moyer, 2011).Therefore, the food fraud prevention has gained more attention as a primary tool to address food risk and is thus, treated as a top priority at the agenda of both regulators and stakeholders in the food industry (Bouzembrak & Marvin, 2016).

2. Food Fraud Prevention Necessitates an Interdisciplinary Approach:

Agriculture Forensic Accounting Food fraud is emerging as a distinct discipline by taking interdisciplinary way and its research work is continuously evolving. Since single-discipline approach has many limitations therefore, multi disciplinary approach better copes with food fraud. For example, food lawyers look at food fraud with legal liability only; food safety experts approach it with health and safety risk only; food scientists examine standards and testing only; criminologists finds its motivation in economic gains etc. (Spink, J., et al., 2019). Therefore, food fraud discipline is interdisciplinary in nature. Moreover, there is a growing consciousness of the need to take a broader and more comprehensive look at the root causes of food fraud. Therefore, the researcher coins the term 'agri-forensic accounting'. It is an amalgamation of agriculture and forensic accounting disciplines that are put together to find solution of food fraud especially the preventive aspect of fraud control.

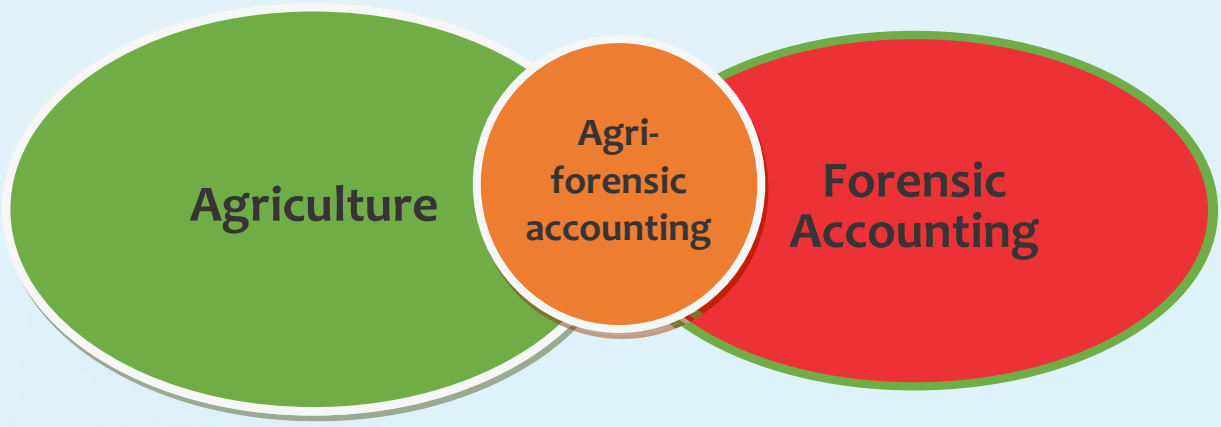


Fig 2: Agri-forensic Accounting (Source: Term coined by the author)

> Prevention is as important as the pursuit of the wrongdoers….that targeting the reduction of opportunities for such fraud to exist is a paramount focus… and on the 'who is likely to commit it' pattern of thought (Spink, J. et al, 2019).

3. The rationale of using forensic accounting as preventive tool to food fraud:

It is important to understand the rationale of using forensic accounting as a preventive tool against food fraud and its significance an as an instrument of enhancing food accountability and governance. It is pertinent to mention that several disciplines are exploring measures to food safety management especially in detection and deterrence but it is the forensic accounting which could be used to 'prevent' food fraud and at the same time making detection and deterrence less desirable (Spink, J. 2019). For sake of explanation, let's have a look on just a few instances that would establish rationale of using forensic accounting as an arsenal against food crime:

(1) The examination of company documents and accounting procedures will demonstrate vulnerability areas, such as unnecessarily complicated supply chains, contradictory payment terms, business processes and fees.

(2) "There are tests you can run that can pick up things like abnormal payments and kickbacks to suppliers. There are tests that, out of the transactions you have, say 'this needs to be investigated" (Gillman, S., 2018).

(3) Lack of internal controls, management override and poor financial discipline makes a company vulnerable to fraud. Beside, chances of procurement fraud can easily be identified and prevented through random checks to establish how the management and supplier relationships had been and what is expected in future (Popoola et al., 2015).

(4) One big chronic accounting problem in the food industry is that companies frequently operate on wafer-thin margins, not taking into account overheads. Large companies are especially vulnerable to this because by 'creative accounting', they offset their overheads with revenue in other fields, complicating budgets, and increasing pressure to meet costs. Therefore, this setting favors perpetrating fraud by the senior management of the company (Addy, R., 2015).

(5) Another issue with big corporations is that they had built chaotic, uncoordinated IT processes in the supply chain that buyers and procurers had no confidence in. It not only discourages various stakeholders but also offers itself as a piece of cake for fraudsters because messy processes make it difficult to identify the occurrences of fraud and necessary measures thereafter (Bouzembrak, Y. & Marvin, H.J.P. (2016).

(6) Red Flags indicate vulnerabilities and predict areas potentially liable to get perpetrated by fraudsters.

(7) While in an interview to 'Food Manufacture' Mag. Dr. Liza Jack (2016) explained that:

"If you are going to do an assessment, you have got to look at management systems. The problem you have at the moment is that

vulnerability assessments are being done by food safety experts, not by forensic accounting experts. The danger is this is just going to be tacked onto the technical team".

(8) Forensic Accounting can be used as a tool for Anti-fraud Governance and Leadership in Food Industry. To control fraud, it is crucial to the top leadership of an organization to set unequivocal 'tone' at the top and reiterate its resolve to champion its anti-fraud and accountability policy time and again (Hammerschmid, G., et al., 2019).

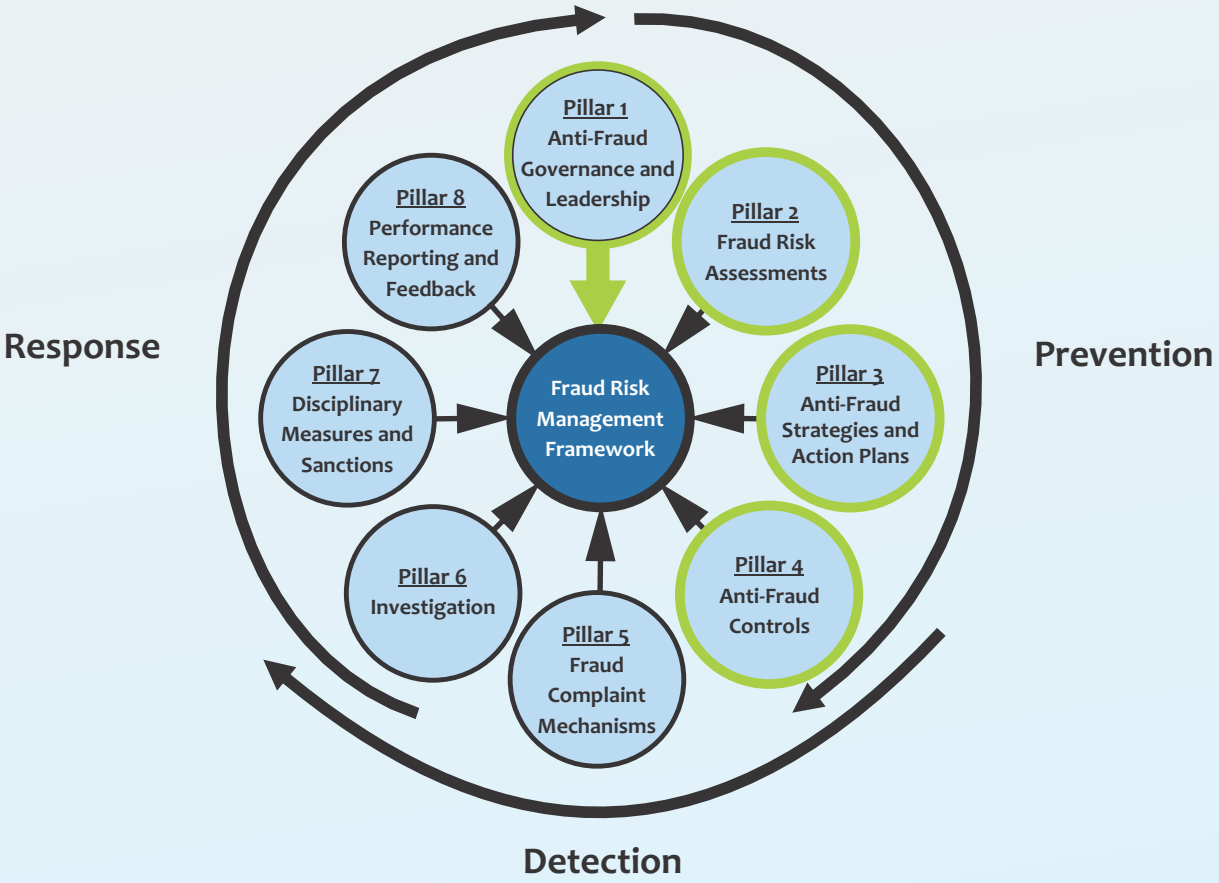


Fig 3: Adapted from Joint Investigation Unit (JIU) of UN, 2016

The top executive plays pivotal role in creating anti-fraud culture by putting in place robust anti-fraud program including anti-fraud awareness initiatives and capacity building of the employees in congruence with the organization's accountability and compliance framework (Joint Investigation Unit of UN, 2016). The fraud prevention mechanism will enable leadership and policy makers introduce better accountability and good governance in an organization.

3. Review of Theoretical Frameworks for Control of Food Fraud:

Just a few research projects have been undertaken so far to develop the possibilities of forecasting and thus preventing future fraud events. Table 1 will provide a summary of this ongoing research and highlight the important models and theoretical concepts of food fraud prevention to date.

Name of concept	Theoretical Framework	Authors
Food Fraud Prevention Cycle (FFPC)	Routine Activity Theory and Situational Crime Prevention	Spink, J. (2019)
Food Fraud Vulnerability Concept	Routine activity theory	van Ruth et al (2017), van Ruth et al. (2018)
Food Fraud Vulnerability Assessment		Cavin et al. (2016), Silvis et al. (2017), Wu et al. (2017)
Threat Assessment		National Food Crime Unit (2016)
Food Fraud Initial Screening model (FFIS)	Enterprise risk management (ERM) framework	Spink et al. (2016)
Bayesian Network model to predict food fraud type	Bayesian Network (BN) approach	Bouzembrak and Marvin (2016);Marvin et al. (2016)
Qualitative food system vulnerability matrix	Systems approach	Paloviita et al. (2016)
Early Warning system for identification of potential health risks and fraudulent practices in the food sector	Horizon Scanning & Root Cause Analysis	Bavarian Health and Food Safety Authority (LGL), Müller et al. (2015)
NSF Fraud Protection Model	Fraud Triangle	NSF (Safety and Quality UK Ltd) (2014)
Product-counterfeiting incident cluster tool	Routine Activity Theory and Situational Crime Prevention	Spink et al. (2013)

Table 1: Theoretical Frameworks related to food fraud prevention
Source: Author's own compilation

The literature also reveals that some disparate and scant work has been done to identify and control food fraud by developing some data bases and meta-analysis. Therefore, a review of these tools is essential to get a meaningful insight.

Category	Provided by	Geographic coverage
Meta-Analyses		
Media analysis of reported food fraud incidents (N=1553)	Zhang & Xue (2016)	China
Analyses of seafood mislabeling (N=51)	Pardo et al. (2016)	Global
Databases		
USP's Food Fraud Database 2.0	The United States Pharmacopeial Convention	Global
Food Adulteration Incidents Registry (FAIR)	Food Protection and Defense Institute (FDPI) at the University of Minnesota	Global
FPDI Economically Motivated Adulteration (EMA) Susceptibility Database	Food Protection and Defense Institute at the University of Minnesota	Global
Rapid Alert System for Food and Feed (RASFF) database	The European Commission	EU/Global
Others		
JRC's Food fraud Alerts	Joint research Centre of the European Commission	EU/Global

Table 2: Review of existing tools of food fraud prevention

Source: Adapted from Tuber, R. (2019)

4. Research Gap:

As discussed food fraud is emerging as a distinct discipline by taking interdisciplinary approach and research work is continuously evolving. Since single-discipline approach has many limitations therefore, multi discipline approach better copes with food fraud. The review of literature reflects that some efforts have been made in areas of food fraud controls particularly in areas of fraud identification and deterrence. But little effort has been made in area of food fraud 'prevention' Moreover, the research work in food fraud prevention by using forensic accounting as a fraud preventive tool has to be initiated yet (Spink, J. et al, 2019).

5. Objective of the Agenda:

The agenda advances food fraud prevention as a unit of analysis wherein principles of forensic accounting would be used to develop a strategic approach to fighting food fraud globally. It will provide useful tools to reduce the food fraud 'opportunity' and protect consumer health and interests. It would enhance accountability and good governance in food system. The agenda highlights the objective as, ***"Development of food fraud prevention framework".***

The agenda aims to tailor food fraud prevention framework rooted in agri-forensic accounting. **To the best of my knowledge, this study would be the first of its kind in the world.** It will contribute to laying foundation and setting direction for future research in the discipline of food fraud prevention. It will also improve accountability and dynamic governance in global food system through preventive fraud measures.

6. Methodology of Developing Conceptual Framework of Food Fraud Prevention

A conceptual framework is not just a set of concepts but a construct in which each concept plays an essential role. According to Miles and Huberman (1994), a conceptual framework "lays out the key factors, constructs or variables, and presumes relationships among them (p. 440). It does not provide knowledge of "hard facts" but rather, "soft interpretation of intentions" (Levering, 2002, p. 38).

6.1. Philosophy and Research Design:

The proposed research fits well into the paradigm of interpretivism/constructivism which assumes that "social phenomena and their meaning are continually being accomplished by social actors" (Stake, 1995). This paradigm construes that "reality is socially constructed" (Mertens, 2005, p.12). Consequently, the researcher assumes that understanding the food fraud and developing its prevention framework is embedded in the disciplines of forensic accounting and agriculture.

6.2. Methods of Data Collection

a. **Survey** (web-based confidential and anonymous) would be suitable to the employees of the participating organizations (food industry, academia, regulators) as well as a second confidential survey to the senior managers of the organizations may be sent.

b. **Questionnaires** should be kept fatigue free by developing short and crisp questions

c. **Interviews** with the leadership and management at participating organizations. Semi-structured interviews should be preferred so that rapport could be developed with the interviewees to get maximum truthful answers.

d. **Review of literature** and critical analyses as well as reports of oversight bodies.

6.3. Design of Interviews and Surveys:

The sample size should be determined as per requirement to make it representative of the whole population. Important considerations in quantitative data collection including population size, confidence level, precision level and the degree of variability should be taken due care of. The sample size should be computed using the formula as below:

$$Sample\ Size = \frac{\frac{z^2 * p(1-p)}{e^2}}{1 + \left(\frac{z^2 * p(1-p)}{e^2}\right)}$$

Where **p** = population size; **e** = margin of error; and **z** = statistic relative to the confidence level chosen.

It should lead to conduct verification of statistical validity.

7. Data Analysis Technique:

Big Data Analysis tools and techniques should be used to analyze large set of data. Moreover, thematic analytical tool may also be employed to analyze the data from interviews, documents and surveys. This tool is appropriate because of its ability of examining, emphasizing, highlighting, and recording pattern (theme) within data (Power M. K. and Gendron Y., 2015). Additionally, this tool impregnates with flexibility to analyze data gathered through various frameworks and answer to various questions.

8. Research Ethics:

The agenda also advocates due compliance with code of conduct and research ethics including maintaining anonymity, confidentiality, integrity, transparency, honesty and others.

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