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IFS Guideline Product Fraud Mitigation

VERSION 2.1

ENGLISH

IFS would like to thank all members of the national working groups, international technical committee, IFS team and experts who have actively participated in the conception and review of this guideline.

We are particularly grateful to Kevin Swoffer, whose experience, knowledge and insights have made this guideline possible, presenting a practical approach to the implementation of product fraud mitigation principles.

Furthermore, we would like to thank Stéphanie Lemaitre for her valuable contribution to this guideline, particularly the chapter covering IFS Broker Version 3 requirements.

Stephan Tromp
IFS Managing Director

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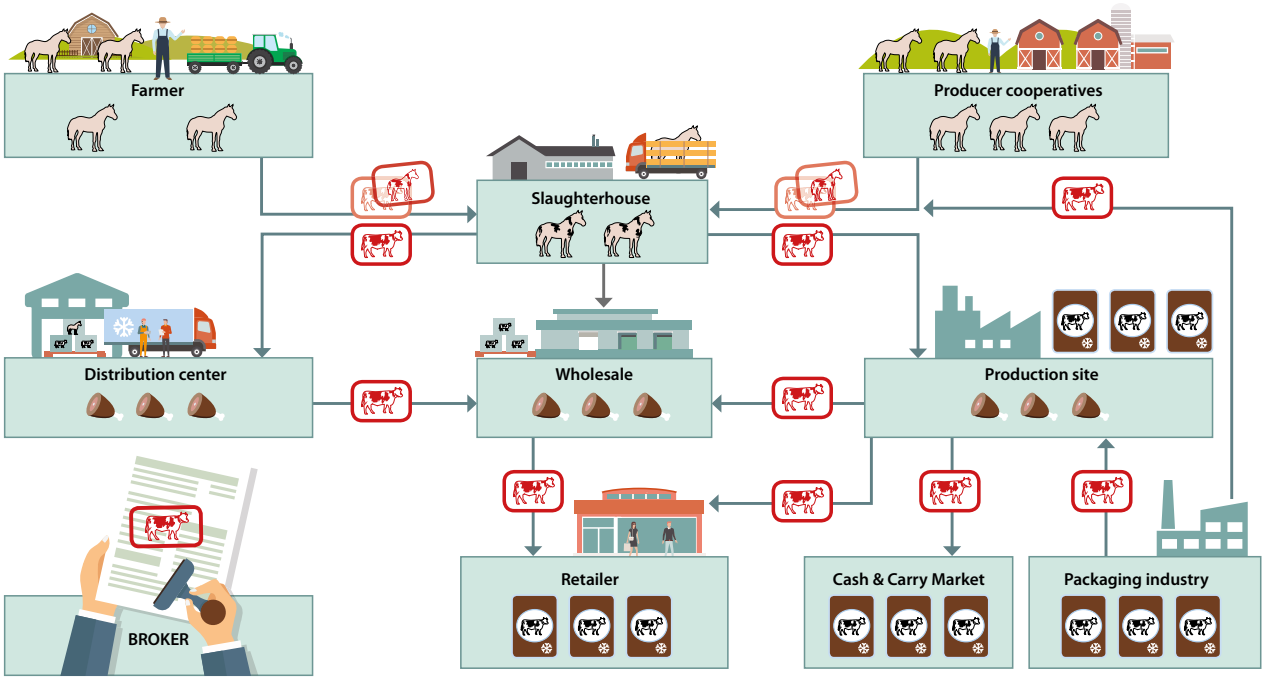
Food Fraud along the supply chain …



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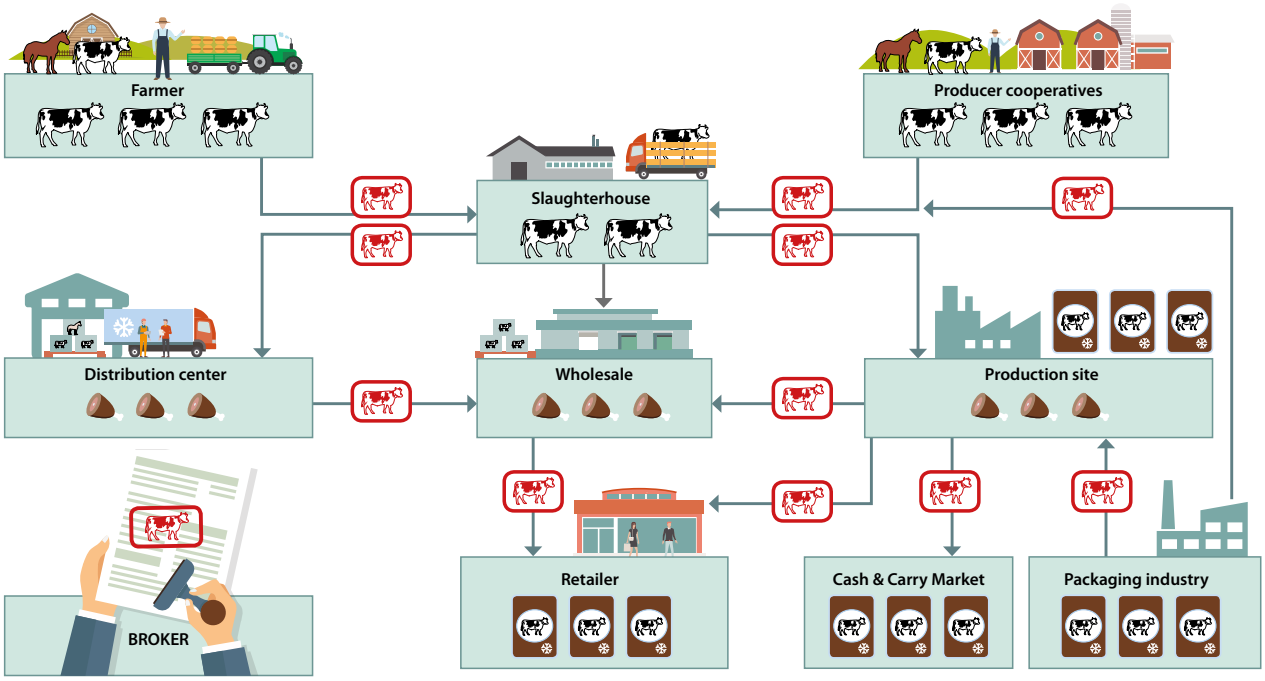


Introduction

Product fraud encompasses a wide range of deliberate fraudulent acts relating to food and food packaging, all of which are economically motivated and have serious ramifications to consumers and businesses. The most serious of these fraudulent acts is the intentional and economically motivated adulteration (EMA) of food and packaging, where there is an elevated risk in relation to consumer health.

Product fraud is not a new crime and there are well documented incidents dating back many hundreds of years. The European horsemeat scandal in 2013 raised the profile of food fraud and exposed the deficiencies of even some of the industry's larger companies. It highlighted the unprecedented challenges the food industry faces to the integrity and safety of its food supply chain, as the chain itself becomes more complex and global in nature.

In addition to legislative requirements, industry bodies such as the Global Food Safety Initiative (GFSI) have driven for food safety schemes, such as IFS, to introduce and implement systems to mitigate the risk of food fraud.

IFS incorporated the need for product fraud mitigation measures to meet the requirements of GFSI benchmarking requirements 2020.1 in several of their Standards since product fraud can occur at any point within the food supply chain.

General guidance has been developed and for each standard, specific examples have been incorporated within a chapter or an annex:

- IFS Food Version 7 and IFS PACsecure Version 1.1 (Annex 1)
- IFS Broker Version 3 (chapter 5)
- IFS Logistics Version 2.2 (chapter 6)

It should be noted that the method of risk assessment may **vary** from company to company and it is recommended that companies use the risk assessment methodology, which they feel most comfortable with.

It is reiterated that IFS does not prescribe a particular methodology for the risk assessment.

Despite the variety of risk assessment methodologies, there are criteria which shall always be considered in relation to product fraud vulnerabilities. These criteria are specific to identify possible product fraud exposure and differ considerably from those criteria related to food safety and food defense.

This guideline has been designed to assist users of IFS Standards to understand the concept of risk management in relation to product fraud threats and how vulnerability assessments are an integral part of the risk management process.

NOTE:
The information in this document is not intended to be mandatory, the intention is to provide guidance for companies implementing the IFS Standards product fraud requirements.


olive
oil

1 Terms and definitions

For the purposes of this document, the key terms and definitions relating to product fraud are:

Product fraud

The intentional substitution, mislabeling, adulteration or counterfeiting of food, raw materials or packaging placed upon the market for economic gain. This definition also applies to outsourced processes.

Assessment team

A team of people who are appointed to undertake the development, implementation and review of the product fraud mitigation plan.

Product fraud vulnerability assessment

A systematic documented form of risk assessment to identify the risk of possible product fraud activity within the supply chain (including all raw materials, food and packaging) until delivery to the customer.

The method of risk assessment may vary from company to company, however the systematic methodology for a product fraud vulnerability assessment shall include as a minimum:

1. The identification of potential product fraud activities, using known and reliable data sources
2. The evaluation of the level of risk; both product and supply source
3. The evaluation for the need of additional control measures
4. The development and implementation of the product fraud mitigation plan, using the results of the vulnerability assessment
5. An annual review, or whenever there is increased risk identified by changes to defined risk criteria.

The criteria used to evaluate the level of risk should be as follows:

- History of product fraud incidents
- Economic factors
- Ease of fraudulent activity
- Supply chain complexity
- Current control measures
- Supplier confidence

Hereafter, the term "vulnerability assessment" is used for ease of reading.

Food defense:

Procedures adopted to assure the security of food and their supply chain from malicious and ideologically motivated threats.

Product fraud mitigation plan

A process that defines the requirements on when, where and how to mitigate fraudulent activities, identified by a vulnerability assessment. The product fraud mitigation plan will define the measures and checks that are required to be in place to effectively mitigate the identified risks.

Hereafter, the term "mitigation plan" is used for ease of reading.

Economically motivated adulteration (EMA)

The fraudulent, intentional substitution or addition of a substance in a product for the purpose of increasing the apparent value of the product or reducing the cost of its production, i.e., for economic gain.

2 IFS Standards – Product fraud requirements

2.1 IFS Food Version 7

There are four (4) requirements relating to food fraud within IFS Food Version 7. These are:

4.20.1

The responsibilities for a food fraud vulnerability assessment and mitigation plan shall be clearly defined. The responsible person(s) shall have the appropriate specific knowledge and full commitment from the senior management.

4.20.2

A documented food fraud vulnerability assessment shall be undertaken on all raw materials, ingredients, packaging materials and outsourced processes, to determine the risks of fraudulent activity in relation to substitution, mislabelling, adulteration or counterfeiting. The criteria considered within the vulnerability assessment shall be defined.

4.20.3

A documented food fraud mitigation plan shall be developed, with reference to the vulnerability assessment, and implemented to control any identified risks. The methods of control and monitoring shall be defined and implemented.

4.20.4

The food fraud vulnerability assessment shall be regularly reviewed, at least annually, and/or in the event of increased risks. If necessary, the food fraud mitigation plan shall be revised / updated accordingly.

2.2 IFS PACsecure Version 1.1

There are three (3) requirements relating to product fraud within IFS PACsecure Version 1.1. These are:

4.20.1

A documented product fraud vulnerability assessment shall be undertaken on all raw materials (raw materials, additives, inks, adhesives, solvents, wrapping, materials and rework), product formula/configuration, processes (including outsourced), packaging and labeling, to determine the risk of fraudulent activity in relation to substitution, mislabeling, adulteration or counterfeiting. The criteria considered within the vulnerability assessment shall be defined.

4.20.2

A documented product fraud mitigation plan shall be developed, with reference to the vulnerability assessment, and implemented to control any identified risk. The methods of control and monitoring shall be defined and implemented.

4.20.3

In the event of increased risks, the vulnerability assessment and mitigation plan shall be reviewed and amended accordingly. Otherwise all the vulnerability assessments, shall be reviewed at least annually.

2.3 IFS Broker Version 3

There are five (5) requirements relating to food fraud within IFS Broker Version 3. These are:

4.7.1

The responsibility for food fraud vulnerability assessment and mitigation plan shall be clearly defined. Those responsible have the appropriate specific knowledge and expertise, and have the full commitment from the senior management.

4.7.2

A documented food fraud vulnerability assessment shall be undertaken on all purchased products (including packaging), to determine the risk of fraudulent activity in relation to substitution, mislabeling, adulteration or counterfeiting. The criteria considered within the vulnerability assessment shall be defined.

4.7.3

A documented food fraud mitigation plan shall be developed, with references to the vulnerability assessment, and implemented to control any identified risk. The methods of control and monitoring shall be defined and implemented.

4.7.4

The food fraud vulnerability assessment shall be regularly reviewed, at least annually, and/or when significant changes occur. If necessary, the food fraud mitigation plan shall be revised/updated.

4.7.5

The company ensures that suppliers have performed and documented a food fraud vulnerability assessment on fraudulent activities and have implemented a food fraud mitigation plan to control the identified risks.

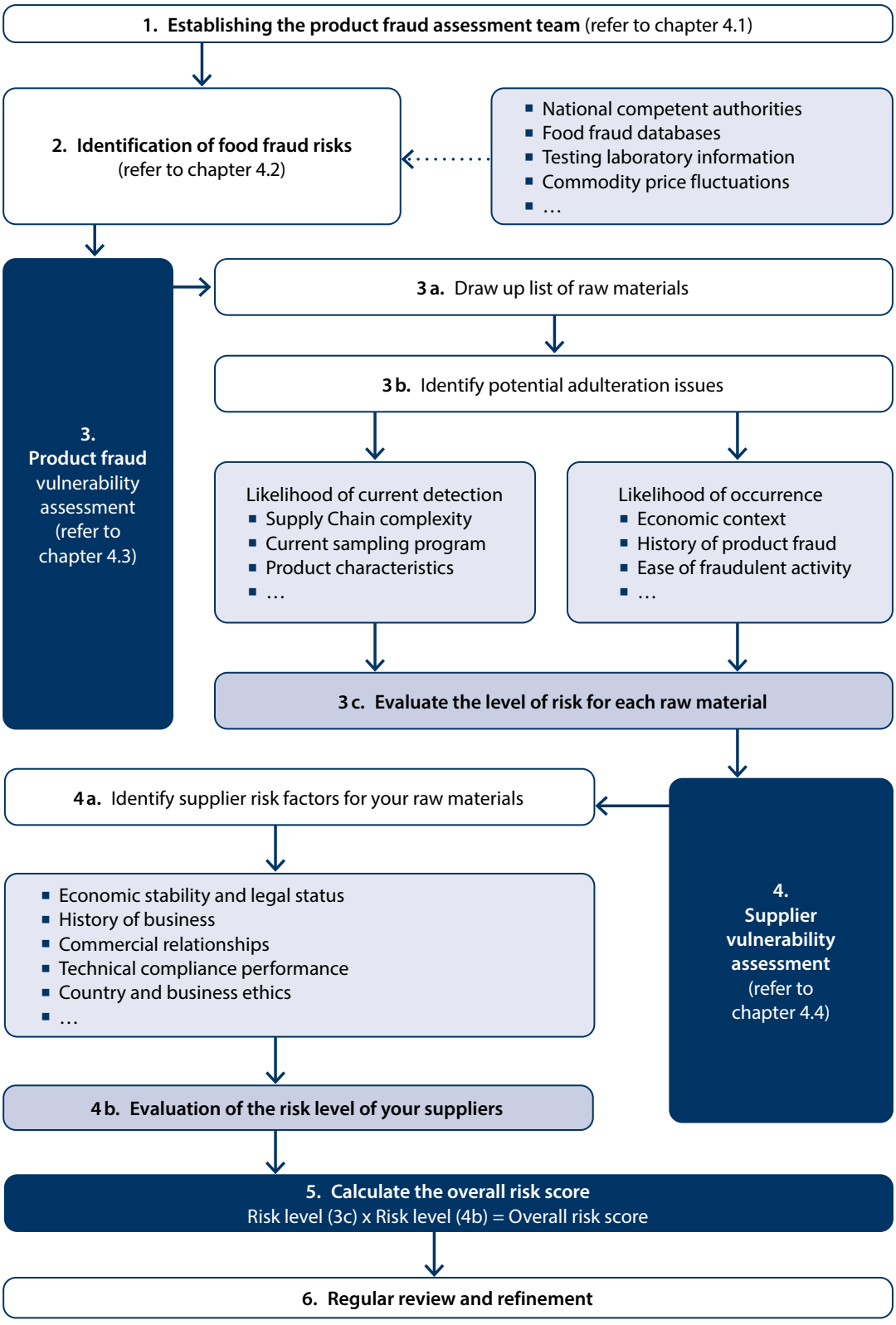
2.4 IFS Logistics Version 2.2

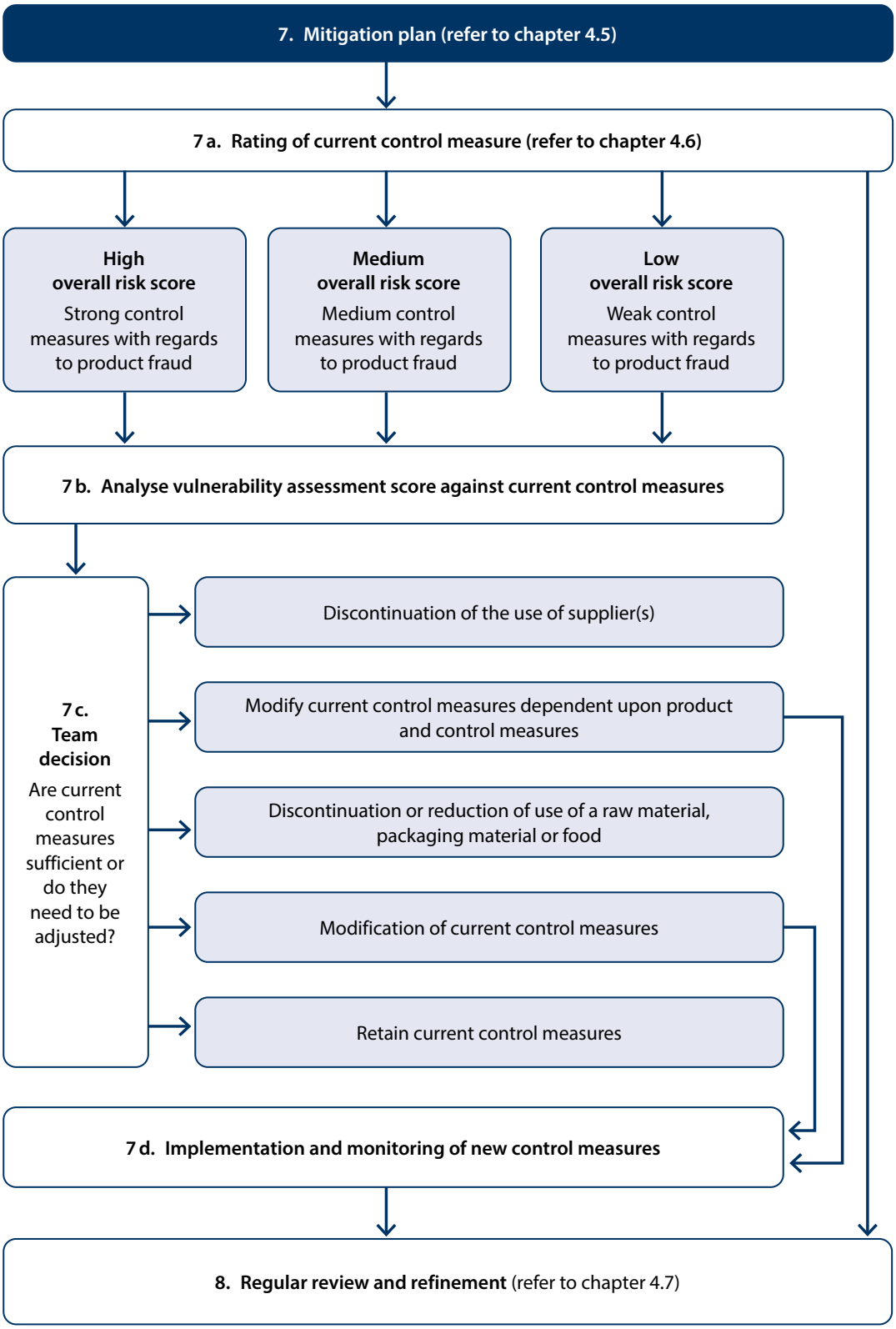
In contrast to the other Standards mentioned, IFS Logistics only has one (1) requirement which reflects the level of risk associated with the scope of the Standard.

4.2.4.8

A hazard analysis and assessment of associated risks for possible food fraud is in place, which realistically can be expected within the process. Based on this, appropriate measures for risk mitigation shall be documented and implemented, if necessary.

3 Process flow




7. Mitigation plan (refer to chapter 4.5)
7 a. Rating of current control measure (refer to chapter 4.6)
High overall risk score
Strong control measures with regards to product fraud
Medium overall risk score
Medium control measures with regards to product fraud
Low overall risk score
Weak control measures with regards to product fraud
7 b. Analyse vulnerability assessment score against current control measures
7 c. Team decision
Are current control measures sufficient or do they need to be adjusted?
Discontinuation of the use of supplier(s)
Modify current control measures dependent upon product and control measures
Discontinuation or reduction of use of a raw material, packaging material or food
Modification of current control measures
Retain current control measures
7 d. Implementation and monitoring of new control measures
8. Regular review and refinement (refer to chapter 4.7)

4 Guideline for the development, implementation and maintenance of a product fraud mitigation plan – IFS Food and IFS PACsecure

It is important to appreciate that the effectiveness of the development and maintenance of any mitigation plan is dependent upon the quality of the data available for the assessment and the competence of the individuals within the assessment team.

4.1 Establishing the product fraud assessment team

The team developing and implementing the mitigation plan shall include representatives of purchasing (who are directly involved with purchasing of products), logistics and of the technical management (that may include product, process and packaging, laboratory and quality technologists), who should have knowledge in risk management and the industry's specific supply chain.

Where specific expertise is not available within a company, external expertise should be used.

The roles and responsibilities of the assessment team should be clearly defined and they should have full support of the company's senior management. The internal audit program should include the review of the activities of the assessment team and there should be commitment for continual improvement of the process.

The initial information that should always be collated is an exhaustive list of all products (raw materials and packaging) and the supplier of each of the products; where a process is outsourced the supplier should be identified.

4.2 Identification of potential product fraud risk

It is necessary to review data from a variety of sources to identify potential product fraud risks that are associated with the raw materials used by the company. The integrity of this information shall be carefully assessed to ensure that only reliable data sources are used.

WHY

In order to undertake an effective vulnerability assessment, the assessment team should identify the sources of information and data that relate to the risk factors that will be used within the vulnerability assessment. Commercial data, such as price and availability, should be the responsibility of the purchasing department team members. Technical data, such as reports of fraudulent activity and detection methodology developments should be the responsibility of the team members of the technical department.

HOW

The information and data sources used to assess the potential risk of product fraud and other associated information should be researched and once agreed, documented prior to the vulnerability assessment. The frequency at which the data is assessed and by whom should also be noted down.

The responsibility for the review of the sources of information should be documented. New data sources should always be considered for inclusion within the data source listing.

Typical sources of data are as follows (this list is not exhaustive):

- IFS Trend Risk Monitor
- EU RASFF - Rapid Alert System for Food and Feed
- EFSA - European Food Safety Authority
- National government authorities – product recall alerts
- National government authorities – changes in legislation and guidelines
- Trade associations websites & newsletters
- Food fraud databases
- Testing laboratory information
- Commercial trade press – commodity price fluctuations
- Commercial trade press – harvest information
- Country risk classification
- Corruption index

The table below shows a list of raw materials (non-exhaustive) that have been subjected to fraudulent activities more often than others in history. If a company handles or produces any of these foods, it is recommendable to pay particular attention to them within the vulnerability assessment – having no control measures in place could expose the company to product fraud.

Raw materials with a higher risk for food fraud
• Olive oil • Fish • Meat • Organic foods • Milk products • Grains • Honey • Maple syrup • Coffee and tea • Spices/spice mixes • Wine • Fruit juices

4.3 Conducting the vulnerability assessment – products

A vulnerability assessment shall be conducted on every raw material, packaging material, food and outsourced process.

Please refer to the Product fraud process flow for a detailed step-by-step description.

WHY

An effective, systematic and documented vulnerability assessment will identify risks of possible fraudulent activity within the supply chain. As product fraud may take form in deliberate and intentional substitution, adulteration, mislabeling or counterfeiting, the vulnerability assessment shall be conducted on raw materials, food packaging and the food itself (including outsourced product). The vulnerability assessment, if carried out correctly, will identify potential weaknesses in the supply chain, which have to be addressed in the mitigation plan to minimize the risk of fraud.

HOW

Companies may undertake a number of risk assessments, which follow risk management principles, but may differ in their detailed methodologies. Typical risk assessments commonly used within the food industry are based on HACCP principles.

IFS cannot prescribe the detailed methodology of a risk assessment a company should use; however, they should use the method they feel most comfortable with and are experienced in using. Typical approaches can include the use of a simple matrix (quadratic matrix), decision tree, spreadsheet/matrix or multi matrices.

By far the most common approach for risk assessments is the quadratic model, which has been used within the food and non-food sectors for some years.

Within the following chapters of this guideline, an example of the quadratic model is provided to assist those companies, who may not have experience of risk assessment methodologies.

The assessment team should firstly draw up a list of all raw materials, packaging and outsourced processes to be able to rate these against their product risks.

The following product risks, that could result out of the previously mentioned data review, are given as example:

Product risk factor
• History of product fraud – incidents • Economic factors • Ease of fraudulent activity • Supply chain complexity • Sampling program for detecting fraud

When undertaking vulnerability assessments, there are two (2) main criteria, which are of the utmost importance, namely:

- **likelihood of occurrence** (the degree of ease of carrying out the fraud in relation to its profitability for the food fraudster), and the
- **likelihood of detection.**

The risk factors used to develop the product vulnerability risk matrix are defined as follows. The two (2) criteria can be differentiated as external factors – which risks are outside of a company's control – and internal factors – which risks are associated to a specific company.

Product risk factor classification

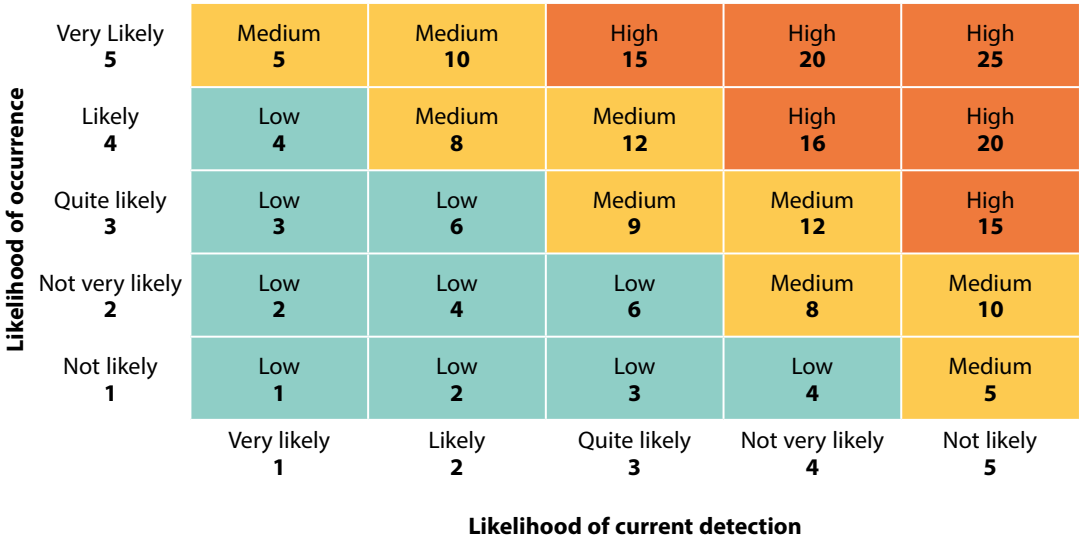
Matrix axis	Risk factors	Criteria for consideration – External factors
Likelihood of occurrence	History of product fraud incidents	• The number, types and frequency of fraud (the more frequent that a product has food fraud associated with it, the higher the risk)
	Economic factors	• Price (the higher the profit margin, the higher the risk) • Availability of the product (the lower the availability of a product, the higher the risk) • Availability of adulterant (the higher the availability and lower cost of an adulterant, the higher the risk) • Tariff costs (the higher the tariff cost, the higher the risk) • Price fluctuation (the frequency and level of fluctuation will determine risk)
	Ease of fraud-ulent activity	• Cost and complexity of a fraudulent process (the more complex and costly a process, the lower the risk) • Staff involvement in the fraudulent activity (the more staff involvement, the lower the risk) • Packaging formats – raw material and adulterant (if a product is available unmarked and in bulk the higher the risk, if a product is pre-packaged, marked and requires unpacking, the lower the risk)
Matrix axis	**Risk factors**	**Criteria for consideration – Internal factors**
Likelihood of current detection	Supply chain complexity	• Geographical origin (the longer the distance from source to company, the higher the risk) • Number of organizations in the supply chain (the greater the number of organizations in the supply chain, the higher the risk) • Types of organization (the greater the number of manufacturers and agents within the supply chain, the higher the risk) • Number of factories within the supplier organization (the greater the number of manufacturing units within one supplier organization, the higher the risk)
	Sampling program for detecting fraud	• Testing authority (accredited testing companies pose the lowest risk, unaccredited or unknown companies pose the highest risk) • Testing methodology (accredited testing methodologies pose the lowest risk; unaccredited or unknown testing methodologies pose the highest risk) • Testing frequency (the higher the frequency of testing, the lower the risk) • Cost of testing (the higher the cost of testing, the higher the risk)
	Product characteristics	• Level of processing (the more complex the processing, the higher the risk) • Physical nature of product (liquids and mixing of individual components pose the highest risk, whereas produce as comparison pose a lower risk) • Processed food using more than one ingredient (the more ingredients, the higher the risk)

The product risk factors are analysed against the two (2) criteria of 'likelihood of occurrence' and 'likelihood of detection' using risk management principles. For this analysis, a quadratic risk matrix is used, which is introduced below.

In relation to a vulnerability assessment, the quadratic matrix approach provides a useful tool. The values on the horizontal and vertical axis of the matrix can be modified from the typical risk matrix.

In this case, the vertical axis shall represent likelihood of occurrence and the horizontal axis shall represent likelihood of current detection (figure 1).

FIGURE 1
An example of a product vulnerability risk matrix with scored risk rating



The colour of the cells within the product vulnerability risk matrix are indicative of the product risk – high (red), medium (yellow) and low risk (green). The determined product risk can be used to indicate the need for increased control measures for the mitigation of product fraud.

4.3.1 Example of a vulnerability assessment for a raw material

The company is assessing the risk of extra virgin olive oil for their business activities.

The assessment team will assign a scoring of each risk factor, using the risk factors and criteria for consideration as described in this guideline.

The overall product risk can be scored for each product/process by multiplying the likelihood of occurrence (highest score assigned) and likelihood of current detection (highest score assigned) to determine a product/process position within the product vulnerability risk matrix.

Extra virgin olive oil

Likelihood of occurrence scoring

Likelihood of occurrence	History of product fraud incidents	Economic factors	Erase of fraudulent activity	Highest score assigned
5 (Not likely)	5			5
4 (Not very likely)			4	
3 (Quite likely)				
2 (Likely)		2		
1 (Very likely)				

Likelihood of current detection scoring

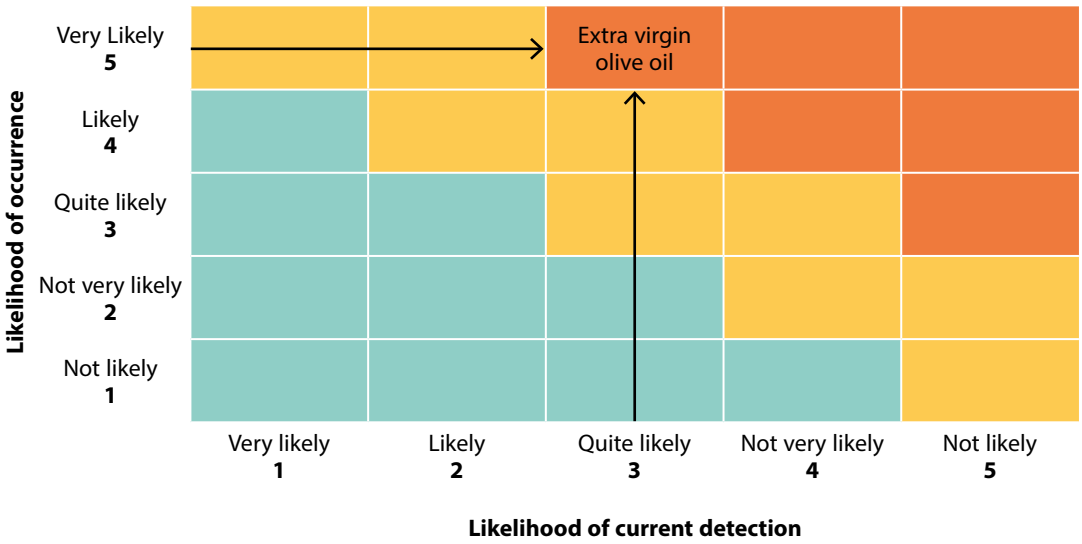
Likelihood of current detection	Supply chain complexity	Sampling program	Product characteristics	Highest score assigned
5 (Not likely)				
4 (Not very likely)				
3 (Quite likely)		3	3	3
2 (Likely)	2			
1 (Very likely)				

Likelihood of occurrence (**5**) x Likelihood of current detection (**3**) = **15**

Overall product risk score for extra virgin olive oil = 15

Extra virgin olive oil has a "very likely" rating for likelihood of occurrence and a "quite likely" rating for likelihood of current detection, which shows an overall risk rating within **the high-risk area** of the matrix.

FIGURE 2



Annex 1 shows the above example plus further vulnerability assessments for ingredients and packaging materials.

Outsourced processes

Outsourcing production processes can be a complex topic and the associated risks are highly reliant on the contractual arrangement between the company and the supplier, as well as the status of the raw material, packaging or food. It is important to assess if the company fully controls the purchasing and/or technical control mechanisms or if the purchasing and/or technical control mechanisms are completely outsourced to the supplier.

If the company has direct control of the purchasing and technical control mechanisms, the risk is reduced and the control measures relate to those specific criteria associated with supplier approval and monitoring requirements. The outsourced processes have to be evaluated in the vulnerability assessment as prescribed in the IFS Standards.

4.4 Conducting the vulnerability assessment – supplier

In addition to the product vulnerability assessment, it is equally important to assess the supplier risk. For example, a product has a defined risk; however, the same product may be procured from a number of sources, all of which will have a differing risk – this can be assessed using the supplier vulnerability assessment.

The following table illustrates the risk factors that can be used for the assessment of supplier risk.

Supplier risk factors	Criteria for consideration
Economic stability and legal status	• Economic stability of supplier • Legal entity of the supplier
History of business	• Duration of business between the companies (the longer the duration of business between the supplier and the company, the lower the risk) • Good business history e.g. no disputes, no commercial or technical issues (the better the business relationship history between the supplier and the company, the lower the risk)
Commercial relationships	• Partnership supplier, contracted supplier, un-contracted supplier, or open market supplier (Partnership lowest risk, open market supplier highest risk) • Regular contracted quantities and supplier reliant on good relationship with the company (the more regular quantities are procured, the lower the risk) • Commercially knowledgeable-margin control, supply chain knowledge, commercially aware (the more commercially knowledgeable, the lower the risk) • Subcontracting or outsourcing of production (the more the supplier subcontracts or outsources, the higher the risk) • Direct control/ownership of raw materials (if the supplier has direct control and ownership of raw materials, the risk is lower)
Technical relationships	• Quality, accuracy and timely provision of technical information such as specifications, requests for specific information and complaint response (the more technically responsive, the lower the risk) • The competence of the supplier's technical staff (the higher the competence of technical staff, the lower the risk) • Supplier transparency on technical issue (the more transparent the supplier is, the lower the risk) • Company's knowledge of supply chain, process steps and technologies used by the supplier • The supplier's knowledge of technical issues and fraud control measures (the more knowledgeable regarding technical issues and food fraud measures, the lower the risk) • Effectiveness of quality management systems (if the supplier has an effective QM system, the risk is lower)

Supplier risk factors	Criteria for consideration
Technical compliance performance	• Compliance to agreed performance KPI's (the more compliant with KPI's, the lower the risk) • Gaining or maintaining a level of certification or audit score (a good level of certification and continued good performance, the lower the risk) • The consistent supply of safe and specification – compliant product (the better consistent performance regarding agreed safety and quality product, the lower the risk) • Minimal intake rejections-quality, temp, etc. (the better the rejection rate, the lower the risk) • Minimal consumer complaints (the lower the complaint level, the lower the risk) • Minimal waste/damage during manufacture (the lower the waste/damage level, the lower the risk)
Country of supply regulatory infrastructure and controls	• Level of regulatory control at the source of product in relation with country regulatory quality (the higher level of comparable regulatory control, the lower the risk) • Intergovernmental relationships with the country of supply (the higher the level of government interface and controls, the lower the risk)
Country and business ethics	• Level of corruption within product supplier's country (the higher the level of corruption, the higher the risk) • Ethical working conditions (the poorer the ethical working conditions within the supplier, the higher the risk) • Environmental conditions (the poorer the environmental conditions within the supplier, the higher the risk)

The supplier risk is rated depending on the confidence the company has with the supplier. It is to be noted that the rating takes into account all of the above details and can be divided as follows:

1. **Very high confidence**
2. **High confidence**
3. **Medium confidence**
4. **Low confidence**
5. **Very low confidence**

4.5 Developing the mitigation plan

WHY

An effective mitigation plan will define the measures and controls that are required to mitigate the risks identified in the vulnerability assessment. The completed mitigation plan is an important document, as it reflects the results of the product fraud mitigation strategy of the business.

HOW

The results of the overall risk assessment shall be reviewed against current control measures that the company has in place to identify fraudulent activity. This determines if the existing measures provide effective mitigation against possible fraud threats.

It is suggested that the technical member(s) of the assessment team rate the current control measures on their effectiveness:

For example:

High – Good level of control measures relating to product fraud activity

Medium – Medium level of control measures relating to product fraud activity

Low – Low level of control measures relating to product fraud activity.

Criteria for control measures

The control measures that can be used are numerous and are specific in nature to the business but should however be implemented to effectively control risks.

The following list (non-exhaustive) shows control measures with their associated criteria for considerations that have proven to be useful:

Control measures	Criteria for consideration
Economic and legal status verification	• Financial stability verification • Legal entity verification
Analytical testing	• Testing methodology – accredited methodology (if the testing methodology is accredited, the risk is lower) • Testing methodology – detection level (the lower the detection level, the lower the risk) • Accredited/non-accredited laboratory (if the laboratory is accredited, the risk is lower; if the laboratory is non-accredited, the risk is higher) • Reliability/validation of the laboratory (if there is evidence of good reliability of the laboratory, the risk is lower) • Controls at receival: orders making reference to agreed specifications, verification of delivery documents, origin and batch related inspection
Availability of certificates of analysis	• Issued by an accredited/non-accredited laboratory (if the certificate is issued by an accredited laboratory, the risk is lower) • Certificate relating to the actual batch/lot code of production (if the certificate is lot/batch specific, the risk is lower)

Control measures	Criteria for consideration
Product inspection prior to export/delivery	• Status of inspection body – Government, independent accredited body, independent non-accredited body, appointed by the company or non-appointed by the company (inspections undertaken by government or an accredited body pose the lowest risk) • Inspection frequency (the more frequent the inspection, the lower the risk) • Inspection sampling methodology (the more thorough the sampling, the lower the risk)
Third party audit	• Accredited certification body against a known and recognized standard (an accredited certification body poses the lowest risk) • Non-accredited certification body against a known and recognized standard (a non-accredited certification body poses the highest risk) • Audit report and certificate (a detailed audit report and certificate poses the lowest risk) • Certificate (a certificate without a report poses the highest risk)
Second party audit	• Accredited certification body against a company standard (an accredited certification body poses the lowest risk) • Non-accredited certification body against a company standard (a non-accredited certification body poses the highest risk) • Audit frequency and scope of audit (the more frequent and robust the scope, the lower the risk)
Internal audit	• Audit undertaken by own employee (the more competent the employee, the lower the risk) • Audit frequency and scope of audit (the more frequent and robust the scope, the lower the risk)
Chain of custody certification	• Accredited certification body against a known and recognized standard (an accredited certification body poses the lowest risk) • Non-accredited certification body against a known and recognized standard (a non-accredited certification body poses the highest risk) • Audit report and certificate (a detailed audit report and certificate poses the lowest risk) • Certificate (a certificate without a report poses the highest risk)
Mass balance testing	• Mass balance testing as part of technical or chain of custody certification audit (testing carried out in accordance with a certification process poses the lowest risk) • Extraordinary testing of mass balance (extraordinary testing under company control poses, the lowest risk) • Frequency and scope of testing (the more frequent and robust the scope, the lower the risk) • Report (a detailed audit report poses the lowest risk)
Supplier questionnaires	• Robustness of questionnaire and evaluation (a robust and detailed questionnaire poses the lowest risk) • Level of use within supply chain (the level to which questionnaires are used e.g. primary, secondary, tertiary suppliers)
Legal compliance checking of supply chain suppliers	• Review of legal conformity (existence and number of prosecutions)

The mitigation plan can then be developed (figure 3), using the overall risk rating score and the assessment of current control measures (current control measure rating – high, medium or low).

Please refer to the product fraud process flow for a detailed step-by-step description.

Taking into account the review of the collated risk score and current control measures rating, the assessment team shall reach a decision by consensus if the control measures in place are sufficient or if new ones need to be implemented.

FIGURE 3
Food fraud mitigation plan template

Raw materials, packaging, food and outsourced processes	Supplier	Product risk score	Supplier risk score	Overall risk score	Current control measure rating	Team decision	Control measures

4.6 Implementation and monitoring of the mitigation plan control measures

4.6.1 Control measures

The decisions of the assessment team may be numerous, depending on the evidence reviewed. They may lead to changes in company policies in relation to the supply of products, modification of current control measures, or to retain current control measures:

- the discontinuation or reduction of use of a raw material, packaging or foodstuff
- the discontinuation of the use of supplier(s)
- the reduction in quantity of a raw material, packaging or foodstuff for specific supplier(s)
- modified control measures depending on the product and control measures, e.g. increased analytical surveillance, use of accredited laboratories and methods, increase in inspections, independent inspections prior to shipment, etc.
- retain current levels of control

The mitigation plan, and any subsequent revisions of the plan, should be fully documented and dated.

When finalizing the mitigation plan, the members of the assessment team should be mindful of the commercial impact of the decisions they consider to be appropriate. This may involve criteria such as the limited availability of a product, the cost of approving new suppliers versus the cost of increased surveillance measures and the overall turnover/importance of the product to the company.

The mitigation plan will allow for a prioritization of actions to mitigate overall risk posed by the higher risk products and suppliers. Some judgments may need to be made in relation to the overall budget for all food controls, particularly in relation to analytical costs for food safety and food fraud. It is extremely important that the assessment team has the full support of company management.

The mitigation plan should be reviewed in alignment with the quality management system review.

4.6.2 Example of a mitigation plan – Extra virgin olive oil

Raw materials, packaging, food and outsourced processes	Supplier	Product risk score	Supplier risk score	Overall risk score	Current control measure rating	Team decision	Control measures
Extra virgin olive oil	**W**	**15**	**1**	15	Medium	Retain supplier	Retain control measures. Product analysis program – 2 analysis per year.
Extra virgin olive oil	**X**	**15**	**2**	30	Medium	Retain supplier	Increase product analysis program to 4 analyses per year.
Extra virgin olive oil	**Y**	**15**	**2**	30	Medium	Retain supplier	Increase product analysis program to 4 analyses per year.
Extra virgin olive oil	**Z**	**15**	**4**	60	Medium	Consider discontinuing	If retained, increase product analysis program to 8 analyses per year. Certificate of analysis for every consignment.

Attention is drawn to the process of reaching the team decision – this is where it is decided if current controls are adequate or if the assessment team needs to develop new control measures. Decisions made at this point have multi-level consequences: in this example, the analysis program has been increased by 10 analysis samples a year!

4.7 Review and refinement of the product fraud mitigation plan

4.7.1 Changes to risk factors and review of the vulnerability assessment

WHY

A mitigation plan will only remain effective if changes to the risk factors from the vulnerability assessment are identified and these changes reviewed. This review is required to maintain integrity of the control measures.

HOW

The members of the assessment team should have access to the appropriate data and information regarding risk factors used for the vulnerability assessments.

It should be acknowledged that the initial mitigation plan is a 'snap shot in time', and there should be recognition that risk factors will change within a dynamic industry such as the food industry. This means it should be possible to revisit individual product risk assessments (and the suppliers of these products), to assess if there are changes to the overall risk in relation to food fraud.

The assessment team should review the vulnerability assessment when significant changes occur. The following list shows significant changes that could prompt the team to conduct a review of the vulnerability assessment:

- change in supply of raw materials e.g. new supplier
- change in management or financial situation of supplier
- change in cost of raw material(s)

- change that effect the cost of finished products e.g. tariff increases, transport costs
- change in supply chain e.g. additional suppliers, type of supplier
- change in raw material availability, e.g. seasonal shortage, poor quality
- evidence of fraud found by control measures such as analytical testing
- evidence of increased customer or consumer complaints which are related to possible fraud, e.g. poor quality and inconsistent quality
- emergence of a newly recognised adulterate
- development of scientific information regarding process, product or analytical identification

4.7.2 Formal review of the product fraud vulnerability assessments

WHY

Vulnerability assessments shall be reviewed on a regular basis, whenever there are significant changes within the business activities. Apart from the regular reviews, it is required to have at least an annual review of the vulnerability assessment for all raw materials, packaging and outsourced processes.

HOW

The members of the assessment team should have access to the appropriate data and information regarding risk factors used for the vulnerability assessments.

They should regularly review data and information for significant change. However, all raw materials, packaging materials and outsourced processes should be reviewed at least annually by conducting a full vulnerability assessment. The assessment team should use the same methodology for this review, and analyse their data/information sources to check if these are still valid and/or if there are new sources.

The review of the vulnerability assessments shall be documented and dated in accordance with company documentation control requirements.

4.7.3 Control and monitoring requirements review and implementation

WHY

As a consequence of the reviews of the vulnerability assessments, there is a need to review the current control and monitoring requirements of the mitigation plan, which should be amended and implemented immediately after the review.

HOW

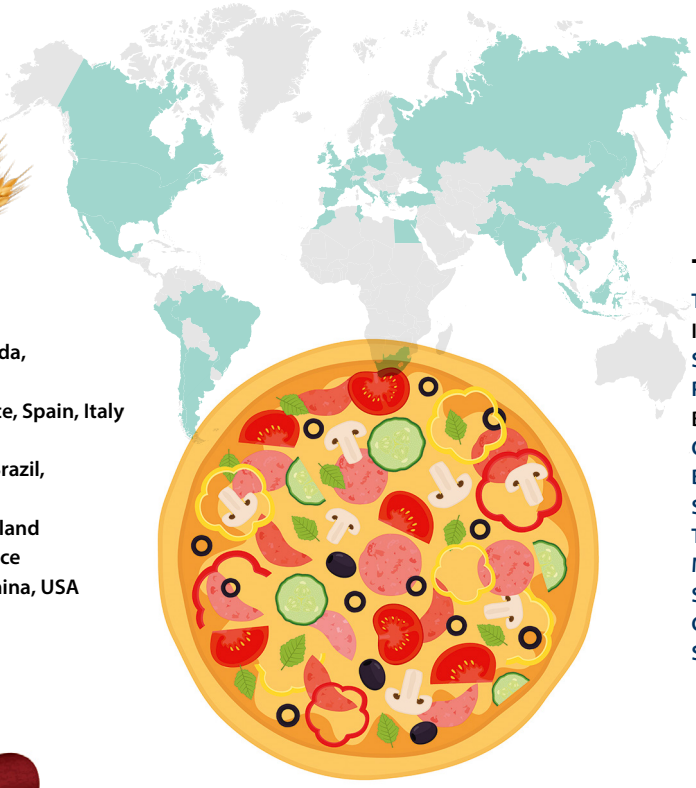
The assessment team should use the same methodology for the development of the mitigation plan, but should review the decisions regarding the control measures. If there are changes to the current control measures, these changes should be made as soon as practical.

Any changes to the mitigation plan should be documented and dated in accordance with company documentation control requirements.

An example of a mitigation plan plus review can be found in annex 1.

Supply Chain Globalization

More than 30 ingredients and potential sourcing origins



PIZZA BASE

Wheat flour: USA, Canada, France, Germany
Rapeseed Oil: UK, France, Spain, Italy
Yeast: Germany, France
Dextrose: USA, China, Brazil, India, Pakistan
Maltodextrin: Brazil, Poland
Salt: Germany, UK, France
Soya Lecithin: Brazil, China, USA

TOMATO SAUCE

Tomato Puree: Greece, Turkey, Italy, Spain, Argentina
Sugar: China, Germany, France, UK
Pepper: Vietnam, Indonesia, India, Brazil, China
Oregano: Greece, Turkey, Macedonia
Basil: Egypt, Turkey
Sage: Albania, Turkey
Thyme: Morocco, Egypt, Albania, Poland
Modified Starch: Netherlands, Germany
Salt: Germany, UK, Russia
Carrageenan: Philippines
Sodium Alginate: UK

SMOKED PORK PEPPERONI

Pork: Poland, Denmark, China, Thailand
Pork Fat: Poland, Denmark, Brazil
Salt: Germany, France, UK
Dextrose: USA, Germany
Spices: India, Pakistan, Sri Lanka, Turkey, Indonesia
Antioxidant (Extract of Rosemary): Tunisia, Morocco, Spain
Sodium Ascorbate: China, Taiwan
Sodium Nitrate: Chile, Peru

MOZZARELLA CHEESE

Denmark, Germany, Italy, France

SPICES AND VEGETABLES

Red Peppers: Spain, South Africa, Mexico, Turkey
Chillies: Mexico, Spain, China
Sweetcorn: Spain, USA, Israel
Gherkin: Poland, Hungary
Mushroom: Ireland, Netherlands, Poland, France

5 Guideline for the development and maintenance of a product fraud mitigation plan – IFS Broker

With the publication of IFS Broker Version 3, IFS used the opportunity to embrace food fraud challenges and include requirements on food fraud mitigation also at the level of brokers.

Brokers do not manufacture products by essence and have few possibilities to directly mitigate food fraud risks. However, there have been food fraud events in the past where broker liabilities were identified. This in addition to the globalization of the supply chain, with more and more intermediates between the raw materials and the final consumers, show that food fraud may occur and brokers play a key role in ensuring that trade commodities are authentic and safe.

The term "food fraud" in the IFS Broker Standard is a generic term which includes the following products:

- Food products, including their packaging material(s)
- Packaging materials for food products.

Other products within the scope of IFS Broker, like packaging materials for non-food products or household and personal care products, are not covered by the food fraud chapter of IFS Broker.

IFS definition of fraud includes four (4) types, which shall be considered when the broker establishes the vulnerability assessment:

Type of fraud	Example in food product	Example in packaging product
Substitution	Mineral oil to replace vegetable oil	Non sustainable source of material in a packaging material sold as "100 % from sustainable source"
Mislabeling	Declaration of wrong country of origin	Material containing BPA in a packaging labelled as "BPA-free" (Bisphenol A)
Adulteration	Addition of forbidden dyer in a product to enhance its colour	Multi-layers PET film sold with fewer layers
Counterfeiting	Copy of a big brand, using downgraded quality of ingredients	Copy of a big brand, using downgraded quality of components

5.1 Defining responsibilities

WHY

It is important to appreciate that the effectiveness of the development and maintenance of any mitigation plan is dependent on the competence of the individuals within the assessment team and that the individual or team have the support of senior management.

HOW

The first step for setting up a vulnerability assessment and mitigation plan is to define the responsible person(s). Usually a team is appointed, but for a broker who may has limited number of employees or even only just one single employee, this may be a challenge. Therefore, the IFS Broker requirement is not requesting to set up a team but to define who is responsible.

Usually, the minimum members of a fraud team should be the quality/food safety manager and purchasing manager; but if those functions are neither defined nor available at the broker, the most appropriate person(s) should be appointed, as long as the person(s) is/are competent in fraud assessments. Competencies can be justified either by training or by past experience and shall always be documented.

Ultimately, if knowledge and expertise are not available on-site, an external expert may be appointed, but her/his role and the responsibilities between this expert and the broker shall be clearly documented.

It is important that the responsible person(s) has/have senior management commitment. Key decisions may be made during the development and implementation of the fraud assessment, e.g. on maintaining supplier approvals, changing suppliers, etc., which require senior management involvement.

Demonstration of senior management commitment can be made through e.g. signature/validation by the management of the mitigation plan, of the annual plan review, or the inclusion of food fraud topics in the agenda of the annual management review.

Documented evidence shall be available for

- The name and function(s) of responsible person(s)
- Competencies (through training, past/gained experience, etc.)
- Involvement and support of senior management for the vulnerability assessment and mitigation plan.

5.2 Food fraud vulnerability assessment principles

WHY

An effective, systematic documented vulnerability assessment will identify risks of possible fraudulent activity within the supply chain. The vulnerability assessment, if carried out correctly, will identify potential weaknesses in the supply chain, which have to be addressed in the mitigation plan to minimize the risk of fraud.

HOW

Before performing the vulnerability assessment, it is important to have a clear overview of the full broker service(s), including the purchased products and the different suppliers. This may include manufacturers (if further processing is performed on the products or when the broker outsources processing activities for own (broker) or customer branded products) and other product suppliers (e.g. brokers). The flow chart required in the IFS Broker standard requirement 2.3.5 may be a good basis for the assessment, if completed with the list of all suppliers.

The broker shall include in the scope of the vulnerability assessment all purchased products which are food and/or food contact packaging materials, regardless if they are:

- Broker own branded products,
- Customer branded products,
- Supplier branded products.

The type of brands will have an impact on the fraud risk scoring, as the level of liability of the broker may vary.

Identification of potential food fraud risks

It is further necessary to review data from a variety of sources to identify potential product fraud risks that are associated with products purchased by the broker.

The data and information shall be documented and include, but is not limited to:

- Price and availability of products
- Official reports on existing frauds
- Technical/scientific data on how to detect frauds

Examples of sources of information may be found in chapter 4.2 and annex 4 of this guideline.

Information for food products are more likely publicly available than for food contact packaging materials.

Following questions may help to identify potential fraud risks for food contact packaging materials:

- Are all criteria of packaging specification authentic (e.g. weight, number of layers if appropriate, composition, claim, etc.)?
- For multi-layer films; how does the supplier control and ensure the right number and quality of layers?
- Were migration tests performed with the right methods and simulants?
- Is the packaging weight accurate and how is it controlled?
- If the packaging is sold with a specific claim (e.g. "made with 20 % recycled PET", or "free from BPA"), how does the manufacturer ensure the accuracy of such claims?

Sources of data and information shall be documented and reviewed regularly, to ensure continuous accuracy. Technical, legislation and scientific data related to food fraud may be included in the scope of the IFS Broker requirement 1.2.5.

5.2.1 Conducting the vulnerability assessment – products

Please refer to chapter 4.3 "Conducting the vulnerability assessment – product fraud" for details on the vulnerability assessment.

As mentioned in chapter 4, the vulnerability assessment shall cover both supplier and product risks and a risk score shall be defined.

Companies may undertake a number of risk assessments, which follow risk management principles (e.g. risk matrix, decision tree, etc.), but may differ in their detailed methodologies.

It is of high importance that the broker is able to score the risk with relevant justification based on pre-defined criteria/risk factors.

The following product risk factors are given as examples that could result out of the data review:

Product risk factor
• History of food fraud incidents • Economic factors • Ease of fraudulent activity • Supply chain complexity: this is of great importance for a broker as the purchased commodity may come from various and faraway countries. • Type of brands (broker, customer or supplier): a supplier branded product may be scored as less risky as the liability of the brand owner belongs to the supplier which would have performed his own vulnerability assessment to protect his brand. In contrast, a broker brand may be assessed with a higher risk score as the liability falls directly under the scope of the broker, which does not have direct control on the processing steps. • Current control measures

Products may be grouped in the vulnerability assessment if this can be justified (e.g. by common fraud risk types, etc.).

If the broker uses a decision tree, the following questions may help to define the riskiest products:

- Have there been fraud incidents in the past and if yes, how often?
- Are the products expensive, seldom on the market, seasonal? Are the prices stable or subject to fluctuation? Are the products broker/supplier or customer branded?
- Are the products packed in sealed containers or in bulk? Are they manufactured or raw? Are transport units sealed? Are storage areas secured?
- Is the supply chain complex with many intermediates?
- Does testing methodology currently exist to detect potential fraud? Does it seem easy to detect fraud with current methods?

If the broker uses a risk matrix (as presented in chapter 4.3), criteria to define the product risk score could be:

- Likelihood of occurrence: the more frequent the defined criteria could occur, the higher the risk score.
- Likelihood of current detection: the more difficult it is to detect potential fraud on the product, the higher the risk score.

5.2.2 Conducting the vulnerability assessment – suppliers

In addition to the product vulnerability assessment, it is equally important to assess supplier risk. For example, a product has a defined risk; however, the same product may be procured from a number of sources, all of which will have a differing risk – this can be assessed using the supplier vulnerability assessment.

Please refer to the table "Supplier risk factors and criteria for consideration" in chapter 4.4 for risk factor details.

5.2.3 Calculating the overall risk score

Once the scoring is defined for each product for each supplier, the overall risk score is determined by multiplying the individual scores.

The overall risk score can be different:

- For a product considered as risky in terms of fraud but supplied by a trusted, financially stable supplier located in a stable country
- For a product considered as a bit risky but supplied by a supplier recently approved which started the supply of this commodity in an unstable country

Implementation of a vulnerability assessment can never be "not applicable": even if the broker does not identify any overall risks, an assessment (showing low or no risks) shall be developed and documented.

Documented evidence shall be available for:

- The list of reliable data/information which was used to rank/score the risks
- The full vulnerability assessment, including:
  - All products used by the broker
  - Used methodology
  - Criteria to define and classify the risks
  - If the broker decided to group the products in the assessment, justification of reasons.

5.3 Developing the mitigation plan

WHY

An effective mitigation plan will define the measures and controls that are required to mitigate the risks identified in the vulnerability assessment. The completed mitigation plan is an important document, as it reflects the results of the product fraud mitigation strategy of the business.

HOW

Once the vulnerability assessment is performed and the overall risk score for each product/supplier is assigned, the broker shall then decide:

- Which ones shall be considered as of higher risk (risk priority)?
- Which mitigation measures are already in place and/or need to be enhanced/implemented for each level of risk?

The main objective is to mitigate the risks through appropriate control measures.

It is expected at this stage to list the current control measures in place and to define whether those control measures are enough or if they need to be strengthened, based on the risk scores defined in the vulnerability assessment.

The following list (non-exhaustive) shows control measures that have proven to be useful:

Type of control measure	What/how to check?
Economic and legal status verification	• E.g. through official website on company status and turnover
Product analyses/testing	• Performed by the manufacturer/supplier, the broker or the customer. If analyses are performed by the supplier, the broker shall frequently verify the analysis results with own analyses • Accreditation of the laboratory • Used methods • Level of detection • Frequency of testing • Sampling procedure • Direct link between what needs to be tested and what was tested by the lab
Certificates	• Certificates of analysis (with clear information regarding the criteria mentioned above) • Certificates ensuring compliance of the product (e.g. "organic" for a food product, certificate of cleaning for a transport provider who transports any type of products but who is appointed by the broker for the transport of sensitive allergen free products)
Product inspection before export/delivery	• Criteria to be inspected • Frequency of inspection • Sampling methodology • Liability and status of the inspector (government, independent, etc.)
Product supplier assessment	• Supplier assessment questionnaire • Audit performed by the broker, the customer or an external auditing/certification body: competencies and independency of the auditor, availability of the audit report, content of the audit report related to food fraud, frequency, etc.
Traceability checks/controls	• Chain of custody certification to ensure traceability of the products across the different intermediates. • Mass balance tests to ensure that the quantity and nature of products which are coming from the manufacturer are the same when arriving at the customer.

The following additional information are important for some of the above-mentioned control measures:

- Product analyses can be performed by the manufacturer/supplier, the broker or the customer, but the owner of the analyses shall be taken into consideration to assess the effectiveness of this control measure, as the level of trust and reliability may not be the same (to which extent a testing result provided by the supplier, to prove compliance and absence of fraud on a certain product, be trustful?). That's why, in this specific situation, it is expected that the broker frequently verifies the results through own analyses.

- Use of product inspections before delivery is very common for brokers and a key control measure, as brokers may use different service providers across the shipment of the products to the customers: the more inspections are made, with clear criteria to be checked, according to a defined methodology and frequency, the better the risk is controlled.
- Product supplier audits can be performed by the broker, by the customer or by an external auditing company/certification body, but the source and type of audit shall be taken into consideration to assess the effectiveness of this control measure, as the level of trust and reliability may not be the same. If the broker relies on audits performed by an external/certification body, it is crucial to ensure the audit report availability after the audit. Audits may be a good control measure if the outcome of the audit is documented, assessed and reviewed to have a good understanding on how the supplier controls the fraud risks.
- If the suppliers are IFS certified or certified against one of the GFSI recognized standard, this may impact the assessment of effectiveness of mitigation measures in a positive way, but this is often not enough to ensure robust mitigation measures. Firstly, because the IFS/GFSI recognized standards are not only focused on food fraud but on many other topics. Secondly, because the expected mitigation plan needs to be performed from the broker's perspective and an association of several mitigation measures controlled by the broker are expected.

Implementation of a mitigation plan may be "not applicable", for example if the vulnerability assessment concludes that there are low or no fraud risks.

Documented evidence shall be available for:

- Current control measures to mitigate the risks
- Assessment of the effectiveness of those measures, in line with the fraud risk rank/score of each product and supplier
- Monitoring and adjustment of those control measures (strengthening, implementation, etc.) accordingly.

5.4 Review of the mitigation plan

A one (1)-year duration is a very long time in a lifecycle of a broker, as supply chains, suppliers, traded commodities, etc., may evolve quickly.

The minimum frequency to review the vulnerability assessment is one (1) year. This frequency may be shortened in case important changes occur. Examples of changes can be, but are not limited to:

- Change or approval of new supplier
- Change of economic or legal status of a supplier
- Change in price of product
- Change in availability of the product
- Non-compliance with one of the implemented control measures (e.g. audit report indicating major non-conformity related to fraud, non-conforming product analysis result, etc.)
- Customer complaint related to fraud
- New information indicating new types of frauds
- New information on control measure, e.g. new testing opportunity, new detection methods, etc.

Once the vulnerability assessment is reviewed, the broker shall assess whether the mitigation plan shall be reviewed or not and shall define if control measures need to be reviewed accordingly.

5.5 Implementation of a vulnerability assessment and mitigation plan by suppliers

As a pre-requisite of the broker's own vulnerability assessment, the broker shall ensure that suppliers themselves have themselves performed a vulnerability assessment and mitigation plan for the products they manufacture.

This requirement applies to all product suppliers the broker is working with.

Compliance to this requirement can be ensured for example by, but not limited to, the following means:

- Verification that the suppliers are IFS certified or certified against other GFSI recognized standards. Such verification needs to cover the following aspects:
  - The broker shall get the audit reports and assess if the findings and level of compliance related to food fraud give enough confidence for the products the broker is receiving.
  - The broker shall have a process in place to continuously monitor and ensure that the suppliers are certified. Maintaining an updated list of suppliers, with their certification status could be a way if this is regularly checked for completeness and accuracy.
- Note that IFS Broker standard requirement 4.4.4 requires that all suppliers of the broker shall be certified and that exceptions can only be made if the customer is expressively accepting other conditions. If the suppliers are not IFS/GFSI certified (and if the customer has accepted alternative control measure), the broker shall identify another mean to verify the implementation of a vulnerability assessment and mitigation plan by the suppliers (e.g. own audit, supplier questionnaire, etc.).
- Audit of suppliers on food fraud aspects: the broker can perform audits or outsource this audit to a competent person, to check if the suppliers have performed and documented a vulnerability assessment and a mitigation plan. Competencies of the auditor and audit conclusions verification shall be reviewed and documented. Frequency of such audits shall be risk based and in line with the results of the brokers' own mitigation plan.
- Supplier questionnaires: the broker may send questionnaires on a regular basis to their suppliers to challenge them on the implementation of a vulnerability assessment and mitigation plan. Results of questionnaires shall be verified and the broker shall document such reviews. The frequency of sending such questionnaire shall be risk based and in line with the results of the brokers' own mitigation plan.

For all these types of verifications, the broker shall check if the products described in the vulnerability assessment and mitigation plan of suppliers correspond to the ones related to the agreement between the broker and the business partners.

6 Guideline for the development and maintenance of a product fraud mitigation plan – IFS Logistics

Logistics service providers have few possibilities to directly mitigate product fraud, as they have less interaction with the product itself. However, product fraud activity may still occur within the logistics sector of the supply chain and therefore reference is made to the assessment of risk and the requirement for measures to be in place to mitigate any identified risk.

Although IFS Logistics Version 2.2 does not specifically reference vulnerability assessments or a formal risk mitigation plan and is part of chapter 4.2.4, Receipt of goods and storage, it is advisable that the general vulnerability assessment principles (chapter 4 of this guideline) are utilised for the assessment of risk within the logistics supply chain.

Product fraud risk assessment principles and mitigation control measures

Substitution and counterfeiting could be expected throughout storage, transport and other services (e.g. packing and labeling) involving raw materials and finished product within the logistics sector. The fraudsters could use the logistic supply chain to substitute or adulterate raw materials, particularly loose or unpackaged product, or use the legitimate supply chain system to place counterfeit product onto the market. Mislabeling is also considered as fraud, for example when best before dates are extended during co-packing activities.

Consideration should be given to factors such as economic factors, ease of fraudulent activity, supplier business history, commercial relationships, supplier technical control measures and country and business ethics. Other factors that are relevant are the nature of the product and its status: typically, loose or unpackaged products are a higher risk to product fraud than products that have been packaged and labelled.

The controls that can be used to mitigate product fraud within the logistics supply chain are similar to those that apply to food defense controls and should be considered (reference IFS Food defense guideline). Good examples are where traceability/lot coding systems are evident as a measure of control and where tamper evidence is incorporated within the packaging design.

The most vulnerable products would be loose or unpackaged product, which are brought into the company or dispatched from the company. The control and monitoring systems must therefore be considered and are similar to those used to mitigate the risk of malicious contamination, e.g. sealed containers, inspection, site security measures, documentation control and regular monitoring of logistic control systems by first, second or third-party audits.

WHY

An effective, systematic documented hazard analysis will identify risk of possible food fraud activity within the logistics supply chain. As food fraud may take the form of intentional substitution, adulteration, mislabeling or counterfeiting, the hazard analysis shall be conducted on raw materials, food packaging and food within the logistics supply chain. The hazard analysis, if carried out correctly, will identify potential weaknesses. These should be addressed by risk mitigation control measures.

HOW

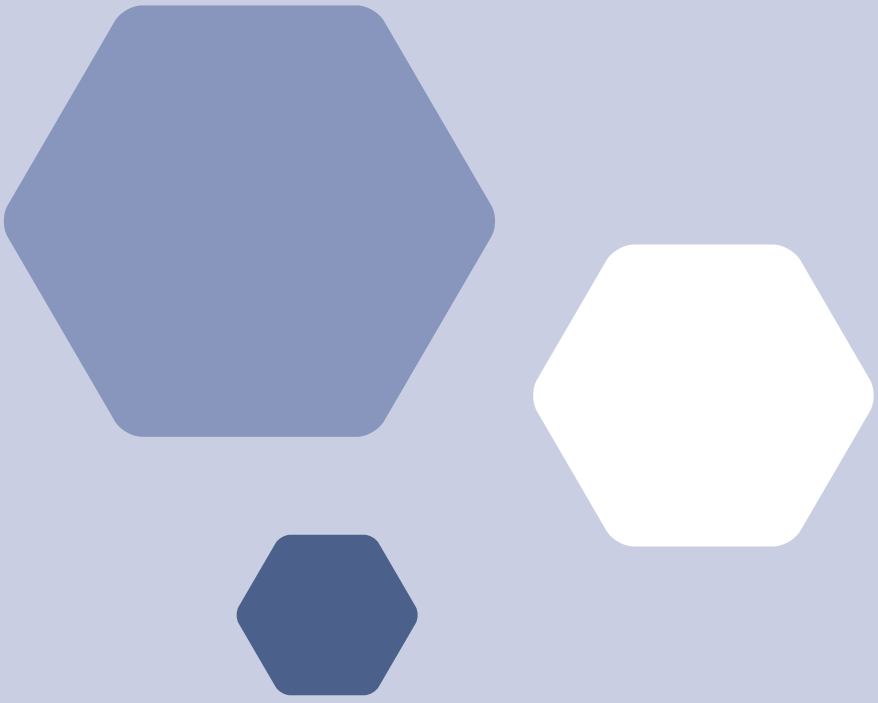
Companies may undertake a number of risk assessments, which follow risk management principles, but may differ in their detailed methodologies. Typical risk assessments commonly used within the food industry are based on HACCP principles. The principles presented in chapter 4 of this guideline should greatly assist companies with this process.

Below is an example of a table of assessed product and supplier risk and mitigation control measures for use within the logistics sector.

Product fraud risk assessment and mitigation control measures

Food fraud risk	Supplier fraud risk	Examples of control measures
Unlabeled packaged product – risk-substitution	Supplier X – large storage and transport corporation, short supply chain (one company) **Low risk**	• Contract requiring locked containers and fitted with company seal during transport. • Review of records of container seals and receipt notes • Company procedures review • Review of intake records • Authorized receipt notes for all deliveries with traceability/ lot code data (audit trail) • Review of journey log • Intake quality checks – medium sampling level
Loose product in open trays – risk-substitution	Supplier Y – small trans-port company driver owned **Low risk**	• Contract requiring locked containers and fitted with company seal during transport. • Review of records of container seals and receipt notes • Company procedures review • Review of intake records • Authorized receipt notes for all deliveries with traceability/ lot code data (audit trail) • Review of journey log Intake quality checks – low sampling level
High value brand product – risk-counterfeiting	Supplier Z – small storage facility poor systems and security **High risk**	• Contract requiring locked containers and fitted with company seal on dispatch • Review of records of product storage and quantity • Company procedures review • Review of intake records • Authorized receipt notes for all products stored with traceability/lot code data • Unannounced audits • Intake quality checks – high sampling level
Mislabeling of product during co-packing or relabeling activities	Customer requesting shelf-life extension or change **Medium risk**	• Consistency with product specifications. • Operations traceability • Legal advisory

7 ANNEXES



ANNEX 1

Example IFS Food Version 7 and IFS PACsecure Version 1.1 – Vulnerability assessment, mitigation plan development and mitigation plan review

1. Examples of product vulnerability assessments

The company is assessing the risk in relation to:

Raw materials

- Extra virgin olive oil
- Tomato paste

Packaging materials

- Card board PEFC mark (Programme for the Endorsement of Forest Certification) compliance
- Vacuum and modified atmosphere film – thickness/specification

The assessment team will assign a scoring of each risk factor by using the risk factors and criteria for consideration; this in turn will confirm the product's position within the product vulnerability risk matrix (reference tables within chapter 4.3).

The overall product risk can be scored for each product by multiplying the likelihood of occurrence (highest score assigned) and likelihood of current detection (highest score assigned) to determine a product position within the product vulnerability risk matrix.

Extra virgin olive oil

Likelihood of occurrence scoring

Likelihood of occurrence	History of product fraud incidents	Economic factors	Ease of fraudulent activity	Highest score assigned
5 (Very likely)	5			**5**
4 (Likely)			4	
3 (Quite likely)				
2 (Not very likely)		2		
1 (Not likely)				

Likelihood of current detection scoring

Likelihood of current detection	Supply chain complexity	Sampling program	Product characteristics	Highest score assigned
5 (Not likely)				
4 (Not very likely)				
3 (Quite likely)		3	3	**3**
2 (Likely)	2			
1 (Very likely)				

Overall product risk score for extra virgin olive oil

Likelihood of occurrence (**5**) × Likelihood of current detection (**3**) = **15**

Tomato paste

Likelihood of occurrence scoring

Likelihood of occurrence	History of product fraud incidents	Economic factors	Ease of fraudulent activity	Highest score assigned
5 (Very likely)				
4 (Likely)				
3 (Quite likely)				
2 (Not very likely)	2	2	2	**2**
1 (Not likely)				

Likelihood of current detection

Likelihood of current detection	Supply chain complexity	Sampling program	Product characteristics	Highest score assigned
5 (Not likely)				
4 (Not very likely)				
3 (Quite likely)				
2 (Likely)		2	2	**2**
1 (Very likely)	1			

Overall product risk score for tomato paste

Likelihood of occurrence (**2**) × Likelihood of current detection (**2**) = **4**

Card board PEFC mark

Likelihood of occurrence scoring

Likelihood of occurrence	History of product fraud incidents	Economic factors	Ease of fraudulent activity	Highest score assigned
5 (Very likely)				
4 (Likely)			4	**4**
3 (Quite likely)	3			
2 (Not very likely)		2		
1 (Not likely)				

Likelihood of current detection scoring

Likelihood of current detection	Supply chain complexity	Sampling program	Product characteristics	Highest score assigned
5 (Not likely)				
4 (Not very likely)				
3 (Quite likely)	3		3	**3**
2 (Likely)		2		
1 (Very likely)				

Overall product risk score for card board PEFC mark

Likelihood of occurrence (**4**) × Likelihood of current detection (**3**) = **12**

Vacuum and modified atmosphere film

Likelihood of occurrence scoring

Likelihood of occurrence	History of product fraud incidents	Economic factors	Ease of fraudulent activity	Highest score assigned
5 (Very likely)				
4 (Likely)				
3 (Quite likely)			3	**3**
2 (Not very likely)	2	2		
1 (Not likely)				

Likelihood of current detection scoring

Likelihood of current detection	Supply chain complexity	Sampling program	Product characteristics	Highest score assigned
5 (Not likely)				
4 (Not very likely)				
3 (Quite likely)				
2 (Likely)				
1 (Very likely)	1	1	1	**1**

Overall product risk score for vacuum and modified atmosphere film

Likelihood of occurrence (**3**) × Likelihood of current detection (**1**) = **3**

From the assigned scores and the product risk matrix (figure 1)

- where a raw material such as extra virgin olive oil has a "very likely" rating for likelihood of occurrence and a "quite likely" rating for likelihood of current detection, the overall risk rating is within a **high-risk area** of the matrix.
- where a raw material such as tomato paste has a "not very likely" rating for likelihood of occurrence and "likely" rating for likelihood of current detection, the overall risk rating is within a **low-risk area** of the matrix.
- where packaging such as card board (PEFC mark) has a "likely" rating for likelihood of occurrence and a "quite likely" rating for likelihood of current detection, the overall risk rating is within a **medium-risk area** of the matrix.
- where packaging such as vacuum and MA film has a "quite likely" rating for likelihood of occurrence and a "very likely" rating for likelihood of current detection, the overall risk rating is within a **low-risk area** of the matrix

FIGURE 4
Raw materials

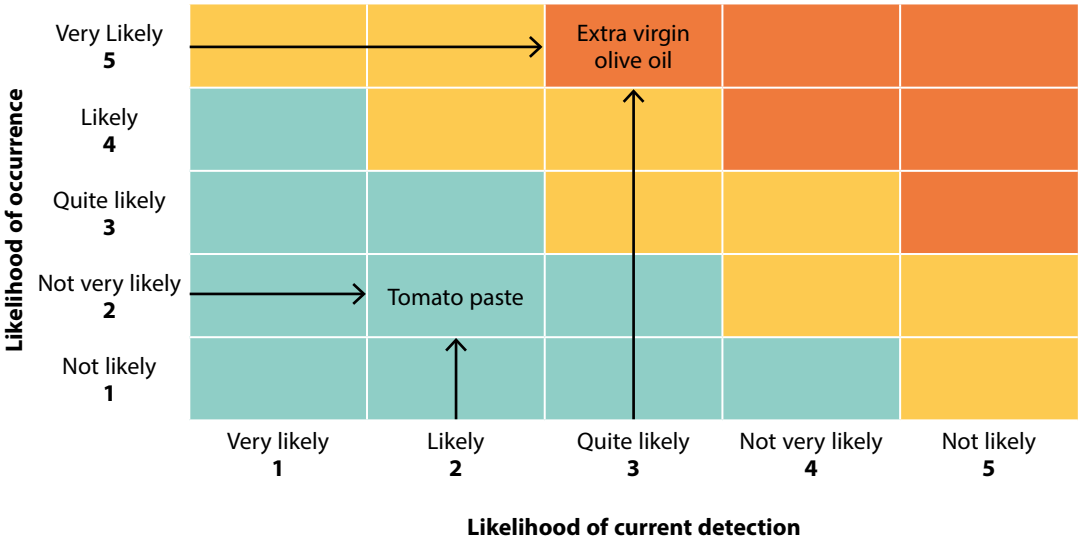
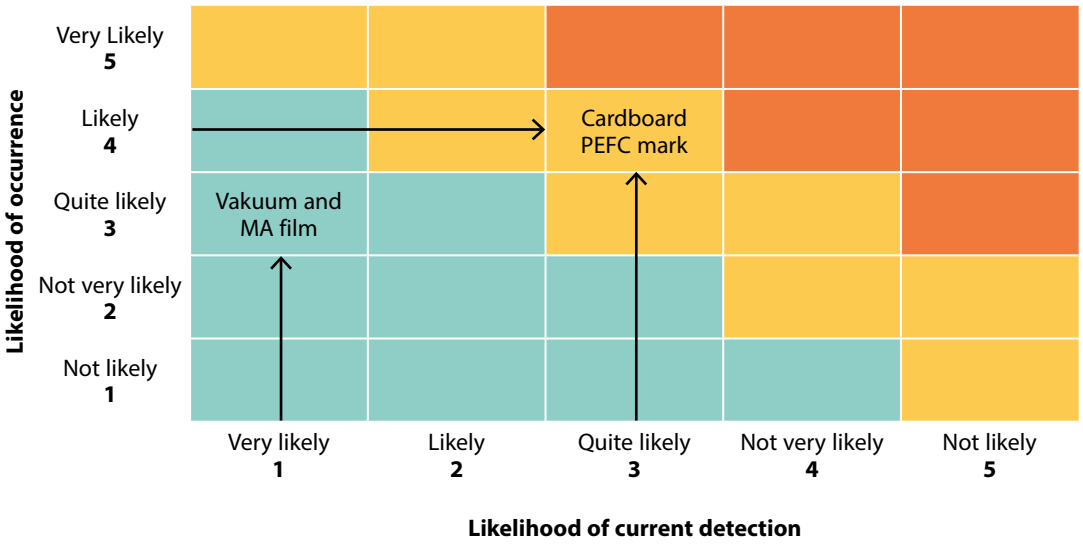


FIGURE 5
Packaging materials



The position of the product within the product risk matrix will determine the need for action to be taken to mitigate any possible risk of product fraud activity. This means in relation to the above examples:

- Extra virgin olive oil: it would be **expected** that, if adequate control measures are not in place, additional control measures should be urgently considered and actioned.
- Tomato paste: it would be **expected** that the current control measures be reviewed for effectiveness and, if necessary, appropriate decisions taken.
- Card board PEFC mark: it would be **expected** that, if adequate control measures are not in place, additional control measures should be urgently considered and actioned.
- Vacuum and modified atmosphere film: it would be **expected** that the current control measures be reviewed for effectiveness and, if necessary, appropriate decisions taken.

2. Example of a product fraud mitigation plan

An example of a mitigation plan is provided below for raw materials and packaging materials:
Date of assessment: 16th October 2018

Raw materials and packaging materials	Supplier	Product risk score	Supplier risk score	Overall risk score	Current control measure rating	Team decision	Control measures
Extra virgin olive oil	W	15	1	15	Medium	Retain supplier	Retain control measures Product analysis program – 2 analyses per year
Extra virgin olive oil	X	15	2	30	Medium	Retain supplier	Increase product analysis program to 4 analyses per year
Extra virgin olive oil	Y	15	2	30	Medium	Retain supplier	Increase product analysis program to 4 analyses per year
Extra virgin olive oil	Z	15	4	60	Medium	Consider dis-continuing	If retained, increase product analysis program to 8 analyses per year Certificate of analysis for every consignment
Tomato paste	A	4	1	4	High	Retain supplier	Retain control measures Certificates of analysis and intake checks
Tomato paste	B	4	1	4	High	Retain supplier	Retain control measures Certificates of analysis and intake checks
Tomato paste	C	4	2	8	High	Retain supplier	Retain control measures Certificates of analysis and intake checks
Kraft board PEFC mark	W	12	1	12	High	Retain supplier	Retain control measures Rely on certification report and chain of custody certification
Kraft board PEFC mark	Y	12	2	24	High	Retain supplier	Certification report and chain of custody certification Additional annual audit with mass balance exercise
Kraft board PEFC mark	Z	12	4	48	High	Consider dis-continuing	Certification report and chain of custody certification Additional annual audit with mass balance exercise
V and MA film	D	3	2	6	Low	Retain supplier	Increase control measures by increased sampling on receipt
V and MA film	E	6	3	18	Medium	Retain supplier	Increase product analyses to every receipt Certificate of analysis for every consignment (accredited laboratory and method)

3. Example of a mitigation plan review and amendment

Below is an example of a reviewed mitigation plan (cells highlighted in yellow indicate where changes to the control measures have been made):
Date of Review: 16th October 2019

Raw materials and packaging materials	Supplier	Product risk score	Supplier risk score	Overall risk score	Current control measure rating	Team decision	Control measures
Extra virgin olive oil	**W**	**15**	**1**	15	Medium	Retain supplier	Retain control measures Product analysis program – 2 analysis per year
Extra virgin olive oil	**X**	**15**	**2**	30	Medium	Retain supplier	Issues identified in supply region Increase product analysis program to 6 analyses per year
Extra virgin olive oil	**Y**	**15**	**2**	30	Medium	Retain supplier	Issues identified in supply region Increase product analysis program to 6 analyses per year
Extra virgin olive oil	**Z**	**15**	**4**	60	Medium	Consider discontinuing	If retained, increase product analysis program to 8 analyses per year Certificate of analysis for every consignment
Tomato paste	**A**	**4**	**1**	4	High	Retain supplier	Retain control measures Certificates of analysis and intake checks
Tomato paste	**B**	**4**	**1**	4	High	Retain supplier	Retain control measures Certificates of analysis and intake checks
Tomato paste	**C**	**4**	**2**	8	High	Retain supplier	Retain control measures Certificates of analysis and intake checks
Kraft board PEFC mark	**W**	**12**	**1**	12	High	Retain supplier	Retain control measures Rely on certification report and chain of custody certification
Kraft board PEFC mark	**Y**	**12**	**5**	60	High	Consider discontinuing supplier	Issues identified by certification body and mass balance chain of custody certification issues and certificate suspended Do not order this product
Kraft board PEFC mark	**Z**	**12**	**4**	48	High	Consider discontinuing	Certification report and chain of custody certification additional annual audit with mass balance exercise
V and MA film	**D**	**3**	**4**	12	Medium	Consider looking for new sources	Increased control measures have identified inconsistent product Increased sampling on intake on every receipt
V and MA film	**E**	**6**	**3**	18	Medium	Retain supplier	Increase product analyses to every receipt Certificate of analysis for every consignment (accredited laboratory and method)

ANNEX 2

Example IFS Broker 3 – Vulnerability assessment, mitigation plan development and mitigation plan review

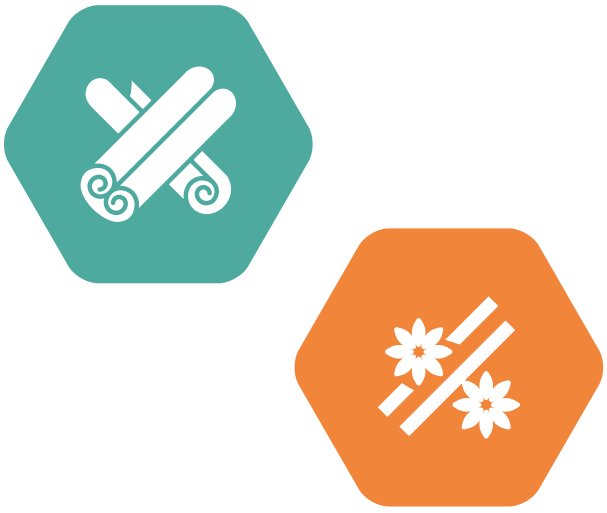
4. Examples of product vulnerability assessments

Purchased products

- Ground cinnamon (Ceylon)
- Ground cinnamon (Cassia)

The assessment team will assign a scoring of each risk factor by using the risk factors and criteria for consideration; this in turn will confirm the product's position within the product vulnerability risk matrix (reference tables within chapter 4.3).

The overall product risk can be scored for each product by multiplying the likelihood of occurrence (highest score assigned) and likelihood of current detection (highest score assigned) to determine a product/process position within the product vulnerability risk matrix.



Ground cinnamon (Ceylon)

Likelihood of occurrence scoring

Likelihood of occurrence	History of product fraud incidents	Economic factors	Ease of fraudulent activity	Highest score assigned
5 (Very likely)		5		**5**
4 (Likely)	4		4	
3 (Quite likely)				
2 (Not very likely)				
1 (Not likely)				

Likelihood of current detection scoring

Likelihood of current detection	Type of product	Supply chain complexity	Sampling program	Product characteristics	Highest score assigned
5 (Not likely)					
4 (Not very likely)					
3 (Quite likely)			3	3	**3**
2 (Likely)	2	2			
1 (Very likely)					

Overall product risk score for ground cinnamon (Ceylon)

Likelihood of occurrence (**5**) × Likelihood of current detection (**3**) = **15**

Ground cinnamon (Cassia)

Likelihood of occurrence scoring

Likelihood of occurrence	History of product fraud incidents	Economic factors	Ease of fraudulent activity	Highest score assigned
5 (Very likely)				
4 (Likely)				
3 (Quite likely)				
2 (Not very likely)				
1 (Not likely)	1	1	1	**1**

Likelihood of current detection scoring

Likelihood of current detection	Type of product	Supply chain complexity	Sampling program	Product characteristics	Highest score assigned
5 (Not likely)					
4 (Not very likely)					
3 (Quite likely)					
2 (Likely)	2			2	**2**
1 (Very likely)		1	1		

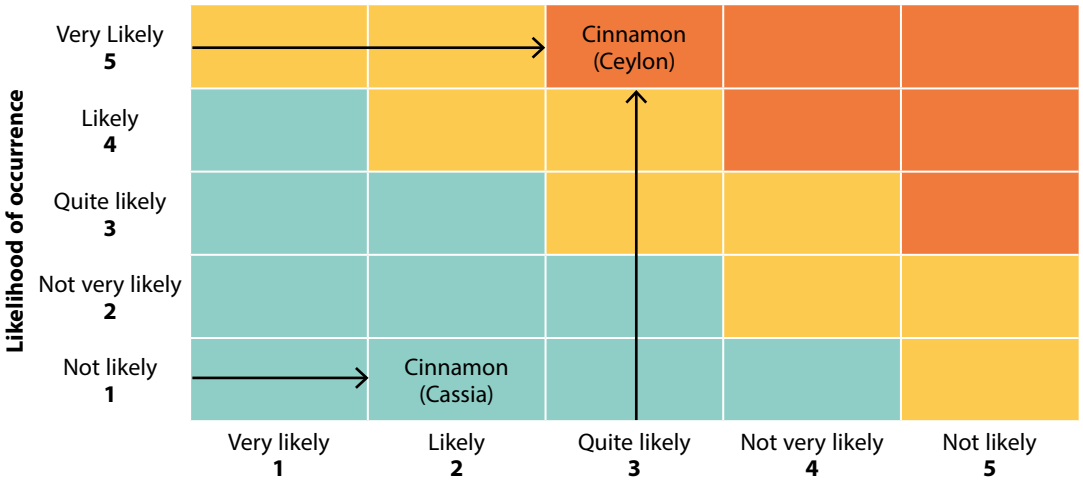
Overall product risk score for ground cinnamon (Cassia)

Likelihood of occurrence (1) × Likelihood of current detection (2) = 2

From the assigned scores and the product risk matrix (figure 1)

- where a product such as ground cinnamon (Ceylon) has a "very likely" rating for likelihood of occurrence and a "quite likely" rating for likelihood of current detection, the overall risk rating is within a high-risk area of the matrix.
- where a product such as ground cinnamon (Cassia) has a "not likely" rating for likelihood of occurrence and "likely" rating for likelihood of current detection, the overall risk rating is within a low-risk area of the matrix.

FIGURE 6
Purchased product



The position of the product within the product risk matrix will determine the need for action to be taken to mitigate any possible risk of food fraud activity. This means in relation to the above examples:

- Ground cinnamon (Ceylon): it would be **expected** that, if adequate control measures are not in place, additional control measures should be urgently considered and actioned.
- Ground cinnamon (Cassia): it would be **expected** that the current control measures are adequate and sufficient.

5. Example of a product fraud mitigation plan

An example of a mitigation plan is provided below for purchased products:
Date of assessment: 16th October 2018

Purchased product	Supplier	Product risk score	Supplier risk score	Overall risk score	Current control measure rating	Team decision	Control measures
Ground cinnamon (Ceylon)	**W**	**15**	**1**	15	Medium	Retain supplier	Retain control measures Product analysis program – 2 analyses per year
Ground cinnamon (Ceylon)	**X**	**15**	**2**	30	Medium	Retain supplier	Increase product analysis program to 4 analyses per year
Ground cinnamon (Ceylon)	**Y**	**15**	**4**	60	Medium	Consider discontinuing	If retained, increase product analysis program to 8 analyses per year Certificate of analysis for every consignment
Ground cinnamon (Cassia)	**Z**	**15**	**1**	15	High	Retain supplier	Retain control measures Certificates of analysis and intake checks by service provider
Ground cinnamon (Cassia)	**A**	**4**	**2**	8	High	Retain supplier	Retain control measures Certificates of analysis and intake checks by service provider
Ground cinnamon (Cassia)	**Y**	**4**	**4**	16	High	Consider discontinuing	Retain control measures Certificates of analysis and intake checks by service provider

6. Example of a mitigation review and amendment

Below is an example of a reviewed mitigation plan (cells highlighted in yellow indicate where changes to the control measures have been made):
Date of assessment: 16th October 2019

Purchased product	Supplier	Product risk score	Supplier risk score	Overall risk score	Current control measure rating	Team decision	Control measures
Ground cinnamon (Ceylon)	**W**	**15**	**1**	15	Medium	Retain supplier	Retain control measures Product analysis program – 2 analyses per year
Ground cinnamon (Ceylon)	**X**	**15**	**4**	60	Medium	Consider looking for new source or increase volume of supplier W	Increased control measures have identified impurity levels of type cassia for certain batches Increased sampling on intake on every batch
Ground cinnamon (Ceylon)	**Y**	**15**	**3**	45	High	Retain supplier	Retain control measures Consider lowering analysis program to 6 analyses per year for next year
Ground cinnamon (Cassia)	**Z**	**15**	**1**	15	High	Retain supplier	Retain control measures Certificates of analysis and intake checks by service provider
Ground cinnamon (Cassia)	**A**	**4**	**2**	8	High	Retain supplier	Retain control measures Certificates of analysis and intake checks by service provider
Ground cinnamon (Cassia)	**Y**	**4**	**4**	16	High	Consider discontinu-ing	Retain control measures Certificates of analysis and intake checks by service provider

ANNEX 3

Auditor questions and documentation

The IFS auditor shall perform an assessment of the development and implementation of the product fraud mitigation plan and other relevant documentation.

Assessment team and data sources

Questions that the auditor should ask:

- Who are members of the assessment team?
- How have the members of the team been trained?
- Are the responsibilities of the assessment team clearly defined?
- How does senior management support the assessment team?
- How are potential data sources relating to product fraud identified?
- Is there a list of data sources with information relating to its review and frequency of review?
- Are credible data sources used?
- How is the data used by the members of the assessment team?

Documents that the auditor may wish to assess:

- Training records of assessment team members
- List of information and data sources
- Evidence for the regular review of information and data sources

Vulnerability assessment

Questions that the auditor should ask:

- What is the defined vulnerability assessment methodology?
- Which risk factors are defined for products (raw materials and packaging materials) and suppliers?
- Are all raw materials and packaging materials subject to the vulnerability assessment?
- Are vulnerability scores, ranking or grading available for review?
- How often are vulnerability assessments undertaken?
- Are vulnerability assessments undertaken on all new raw materials and packaging materials and the suppliers of these products?

Documents that the auditor may wish to assess:

- Vulnerability assessment records
- List of raw materials and packaging materials and their suppliers
- Results of internal audit reviews

Product fraud mitigation plan

Questions that the auditor should ask:

- Is there a mitigation plan procedure in place?
- What are the control measures applied to mitigate the risk of potential product fraud activity identified within the vulnerability assessment?
- Are the control measures appropriately and consistently applied in accordance with identified risks?
- Who monitors issues identified by the control measures?
- Are control measures regularly reviewed for suitability and effectiveness?

Documents that the auditor may wish to assess:

- Product fraud mitigation plan
- Product fraud mitigation plan control measure records and reviews (and actions)
- Customer and consumers complaints
- Results of internal audits

Review and monitoring requirements

Questions that the auditor should ask:

- How often is a vulnerability assessment undertaken?
- Is there, within the mitigation plan procedure, criteria defined when the vulnerability assessment shall be reviewed in addition to the annual review, i.e. when changes to risk could occur?
- Is the effectiveness of the mitigation plan reviewed? If so, how is this undertaken?
- Are control and monitoring requirements changed, and if so, why?

Documents that the auditor may wish to assess:

- Product fraud mitigation plan procedures
- Product fraud mitigation plan control measures, records and reviews (and actions)
- Customer complaints
- Results of internal audits

ANNEX 4

Examples of Data Resources

The following references may be useful in relation to data sources:

- IFS Trend Risk Monitor
- RASSF Portal
  https://webgate.ec.europa.eu/rasff-window/portal/?event=SearchForm&cleanSearch=1
- FAO Food Price Index (Food and Agriculture Organisation of the United Nations)
  http://www.fao.org/worldfoodsituation/foodpricesindex/en/
- Animal Disease – EMPRES (Food and Agriculture Organisation of the United Nations)
  http://www.fao.org/ag/againfo/programmes/en/empres/home.asp
- Food Outlook/Crop Forecasting – GIEWS (Global Information and Early Warning System, Food and Agriculture Organisation of the United Nations)
  http://www.fao.org/giews/en
- Country Risk Index
- Corruption Index – Transparency International
- Food Fraud Database – Decernis
  https://decernis.com/solutions/food-fraud-database
- Food Protection and Defense Institute
  https://foodprotection.umn.edu
- EU Food Fraud Network
  https://ec.europa.eu/food/safety/food-fraud_en
- Europol Interpol Operation Opson
  https://www.europol.europa.eu/operations/opson

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