

Accelerating HACCP Certification Using Food Microbiology



A brief introduction to HACCP

HACCP, or Hazard Analysis Critical Control Point, was first developed in the United States during the late 1960s. NASA (National Aeronautics and Space Administration) partnered with the United States Army Laboratories and The Pillsbury Company to develop a food safety management system for space missions. The foundational Critical Control Points (CCP) guidelines were based off a similar system used to engineer and test weapons by identifying and eliminating potential system failures or areas of risk. Following NASA's success, HACCP systems have had a positive impact on various food industries, such as manufacturing, agriculture, seafood, retail, and much more. This article will briefly cover the definition and purpose of HACCP, as well as the benefits of this food safety management system to food businesses in Japan and other APAC countries.

The benefits of being HACCP certified

With the rise of global trade and tourism, government agencies around the world are working toward an integrated approach to food safety management systems. Internationally recognized food safety certifications such as HACCP ensure:

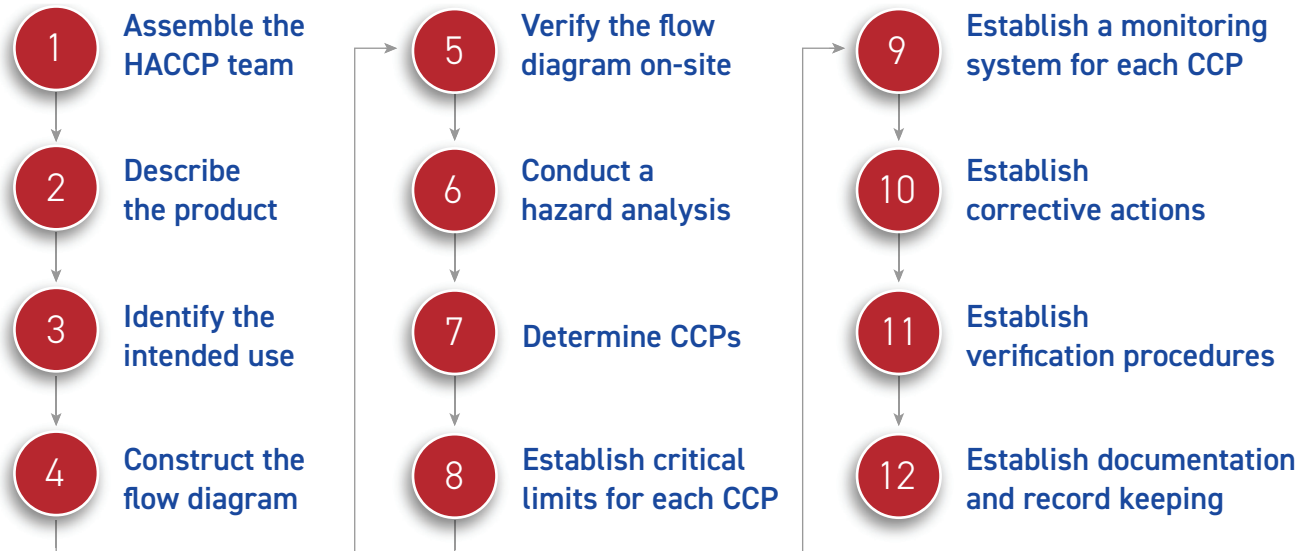
- A systematic approach to compliance from farm to fork
- An increase in operational effectiveness
- A considerable reduction in food wastage, due to better inventory management
- The prevention of food poisoning incidents and food borne diseases
- An increase in quality and customer satisfaction
- Bottom line protection

Countries like Australia and New Zealand are some of the pioneers in food safety management and have robust international standards in place. The food safety standards implemented by Australia have been customized to fit not only small home-based businesses, but also large manufacturing plants.

In Japan, more food businesses are now required to obtain HACCP certification as a result of revisions introduced by the country's Food Sanitation Law in 2018.

A brief overview of the 12 Steps of HACCP

The Food and Agriculture Organization of the United Nations ([FAO](#)), outlines the 12 steps of HACCP:



Food microbiology and HACCP

Food microbiology is a great tool to support the development and maintenance of a HACCP plan. Microbiological testing helps determine possible contamination routes and measures to prevent them. Microbiologists play an important role within the HACCP team as they are able to assess potential hazards, their severity, and the likelihood of occurrences. For example, food microbiologists can provide great insights on available water, time or temperature requirements, pH levels, and other parameters that influence the growth of microbial contaminants. It is [estimated](#) that the global food safety testing market will be valued at over \$21 billion by 2024.

Using food microbiology as a verification tool

The effectiveness of cleaning and sanitation programs can be monitored by using food microbiology as a tool. For example, surface swabs of cutting boards following a cleaning and disinfection cycle can help determine whether the sanitation program in place is satisfactory. Investing in the right technology is important to achieve this. Cooled incubators offer precision-based incubation environments for culturing colonies by modifying the temperature, humidity, and lighting conditions. This is also a great tool to utilize for shelf-life validation procedures. Other devices that are worth considering when it comes to investing in the right





type of laboratory equipment are pH meters, moisture analyzers, refractometers, thermometers, laminar airflows, autoclaves, and colony counters. Investing in this life science equipment is feasible only if in-house microbiology testing is an available resource to the organization. Most food businesses rely on third-party food testing services to verify their preventive and control measures in place are effective.

Using microbiological data in HACCP

Food microbiological data can be used to make various critical decisions such as choosing the right suppliers prior to purchasing raw materials. Supplier inspection reports and food testing data will provide insights into the effectiveness of their food safety management

systems. Food microbiological reports also highlight what corrective actions were taken when a deviation from the set standard was identified. For example, a higher count of *Staphylococcus aureus* indicates the food handler probably did not wash their hands thoroughly. On the other hand, potential buyers, vendors, or clients may require your organization to maintain a HACCP certification in order to do business with them. Though it is not uncommon for importers and exporters to be certified, more food businesses like farms are realizing the benefits of being HACCP certified and are opting for it as well. By integrating laboratory testing techniques with automated reporting and data management, it is easier to retrieve information in a more efficient and speedy fashion.

Conclusion

Japan is on the path to helping its local food businesses gain international recognition. Gaining a HACCP certification is certainly key to achieving that goal. While different countries within the APAC region maintain and follow different food safety standards, HACCP remains a global system. More countries are now implementing technology-based systems (such as Singapore). Food microbiology can help leverage HACCP certifications by using an evidence-based and scientific approach. Food microbiologists and lab technicians certainly serve as valuable members of the HACCP team. By investing in the right type of laboratory equipment, it is possible to verify and validate the existing food safety management system, and the preventive and control measures in place.