

**HACCP, VACCP and TACCP- Where is
the food industry going with all these
control systems?**

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Objectives

- Introduce you to emerging concepts
- Assist you in developing TACCP and VACCP

Food Risk Matrix

Source: Adapted from: Spink (2006), The Counterfeit Food and Beverage Threat, Association of Food and Drug Officials (AFDO), Annual Meeting 2006

Food Quality	Food Fraud	Motivation Economic gain
Food Safety	Food Defense	Harm Public Health, Economic or Terror
Un- intentional	Intentional	

Approach to Food Fraud Prevention



Food Safety

HACCP

Hazards

Prevention of
**unintentional /
accidental
adulteration**

- Science based
- Food borne illness

Food Defence

TACCP

Threats

Prevention of
**intentional
adulteration**

- Behaviourally or ideologically motivated

Food Fraud

VACCP

Vulnerabilities

Prevention of
**intentional
adulteration**

- Economically motivated

HACCP, VACCP & TACCP- Acronyms

- **HACCP** (Hazard Analysis Critical Control Point)
- **TACCP** (Threat Assessment Critical Control Point System), and/or
- **VACCP** (Vulnerability Assessment Critical Control Point System)

HACCP- Hazard Analysis Critical Control Point System

- Logical and scientific approach to food safety
- Procedures to prevent customer from food born illness
- Proactive rather than reactive
- Science based; risk based
- Step wise process:
 - Identifies hazards
 - Installs preventative measures to eliminate or reduce hazards in foods

Food Chain

- Crop Producers
- Feed Producers
- Primary Food Producers
- Food Manufacturers
- Secondary Food Manufacturers
- Wholesalers
- Retailers
- Consumers



TACCP

Threat Assessment Critical Control Point

TACCP- Threat Assessment Critical Control Point

TACCP aims to:

- Reduce the likelihood (chance) and consequence (impact) of a deliberate attack;
- Protect organizational reputation;
- Reassure customers and the public that proportionate steps are in place to protect food; and,
- Demonstrate that reasonable precautions are taken and due diligence is exercised in protecting food.

Types of Threats

- Economically Motivated Adulteration (EMA)
- Malicious Contamination
- Extortion
- Espionage
- Counterfeiting
- Cyber crime

Examples of Threat-Economically Motivated Adulteration (EMA)

- In 2013, a food factory in Asia was labelling cooking oil as peanut and olive when it contained none of these oils.
- A 2013 report suggested that one third of retail fish in the USA was mislabeled. Examples, tilapia sold as red snapper and tilefish sold as halibut.
- In 2010, some producers of buffalo mozzarella in Italy were accused of adulteration of their product with cow's milk.

Ref: <http://www.foodnavigator.asia.com/Markets/False-foodlabels-on-82-impure-oils-in-China>;

http://oceana.org/sites/default/files/National_Seafood_Fraud_Testing_Results_Highlights_FINAL.pdf.

Examples of Malicious contamination

- In 2005, a major British bakery reported that several customers had found glass fragments and sewing needles inside the wrapper of loaves.
- In 2013, a major soft drinks supplier was forced to withdraw product from a key market when it was sent a bottle which had had its contents replaced with mineral acid. The attackers included a note indicating that more would be distributed to the public if the company did not comply with their demands.

Examples of Extortion

- In 1990, a former police officer was convicted of extortion after contaminating baby food with glass and demanding money from the multi-national manufacturer.
- In 2008, a man was jailed in Britain after being convicted of threatening to bomb a major supermarket and contaminate its products.

Examples of Espionage

- One business consultancy uses the theft of the intellectual property of a fictitious innovative snack product as an example of commercial espionage.
- In July 2014, Reuters reported that a woman was charged in the USA with attempting to steal patented U.S. seed technology as part of a plot to smuggle types of specialized corn for use in China.

The TACCP Process

It is a 15 step process as indicated below.

1. Assess new information
2. Identify and assess threats to organization
3. Identify and assess threats to operation
4. Select product
5. Identify and assess threats to product
6. Devise flow chart of product supply chain
7. Identify key staff and vulnerability chain
8. Consider impacts of threats identified

The TACCP Process-contd.

9. Identify which supply points are more critical
10. Determine if control procedures would detect the threat
11. Likelihood Vs Impact = Priority
12. Identify who could carry out
13. Decide and implement necessary controls
14. Review and revise
15. Monitor horizon scans and emerging risks.

Assessment of Threats- Risk Assessment Scoring

Likelihood	Score	Impact
Very high chance	5	Catastrophic
High chance	4	Major
Some chance	3	Significant
May happen	2	Some
Unlikely to happen	1	Minor
Ref: PAS 96:2014		

Critical Controls- Access Control

	Access to premises/vehicles	Relevant Proportionate
1	Access to people on business only	
2	Vehicle parking outside perimeter	
3	Premises zoned to restrict access to those with a business need	
4	Visible and comprehensive perimeter fencing	
5	Perimeter alarm system	
6	CCTV monitoring/recording of perimeter vulnerabilities	
7	Monitored access points	
8	Scheduled deliveries	
9	Documentation checked before admittance	
10	Missed deliveries investigated	

Critical Controls- Access Control contd.

	Access to people/visitors/other aspects	Relevant Proportionate
11	Chip & PIN access control	
12	Changing facilities, separate personal clothing from work wear	
13	By appointment only	
14	Proof of identity required	
15	Accompanied throughout	
16	Positive identification of staff and visitors	
17	CCTV monitoring/recording of sensitive areas	
18	Limitations on access to mains services	
19	BS ISO/IEC 27000 compliant 1cyber security Ref: PAS 96:2014	

Critical Controls- Tamper detection

•	Detecting Tampering	Relevant Proportionate
	1	Numbered seals on bulk storage silos
	2	Numbered seals on stores of labels and labelled packs
	3	Effective seals on retail packs
	4	Numbered seals on hazardous materials
	5	Close stock control of key materials
	6	Recording of seal numbers on delivery vehicles
	7	Secure usernames and passwords for electronic access
	8	Incursion reporting by cyber systems
	Ref: PAS 96: 2014	

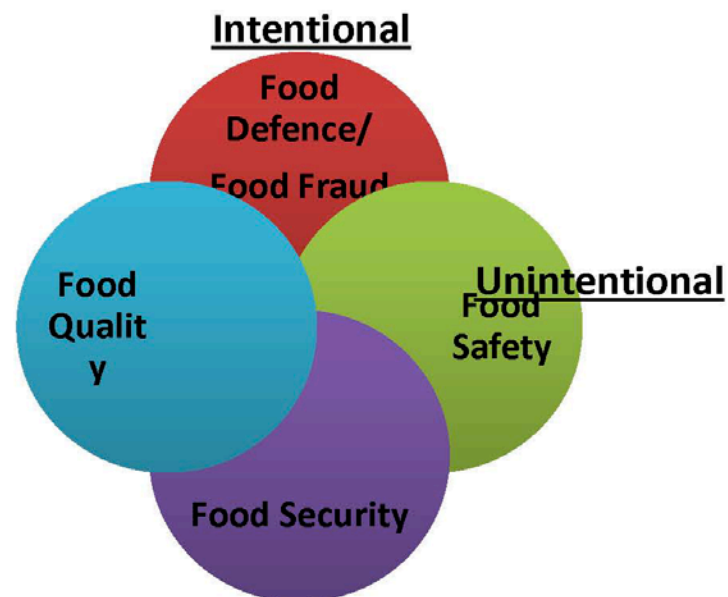
Critical Controls- Personnel Security

	Pre-employment check/on-going checks/End of contract arrangements	Relevant Proportionate
1	Proof of identity	
2	Proof of qualifications	
3	More sensitive roles identified with appropriate recruitment	
4	Staff in critical roles motivated and monitored	
5	Whistleblowing arrangements	
6	Temporary staff supervised	
7	Access and ID cards and keys recovered	
8	Computer accounts closed or suspended	
9	Termination interview assesses security implications	

Definitions for 'Glossary of Terms'

○ Food Fraud*

A collective term encompassing the deliberate and intentional substitution, addition, tampering or misrepresentation of food, food ingredients or food packaging, labelling, product information or false or misleading statements made about a product for economic gain that could impact consumer health.



○ Vulnerability

Susceptibility or exposure to a food fraud risk, which is regarded as a gap or deficiency that could place consumer health at risk if not addressed.

* Source: J. Spink & D.C. Moyer, (2011) *Journal of Food Science*, 76(9), 157-163

Terminology



Six Steps of Vulnerability Assessment (VA)

1. Conduct a risk analysis. Evaluate any significant risks and exposures.
2. Determine the critical points for controlling the security.
3. Determine procedures and technical means of verifying each critical point to control security.
4. Determine the corrective measures to be implemented when the surveillance reveals that a critical point for security control is no longer under control.
5. Apply verification procedures in order to confirm that the system is functioning effectively.
6. Build up a file which includes all procedures and reports concerning these provisions and their implementation.

VA and Economically Motivated Adulteration (EMA)

Questions which the TACCP team could ask include:

- Are low cost substitute materials available?
- Have there been significant material cost increases?
- Has pressure increased on suppliers' trading margins?
- Do you trust your suppliers' managers, and their suppliers' managers?
- Do key suppliers use personnel security practices?
- Do suppliers think that we monitor their operation and analyze their products?

VA and Economically Motivated Adulteration (EMA)-contd.

- Which suppliers are not routinely audited?
- Are we supplied through remote, obscure chains?
- Are major materials becoming less available (e.g. from crop failure) or alternatives plentiful (e.g. from overproduction)?
- Have there been unexpected increases or decreases in demand?
- Are we aware of shortcuts to the process which could affect us?
- Are accreditation records, certificates of conformance and analyzes reports independent



Q &A

Questions?