

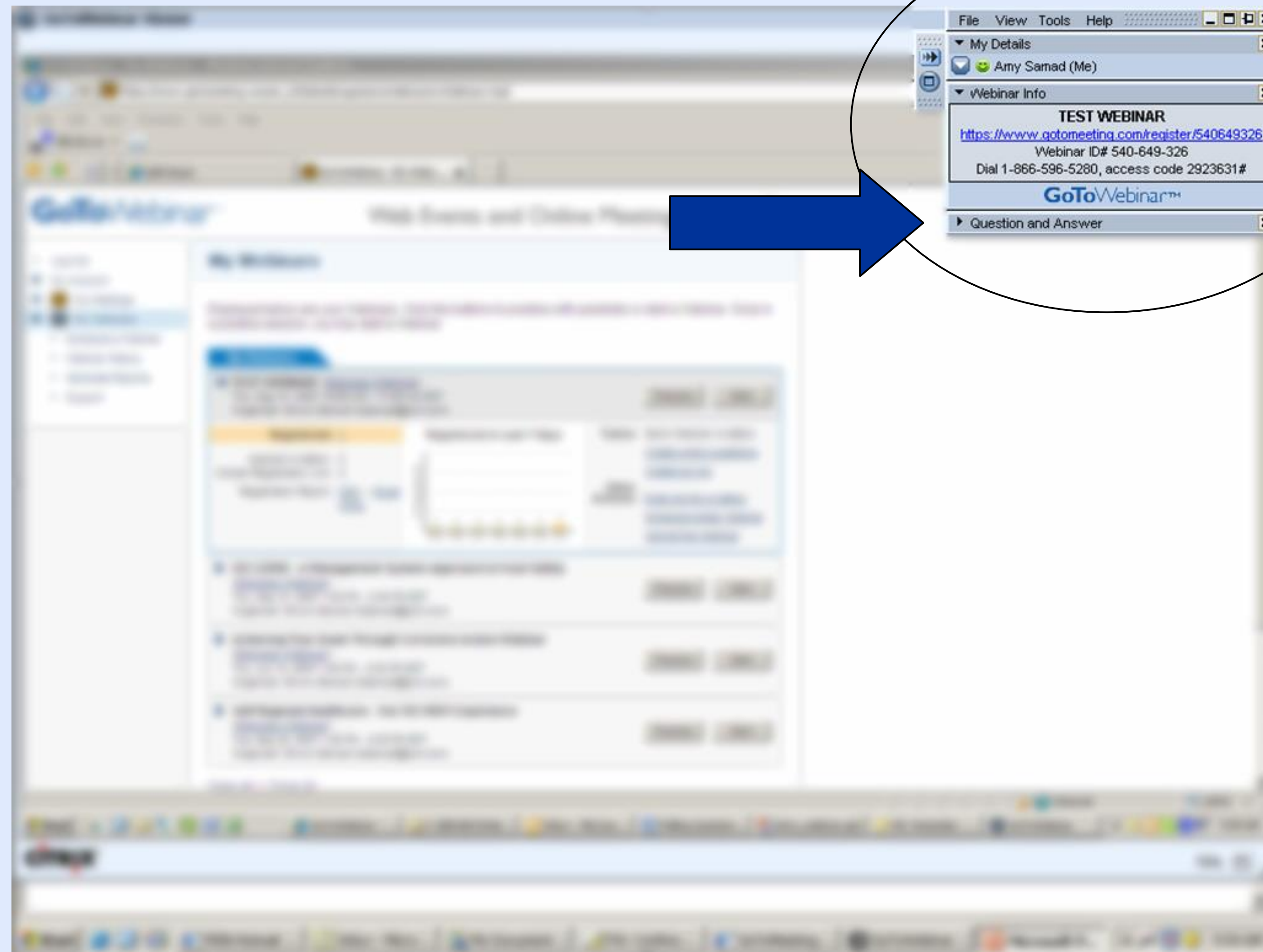


John W Spink, Ph.D.

Director, Food Fraud Prevention Academy

Also: Assistant Professor, Department of
Supply Chain Management, Business
College, Michigan State University (USA)

Cybersecurity and the Role of the Food Safety Manager



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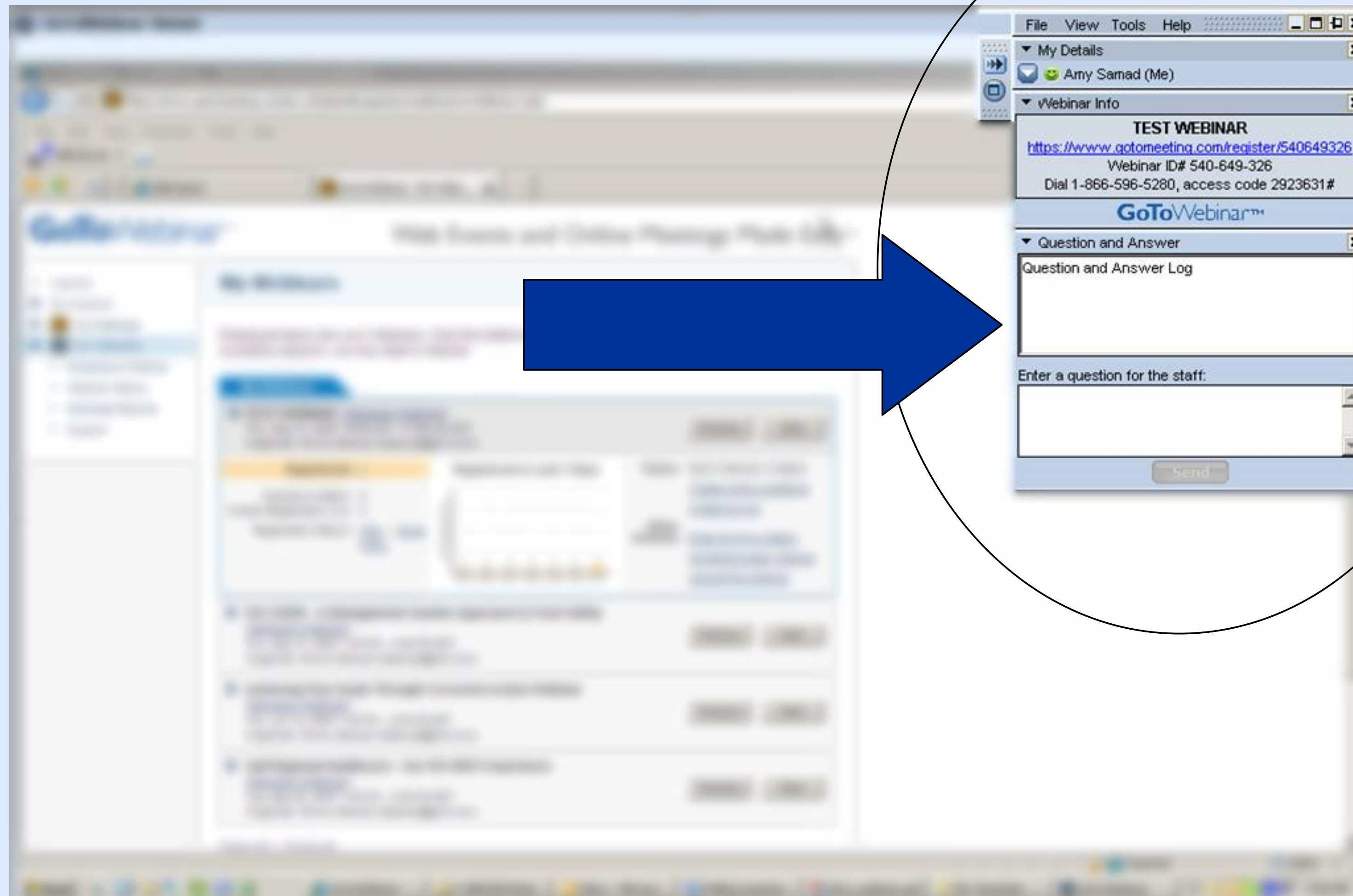
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Dial 1-866-596-5280, access code 2923631#

GoToWebinar™

Question and Answer





Paul Damaren

Senior Vice President of
Food Safety & Supply
Chain, PJRF SI



PJRF SI – Your Partner for Food Safety



In January 2020
EVERYONE
began a journey,
that is not yet
complete



Cybersecurity and the Role of the Food Safety Manager

John W Spink, Ph.D.

Director, Food Fraud Prevention Academy

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Chain Management, Business College, Michigan
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**Perry Johnson Registrars
Food Safety Inc.**
September 16, 2021 – 2 to 3pm ET

FoodFraudPrevention.com Twitter: @FoodFraud #FoodFraud





Food Fraud Prevention Think Tank: Our Resources

Textbook: Food Fraud Prevention (Spink, 2019)

Massive Open Online Course (MOOC – free, open, online)

- With a '**certificate of completion**' based on **assessments**
- On-demand, ten professional training hours
- 1. Food Fraud Prevention Overview MOOC
- 2. Food Fraud Prevention Audit Guide MOOC
- 3. Food Defense Threat Audit Guide MOOC
- 4. Food Fraud Vulnerability Assessment & Prevention Strategy (VACCP)
- 5. *Developing an Organic Fraud Prevention Plan (with OTA)*
- 6. *Food Fraud & Enterprise Risk Management (ERM)*

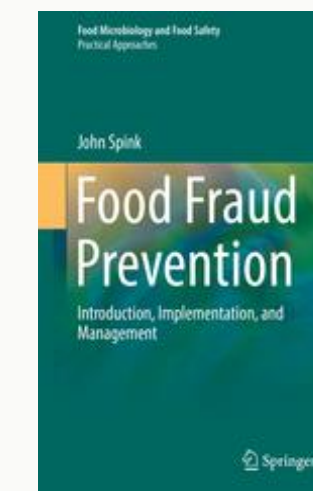
Also:

1. *USDA NOP – Organic Fraud and the Criminal Mind (See USDA.gov)*
2. *USDA NOP – Preventing Organic Product Fraud (See USDA.gov)*

Executive Education

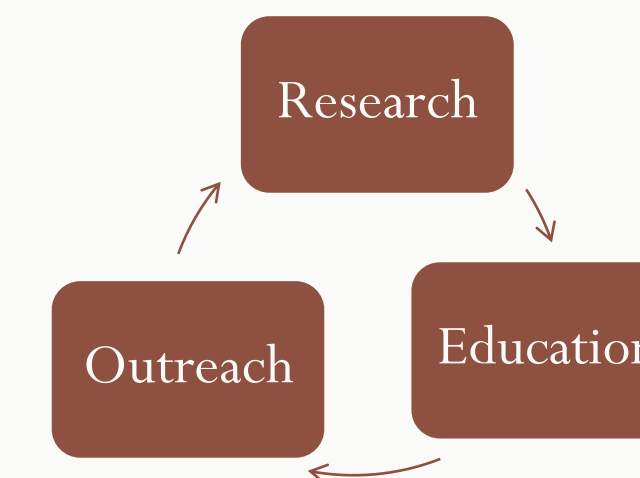
- (Includes invitation-only/ brand owner-only sessions)
- 1. Food Fraud Prevention Annual Update
- 2. Food Fraud Management Strategy
- 3. Food Fraud Initial Screening FFIS/ FFVA Workshop

Reports, Primer Documents, Scholarly Works, Videos and Training



Link to Textbook:

<http://www.anrdoezrs.net/links/9101220/type/dlg/https://www.springer.com/us/book/9781493996193>





Resources: Supply Chain Management Book

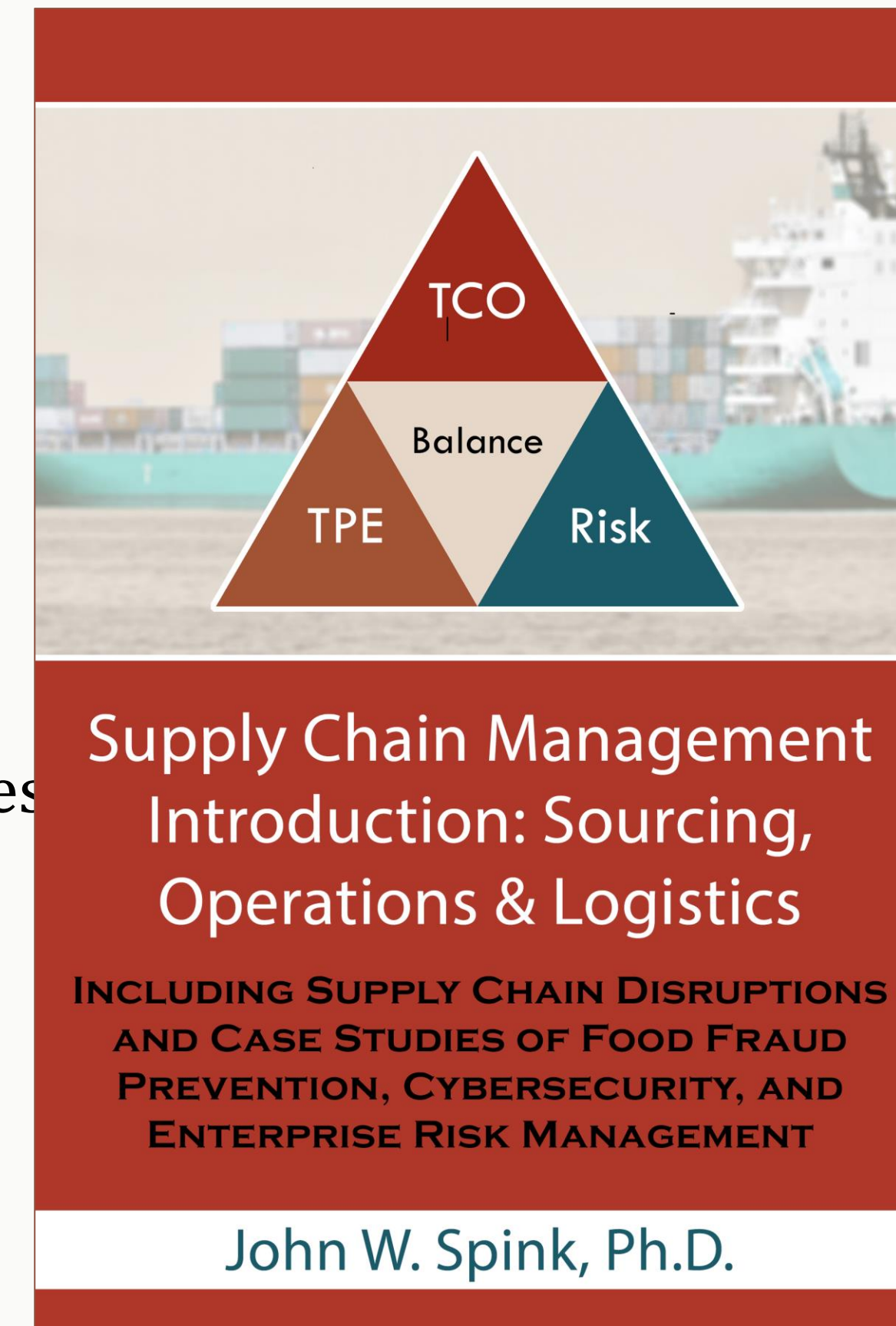
NEW BOOK, pre-order, October release

Supply Chain Management Introduction – Sourcing, Operation & Logistics

- Including Supply Chain Disruptions and a
- Case Study of Food Fraud Prevention,
- ***Cybersecurity***, and
- Applying Enterprise Risk Management
- Required reading in MSU SCM undergraduate courses (all MSU business school students)
- Supply Chain Management teaching Supply Chain Managers about best practices in Supply Chain Management.

For an update, subscribe at:

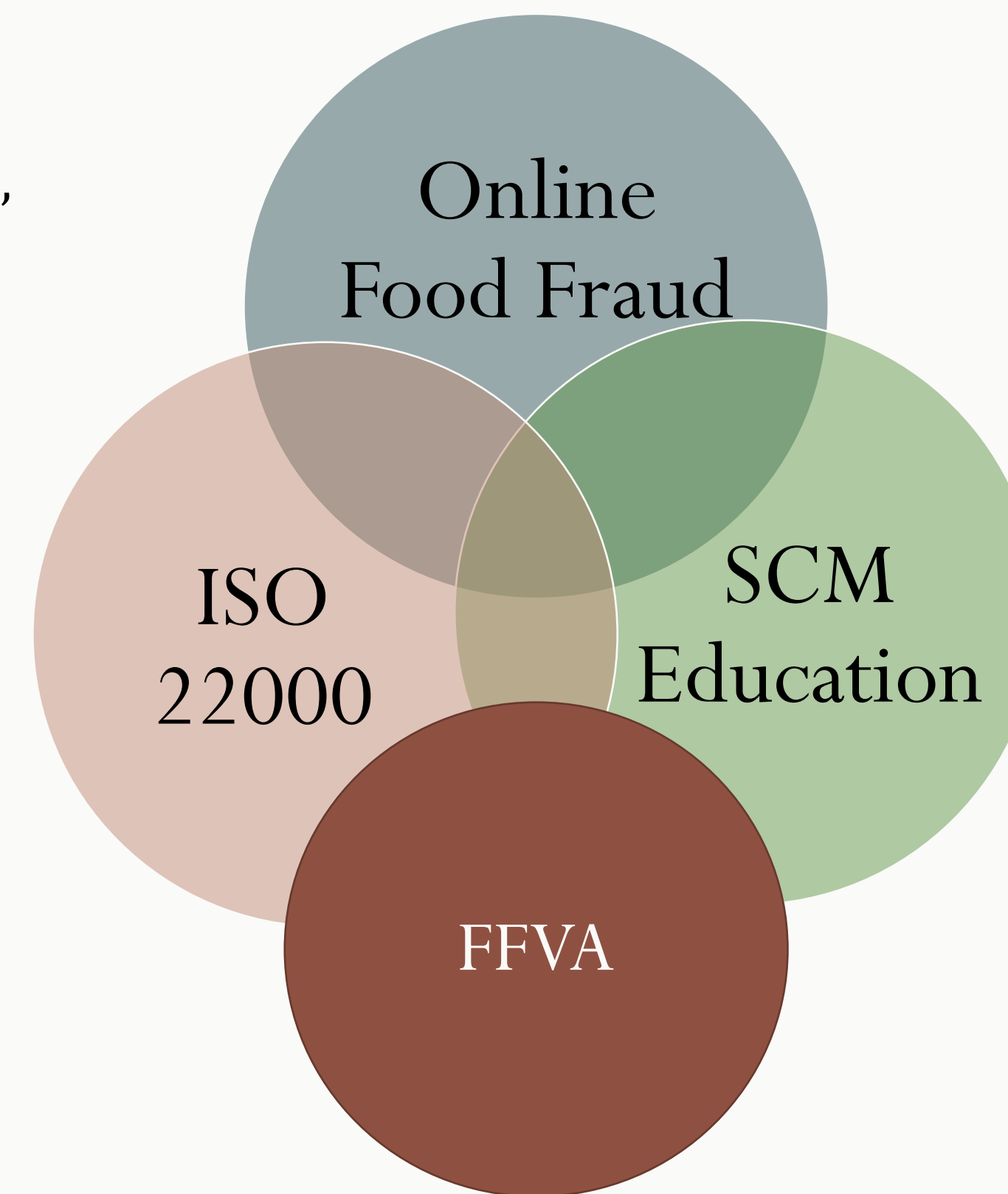
www.Scmlntro.com





From Food Fraud Prevention to Cybersecurity

- **E-Commerce and food fraud:**
 - Online marketplaces and sales channels have been a source of food fraud for counterfeit, stolen goods, diverted goods, and expired products.
 - FFVA for online sales for FSAI, Interpol/ Europol, and others.
 - Research and presentations on the impact of e-commerce on food safety and food fraud
- **ISO 22000 Food Safety Management**
 - In 2018, section 4.1 expanded to “external issues” including “cybersecurity and food fraud.”
 - Question: cybersecurity and food fraud... separately or together?
- **Supply Chain Management education**
- **Vulnerability assessments** of novel events: applying FFIS, FFVA, and VACCP



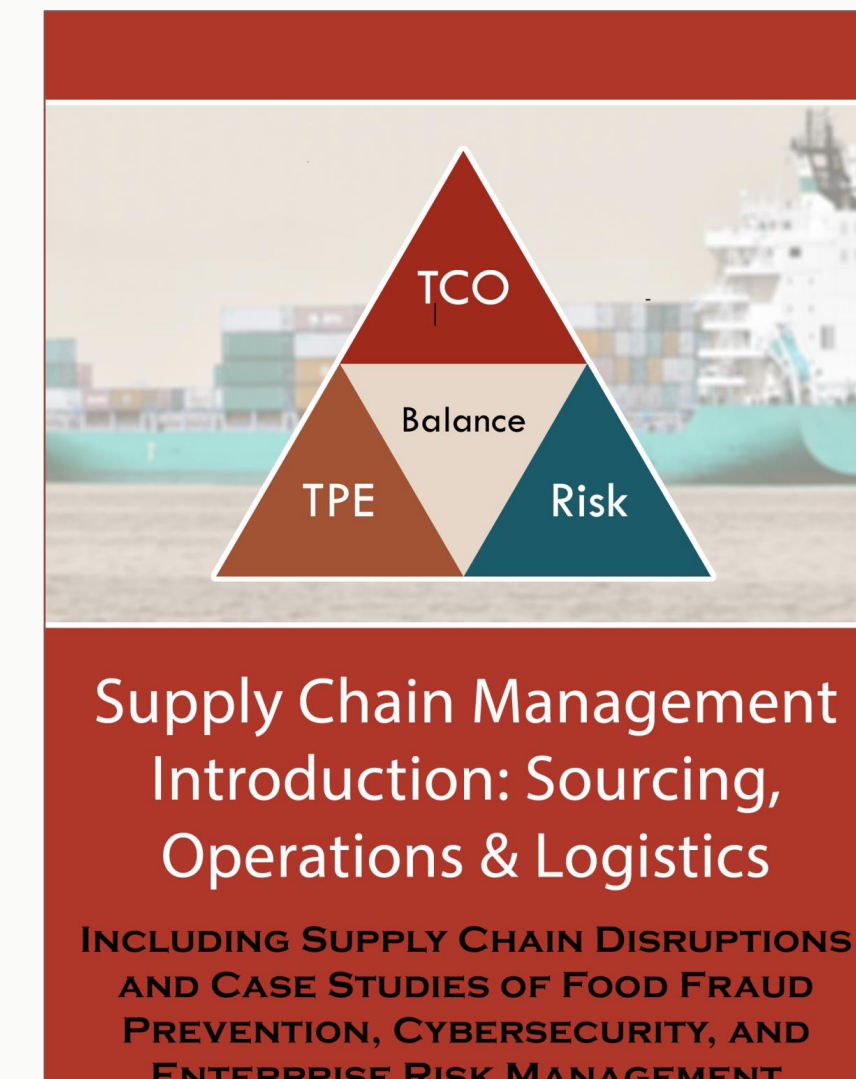


New Book Chapter-Section: Cybersecurity in ISO 22000 Food Safety Management

- The foundation of this presentation is my chapter-section draft.
- Please review and comment on the chapter-section in the shared Google Document:
- <https://docs.google.com/document/d/1SF9hLtO4yfvaRzPLradS9ILwnkC5E2SU/edit?usp=sharing&ouid=106328742619920569986&rtpof=true&sd=true>



CONTRIBUTE!!!



CHAPTER 13: CYBERSECURITY

13.04 Cybersecurity in ISO 22000 Food Safety Management

Since first published in 2015, Iso 22000 has been the foundational standard for food safety management. The most widely adopted requirements are based on the Global Food Safety Initiative (GFSI) benchmark which built upon ISO 22000. In 2018 the ISO 22000 standard was updated acknowledge of "external issues" including "cybersecurity and food fraud." But, what is "cybersecurity"? Why is cybersecurity included in the same concept as food fraud? Do they intend to present two separate topics of "cybersecurity" and separately "food fraud" or both together in "cybersecurity and food fraud"? Does it matter?

This review will focus on the cybersecurity part of the question. Let's start with some basics questions:

For ISO 22000 Food Safety Management:

- What is the scope?
- What is the definition of food safety (and related terms)?
- What is the cybersecurity requirement?
- How formal or direct is the cybersecurity requirement?
- What is the definition of cybersecurity (and food fraud)?
- What is the compliance role of a Food Safety Management system in Cybersecurity?

Agenda: The Role of the Food Safety Manager in Cybersecurity (or vice versa)



Agenda

- Start with the FSMA and Food Safety Management Systems
 - ISO 22000 Food Safety Management (the foundation for GFSI and the food safety standards)
 - FSMA
- General Cybersecurity standards:
 - NIST
 - ISO 27000 Information Security
 - ISO 27034 Cybersecurity
- The role of the food safety manager is cybersecurity.

What do you need to do?

Food Safety Compliance for

- GFSI/ Food Safety Management System
- Food laws and regulations
- Corporate requirements
- Others



FSMA

- **FSMA-Preventive Controls – September 2016**
 - “The hazard analysis must be written regardless of its outcome”
[21CFR507.33 (a)(2)]/ 21CFR117.130

21 USC Ch. 27: FOOD SAFETY MODERNIZATION	
From Title 21—FOOD AND DRUGS	
CHAPTER 27—FOOD SAFETY MODERNIZATION	
SUBCHAPTER I—IMPROVING CAPACITY TO PREVENT FOOD SAFETY PROBLEMS	
Sec.	
2201.	Performance standards.
2202.	National Agriculture and Food Defense Strategy.
2203.	Food and Agriculture Coordinating Councils.
2204.	Building domestic capacity.
2205.	Food allergy and anaphylaxis management.
2206.	Alcohol-related facilities.

Cybersecurity
Explicit or
Implicit?

If it’s a hazard it
must be assessed.



GFSI Food Safety Management System

- Keywords:
 - Cyber = 0
 - Internet = 0
 - Information Technology/ IT = 0
 - ***Conclusion: No cybersecurity requirements?***
- Food defence: The process to ensure the security of food, food ingredients, feed or food packaging from all forms of intentional malicious attack....
- Food safety: Assurance that any product within the GFSI scopes of recognition will not cause an adverse health effect...
- HACCP: A system which identifies, evaluates, controls and monitors hazards relating to food safety....



Explicit or Implicit?



Corporate or Customer Requirements

- Beyond food safety to supplier qualification.
- Information Technology/ Cybersecurity standards

BUT...

...what is the problem?

...what are the requirements for your company?

...what are the requirements for your FSMS?

Cybersecurity Hot Topics



High Profile Incidents

- Solar Winds (malware, software access)
- Colonial Pipeline (ransomware, proactively shut down the entire system)
- JBS US Holdings (Ransomware, encrypted server)
- Genome Information Cybertheft
- Oldsmar Water Authority (remote access, changed levels of lye, 2017)
- AmeriCold Logistics (Ransomware, cold storage, encrypted servers)
- State sponsored hacking to get sensitive information and lists.

Hot topic and pressure

- FDA New Era in Smarter Food Safety, Public Meeting on E-Commerce in October 19-21, 2021.
- Note: focused on B2C commerce and food safety hazards during the preparation and delivery by new businesses
 - “e.g., produce and meal kit subscription services, ghost kitchens, dark stores),”
 - “U.S. Postal Service, UPS, FedEx, Uber, Lyft, DoorDash, etc.”

Wait... Cybersecurity or e-commerce (or both)?



FDA New Era for Smarter Food Safety E-Commerce Meeting

The FDA is taking a proactive first step aligned with standards such as ISO 31000 Risk Management of “establishing the context.”

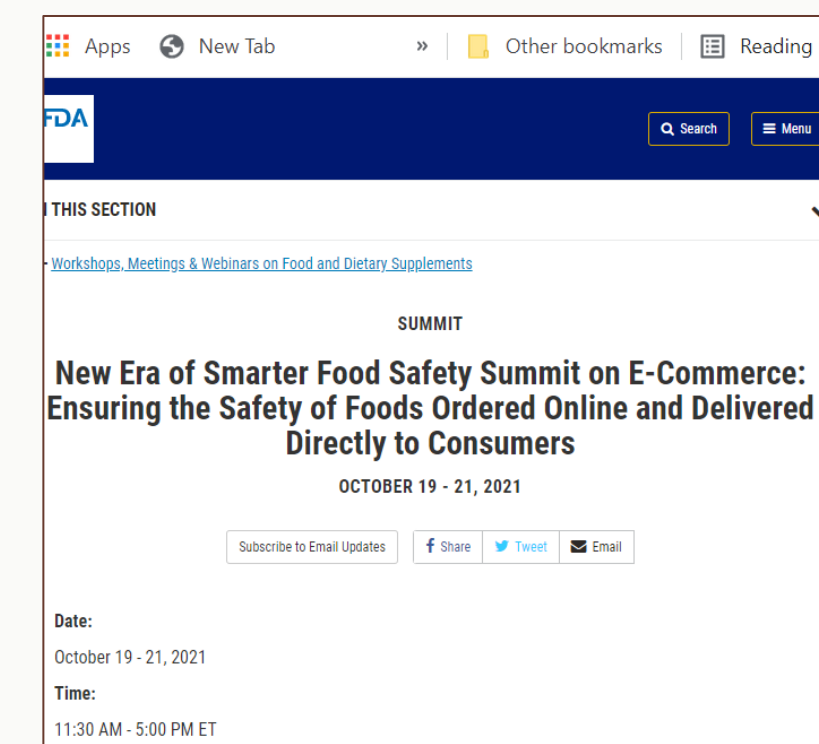
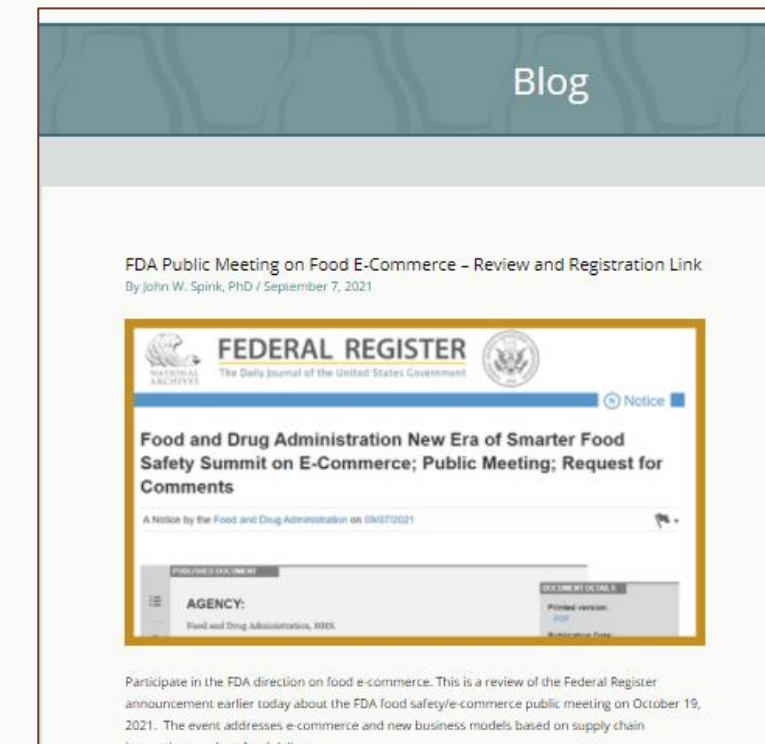
Following ISO 9000 Quality Management and ISO 22000 Food Safety Management, the next step is to gather incident information to conduct risk identification before considering the risk assessment models or methods.

Key steps include supply chain mapping to identify how product flows and who handles the products.

This provides the information to conduct a criminology hot spot analysis outlined in the USDA Organic Integrity Learning Center video training courses on food fraud prevention.

Reference:

- <https://www.blog.foodfraudpreventionthinktank.com/>
- <https://www.ams.usda.gov/services/organic-certification/training>
- <https://www.fda.gov/food/workshops-meetings-webinars-food-and-dietary-supplements/new-era-smarter-food-safety-summit-e-commerce-ensuring-safety-foods-ordered-online-and-delivered>



ISO 22000 Food Safety Management

Observer Status, ISO TC23/WG17 (ISO 22000)



ISO 22000 Food Safety Management

- ***Builds on ISO 9000 Quality Management, ISO 31000 Risk Management, and others.***
- International Standards Organization, Technical Committee 34 Food products, Sub-Committee 34 Management systems for food safety (ISO/TC 34/SC 17)
- Health hazards from food safety incidents
- Reduce health hazards and increase the methodology to reduce the possibility of incidents
- Focuses on health hazards, new food fraud requirements in 2018.
- ***The foundation for GSFI food safety management systems.***

“The ISO 22000 family contains a number of standards each focusing on different aspects of food safety management.

- ISO 22000:2005 contains the overall guidelines for food safety management.
- ISO 22004:2014 provides generic advice on the application of ISO 22000
- ISO 22005:2007 focuses on traceability in the feed and food chain
- ISO/TS 22002-1:2009 contains specific prerequisites for food manufacturing
- ISO/TS 22002-2:2013 contains specific prerequisites for catering
- ISO/TS 22002-3:2011 contains specific prerequisites for farming
- ISO/TS 22002-4:2013 contains specific prerequisites for food packaging manufacturing
- ISO/TS 22003:2013 provide guidelines for audit and certification bodies.”



ISO 22000: Overview

- “Introduction - 0.3.3.3 Hazard analysis — Operational processes: The concept of risk-based thinking based on the HACCP principles at the operational level is implicit in this document. The subsequent steps in HACCP can be considered as the necessary measures to prevent hazards or reduce hazards to acceptable levels to ensure food is safe at the time of consumption.”



What is the cybersecurity requirement for ISO 22000 compliance?

The scope includes anything that could lead to a food safety-based adverse health effect.

- “4.1. The organization shall determine external and internal issues that are relevant to its purpose and that affect its ability to achieve the intended results of its food safety management system. The organization shall identify, review and update information related to these external and internal issues.”

Then Section 4.1, Note 1 clearly defines food fraud within the scope of the standard. *The standard only mentions the term once and only in a “note.”*

- “Understanding the context can be facilitated by considering external and internal issues including but not limited to legal, technological, competitive, market, cultural, social, economic environments, cybersecurity and food fraud, food defence and intentional contamination, knowledge, and performance of the organization, whether international, national, regional or local.”

Together? Typo?
...the “and”



How formal or direct are the cybersecurity requirements?

- *There are no further details or explicit compliance requirements.*
- *Iso 22000 does not have a definition of cybersecurity.*
- *Iso 28000 Supply Chain Security does not even mention cybersecurity (only IT/ ICT security)*
- *The GFSI Benchmarking document does not mention cybersecurity.*
- *...now what? Ignore it?*
- *...insight from where cybersecurity mentioned in ISO?*

NIST

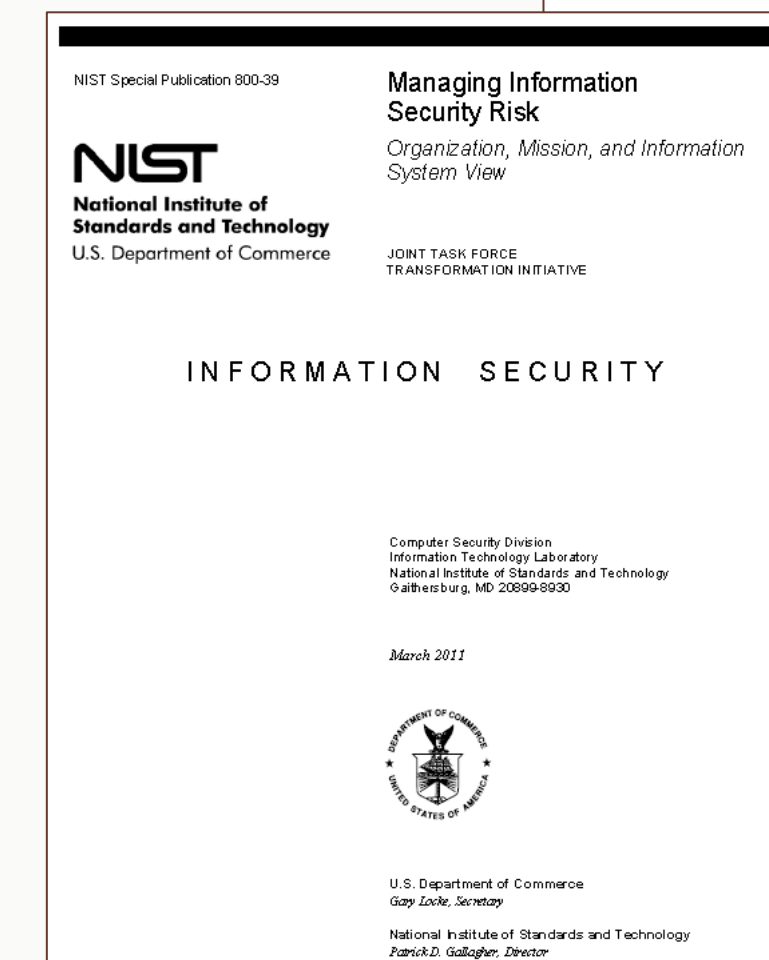
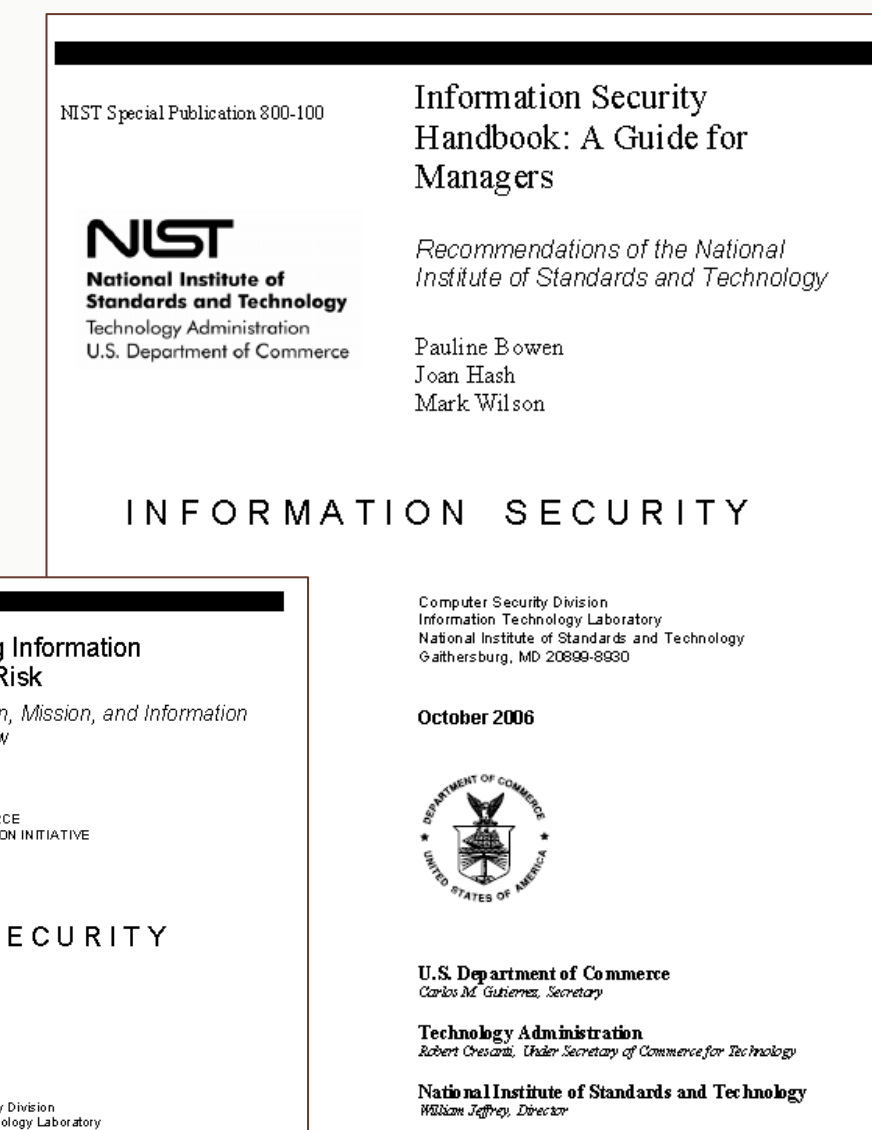
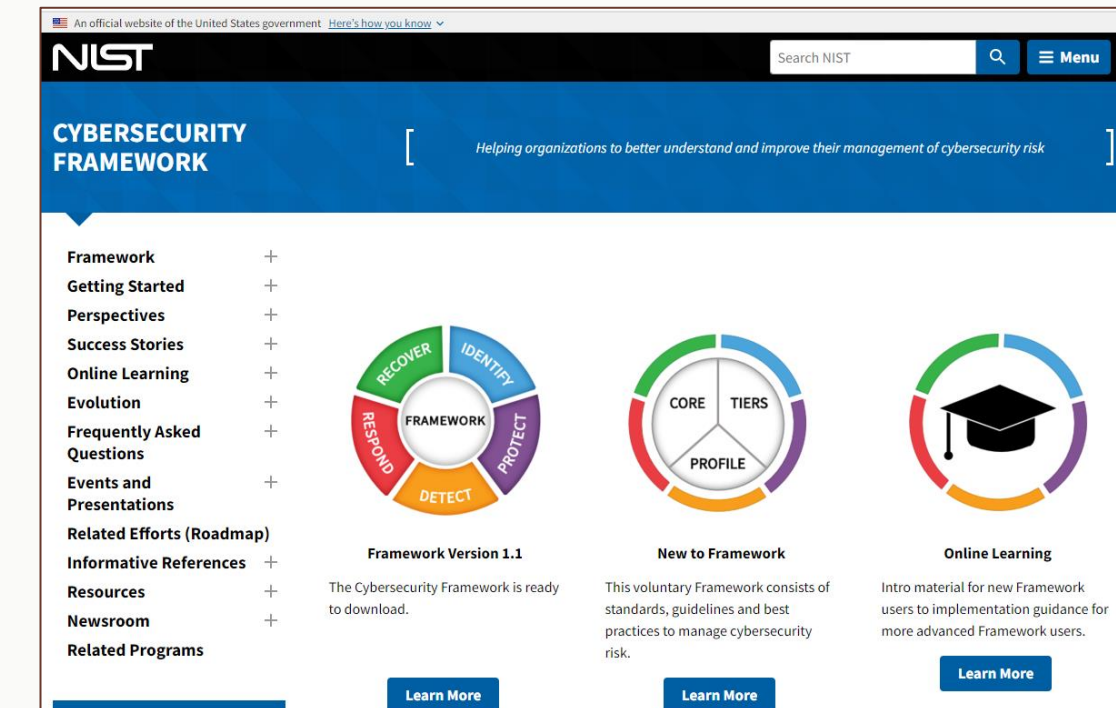
ISO 27000 & ISO 27001

ISO 27032 Cybersecurity



NIST in One Slide: The Foundation

- US National Institute of Standards and Technology (NIST)
- US Department of Commerce, coordinates measurement standards including information security standards for federal computer systems.
- NIST Cybersecurity Framework
- Information Security Handbook: Guide for Managers (SP-800-100)
- Managing Information Security (SP-800-39)
- *...and more on the way*





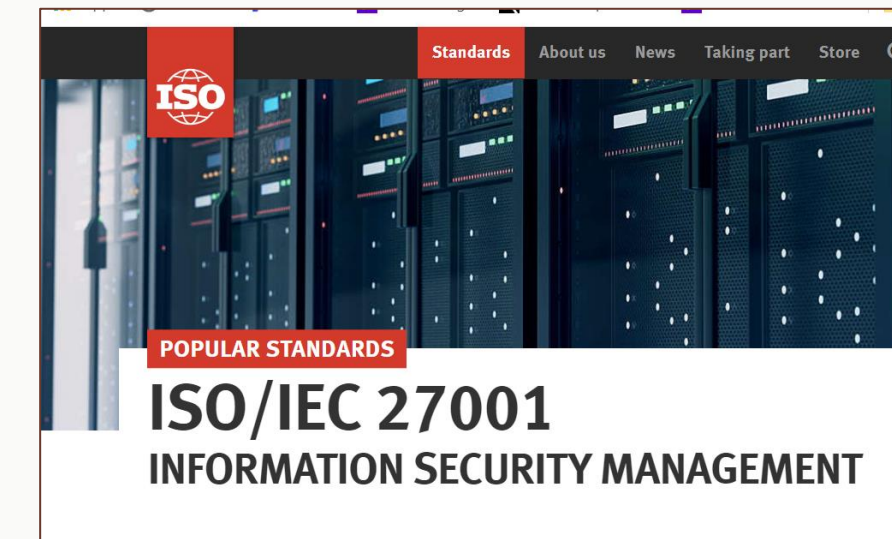
ISO 27000 Information Security Management ISO 27001 IS Management Systems Requirements

ISO 27000 – the series

- Management System Standard (MSS) comprised of standards including ISO 27001 requirements and ISO 27032 Information technology – Security Techniques – Guidelines for Cybersecurity (Cybersecurity).
 - ***Information Security Incident Management:*** processes for detecting, reporting, assessing, responding to, dealing with, and learning from information security incidents. (REF 27000)

ISO 27001 – the requirements

- The requirements for establishing, implementing, maintaining and continually improving an information security management system within the context of the organization.





ISO 27000 TITLE/ 27034 Definitions

ISO 27000/ 27001, 27032

- **Cybersecurity or Cyberspace security** (ISO 27031, 4.20): preservation of confidentiality, integrity, and availability of information in the Cyberspace.
- **the Cyberspace** (ISO 27031, 4.21): complex environment resulting from the interaction of people, software, and services on the Internet by means of technology devices and networks connected to it, which does not exist in any physical form
- **Internet or internetwork**: collection of interconnected networks
- **the Internet**: global system of inter-connected networks in the public domain
- **Internet security**: preservation of confidentiality, integrity and availability of information in the Internet
- **Virtual world**: simulated environment accessed by multiple users through an online interface

Others

- **E-commerce**, Electronic Commerce): (NIST SP 800-32) The use of network technology (especially the internet) to buy or sell goods and services.
- **B2C e-commerce** (FDA SFS E-Commerce): is the manufacturing, packaging, labeling, storage, and delivery of human and animal foods sold directly to consumers, through commercial transactions conducted electronically on the internet.
- **E-business** versus E-commerce (GAO-02-404): In a transaction-based definition, electronic commerce is restricted to buying and selling, as distinct from conducting E-business (purchasing, selling, tracking inventory, managing production, handling logistics, and supplying communications and support services).

Cybersecurity and ISO 22000 Food Safety Management

Leverage ISO 27032 Cybersecurity



ISO 27032 Cybersecurity Guidelines

- Emphasis on collaboration (it's not just your job or just the IT department job:
 - Information security,
 - Network security,
 - Internet security, and
 - Critical information infrastructure protection (CIIP)
 - Note: different from Critical Infrastructure Protection (CIP)
 - Note: the CIIP protection is with function specific standards such as ISO 22000 for food safety) or ISO 28000 for supply chain security.



You're not an expert in IT or cybersecurity and they're not an expert in food safety or the food manufacturing operations



Call to Action

Cybersecurity for Food Safety Managers (ISO 22000)

- The Key is “accountable” versus “responsible.”
 - Accountable: you are to confirm your company meets ISO 22000
 - Accountable: for explaining to IT/ Cyber your Critical Information Infrastructure Protection (CIIP) and Critical Infrastructure Protection (CIP)
 - Responsible: the cyber team is tasked with selecting and implementing the processes across the entire enterprise – this leads to a harmonized and coordinated approach that levels the enterprise-wide risk tolerance.
 - Responsible: that your team follows the IT/ cyber requirements such as updates.
 - **From NIST, ISO 27000, ISO 27032: you are NOT accountable or responsible for conducting IT/ cybersecurity assessments or selecting/ implementing/ managing those systems.**



Food Fraud Prevention ACADEMY

Discussion

John Spink, PhD

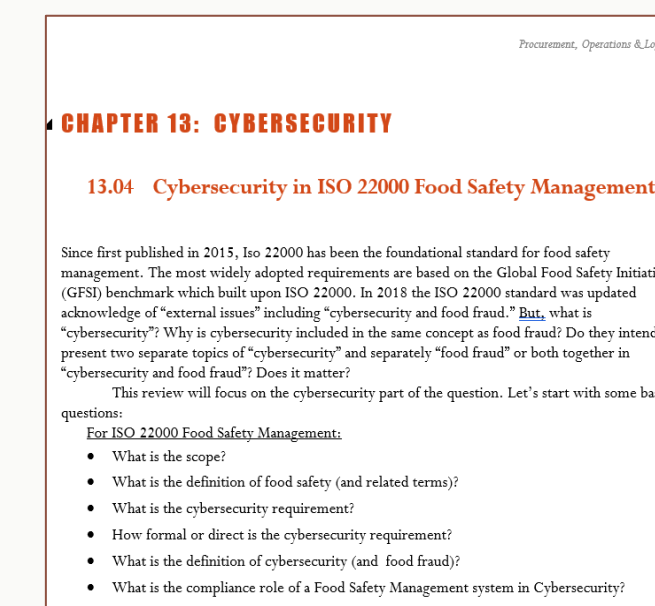
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Please review and comment on the chapter-section in the shared Google Document:



<https://docs.google.com/document/d/1SF9hLtO4yfvaRzPLradS9lLwnkC5E2SU/edit?usp=sharing&oid=106328742619920569986&rtpof=true&sd=true>

FoodFraudPrevention.com

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Acknowledgements

- **MSU Supply Chain Management:** Ex-Chair Cheri Speier-Pero, Dr. Ken Boyer, Dr. John MacDonald, Ex-Chair David Closs, Dr. Stan Griffis, Dr. Judy Whipple, Dr. Steven Melnyk, Dr. Claudia Rosales, Dr. Justin Jagger, Dr. Jason Miller
- **MSU Veterinary Medicine:** Dean Christopher Brown, Chair Dan Grooms, Chair Ray Geor, Dr. Wilson Rumbelha, Cindy Wilson, Ex-Dean John Baker
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- **MSU Criminal Justice:** Dr. Jeremy Wilson, Director Ed McGarrell, Dr. Justin Heinonen, Roy Fenoff, Zoltan Fejas, Barbara Sayre, and Sara Heeg
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- **State of Michigan's Ag & Food Protection Strategy Steering Committee:** Dr. John Tilden, Brad Deacon, Gerald Wojtala, Byron Beerbower
- **The Citadel:** Dr. Roy Fenoff

Upcoming Webinars



Allergen Management in 2021: Rules and Tools for Safe Foods

September 30, 2021 – 2:00 pm EST

Speaker: Emily Kaufman, President, Emport LLC



The Growth, Challenges, Certification and Sustainability of CBD in 2021 & Beyond

October 5, 2021 – 2:00 pm EST

Speakers:

- Allyn Shultis, Executive Director from the Global Retailer, Manufacturers Association (GRMA)
- Neshat Soofi, CEO & President, JIT Experts Hive
- Brett McMillen, Cannabis & Hemp Division Manager, PJRFSI
- Jennifer Knaack, Sr. Director of Compliance and Science, KOI CBD



Audience Q&A

