



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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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.
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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

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

Food Fraud Curriculum

Massive Open Online Course (MOOC – pronounced /moōk/)

<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)

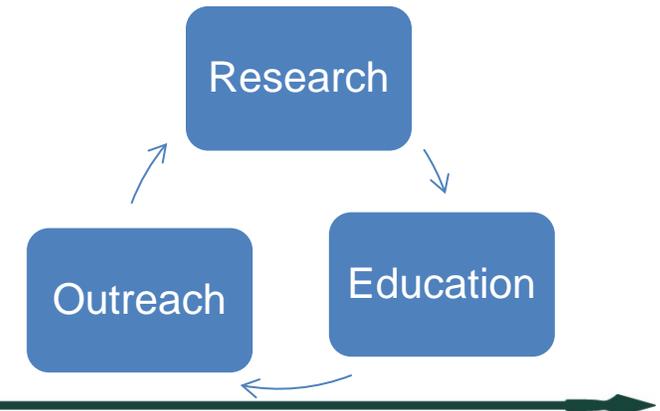
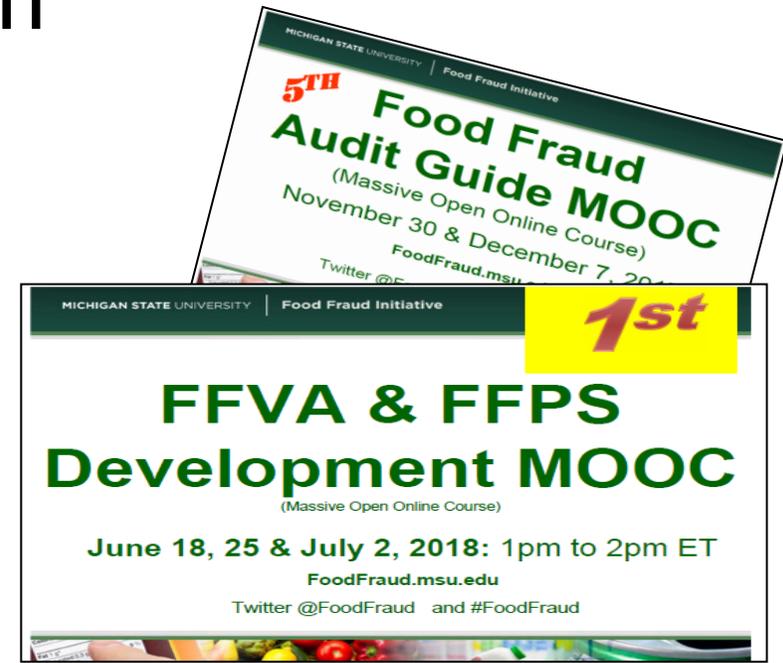
- Certificate in Food Fraud Prevention (Food Safety)

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

Requirement	Effective Date	Scope
Food, Drug & Cosmetics Act – Section on “Adulterated Foods” and “Misbranded Foods”	1938	<u>Requirement:</u> assess and address ‘hazards that require a preventive control’ – they do not specifically mention or address food fraud. <u>Consequence:</u> illegal product could be subject to product recall and financial penalties
Sarbanes-Oxley Act	2002	<u>Requirement:</u> address or disclose risks to revenue <u>Consequence:</u> not an enforcement priority but non-compliance could be a felony crime.
FSMA Preventive Controls	September 2016	<u>Requirement & Consequence:</u> see FDCA above
GFSI Version 7 (including certification programs such as FSSC, SQF, etc.)	January 2018	<u>Requirement:</u> 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. <u>Consequence:</u> non-compliance will lead to being de-certified.
GFSI Certification Programs Organizations (CPOs)	January 2018	<u>Requirement & Consequence:</u> see GFSI above

GFSI Announcement 5/9/2018

- Food fraud review:
- Blog, Technical Report



http://www.mygfsi.com/files/Technical_Documents/201805-food-fraud-technical-document-final.pdf

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)



APPENDIX: DETAIL OF TYPE OF FRAUD, AND EXAMPLES

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))

GFSI (1) Type of Food Fraud	Definition from SSAFE (2)	Examples from GFSI FFTT (3)	General Type of Food Fraud
Dilution	The process of mixing a liquid ingredient with high value with a liquid of lower value.	<ul style="list-style-type: none"> Watered down products using non-potable / unsafe water Olive oil diluted with potentially toxic tea tree oil 	Adulterant-substance (Adulterant)
Substitution	The process of replacing an ingredient or part of the product of high value with another ingredient or part of the product of lower value.	<ul style="list-style-type: none"> Sunflower oil partially substituted with mineral oil Hydrolyzed leather protein in milk 	Adulterant-substance or Tampering
Concealment	The process of hiding the low quality of a food ingredients or product.	<ul style="list-style-type: none"> Poultry injected with hormones to conceal disease Harmful food colouring applied to fresh fruit to cover defects 	Adulterant-substance or Tampering
Unapproved enhancements	The process of adding unknown and undeclared materials to food products in order to enhance their quality attributes.	<ul style="list-style-type: none"> Melamine added to enhance protein value Use of unauthorized additives (Sudan dyes in spices) 	Adulterant-substance or Tampering
Mislabelling/ Misbranding	The process of placing false claims on packaging for economic gain.	<ul style="list-style-type: none"> Expiry, provenance (unsafe origin) Toxic Japanese star anise labeled as Chinese star anise Mislabeled recycled cooking oil 	Tampering
Grey market production/ theft/diversion	Outside scope of SSAFE tool.	<ul style="list-style-type: none"> Sale of excess unreported product, Product allocated for the US market appearing in Korea 	Over-run, Theft, or Diversion (4)
Counterfeiting (IPR)	The process of copying the brand name, packaging concept, recipe, processing method etc. of food products for economic gain.	<ul style="list-style-type: none"> Copies of popular foods not produced with acceptable safety assurances Counterfeit chocolate bars 	Counterfeiting (IPR)

Notes:
 (1) GFSI – Global Food Safety Initiative
 (2) SSAFE – Safe Secure and Affordable Food For Everyone
 (3) GFSI FFTT – Global Food Safety Initiative: Food Fraud Think Tank
 (4): Gray Market -- a market employing irregular but not illegal methods; Theft -- something stolen; Diversion/ Parallel Trade -- the act or an instance of diverting straying from a course, activity, or use

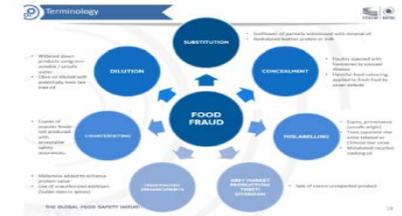


Figure 2: GFSI Presentation of Food Fraud Terminology (GFSI, 2014b)

Both 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 (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.”
- (1): GFSI Position paper on food fraud (2014) and Benchmarking Document (2017)

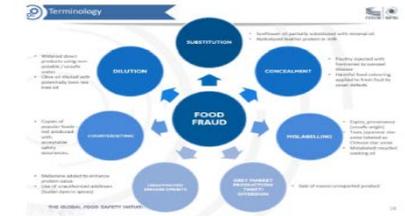


Figure 2: GFSI Presentation of Food Fraud Terminology (GFSI, 2014b)

Both 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.

- “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

Organization	Document Type	Document Title (fees are noted)	Document Publication Date
GFSI	Benchmarking	GFSI Guidance document v7.0 and 7.1 [2] <Plus FFTD>	February 2017
GFSI	Guidance	GFSI Food Fraud Technical Document	May 2018
BRC	Standard	BRC Global Standard Food Safety Issue 8 (Section 5.4 Product authenticity, claims, and chain of custody) [3]	August 2018
BRC	Guidance	BRC Global Standard for Food Safety Issue 7 Understanding Vulnerability Assessment [4]	January 2015
IFS	Standard	IFS Food: Standard for auditing quality and food safety of food products V6.1 (4.21 Food Fraud) [5]	November 2017
IFS	Guidance	IFS Product Fraud Guideline [6]	May 2018
SQF	Standard	SQF Code, 8 th edition (Part B, section 2.7) [7]	October 2016
SQF	Guidance	Food Fraud Guidance for Sites and Auditors [8]	August 2018
FSCC	Standard	V 4.1 July 2017 [9]	July 2017
FSSC	Guidance	Guidance on Food Fraud Mitigation [10]	April 2018

Other Resources

Food Fraud Vulnerability Assessments:

- SSAFE Food Fraud Vulnerability Assessment Tool
- Food Fraud Initial Screening Tool (Michigan State University, Food Fraud Initiative):
- FPGI 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
- FPGI 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

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- 9. FSSC, Foundation for Food Safety Certification, *International food safety and quality management system, Version 4*, URL: <http://www.fssc22000.com/documents/standards/downloads.xml?lang=en>
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- **The Citadel:** Dr. Roy Fenoff

Discussion

John Spink, PhD

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Twitter: [Food Fraud](#) and [#FoodFraud](#)

www.FoodFraud.msu.edu



Passion for
FLAVOR™



Power of
PEOPLE™



Taste you
TRUST™



Driven to
INNOVATE



Purpose-led
PERFORMANCE

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!



**Taste you
TRUST™**



**Purpose-led
PERFORMANCE**

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



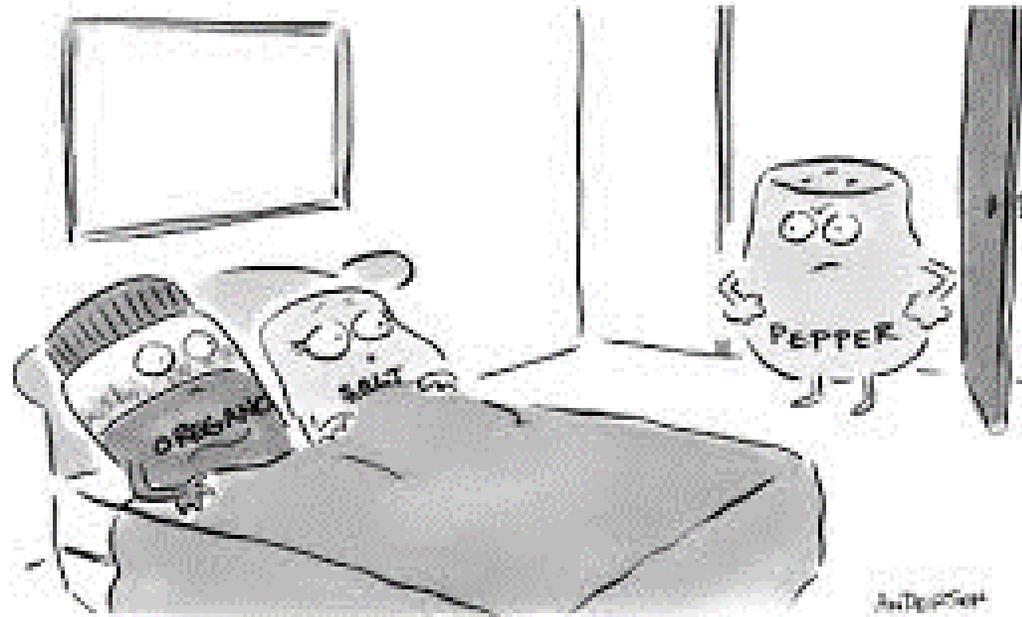
Traditional Supply Chain



McCormick



Herb & Spice adulteration is nothing new



Supply Chain Controls , Long Term Alliances and Global Standards Drive Prevention...

Chain of Custody Controls to Prevent Adulteration



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

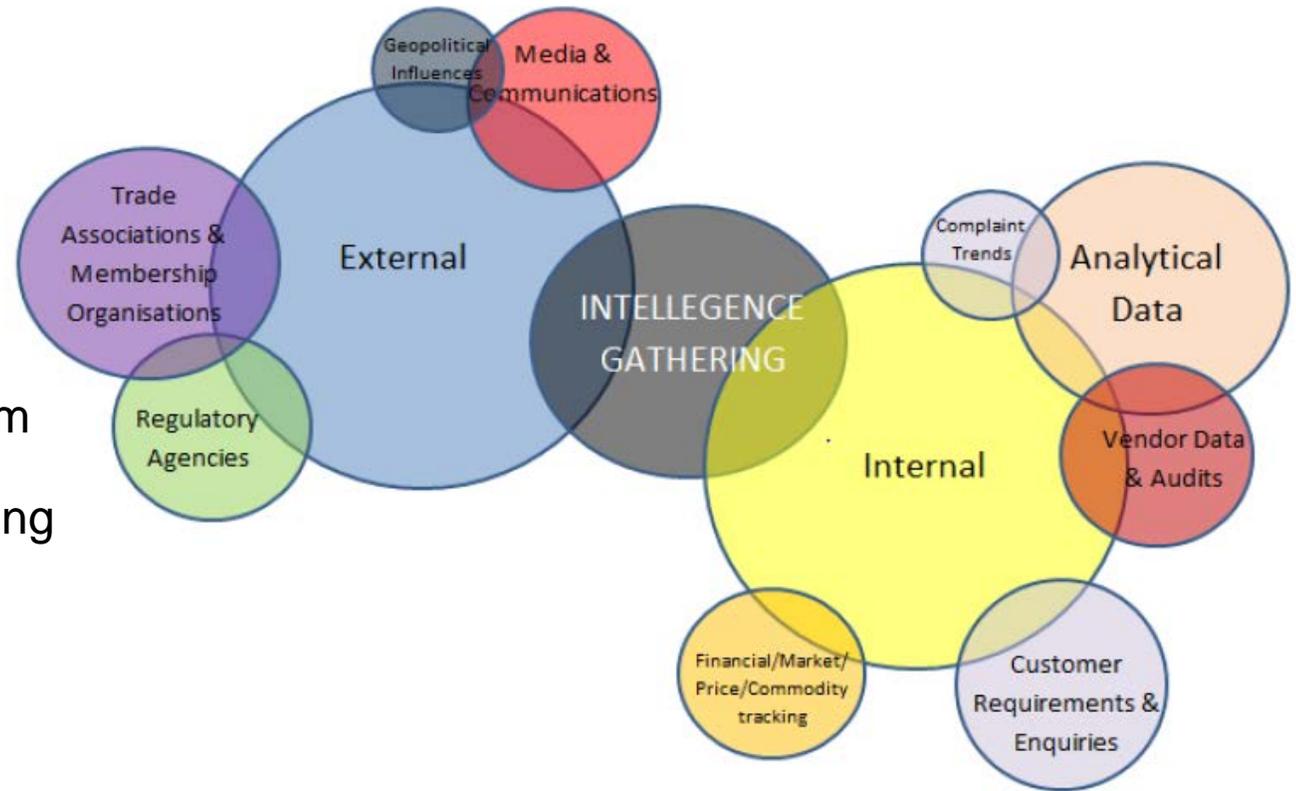
- Fewer touch points reduces complexity and risk of contamination
- More direct access up the supply chain has greater impact on product safety & quality



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

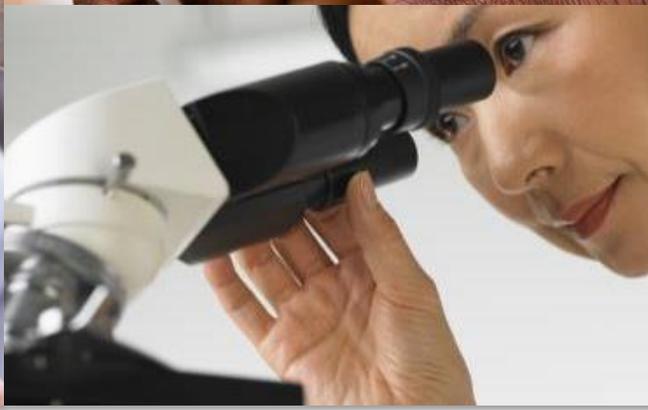


Sustainability Issues





PURE
TASTES
BETTER



Thank you!



Questions?

Questions can be submitted to the presenters via the **Questions section** at the right of the screen.

Slides and a recording of this webinar will be available for access by IAFP members at www.foodprotection.org within one week.