



Knowing your HACCP from your TACCP and VACCP

Using Food & Beverage Management Systems Effectively
to Deliver Safe Products

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A Leatherhead Food
Research white paper

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Knowing your HACCP from your TACCP and VACCP

In this white paper, Dr Peter Wareing and Professor Tony Hines talk you through the differences between HACCP, TACCP and VACCP. They explain why a firm understanding and deployment of these three food and beverage management systems is vital in forming a strong defence against food fraud and adulteration, and ensuring safe and authentic final products.

HACCP, TACCP and VACCP – the acronyms trip off the tongue easily, but do you actually know the differences between these three food and beverage management systems and why each is important?

What is HACCP?

Hazard Analysis and Critical Control Point (HACCP) is an internationally-recognised food safety management system that is an essential tool for ensuring that commercial food processors make a safe final product. It was devised originally by Pillsbury in the early 1960s to produce safe food for the space industry, upon request by NASA. Over time, it was taken up by the food industry, and standardised by The Codex Alimentarius Commission (CAC) into the system which is used today across the world. In the EU it is implemented by Commission Regulations 852/2004 and 853/2004.

HACCP, as a system, provides a means of identifying and assessing potential hazards in food production and establishing preventive control procedures for those hazards. The emphasis on prevention of hazards reduces

reliance on traditional inspection and end-product testing.

The HACCP concept can be applied to new or existing products and processes, and throughout the food chain from primary production to consumption. It is compatible with existing standards for quality management systems; for example, the International Standards Organisation have worked HACCP into the ISO 9000 series, to produce an integrated quality and safety standards, ISO 22000.

The 7 principles of HACCP

HACCP is a logical process that needs to be followed step by step in order for it to work properly. The HACCP system is made up of seven principles as described by Codex; they can be summarised as:

1. Hazard analysis
2. Determine Critical Control Points (CCPs)
3. Establish critical limits at CCPs
4. Monitor critical limits
5. Establish corrective actions when control at CCPs is lost

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6. Verify that the HACCP system is working effectively
 7. Document procedures and devise records appropriate to the process

Inappropriate uses of HACCP

HACCP is not designed to control issues related to quality or legal aspects within food manufacturing, but it is sometimes assumed that HACCP can be used to address these issues.

In recent years, a number of high profile cases of deliberate food contamination and food fraud have occurred, which HACCP was not designed to prevent. HACCP is only intended to prevent unintentional contamination. This is where TACCP and VACCP step in.

Following cases of deliberate food contamination, TACCP was developed to defend against intentional contamination. TACCP alone, however, left companies exposed to broader, *unidentified* risks in their supply chains as a result of intentional contamination. VACCP was therefore developed, and, alongside TACCP and HACCP, the three form a comprehensive set of management processes to ensure the consumer receives a safe and authentic final product.

Using TACCP and VACCP effectively

PAS 96 (2014), the Publicly Available Specification for the protection of food from intentional attack, outlines the following examples of the types of threats that can occur: economically motivated adulteration, malicious contamination, extortion, espionage, counterfeiting and cyber-crime. The common theme running through PAS 96 2014 is that

intentional contamination requires human intervention.

PAS 96 2014 invites food business operators (FBOs), both large and small, to assess any specific threats to their business from intentional contamination, either from rogue employees at one end of a spectrum to pressure groups, ideologically motivated individuals and terrorists at the other end. It recommends that FBOs assess their vulnerability to such an attack and specifically suggests that they 'know their people' - staff, contractors, cleaners and visitors. Notwithstanding advising a proportionate response, an existing HACCP team with the addition of Human Resource and site security representatives to manage 'physical site security and people' is essential.

TACCP, Threat Assessment Critical Control Point, is best defined as a management process to defend a food supply chain from intentional contamination.

The well documented 'horsemeat scandal' of 2013 (the contamination of beef with horsemeat) awakened the food industry to wholesale substitution, adulteration, dilution and concealment – food fraud for economic gain.

VACCP, Vulnerability Assessment Critical Control Point is best defined as a management process to defend a food supply chain from any form of dishonest conduct that impacts detrimentally on the quality or authenticity of food and drink.

FBO's are invited to 'think like criminals' and assess their supply chain vulnerabilities to economically motivated dilution, substitution or

concealment. At Leatherhead, we often describe VACCP as being:

"Horizon Scanning for 'clues' & 'actionable intelligence' relating to adulteration, substitution and supply chain integrity and suggest 'Thinking like a Criminal' and entering the mind-set of a criminal to identify opportunities for fraud and criminal activity."

A second and very valuable process is to identify non-HACCP vulnerabilities, for example: mislabelling or misdescription, varietal misdescription, incorrect country of origin labelling, adulteration, dilution, concealment, counterfeiting and unapproved enhancements.

The key to a successful VACCP assessment is identifying vulnerabilities based on historical and potential opportunities for dishonest activity and, once identified, to introduce mitigation strategies to ensure your exposure is reduced or eliminated.

Although many cases of contamination are economically motivated (food fraud), the ongoing concern is that there could be a food safety issue associated with the affected material. The 'horsemeat scandal' contamination of beef with horsemeat was essentially an economic incident. Consuming horsemeat raised ethical or social issues, but in this instance was not a safety issue; the next case of food fraud, however, could be.

The contamination of chilli powder with Sudan I, an illegal textile dye, for example, whilst economically motivated, became a food safety incident; Sudan dyes are toxic, regarded as potential carcinogens and not permitted for food use at any level within the Regulatory Framework.

Conclusions

HACCP, VACCP and TACCP form a veritable alphabet soup and whilst practices for HACCP are well defined, VACCP and TACCP are much more inter-related. Essentially, the three together help you ensure the safety of your products from both intentional and unintentional contamination.

Remember:

- **HACCP:** The critical controls to ensure safe food
- **TACCP:** Supply Chain and Physical Security of food supply chains, people and finished product
- **VACCP:** Horizon Scanning for 'clues' & 'actionable intelligence' relating to adulteration, substitution and supply chain integrity. Think like a criminal, enter the mind-set of a criminal to identify opportunities for fraud and criminal activity.

To summarise, HACCP focusses on protecting from the unintentional, whilst TACCP and VACCP focus on intentional contamination and preventing dishonest conduct. Using the three food and beverage management systems correctly and effectively will ensure you deliver a safe final product to your consumer.

How Leatherhead can help

Contact safety@leatherheadfood.com to discuss any of your food and beverage safety needs. We can help you with desk based and on-site risk assessments on any safety related issues. We are able to help you with advice and guidance with your HACCP, TACCP and VACCP assessments, either by documentation review, or on-site assessments. Our On-site Food Defence Training is very popular and can incorporate all aspects of TACCP, VACCP and Incident Management training. We can also help you to troubleshoot microbiological problems.

Current training courses at Leatherhead include:

Caveat Emptor - Beware of Food Fraud!

18th October 2016 at Great Burgh

A practical workshop that gives you the tools and techniques to identify, prioritise and manage supply chain food authenticity risks – Food and Drink Federation (FDF) 5 step process, concepts of TACCP and online industry scanning tools.

Food Defence and Incident Management: Developing a Food Defence Plan

17th November 2016 at Great Burgh

A seminar to help you minimise the risk of possible tampering or contamination and look at the protection of your produce, processes, people, buildings and brands from intentional harm.

About the authors

Dr Peter Wareing is a Food Safety and Manufacturing Consultant at Leatherhead. He obtained his B.Sc. in Agricultural Science from the University of Leeds, and a Ph.D. in Plant Pathology from the University of Hull. Before he joined Leatherhead Food Research in 2001, he worked for the Natural Resources Institute undertaking development work on food processing and food security projects in Central and South America, Africa and South East Asia. Peter has many years' experience working in microbiological research, development and training. His specialist areas are food safety systems including HACCP, microbiology and mycology, and he is particularly interested in confectionery and snack foods, sauces and dressings, soft drinks and dried foods. At Leatherhead, Peter undertakes troubleshooting audits and investigations for clients, is an expert witness and delivers food safety-related sessions on training courses.

Professor Tony Hines, MBE, FIFST, is the Director of Global Regulatory Services and Crisis Management at Leatherhead Food Research. Tony has been involved in incident management for over 25 years. He has extensive experience of food fraud and crisis management, dealing with serious, accidental and malicious food contamination issues. He is a trustee and former chairman of the Anaphylaxis Campaign.

About Leatherhead Food Research

Leatherhead Food Research provides expertise and support to the global food and drink sector with practical solutions that cover all stages of a product's life cycle from consumer insight, ingredient innovation and sensory testing to food safety consultancy and global regulatory advice. Leatherhead operates a membership programme which represents a who's who of the global food and drinks industry. Supporting all members and clients, large or small, Leatherhead provides consultancy and advice, as well as training, market news, published reports and bespoke projects. Alongside the Member support and project work, our world-renowned experts deliver cutting-edge research in areas that drive long term commercial benefit for the food and drink industry. Leatherhead Food Research is a trading name of Leatherhead Research Ltd, a Science Group Company.

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Founded in 1986, Science Group was one of the founding companies to form the globally recognised Cambridge, UK high technology and engineering cluster. Today Science Group has two dedicated, UK-based R&D innovation centres in Cambridge and Epsom, and additional offices in London, Boston, Houston and Dubai.

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