YOUR GUIDE TO IMPLEMENTING AN EFFECTIVE FOOD FRAUD PREVENTION PROGRAMME
Implementing a Food Fraud Programme

We have only just managed to get to grips with the food defence requirement and now recently, we have been hearing quite a bit about food fraud or VACCP. This was introduced in February 2017 as a new requirement in the GFSI (Global Food Safety Initiative) benchmarking scheme. We can hear the already heavily burdened Food Safety Managers groaning “All of this stuff is getting really hectic; how are we going to manage this on-top of everything else?” Yes, we agree, food safety compliance is certainly getting tougher and the job of a Food Safety Manager is definitely not for sissies. This eBook aims to provide you, the Food Safety Managers (our heroes out there), with a simple guide to getting started.

What is food fraud?

We give you the GFSI (Global Food Safety Initiative) definition of Food Fraud: “A collective term encompassing the intentional substitution, addition, tampering or misrepresentation of food/feed, food/feed ingredients or food/feed packaging, labelling, product information or false or misleading statements made about a product for economic gain that could impact consumer health”. (Definition adopted by FSSC).

So food fraud can be simply defined as intentional deception using food for economic gain.
WHAT IS HACCP, TACCP AND VACCP?

HACCP (Hazard Analysis Critical Control Point)
HACCP is the unintentional contamination of food that makes the food injurious to health - Food Safety.

VACCP (Vulnerability Assessment Critical Control Point)
VACCP is the prevention of economically motivated intentional adulteration that may or may not be injurious to health - Food Fraud.

TACCP (Threat Assessment Critical Control Point)
TACCP is the prevention of ideologically motivated, intentional malicious threats to food, such as sabotage, extortion or terrorism - Food Defence.

According to the GFSI, Food Fraud is an essential component of a Food Safety Management System.

WHY HAS THIS NEW REQUIREMENT BEEN INTRODUCED?
Since there has been a global increase in food fraud incidents, the GFSI benchmarking scheme was updated in February 2017 to include new requirements to fight food fraud.

WHAT FOODS ARE MOST COMMONLY INVOLVED IN FOOD FRAUD?
The top five food products reported for fraud are: meat & meat products (excluding poultry), fish & fish products, fats & oils, poultry & poultry meat products, milk & milk products. Other food products include: wine, organic foods, spices (such as saffron and chilli powder), grains, honey & maple syrup, coffee & tea and certain fruit juices.

Mislabelling product composition was the largest violation observed according to the EU Food Fraud Network 2017 Annual Report
TYPES OF FOOD FRAUD

A few examples of how food fraud can be conducted. Sadly, criminals dream up new ways almost daily!

**SUBSTITUTION**
The complete replacement of a food product or ingredient with an alternate product or ingredient, usually of lower value. For example, fish species fraud.

**DILUTION**
The partial replacement of a food product or ingredient with an alternate ingredient, usually of lower value. This could be the dilution of honey with sugar, addition of horse meat to ground beef, or olive oil diluted with potentially toxic tea tree oil.

**CONCEALMENT**
Hiding the low quality of food ingredients or product. For example, poultry injected with hormones to mask disease or harmful food colouring applied to fresh fruit to cover defects.

**GREY MARKET PRODUCTION**
Grey market production/theft/diversion is the sale of excess unreported product. It is the resale of stolen products through unapproved channels.

**COUNTERFEITING**
Copying the brand name, packaging concept, recipe, processing methods etc. of food products for economic gain. For example, copies of popular foods – not produced with acceptable safety assurances.

**TRANSHIPMENT**
Transhipment or origin masking is the misrepresentation of the geographic origin of a product, in order to avoid import duties.

**ARTIFICIAL ENHANCEMENT**
Artificial/unapproved enhancement is the addition of unapproved or undeclared chemical additives to food products to enhance the quality attribute; like Sudan dyes in chili powder, or melamine added to enhance protein value.

**MISLABELLLING**
Misrepresentation with regards to harvesting or processing information. Placing false claims on packaging for economic gain. This could be labeling such as “free range eggs”, or "organic produce".

**INTENTIONAL DISTRIBUTION OF CONTAMINATED PRODUCT**
For example, selling a product past its sell-buy date.

"Food fraud could be costing the UK food industry a colossal £12 billion annually" says Frank Woods, retail specialist at NFU Mutual. Click here to read the report.
How much does the consumer know about food fraud?

The NFU Mutual report (click this link here) summarises the consumers confidence in the food industry within different food sectors. It seems that take-away outlets and online sellers are the least trusted of all the food outlets. From this report, it is concluded that from a study conducted of over 2000 consumers in the UK, that the recent high profile of food fraud incidents such as the horse-meat scandal in 2013, has been the most common cause of the decline in confidence in nearly half of the consumers tested. The report states “Consumers have a high level of perception that fraudulent activity takes place, influencing them to pursue food they can trust.” It is evident from this report that food companies have a lot of work to do to build the consumer’s trust to provide reassurance that the foods are authentic.

Why do companies commit Food Fraud?

Professor Chris Elliot of the Institute of Food Security is quoted as saying “Food fraud generally occurs where the potential for and the temptation of food fraud are high and the risk of getting caught are low.”

**WHAT MOTIVATES COMPANIES TO COMMIT FOOD FRAUD?**

- Economic and market factors such as financial strains, the level of competition, supply/demand and pricing, competitive strategy, and economic health or conditions.
- Cultural or behavioural factors such as personal gains or desperation, ethical business culture, corruption level, victimisation, competitive strategy and blackmail are also motivations for Food Fraud.
THE FOOD FRAUD STRATEGY

HOW DO WE IMPLEMENT A FOOD FRAUD STRATEGY?

1. GATHER THE TEAM
2. DECIDE ON ASSESSMENT TOOL
3. GATHER INFO
4. CONDUCT ASSESSMENT
5. RISK THE ITEMS
6. PRIORITIZE
7. MITIGATION MEASURES
8. VALIDATE MEASURES
9. VERIFY MEASURES
10. REVIEW
THE STEPS TO IMPLEMENTING A FOOD FRAUD MANAGEMENT STRATEGY

**Step 1: Assemble a Food Fraud Team**

You should start by establishing a multi-disciplinary team. You may need to expand your current food safety team to include purchasing, security and IT.

**Step 2: Decide on the assessment tool**

You will need to describe in your food fraud prevention procedure which vulnerability assessment tool your team will be using. There are a number of vulnerability assessment tools, some of which are listed below:

- BRC Vulnerability Assessment Tool
- PWC Tool
- NSF Tool
- Entecom FF Tool

The BRC standard focuses on raw materials and the supply chain, rather than on site vulnerabilities, to determine potential concerns or weaknesses and to identify raw materials that are at a particular risk of adulteration or substitution, so that appropriate controls can be put in place.

**Step 3: Gather information:**

The first step in conducting an assessment is to gather information. Consider the following:

- **Historical incidences/fraud history**

  The history of fraud for a particular ingredient can be indicative of future vulnerabilities. There are various online databases (click on site name to open) which provide information regarding historical food fraud incidences, for example:

  - Food Fraud - USP Subscription Database
  - Food Fraud Advisors
  - Trello
  - Our World in Data - provides a Corruption Perception Index (scores are on a scale of 0-100)
Emerging concerns: (new alerts, etc.)

Geographic origin/political considerations:
Geographic origin/geopolitical considerations: consider whether an ingredient originates from a country with a lack of food control and safety systems. The website, Our World in Data, assigns corruption perception indexes to different countries around the world.

Length and complexity of the supply chain:
Length and complexity of the supply chain: a food ingredient’s vulnerability to fraud increases with the complexity of the supply chain. Map out the supply chain and identify where vulnerabilities in the supply chain can occur.

Economic factors and price fluctuations:
Economic factors/price fluctuations: given that food fraud is driven by economic opportunity, anomalies in the economics of particular foods or food sources can be an indicator of potential problems.

Availability: seasonality/harvest variability:
A good example of how harvest availability can be an opportunity for food fraud is this article on Food & Wine, where it is is suspected that garlic from China might be adulterated with chalk as a result of a stretch of cold weather partially destroyed the garlic crops in China which supplies 75% of the world’s garlic supply.

Nature of raw material:
The incentive to commit fraud is higher in more expensive raw materials. Ask, does the raw material have a claim attached to it that increases its value in relation to “standard” products? For example, an organic status. You would need to consider the value of raw material or size of the market in relation to other products of the same group. Make sure that detailed specifications are available for all raw materials and packaging materials. Try to include authenticity control criteria in the raw material specifications as far as possible where vulnerabilities have been identified. A suitable chemistry testing laboratory would need to be consulted for guidance to ensure that the analytical criteria can be tested against.

Physical form of material:
Is the raw material whole, chopped, minced, powdered or liquid? It is easier to commit food fraud in powdered or liquid items.

Existing controls:
Existing controls, including routine testing and supply chain audits. Ask: What is the company already doing to combat food fraud? How robust are the supply chain audits? What testing gets done? Once the adulteration risks have been identified in the raw materials and the analytical control criteria for the risks established in the raw material specifications, then a raw material surveillance monitoring system should be established.
Step 3: Gather information (continued):

- **Ease of access to raw materials:**
  Ease of access to raw materials: security measures such as tamper-proofing need to be considered. Consider the type of packaging/containers are the raw materials stored and transported in?

- **Sophistication of routine testing:**
  Consider the sophistication of routine testing to identify adulterants: analytical testing can be performed to identify a specific adulterant, or testing against a raw material chemical component blueprint to determine if the raw material contains any fraudulent substances can also be an option. Not many laboratories however have the required equipment or technical expertise to perform these tests and these tests can also be expensive. This makes it more difficult to detect adulteration in raw materials.

- **Storage and distribution**
  Consider where and how are the raw materials stored and distributed. What security measures are in place at the storage sites? How secure are distribution systems? Can the goods be tampered with during storage or distribution?

The information gathering can be from various industry sources like; subscribing to newsletters or updates from the websites below and ensuring active membership of industry sector forums or associations such as SAAFoST (South African Association for Food Science and Technology), RMIF (Red Meat Industry Forum), DSA (Dairy Standard Agency), Consumer Goods Council of South Africa (CGCSA), AFMA (Animal Feed Manufacture Association) etc.

There are a number of organisations that have websites providing useful information; summaries of historical concerns and emerging concerns, these websites include:

- Food Fraud Database
- US National Centre for Food Protection and Defense (NCFPD)
- EU Food Fraud Network - monthly reports
- US Michigan State University
- US Food and Drug Administration (FDA)
- UK Food Standards Agency (FSA)
- UK Serious Fraud Office
- UK Food and Drink Federation (FDF)
- The Chilled Food Association
Step 4: Conduct the Assessment

Let’s take a look at the assessment tools in more detail:

1. Simple Quadratic Model

A simple matrix is utilised to determine the likelihood of the occurrence (horizontal axis) and the likelihood of detection (vertical axis), giving the potential risk a risk rating. The risk ratings are colour coded, showing low risk, medium risk and high risk. This model is applied to each raw material individually and the results used to determine which raw materials are vulnerable to Food Fraud. This use of this model is recommended by the BRC. There is a limitation of using this model is that it only focuses on raw materials.

2. Categorise the risk using Priority Risk Numbers

Priority Risk Numbers (PRN) method categorises the information according to criteria. BRC use the examples of: likelihood of occurrence, likelihood of detection and profitability. Each criteria is rated, example of 1 – 5, with 1 being very low/no risk and 5 being very high risk.

The 3 ratings are then multiplied to obtain a PRN score.

\[ PRN = O \times D \times P \]

The output of the calculation is, therefore, a PRN for each raw material (or group of raw materials) with a value of 1 (overall very low risk) to 125 (overall extremely high risk).

This model is applied to each raw material individually and the results used to determine which raw materials are vulnerable to Food Fraud. The use of this model is recommended by the BRC, and the limitation of using this model is that it only focuses on raw materials.

3. SSAFE/PWC Food Fraud Vulnerability Assessment

The non-profit organisation SSAFE, in collaboration with PwC, Wageningen University, VU University Amsterdam and in consultation with food industry leaders, created a free Food Fraud vulnerability assessment tool in 2016.

Go to this website to use their tool as an online assessment or to download the application. The tool goes further than only concentrating on raw materials. It encompasses an assessment of ingredients, product, brand, facility, country and company. After completing the assessment, the tool will give you a profile of your company’s potential Food Fraud vulnerabilities.
4. Entecom FF Model

We introduce the very easy-to-use Entecom Food Fraud Vulnerability Assessment Tool, taking you through the tool functionality using a step-by-step approach. If you attend our Food Fraud workshop, you will receive this handy tool for free.

**Step 1: Listing raw materials and finished products**

a) List all the raw materials entering into your facility by supplier, including packaging materials
b) List all the intermediate products and finished goods in your facility with “self” as supplier.

**Step 2: Pre-screening**

Answer the following four questions for each item:
1. Has there been any historic Food Fraud incident or are there any current or emerging concerns?
2. Does the supplier or internal department have a general vulnerability to Food Fraud?
3. Is the RM susceptible to significant price fluctuations?
4. Could Food Fraud go undetected in this RM, IP or FG, due to limited tests?

**Step 3: Add notes to support answers**

You need to record your thinking process so that you can support the answers.

**Step 4: Advance to the vulnerability assessment screen**

**Step 5: Update the list of materials to only include at risk items (items which had a “yes” during pre-screening)**

**Step 6: Risk rating**

6.1 Rank each item in this category list according to perceived risks and the likelihood of occurrence (1 = very low/no risk, and 5 = high risk): fraud history, emerging concerns/geo-political considerations, economic factors, length & complexity of supply chain, ease of access, nature of the product, availability, physical form.

6.2 Consider the Likelihood of Detection on the following factors: ease of access, physical form, existing controls, length & complexity of supply chain, susceptibility of QA methods & specs, testing frequency, relevant audits.

6.3 Consider the following profitability factors on the following: economic factors & price fluctuations, ease of access, nature of product, availability/seasonality, complexity of committing food fraud, availability of cheaper substitutes, significance to raw material brand, and final product.
Step 7: Categorise

- Categorise the type of Food Fraud
- List the current and proposed control measures for each

Step 8: Advance to supplier risk assessment

Step 9: Update the list of materials only focusing on Medium and High-risk items

Step 10: Rank each supplier

Rank each supplier according to perceived risk (1 = very low/no risk, and 5 = high risk) for the following selected factors:
- % volume contribution
- % value contribution
- No of locations supplied
- Position in supply chain
- History of supplier
- Supplier certification status
- Relationship with supplier
- Rigorousness of supplier audits

Step 11: List the current and proposed control/mitigation measures per supplier

Control measures include: Information systems (e.g. traceability, mass balance) fraud monitoring and verifications systems, whistle blowing guidelines and protections, ethical codes of conduct, legal framework and enforcement social control chain network, contractual requirements, employee integrity screening, good supplier relationships.

Examples of mitigation measures that one could consider using

- EFFECTIVE SUPPLIER APPROVAL
- CONTROL AT SOURCE
- SEPARATION AND ISOLATION
- SUPERVISION
- FINAL PRODUCT TESTING
- CERTIFICATES OF ANALYSIS
Step 12: Generate the Food Fraud Summary Report

Here, you are reviewing the fraud fraud vulnerability assessment. Since the potential risks are always changing, the vulnerability assessment should be reviewed at least annually. According to the BRC standard, the following are possible triggers that would initiate an earlier review:

• New raw materials being considered for purchase.
• A change in the country of origin or the supplier of raw materials.
• A change in the financial situation of the raw materials supplier or country of origin.
• A change in the cost of raw materials, either upwards or downwards.
• A change in the supply chain, logistics and delivery of materials.
• A change in the availability of the material (e.g. due to seasonal demand shortages).
• Emergence of a new risk (e.g. publication of information relating to the adulteration of an ingredient).
• Developments in scientific information associated with ingredients, process or product.
• Information received as part of supplier approval or raw material risk assessment which highlights a new or evolving risk.

The Entecom food fraud vulnerability assessment tool is provided for FREE to all delegates who attend the Food Fraud Workshop.
The Food Fraud Vulnerability Assessment Tool is now included in TEMPO: the paperless Food Safety Management Software Solution.

Food Fraud Vulnerability Assessments can now be conducted in Tempo. This is based on the popular Entecom Food Fraud Tool which includes the following:

- Pre-screening of suppliers
- Raw material Vulnerability Assessment
- Supplier Vulnerability Assessment
- Classification of identified potential Food Fraud
- Recording of Mitigating Control Measures
Some of the features of VACCP on Tempo:

- Customised Supplier and Raw Material Lists: Give us your list of suppliers and raw materials and we will create your unique lists

- Scheduling: Let us know how often each supplier assessment needs to be conducted and we will schedule these for you, and send you a timely reminder

- Reports and Trends: Tempo has powerful reporting tools that allow you to find and trend the information you need on each supplier or raw material

- Evidential Documentation for Audit Purposes: Tempo is user-friendly, and any vulnerability assessment and control measures captured on Tempo - no matter how long ago - are easy to retrieve for any purpose... Especially convenient during an audit!

Take advantage of the Entecom/Tempo synergy that includes regular software updates based on user feedback and industry best practice.
We understand the demands of business within the food safety industry; our courses are designed to move with current problems - using innovative, practical and customised solutions that will create value for our customers.

Food Fraud is a serious matter. Equip yourself, your staff and future leaders in the food industry by attending our Food Fraud course and receiving our Entecom Food Fraud assessment tool for free.

Click [here](#) for our Food Fraud Training Brochure

View our comprehensive training calendar [here](#)

Contact us at info@entecom.co.za to learn more about our Food Fraud Software tool in Tempo. We are here for you!
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