

Food Fraud - Know the Pitfalls in Your Supply Chain!

Dr. Ramakrishnan Nara
V.P. Product Safety & Research
Perry Johnson Registrar Food Safety Inc., (PJR, USA)

Objectives

- To introduce the concept of food fraud;
- To outline food fraud requirements of GFSI standards ;
- To outline details of a robust food fraud vulnerability assessment and mitigation plan.

Food Fraud Definition Matrix

Element	FDA	EU	MSU	USP
Economical motivated	X		X	X
Dilution	X		X	
Substitution	X		X	
Addition	X		X	X
Tampering			X	
False labeling		X		
Counterfeit			X	X
False or misleading statements		X	X	
Use of illicit substances			X	
Removal/replacement			X	X
Misrepresentation of the packaging		X	X	

Definitions for 'Glossary of Terms'

○ Food Fraud*

A collective term encompassing the deliberate and intentional substitution, addition, tampering or misrepresentation of food, food ingredients or food packaging, labelling, product information or false or misleading statements made about a product for economic gain that could impact consumer health.

Intentional

Food
Defence/
Food Fraud



○ Vulnerability

Susceptibility or exposure to a food fraud risk, which is regarded as a gap or deficiency that could place consumer health at risk if not addressed.

* Source: J. Spink & D.C. Moyer, (2011) *Journal of Food Science*, 76(9), 157-163

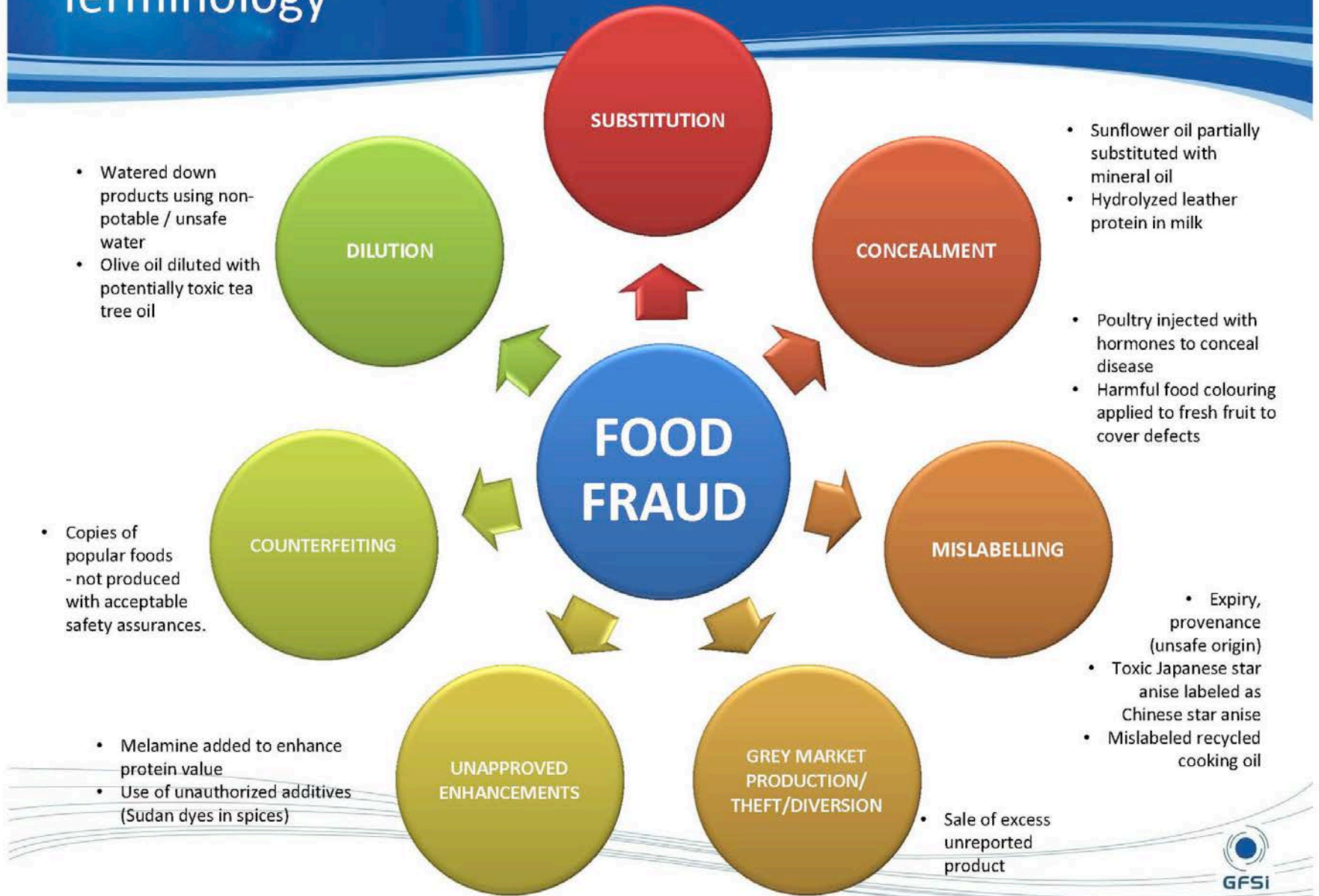
Incidence of Food Fraud Cases 2005-2016

Database	Herbs & Spice	Olive oil	Fish	Dairy	Meat	Melamine	Horse meat	Total
ABI/Inform Global	157	201	202	555	476	130	213	2287
Elsevier	117	101	81	220	174	51	85	968
Taylor and Francis	106	112	360	356	257	39	121	1351

Types of Food Fraud

- Dilution
- Substitution
- Concealment
- Mislabeling
- Unapproved enhancement
- Counterfeiting
- Grey market production/theft/diversion

Terminology



Food Fraud Vs Food Safety

- Unintentional Vs Intentional contamination
- Addition of unconventional substances
- Ignorance of perpetrators

Food Risk Matrix

Source: Adapted from: Spink (2006), The Counterfeit Food and Beverage Threat, Association of Food and Drug Officials (AFDO), Annual Meeting 2006

Food Quality	Food Fraud	Motivation Economic gain
Food Safety	Food Defense	Harm Public Health, Economic or Terror
Un- intentional	Intentional	

HACCP, VACCP & TACCP- Acronyms

- **HACCP** (Hazard Analysis & Critical Control Point)
- **TACCP** (Threat Analysis & Critical Control Point System), and/or
- **VACCP** (Vulnerability Analysis & Critical Control Point System)

Approach to Food Fraud Prevention



Food Safety

HACCP

Hazards

Prevention of **unintentional / accidental adulteration**

- Science based
- Food borne illness

Food Defence

TACCP

Threats

Prevention of **intentional adulteration**

- Behaviourally or ideologically motivated

Food Fraud

VACCP

Vulnerabilities

Prevention of **intentional adulteration**

- Economically motivated

Melamine Scandal- Supply Chain Losses

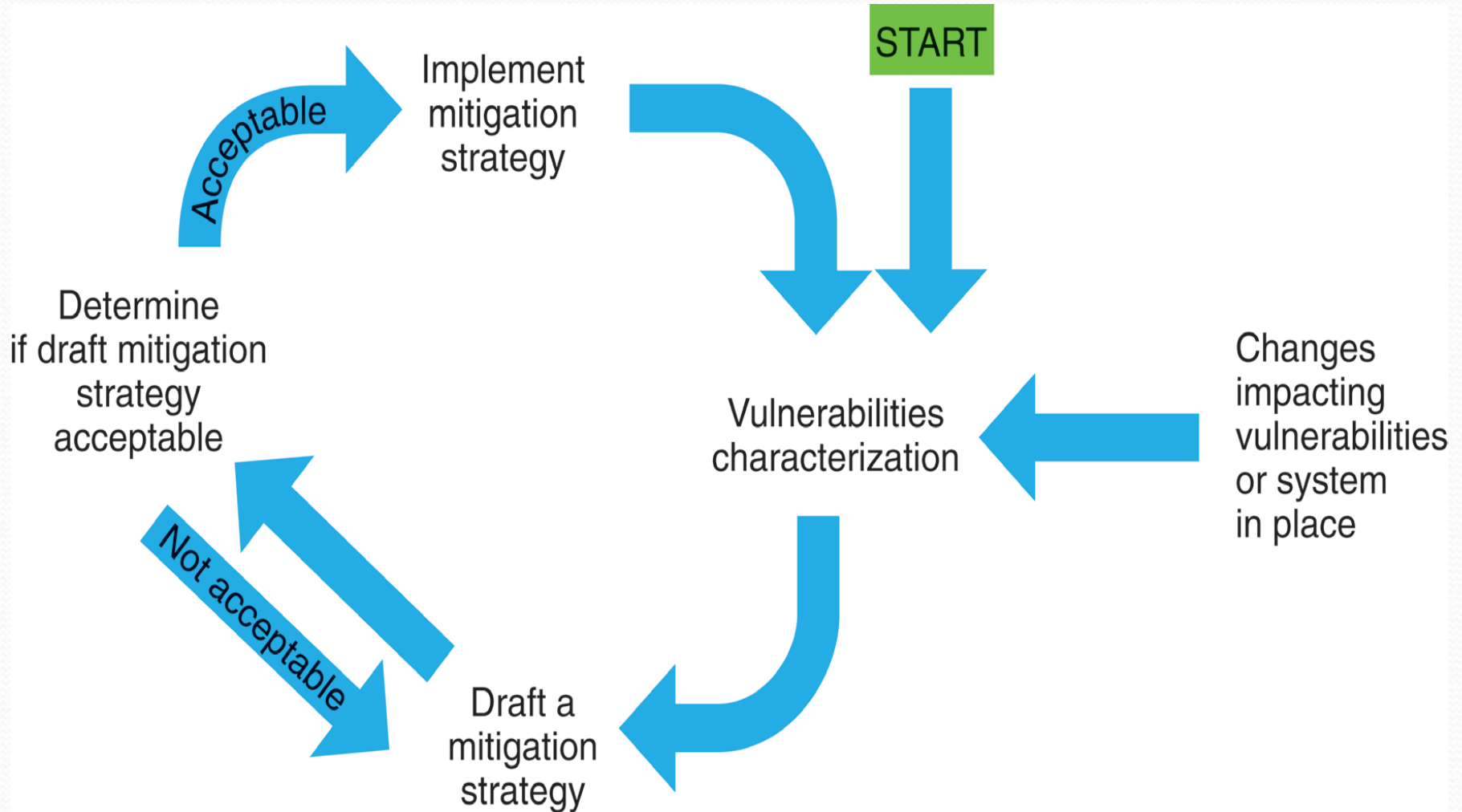
- Social losses and punishments
- Third Party losses
- Confidence losses
- Sales losses
- Recall losses

Ref: Costs and benefits of the Food Fraud Vulnerability Assessment in the Dutch food supply chain, Bindt, Victor , 22 February-August 2016

“Life-Cycle Approach ”to Food Fraud

- **Step 1 : Contributing factors assessment**
- **Step 2: Potential Impacts Assessment**
- **Step 3:Overall Vulnerability Characterization**
- **Step 4: Mitigation Strategy Development**

Life-cycle for food fraud management system



Contributing Factors Assessment

- Supply Chain
- Audit Strategy
- Supplier Relationship
- History of supplier regulatory, quality and safety issues
- Susceptibility of QA methods and specs
- Testing frequency
- Geopolitical considerations
- Fraud history
- Economic anomalies

Potential Impact Assessment Assessment

- Public health
- Economic impact

Ref: USP Food Fraud Mitigation Guidance 2016

Vulnerability Characterization

- Potential Contributing factors

Vs

- Potential impact

Ref: USP Food Fraud Mitigation Guidance 2016

Food Fraud-**Control** measures

- Monitoring and Verification
- Whistleblowing
- Ethical code of conduct
- Legal framework and enforcement
- Contractual requirement
- Employee integrity

Ref: Food Fraud Vulnerability Assessment and Mitigation, PWC 2016

Food Fraud Compliance Requirements: Dates

- GSFI (FSSC, SQF) – January 2018
- GFSI (BRC) – July 2015 (2 years ago)
- FSMA-Preventive Controls – September 2016 (last year)

Food Fraud Compliance Requirements: Scope

“Food Fraud Compliance Requirements — The general compliance requirements for Food Fraud prevention are:

1. Conduct a Food Fraud Vulnerability Assessment (Y/N)
 2. Written (Y/N)
 3. Implement a Food Fraud Prevention Strategy (Y/N)
 4. Written (Y/N)
 5. Minimally conduct an annual Food Fraud Incident Review (Y/N)
 6. Note: Address all types of Food Fraud (Y/N)
 7. Note: Address all products from both incoming goods (e.g., ingredients) and outgoing goods (e.g., finished goods) through to the consumer.” (Y/N)
- Reference:
 - Food Safety Magazine, Feb 2017, “*Food Fraud Vulnerability Assessment and Prefilter for FSMA, GFSI and SOX Requirements*”, <http://www.foodsafetymagazine.com/magazine-archive1/februarymarch-2017/food-fraud-vulnerability-assessment-and-prefilter-for-fsma-gfsi-and-sox-requirements/>

GFSI Issue 7 - Food Fraud Requirements

FSM AI 21 Food fraud vulnerability assessment

- The standard shall require that the organisation has a **documented food fraud vulnerability assessment procedure** in place to identify potential vulnerability and prioritize food fraud mitigation measures.

FSM AI 22.1 Food fraud mitigation plan

- The standard shall require that the organization has a **documented plan** in place that specifies the measures the organization has **implemented to mitigate** the public health risks from the **identified food fraud vulnerabilities**.

FSM AI 22.2 Food fraud mitigation plan

- The standard shall require that the organization's Food fraud mitigation plan **shall cover the relevant GFSI scope** and shall be supported by the organization's Food Safety Management System.

SQF Edition 8: Requirements

2.7.2 Food Fraud

- 2.7.2.1 The methods, responsibility and criteria for identifying the site's vulnerability to food fraud shall be documented, implemented and maintained.
- The food fraud vulnerability assessment shall include the site's susceptibility to product substitution, mislabeling and counterfeiting which may adversely impact the food safety of packaging product.
- 2.7.2.2 A food fraud mitigation plan shall be developed and implemented which specifies the methods
- by which the identified food fraud vulnerabilities shall be controlled.
- 2.7.2.3 The food fraud vulnerability assessment and mitigation plan shall be reviewed and verified at least annually.
- 2.7.2.4 Records of reviews of the food fraud vulnerability assessment and mitigation plan shall be maintained.

BRC Food Issue 7 : Requirements

Sec. 5.4.1

- The company shall have processes in place to access information on historical and developing threats to the supply chain which may present a risk of adulteration or substitution of raw materials. Such information may come from:
 - trade associations
 - government sources
 - private resource centers.

BRC Food Issue 7 : Requirements

Sec. 5.4.2

- A documented vulnerability assessment shall be carried out on all food raw materials or groups of raw materials to assess the potential risk of adulteration or substitution. This shall take into account:
 - historical evidence of substitution or adulteration
 - economic factors which may make adulteration or substitution more attractive
 - ease of access to raw materials through the supply chain
 - sophistication of routine testing to identify adulterants
 - nature of the raw material.
- The vulnerability assessment shall be kept under review to reflect changing economic circumstances and market intelligence which may alter the potential risk. It shall be formally reviewed annually.

BRC Food Issue 7 : Requirements

Sec. 5.4.3

- Where raw materials are identified as being at particular risk of adulteration or substitution appropriate assurance and/or testing processes shall be in place to reduce the risk.

FSSC 22000 version 4.1 : Requirements

FSSC Part II 2.1.4.4

2.1.4.4.1 Vulnerability assessment

- 1) The organization shall have a documented and implemented vulnerability assessment procedure in place that:
 - a) identifies potential vulnerabilities,
 - b) develops control measures, and
 - c) prioritizes them against the identified vulnerabilities.

- 2) To identify the vulnerabilities, the organization shall assess the susceptibility of its products to potential food fraud acts.

FSSC 22000 version 4.1 : Requirements

FSSC Part II 2.1.4.4

2.1.4.4.2 Control measures

The organization shall put in place appropriate control measures to reduce or eliminate the identified vulnerabilities.

2.1.4.4.3 Plan

- 1) All policies, procedures and records are included in a food fraud prevention plan supported by the organization's Food Safety Management System for all its products.
- 2) The plan shall comply with applicable legislation

How Do We Comply With Requirements?

- Conduct and document a Food Fraud Vulnerability Assessment
 - Start with a light but complete review, then go deeper where needed.
- Conduct and document a Food Fraud Prevention Strategy
 - Start by filling in a report, then go deeper where needed.
 - Consider other strategies or systems – such as HACCP – as a template
- Review and make sure to address the details
 - Frequency, types of issues to consider, etc.

Food Fraud Challenges

- Supply Chain Traceability
- ‘Moving Target Effect’
- Supply Chain Risk Management



Q & A

Questions?