

# FOOD FRAUD

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WHEN YOU NEED TO BE SURE





Fraudulent and intentional substitution, dilution or addition to a product or raw material, or misrepresentation of the product or material, for the purpose of financial gain, by increasing the apparent value of the product or reducing the cost of its production.

## The two main types of food fraud

The sale of food which is unfit and potentially harmful such as:

- recycling of animal by-products back into the food chain
- knowingly selling goods which are past their 'use by' date.

The deliberate misdescription of food, such as:

- products substituted or altered with a cheaper alternative.
- making false statements about the source of ingredients, i.e. their geographic, plant or animal origin.

## EXAMPLES OF FOOD FRAUD ISSUE

### Oregano



### Oregano Substitution (UK)

Reported from 78 samples of Oregano tested, 19 contained 30% - 70% of substitute ingredients such as olive or myrtle leaves.

## **Other known food adulterations and substitutions**

### **Turmeric**

- Metanil Yellow and Kesari Dal (Added to enhance the yellow colour of a food substance)

### **Green chilies**

- Malachite Green (To accentuate the bright, glowing green colour of the chilies)

### **Mustard seed**

- Argemone seeds (used to add bulk and weight)

### **Black pepper**

- Papaya seeds (used to add bulk)

## TOP 10 MOST AT RISK FROM FOOD FRAUD

Draft Report on the Food Crisis, Fraud in the Food Chain and the Control Thereof (2013/2091 (INI)) (European Parliament, 2013), the top 10 food products most at risk from food fraud



FoodSafetyNews.com estimates **Food Fraud** costs the global food industry

**\$10B - \$15 Billion per year**



Key definitions associated with food fraud:

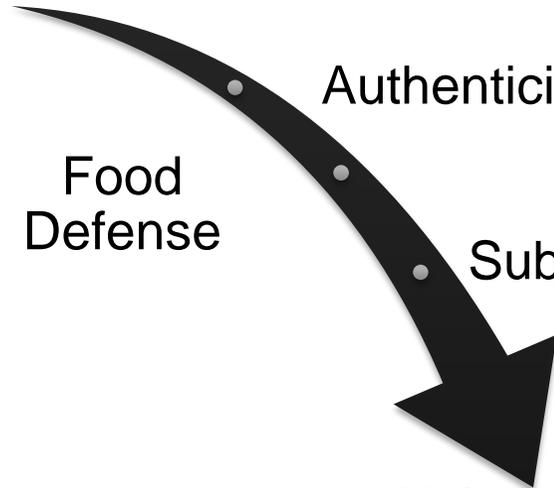
Adulteration

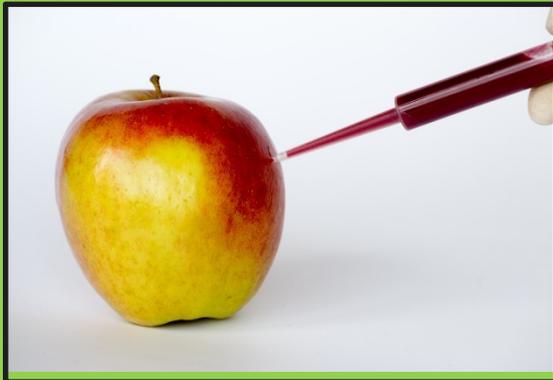
Authenticity

Food  
Defense

Substitution

Vulnerability  
Assessment





## Adulteration

The addition of an undeclared material into a food item for economic gain.

## Authenticity



Food authenticity is ensuring that food or raw materials purchased and offered for sale, are of the nature, substance and quality expected.





## Substitution

The action of replacing all or part of a raw material, packaging or process chemical with another substance (generally lower grade) for financial gain.



## Vulnerability Assessment

Risk-assessment-style evaluation of a food's vulnerability to *food fraud*.



GFSI described recommendations for the food industry to aid in reducing the food safety risks of food fraud. It recommended that two steps be carried out by food businesses:

1. Perform food fraud vulnerability assessments, “in which information is collected at the appropriate points along the supply chain (including raw materials, ingredients, products, packaging) and evaluated to identify and prioritize significant vulnerabilities for food fraud” (GFSI 2014)
2. Put in place control measures to reduce the risks from the vulnerabilities that are identified in the food fraud vulnerability assessments and describe these control measures in a written document, or plan.



# GFSI STANDARD FOOD SAFETY REQUIREMENTS BRC FOOD ISSUE 7

Clause	Requirement
1.1.6	The company's senior management shall have system in place to ensure that the site is kept informed of and reviews... new risks to authenticity of raw materials.
3.5.1.1	The company shall undertake a documented risk assessment of each raw material or group of raw materials including packaging to identify potential risks to product safety, legality and quality.
5.4	Systems shall be in place to minimize the risk of purchasing fraudulent or adulterated food raw materials and to ensure that all product descriptions and claims are legal, accurate and verified.

# GFSI STANDARD FOOD SAFETY REQUIREMENTS BRC FOOD ISSUE 7

Clause	Requirement
5.4.1	<p>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:</p> <ul style="list-style-type: none"><li>• trade associations</li><li>• government sources</li><li>• private resource centers</li></ul>

# GFSI STANDARD FOOD SAFETY REQUIREMENTS BRC FOOD ISSUE 7

Clause	Requirement
5.4.2	<p>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:</p> <ul style="list-style-type: none"> <li>• historical evidence of substitution or adulteration</li> <li>• economic factors which may make adulteration or substitution more attractive</li> <li>• ease of access to raw materials through the supply chain</li> <li>• sophistication of routine testing to identify adulterants</li> <li>• nature of the raw material.</li> <li>• 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.</li> </ul>

# GFSI STANDARD FOOD SAFETY REQUIREMENTS BRC FOOD ISSUE 7

Clause	Requirement
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.

## DOCUMENTATION REQUIRED

- Raw material risk assessments that include consideration of authenticity, legality and adulteration risks
- Food fraud vulnerability assessment(s)
  - Must be conducted on food raw materials or groups of such
  - Fraud types: adulteration or substitution
  - Specific elements must be included in the vulnerability assessment (historical evidence, economic factors, etc. as listed in 5.4.2)
- Food fraud mitigation plan(s)
- Evidence that the company has access to information about historical and developing food fraud threats and reviews that information periodically
- Senior management meeting agendas and minutes that address or describe activities to keep the site informed of new risks to authenticity of raw materials.

# GFSI STANDARD FOOD SAFETY REQUIREMENTS

## SQF V8

Clause	Requirements
2.7.1.1 (Quality)	The food fraud vulnerability assessment shall include the site's susceptibility to ingredient or product substitution, mislabeling, dilution and counterfeiting that could adversely impact food quality.
2.7.2.1 (Quality)	A food fraud mitigation plan shall be developed and implemented which specifies the methods by which the identified food fraud vulnerabilities that could adversely impact food quality shall be controlled.
2.7.2.1 (Manufacturing)	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, dilution, counterfeiting or stolen goods which may adversely impact food safety.

# GFSI STANDARD FOOD SAFETY REQUIREMENTS

## SQF V8

<b>Clause</b>	<b>Requirements</b>
2.7.2.2 (Manufacturing)	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 (Manufacturing)	The food fraud vulnerability assessment and mitigation plan shall be reviewed and verified at least annually.
2.7.2.4 (Manufacturing)	Records of reviews of the food fraud vulnerability assessment and mitigation plan shall be maintained.

## DOCUMENTATION REQUIRED

- Food fraud vulnerability assessment(s) for:
  - products and/or ingredients
  - Fraud types: substitution, mislabeling, dilution, counterfeiting and stolen goods
- Food fraud mitigation plan(s)

# GFSI STANDARD FOOD SAFETY REQUIREMENTS

## FSSC 22000 V4.1

Clause	
2.1.4.4.1	<p data-bbox="644 415 1176 462">Vulnerability assessment</p> <p data-bbox="644 529 1732 689">1) The organization shall have a documented and implemented vulnerability assessment procedure in place that:</p> <ul style="list-style-type: none"> <li data-bbox="716 704 1466 751">a) identifies potential vulnerabilities,</li> <li data-bbox="716 758 1446 805">b) develops control measures, and</li> <li data-bbox="716 815 1545 915">c) prioritizes them against the identified vulnerabilities.</li> </ul> <p data-bbox="644 986 1825 1143">2) To identify the vulnerabilities, the organization shall assess the susceptibility of its products to potential food fraud acts.</p>

# GFSI STANDARD FOOD SAFETY REQUIREMENTS

## FSSC 22000 V4.1

Clause	
2.1.4.4.2	<p>Control measures</p> <p>The organization shall put in place appropriate control measures to reduce or eliminate the identified vulnerabilities.</p>
2.1.4.4.3	<p>Plan</p> <p>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.</p> <p>2) The plan shall comply with applicable legislation.</p>

## DOCUMENTATION REQUIRED

- Food fraud prevention plan
- Food fraud prevention procedure that includes a vulnerability assessment procedure
- Food fraud vulnerability assessments for:
  - Products
  - All fraud types
- Food fraud control or mitigation plan that describes control measures.

# VULNERABILITY ASSESSMENT

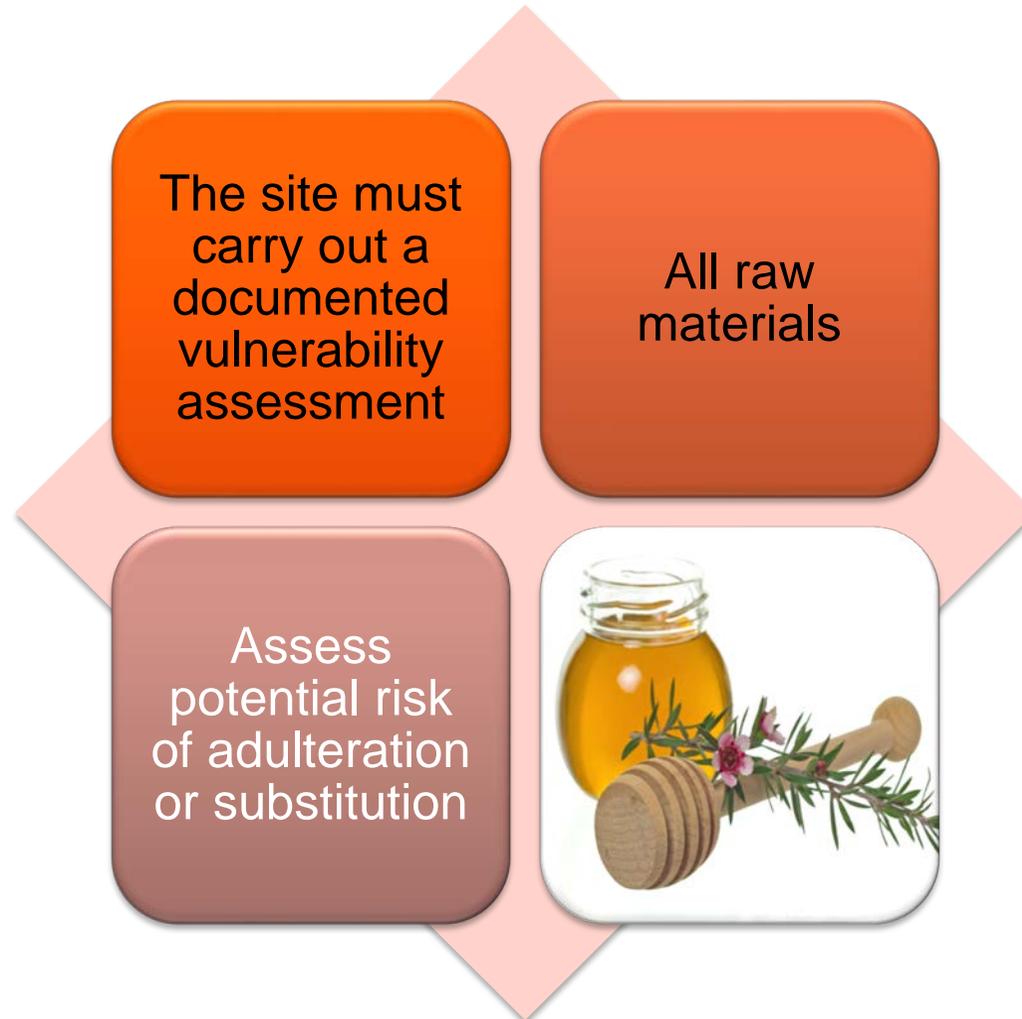


WHEN YOU NEED TO BE SURE



## Vulnerability Assessment tools:

- Vulnerability Process
- Horizon Scanning (historical and developing threats)
- Supply Chain Mapping



# HORIZON SCANNING (EMERGING ISSUES)

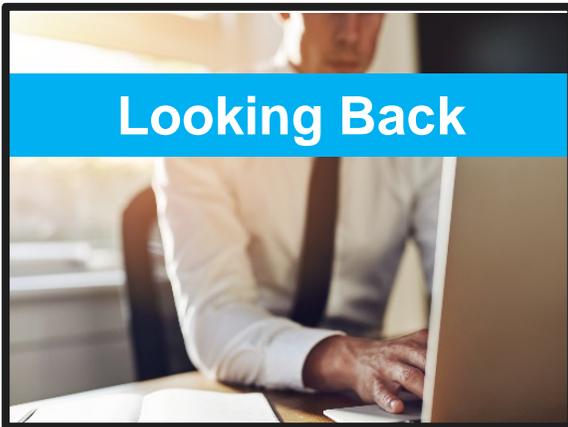
What products may be at risk from fraud?  
Where could a company get information  
from regarding these threats?



**Horizon Scanning has been defined as:**

‘the systematic examination of potential threats, opportunities and likely future developments’

**Looking Back**

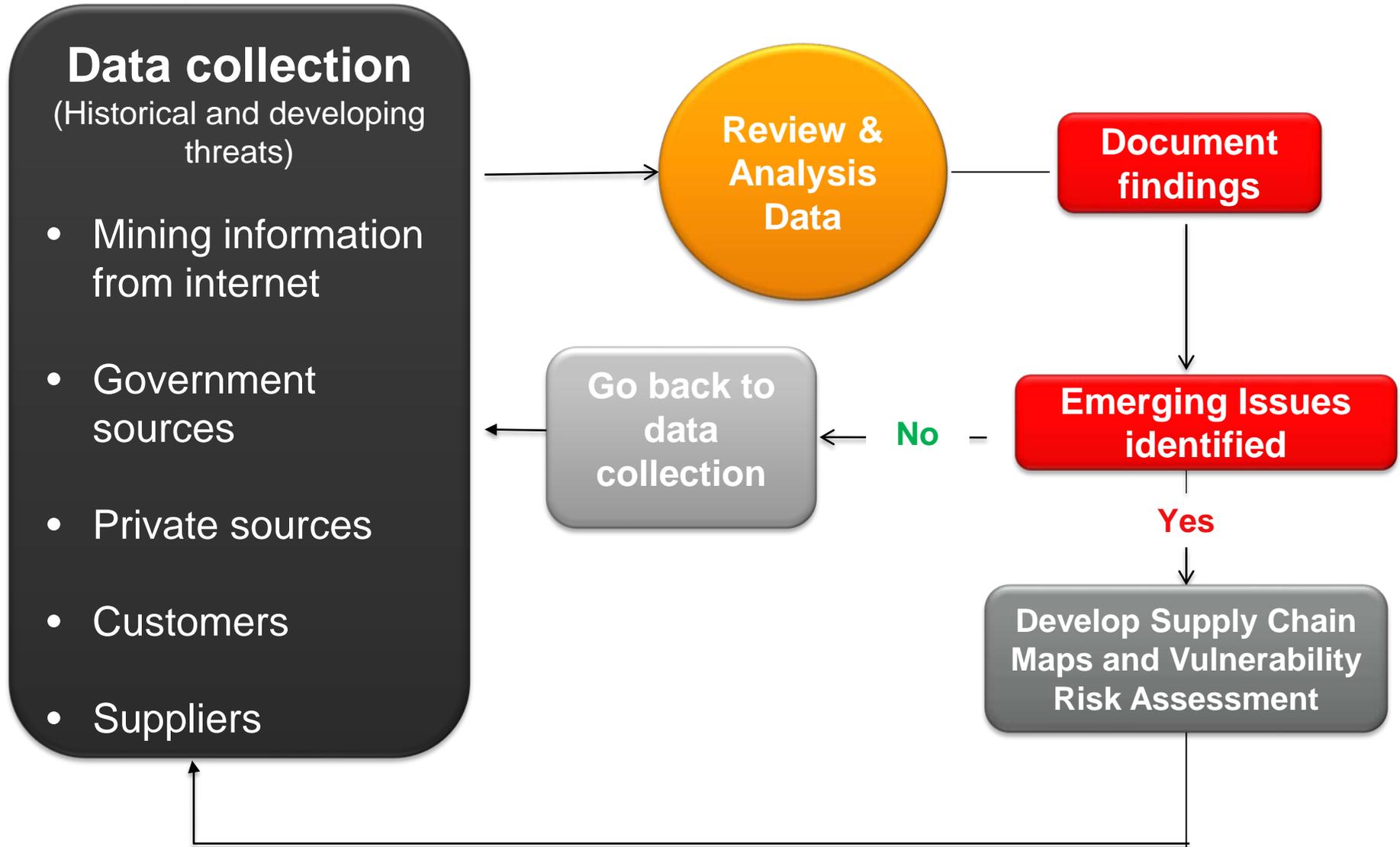


**Looking Across**



**Looking Ahead**





# Information Sources

**Internet**

**Customers**

**Private**

**Employees**

What products may be at risk from fraud?

Where could a company get information from regarding these threats?

**News feeds**

**Associations**

**Government**

**Suppliers**

## CURRENT INFORMATION SOURCES



- ❖ **US Pharmacopeial Convention (USP):**  
<https://www.foodfraud.org/>
- ❖ **US National Center for Food Protection and Defense (NCFPD):**  
<https://www.ncfpd.umn.edu/>
- ❖ **US Michigan State University:**  
<http://foodfraud.msu.edu/>
- ❖ **Food Authenticity Network (FAN)**  
<http://www.foodauthenticity.uk/>

# EXAMPLES OF INFORMATION ARISING FROM HORIZON ACTIVITIES

El Niño



United Nations

- United Nations reported in October 2015

## El Niño (October 2015)

a complex series of climate change affecting the Pacific potentially causing:

- sugar price (surging 17.2 percentage from September)
- Vegetable oils price (6.2 increase)

# SUPPLY CHAIN MAPS

In increasingly global and complex supplier networks a supply chain map is a graphical representation of the journey a raw material takes from source to end user.

## Supply chain maps

- Detailing each step of the supply chain providing greater transparency across the chain.
- Allow the risk of food fraud, adulteration and substitution to be identified at an earlier stage.
- Allow organisations' roles and responsibilities to be identified.



## Supply chain map example



Sourcing



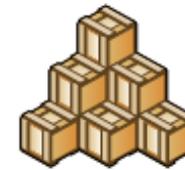
Manufacturing



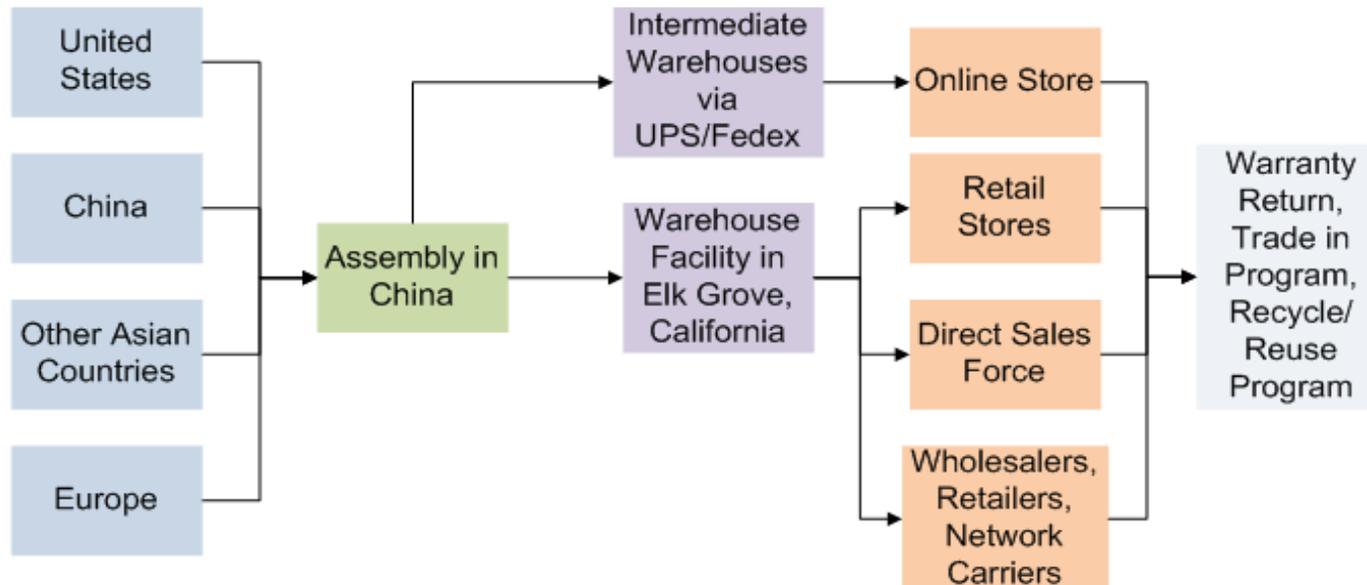
Warehousing



Distribution



Return



Questions?

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Requirement	BRC Issue 7		SQF v8.0		FSSC 22000 v4.1		Documentation
Authenticity	1.1.6	The company's senior management shall have system in place to ensure that the site is kept informed of and reviews... new risks to authenticity of raw materials.	2.7.1.1	The methods, responsibility and criteria for preventing food adulteration caused by a deliberate act of sabotage or terrorist-like incident shall be documented, implemented and maintained.	2.1.4.1	<p>The organization in the food chain shall ensure that all services that may have an impact on food safety:</p> <ul style="list-style-type: none"> <li>a) have specified requirements which are regularly reviewed,</li> <li>b) are described in documents to the extent needed to conduct hazard analysis,</li> <li>c) are managed in conformance with the requirements of technical specification for sector PRPs,</li> <li>d) are assessed and approved demonstrating compliance with specified requirements,</li> <li>e) are monitored to assure continued service provider approval status.</li> </ul>	<ul style="list-style-type: none"> <li>• Raw material risk assessment</li> <li>• Management of Services</li> </ul>

Requirement	BRC Issue 7		SQF v8.0		FSSC 22000 v4.1		Documentation
<b>Raw Material Risk Assessment</b>	3.5.1.1	The company shall undertake a documented risk assessment of each raw material or group of raw materials including packaging to identify potential risks to product safety, legality and quality.	2.7.1.1 Quality	The food fraud vulnerability assessment shall include the site's susceptibility to ingredient or product substitution, mislabeling, dilution and counterfeiting that could adversely impact food quality.	2.1.4.4.1	<p>The organization shall have a documented and implemented vulnerability assessment procedure in place that:</p> <ol style="list-style-type: none"> <li>a) identifies potential vulnerabilities,</li> <li>b) develops control measures, and</li> <li>c) prioritises them against the identified vulnerabilities.</li> </ol> <p>To identify the vulnerabilities, the organization shall assess the susceptibility of its products to potential food fraud acts.</p>	<ul style="list-style-type: none"> <li>• Raw material risk assessment</li> </ul>

Requirement	BRC Issue 7		SQF v8.0		FSSC 22000 v4.1		Documentation
<b>Food Fraud Assessment</b>	5.4	Systems shall be in place to minimize the risk of purchasing fraudulent or adulterated food raw materials and to ensure that all product descriptions and claims are legal, accurate and verified.	2.7.1.1 Quality	The food fraud vulnerability assessment shall include the site's susceptibility to ingredient or product substitution, mislabeling, dilution and counterfeiting that could adversely impact food quality.	2.1.4.4.1	<p>1) The organization shall have a documented and implemented vulnerability assessment procedure in place that:</p> <ul style="list-style-type: none"> <li>a) identifies potential vulnerabilities,</li> <li>b) develops control measures, and</li> <li>c) prioritizes them against the identified vulnerabilities.</li> </ul> <p>2) To identify the vulnerabilities, the organization shall assess the susceptibility of its products to potential food fraud acts.</p>	Food Fraud Vulnerability Assessment/Mitigation Plans
			2.7.1.2 Quality	A food fraud mitigation plan shall be developed and implemented which specifies the methods by which the identified food fraud vulnerabilities that could adversely impact food quality shall be controlled.			

Requirement	BRC Issue 7		SQF v8.0		FSSC 22000 v4.1		Documentation
<b>Historical/developing threat assessment</b>	5.4.1	<p>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:</p> <ul style="list-style-type: none"> <li>• trade associations</li> <li>• government sources</li> <li>• private resource centers</li> </ul>	2.7.2.1 Manufacturing	<p>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, dilution, counterfeiting or stolen goods which may adversely impact food safety.</p>	2.1.4.4.3	<p>All policies, procedures and records are included in a food fraud mitigation plan supported by the organization's Food Safety Management System for all its products. The plan shall comply with applicable legislation.</p>	<ul style="list-style-type: none"> <li>• Food Fraud Vulnerability Assessment/Mitigation Plans</li> <li>• Fraud Types – Substitution, mislabelling, dilution, counterfeiting, and stolen goods</li> </ul>

Requirement	BRC Issue 7		SQF v8.0		FSSC 22000 v4.1		Documentation
<b>Vulnerability Assessment</b>	5.4.2	<p>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:</p> <ul style="list-style-type: none"> <li>• historical evidence of substitution or adulteration</li> <li>• economic factors which may make adulteration or substitution more attractive</li> <li>• ease of access to raw materials through the supply chain</li> <li>• sophistication of routine testing to identify adulterants</li> <li>• nature of the raw material.</li> <li>• 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.</li> </ul>	2.7.2.3 Manufacturing	The food fraud vulnerability assessment and mitigation plan shall be reviewed and verified at least annually.	2.1.4.4.1	<p>1) The organization shall have a documented and implemented vulnerability assessment procedure in place that:</p> <ol style="list-style-type: none"> <li>a) identifies potential vulnerabilities,</li> <li>b) develops control measures, and</li> <li>c) prioritizes them against the identified vulnerabilities.</li> </ol> <p>2) To identify the vulnerabilities, the organization shall assess the susceptibility of its products to potential food fraud acts.</p>	<ul style="list-style-type: none"> <li>• Vulnerability Assessment</li> <li>• Management Reviews</li> </ul>

Requirement	BRC Issue 7		SQF v8.0		FSSC 22000 v4.1		Documentation
<b>Testing</b>	5.4.3	Where raw materials are identified as being at risk of adulteration or substitution appropriate assurance and/or testing processes shall be in place to reduce the risk.	2.7.2.4	Records of reviews of the food fraud vulnerability assessment and mitigation plan shall be maintained.	2.1.4.1	The organization shall implement a system to assure that when analysis critical to the verification of food safety is undertaken, this is conducted by a competent laboratory that has the capability to produce precise and repeatable test results using validated test methods and best practices (e.g. successful participation in proficiency testing programs, regulatory approved programs or accreditation to international standards such as ISO 17025).	<ul style="list-style-type: none"> <li>Food Fraud Vulnerability Assessment/Mitigation Plans</li> </ul>