Challenges Identified with Food Fraud Implementation – Part 1 of 5: A Strategic Approach to Operationalize Food Fraud Mitigation

Presented By: Zoe Shuttlewood and John Spink
Organized by: Food Fraud Professional Development Group
Webinar Housekeeping

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• Audio is being transmitted over the computer, so please have your speakers ‘on’ and volume turned up in order to hear. A telephone connection is not available.

• Questions should be submitted to the presenters during the presentation via the **Questions section** at the right of the screen.
Webinar Housekeeping

• It is important to note that all opinions and statements are those of the individual making the presentation and not necessarily the opinion or view of IAFP.

• This webinar is being recorded and will be available for access by IAFP members at www.foodprotection.org within one week.
IAFP Food Fraud PDG – Webinars

1) Risk Mitigation

2) Understanding the types of risk

3) Managing the risk

4) Ecommerce/Surveillance and Risk Assessment
Speakers

Dr. John Spink: “A comparison of food fraud mitigation resources”
Director of the Food Fraud Initiative within the College of Veterinary Medicine at Michigan State University (USA) [www.FoodFraud.msu.edu](http://www.FoodFraud.msu.edu)

Zoe Shuttlewood: “Strategic approach to food fraud mitigation”
Food Safety and Quality Systems Lead at McCormick Company Inc.
Food Fraud Prevention
Compliance and Guidances

IAFP Food Fraud Professional Development Group PDG
Title of series: Challenges with Food Fraud Implementation & Best Practices
Part 1 (Feb.): A strategic approach to operationalize food fraud mitigation

Feb 20, 2019 – 12-1 PM CT (12:05 to 12:25)

John Spink, PhD
Director & Assistant Professor, Food Fraud Initiative
College of Veterinary Medicine/ Food Safety

WWW.FoodFraud.MSU.edu Twitter @FoodFraud and #FoodFraud
John Spink, PhD

- Director, Food Fraud Initiative
- Asst. Professor, College of Veterinary Medicines

Activities:
- Instructor: Graduate Courses: Anti-Counterfeiting and Product Protection, Packaging for Food Safety, & Quantifying Food Risk
- Director, MSU Food Fraud Think Tank: Danone, Mars, Cargill, Wegman’s, Mondelez, Hershey & Woolworths
- Global Food Safety Initiative (GFSI) Food Fraud Think Tank: Member
- EU Food Integrity Project: Researcher and former Advisory Board Member.
- Queen’s University Belfast: Visiting researcher
- ISO 22000 Food Safety: Observer
- ISO TC292 Security Management/ Product Fraud: Chair, Member
- GMA: Work Group on Economic Adulteration, Member
- CODEX: US Codex Delegation & Food Fraud EWG: Member
- Chinese National Center for Food Safety Risk Assessment (CFSA): Foreign Subject Matter Expert and researcher.
- WHO/FAO - INFOSAN the WHO and FAO-UN Food Safety Information Sharing Network: Presenter and researcher.
- Canadian Food Fraud Work Group (FFWG): Ex-Officio Member
- USP Expert Panel: Food Ingredient Intentional Adulteration (FFMG)
- ISLI food authenticity project and task force: Member
- AOAC Presidential Task for on Food Authenticity: Member
Massive Open Online Course (MOOC – pronounced /moʊk/)  
http://foodfraud.msu.edu/mooc/  
Free, open, online, open to anyone, with an optional Certificate of Completion  
Format: Typically monthly with two webinars that also on-demand  
1. Food Fraud Overview MOOC  
2. Food Fraud Audit Guide MOOC  
3. Food Defense Audit Guide MOOC  
4. Food Fraud VACCP (Vulnerability Assessment and Food Fraud Prevention Strategy Development) MOOC  

Executive Education (Short-Course)  
• Food Fraud Strategy, Quantifying Food Risk with Vulnerably Assessments  

Graduate Courses (Online, Three Credits)  
1. Food Fraud Prevention  
2. Anti-Counterfeit & Product Protection (Food Fraud)  
3. Quantifying Food Risk (including Food Fraud)  
4. Global Food Safety (including Food Fraud)  
5. Food Protection and Defense (Packaging Module)  
6. Packaging for Food Safety  

Graduate Certificate (Online, Four Courses Each)  
• Certificate in Food Fraud Prevention (Food Safety)  

Master of Science in Food Safety (Online)  
• www.online.FoodSafety.msu.edu  
  Certificate in International Food Law  
  – https://www.canr.msu.edu/iflr/
Functions and purpose of guidance and tools

• Guidance docs, resources, IT tools and analytical methods
  – (1) Resources to do what?
    • FSMA Preventive Controls
    • FSMA Law – Hazard Analysis
    • GFSI – was due January 1, 2019
  – (2) What Resources
  – (3) Into action – tools, methods, and information
## Summary of Compliance Requirements Regarding Food Fraud

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Effective Date</th>
<th>Scope</th>
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</thead>
<tbody>
<tr>
<td><strong>Food, Drug &amp; Cosmetics Act – Section on “Adulterated Foods” and “Misbranded Foods”</strong></td>
<td>1938</td>
<td>Requirement: assess and address ‘hazards that require a preventive control’ – they do not specifically mention or address food fraud. Consequence: illegal product could be subject to product recall and financial penalties.</td>
</tr>
<tr>
<td><strong>Sarbanes-Oxley Act</strong></td>
<td>2002</td>
<td>Requirement: address or disclose risks to revenue. Consequence: not an enforcement priority but non-compliance could be a felony crime.</td>
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<tr>
<td><strong>FSMA Preventive Controls</strong></td>
<td>September 2016</td>
<td>Requirement &amp; Consequence: see FDCA above</td>
</tr>
<tr>
<td><strong>GFSI Version 7 (including certification programs such as FSSC, SQF, etc.)</strong></td>
<td>January 2018</td>
<td>Requirement: conduct and document annually a (1) food fraud vulnerability assessment, (2) food fraud prevention strategy, and (3) address the GFSI scope. Note: FFVA – and food defense vulnerability assessment – must be separate from the food safety assessment. Consequence: non-compliance will lead to being de-certified.</td>
</tr>
<tr>
<td><strong>GFSI Certification Programs Organizations (CPOs)</strong></td>
<td>January 2018</td>
<td>Requirement &amp; Consequence: see GFSI above</td>
</tr>
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</table>
GFSI Announcement 5/9/2018

- Food fraud review:
- Blog, Technical Report

Terminology (Types of Fraud)

Table 2: Table: Food Fraud Types, Definitions, and Examples (adapted from (Spink and Moyer 2011, Spink 2013, SSAFE Organization 2015, PWC PriceWaterhouseCooper 2016, GFSI 2017, Spink, Ortega et al. 2017))

- Dilution
- Substitution
- Concealment
- Unapproved Enhancements
- Mislabeling
- Gray Market Production/ Theft/ Diversion
- Counterfeiting (IPR)
Terminology (Definitions)

• “Both(1) definitions cover *all types of fraud* and *all products* and highlight that the motivation behind food fraud is intentional and economically driven, i.e. potentially linked to criminal activities and at least aiming to avoid detection.”

Terminology (Detail)

• “This implies that any plans and activities to mitigate, prevent or even understand the risks associated with food fraud should consider an entire company’s activities, including some that may not be within the traditional food safety or even HACCP scope, applying methods closer to criminal investigation.”
GFSI Issue 7 Published Food Fraud Terms

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 prioritise food fraud mitigation measures.

FSM AI 22.1 Food fraud mitigation plan

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

**Every ‘vulnerability’ does NOT need a control plan.**

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 organisation’s Food Safety Management System.
# GFSI Benchmark, Standards, and Guidances

<table>
<thead>
<tr>
<th>Organization</th>
<th>Document Type</th>
<th>Document Title (fees are noted)</th>
<th>Document Publication Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>GFSI</td>
<td>Guidance</td>
<td>GFSI Food Fraud Technical Document</td>
<td>May 2018</td>
</tr>
<tr>
<td>BRC</td>
<td>Standard</td>
<td>BRC Global Standard Food Safety Issue 8 (Section 5.4 Product authenticity, claims, and chain of custody) [3]</td>
<td>August 2018</td>
</tr>
<tr>
<td>SQF</td>
<td>Guidance</td>
<td>Food Fraud Guidance for Sites and Auditors [8]</td>
<td>August 2018</td>
</tr>
<tr>
<td>FSSC</td>
<td>Guidance</td>
<td>Guidance on Food Fraud Mitigation [10]</td>
<td>April 2018</td>
</tr>
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</table>
Other Resources

Food Fraud Vulnerability Assessments:

• SSAFE Food Fraud Vulnerability Assessment Tool
• Food Fraud Initial Screening Tool (Michigan State University, Food Fraud Initiative):
• FPDI Food Adulteration Information Resource FAIR (Food Protection and Defense Institute, formerly National Center for Food Protection and Defense, NCFPD) (Note: the assessment is automatically conducted, and there is no public algorithm)
• And others…

Food Fraud Incident Databases or Notifications:

• Discernes (formerly managed by US Pharmacopeia) Food Fraud Incident Database:
• RASFF Incident Summary
• FDA recall and warning letters
• FPDI Food Adulteration Information Resource FAIR (Food Protection and Defense Institute, formerly National Center for Food Protection and Defense, NCFPD)
• HorizonScan, UK FERA and GenticID
• FoodAkai
• And others: UK DEFRA – The Elliott Review,
• Food Industry Asia (FIA), Food Fraud Report
• FAO Seafood Fraud Report, etc.
References


Acknowledgements

- **MSU Veterinary Medicine:** Dean Christopher Brown, Chair Dan Grooms, Chair Ray Geor, Dr. Wilson Rumbeiha, Cindy Wilson, Dean John Baker
- **MSU Global:** Associate Provost/Executive Director Christine Geith, Jerry Rhead, Gwyn Shelle, Lauren Zavala, Associate Provost/EVP Dr. Karen Klopmares, Rashad Muhammad
- **Queens’s University Belfast (UK):** Professor & Director Christopher Elliott, Dr. Moira Dean, Dr. Michael Hollis
- **MSU Online Master’s of Science in Food Safety:** Director Melinda Wilkins, Ex-Director Julie Funk, Kristi Denbrook, Heather Ricks, Peggy Trommater, Heidi Chen, Dr. Gary Ades, Chair Ray Geor
- **MSU Food Science:** Chair Fred Derksen, Les Bourquin, Bradley Marks, Felicia Wu, VP of Research Ian Gray, David Ortega, Gale Strasburg
- **MSU Program in Public Health:** Director Michael Rip and Douglas C Moye
- **MSU NFSTC:** Dr. Scott Winterstein, Trent Wakenight, Dr. Kevin Walker, Sandy Enness, Jen Sysak, Dr. Rick Foster, to name a few critical contributors and supporters.
- **MSU Food Safety Policy Center:** Dr. Ewen Todd
- **MSU School of Packaging:** Dr. Bruce Harte, Dr. Robb Clarke, Dr. Laura Bix, Dr. Paul Singh, Dr. Diana Twede, Dr. Gary Burgess, Dr. Harold Hughes, Dr. Mark Uebersax, Dennis Young, and Director Joseph Hotchkiss
- **MSU Communication Arts/Consumer Behavior:** Dr. Maria Lapinski and Dr. Nora Rifon
- **MSU Criminal Justice:** Dr. Jeremy Wilson, Director Ed McGarrell, Dr. Justin Heinonen, Roy Fenoff, Zoltan Fejas, Barbara Sayre, and Sara Heeg
- **MSU Supply Chain Management:** Dr. Cheryl Speier, Dr. Ken Boyer, Dr. John MacDonald, Chair David Closs, Dr. Stan Griffis, Dr. Judy Whipple
- **MSU College Social Science:** Dean Marietta Baba and Assoc Dean Chris Maxwell
- **MSU College of Law:** Dr. Neil Fortin and Dr. Peter Yu
- **MSU Libraries:** Anita Ezzo, Nancy Lucas, Kara Gust
- **MSU International Programs:** Dr. Mary Anne Walker, Dr. John Whimms
- **State of Michigan’s Ag & Food Protection Strategy Steering Committee:** Dr. John Tilden, Brad Deacon, Gerald Wojtala, Byron Beerbower
- **The Citadel:** Dr. Roy Fenoff
Discussion

John Spink, PhD

SpinkJ@msu.edu

Twitter: Food Fraud and #FoodFraud

www.FoodFraud.msu.edu
Zoe Shuttlewood
EMEA Food Safety and Quality Systems Lead
Our 6 Principles of Food Integrity

1. The food we produce is safe & legal
2. The food we produce is authentic
3. The food we produce is nutritious
4. The systems we use to produce our food are sustainable
5. Our food is produced to the highest ethical standards
6. We respect the environment and those who work in our food industry

Culminating in the best tasting products – with full transparency & authenticity!
McC Vulnerability Model

Split into 3 sections with a high (3), medium (2), low (1) score assigned to each

- **Controllable Factors**
  - Supply Chain

- **Uncontrollable**
  - Geographical Considerations / Country of Origin
  - Economic anomalies / cost
  - Fraud History
  - Emerging issues

- **Mitigating**
  - Audit Strategy
  - Supplier Relationship / History of Supplier quality and safety
  - Testing frequency

~ 2,800 suppliers

14,500+ raw materials

~100 raw materials / ingredient source

countries (39 for spice and herbs)
Spice Trade Background

- Items primarily grown in developing countries
- Crops grown on small farms by 10’s to 100’s of thousands of farmers following farming practices that, for the most part, have not changed for centuries
- Poor drying practices and handling & storage methods are typical
- Black pepper – 81% of land holding is <2.5 acres, only 5% >5 acres
- 10-150K farms, 50-500 collectors, 5-10 processors is not uncommon
Herb & Spice adulteration is nothing new
Supply Chain Controls, Long Term Alliances and Global Standards Drive Prevention…

Chain of Custody Controls to Prevent Adulteration

- Strategic Vendor Alliances
- Source Material Control
- Manufacturing Process Control

Field  McCormick
We Have the Most Direct Spice Supply Chain that Reduces Contamination via Strategic Vendor Alliance

- Fewer touch points reduces complexity and risk of contamination
- More direct access up the supply chain has greater impact on product safety & quality
Horizon Scanning Process
Quarterly Intelligence Gathering (QIG)

- Cross function activity at McCormick
  (Local > Regional > Global)
- Site/Customer Quality, Regulatory, Supplier Assurance, Procurement, International Trade Team
- Meet quarterly to share, review and discuss ongoing issues
- Connectivity between teams pinpoint issues and drives McCormick actions / Activities
Tools that continue to Advance our Analytical Science Capability

- Microscopy & Complementary analysis - FTIR, NIR, Spectral Imaging
- Molecular Spectroscopy - NMR
- Chromatography – GC-MS (MIDI) chemotaxonomic approach coupled with microscopy, HPLC
- Mass Spectrometry LC-HR/MS (LCMS QTof or LCMS Q-Orbitrap)
- Trace Element Analysis – LC-ICP-MS
- Stable Isotope Analysis – SNIF-NMR
5 Trends Having a Profound Effect on Quality

- Globalization
- Supply Chain Complexity
- Rising Purity Concerns
- Increased Regulator Activity
- Sustainability Issues
Thank you!
Questions?

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