Food and Agriculture Organization
of the United Nations

# INTRODUCTION TO HAZARD ANALYSIS AND CRITICAL CONTROL POINT (HACCP)

FAO Good Hygiene Practices (GHP) and
Hazard Analysis and Critical Control Point
(HACCP) Toolbox for Food Safety

# INTRODUCTION TO HAZARD ANALYSIS AND CRITICAL CONTROL POINT (HACCP)

FAO Good Hygiene Practices (GHP) and
Hazard Analysis and Critical Control Point
(HACCP) Toolbox for Food Safety

Food and Agriculture Organization of the United Nations
Rome, 2023

Required citation:

FAO. 2023. *Introduction to Hazard Analysis and Critical Control Point (HACCP).* FAO Good Hygiene Practices (GHP) and Hazard Analysis and Critical Control Point (HACCP) Toolbox for Food Safety. Rome. https://doi.org/10.4060/cc6246en

## CONTENTS

**Technical note for readers**

This PDF file has been designed for use of handheld mobile devices in horizontal view.

This PDF file includes interactive options and links to better browse the document. Clicking on the title icon on the top right corner of each page will bring you either the Content page or the Mind map within the PDF file.

# CONTEXT

This guidance document is part of a toolbox of materials and has been developed to provide users with a good understanding of food safety management practices, including HACCP systems, based on the Codex General Principles of Food Hygiene (CXC 1-1969).

**Hazard analysis critical control points (HACCP)** is an important part of food safety management. It is a globally recognized, systematic and science-based approach to food safety that addresses biological, chemical and physical hazards throughout the food chain from primary production to final consumption. The HACCP approach focuses on control measures for significant hazards rather than relying only on end-product inspection and testing. A food business should only implement HACCP once it has established solid prerequisite programmes of food safety management, such as good hygiene practices (GHP).

Implementing HACCP may be challenging for some businesses. However, HACCP principles can be applied with flexibility in individual operations, and businesses may use external resources or adapt a generic HACCP plan to their specific circumstances.

**INTRODUCTION TO HAZARD ANALYSIS AND CRITICAL CONTROL POINT (HACCP)**

# CONTEXT

## Learning objectives

This document provides guidance on how to:

- become familiar with the HACCP approach, definitions, 7 principles and 12 steps to implementing HACCP;
- understand the importance of management commitment and an effective GHP programme as foundations for successfully implementing HACCP; and
- understand the benefits and advantages, while recognizing the challenges, of implementing HACCP for some businesses, especially for small and less developed businesses (SLDBs).

# CONTEXT

## Codex definitions:

**Competent authority:** The government authority or official body authorized by the government that is responsible for the setting of regulatory food safety requirements and/or for the organization of official controls including enforcement.

**Food business operator (FBO):** The entity responsible for operating a business at any step in the food chain.

**Food safety:** Assurance that food will not cause adverse health effects to the consumer when it is prepared and/or eaten according to its intended use.

**HACCP system:** The development of a HACCP plan and the implementation of the procedures in accordance with that plan.

**HACCP plan:** Documentation or set of documents, prepared in accordance with the principles of HACCP to ensure control of significant hazards in the food business.

**Prerequisite programme:** Programmes including Good Hygiene Practices, Good Agricultural Practices and Good Manufacturing Practices, as well as other practices and procedures such as training and traceability, that establish the basic environmental and operating conditions that set the foundation for implementation of a HACCP system.

**Good Hygiene Practices (GHP):** Fundamental measures and conditions applied at any step within the food chain to provide safe and suitable food.

# GENERAL GUIDELINES

HACCP is a management tool for ensuring food safety. It is based on prevention – identifying possible hazards before they occur and defining control measures to maximize food safety at every step of the food production and handling processes.

## Some of the main characteristics of HACCP are the following:

- HACCP is a preventive tool that allows food businesses to develop systematic controls of hazards beyond the control achieved through GHP.

- As an internationally recognized tool for controlling food operations, HACCP is promoted by national and regional authorities.

- Food businesses should only implement HACCP once prerequisite or GHP programmes are in place. By adopting HACCP, businesses will be able to further improve their control of hazards and, thus, considerably enhance their confidence in the safety of their final products.

- HACCP has a long track record of successful application in the food industry. In addition, it can be applied throughout the food chain, beginning with primary production.

**cont.**

# GENERAL GUIDELINES

- By implementing a HACCP system, food businesses can identify any changes needed in processing parameters, processing steps, manufacturing technology, end product characteristics, distribution methods, intended use and GHP applied.

- Any HACCP system should be capable of accommodating change, such as advances in equipment design and processing procedures or technological developments.

- The HACCP system has a very structured design and an internationally understood approach and language. This facilitates communication across different processes so that audits follow a standardized procedure based on HACCP plans. As such, communication between food businesses and inspectors or auditors is straightforward, creating opportunities to learn from each other about hazard control.

# GENERAL GUIDELINES

## Advantages of HACCP

The HACCP system reduces cases of food-borne disease, enhances food safety and provides clear benefits to food businesses such as:

- increasing the efficiency of food production and handling processes by means of a thorough analysis of operations;
- using food safety resources more effectively by focusing on critical areas and reducing expensive and time-consuming end-product inspection and testing;
- reducing recalls by identifying problems before products are released (through an emphasis on prevention), leading to more efficient systems of food safety management;
- reducing the costs of small and less developed businesses (SLDBs) in the medium and long term, through more efficient use of staff, provision of adequate documentation and reduced waste;
- providing a basis for defence against litigation and, potentially reducing insurance costs;
- improving the competitiveness of HACCP-compliant companies on national and international markets;
- facilitating inspection processes by regulatory authorities through documented procedures and monitoring records;
- promoting trade by increasing confidence in food safety; and
- facilitating international trade by promoting science-based targets.

# GENERAL GUIDELINES

## HACCP is an important part of food safety management

HACCP completes any food safety management system by providing an approach that is:

- systematic
- science-based
- applicable throughout the food chain

The HACCP system and the guidelines for its application are part of the Codex General Principles of Food Hygiene (CXC 1-1969).

# GENERAL GUIDELINES

## HACCP requires senior management commitment

Successful HACCP implementation requires the commitment and involvement of both senior management and staff. Collecting all relevant information, documenting it and conducting a hazard analysis can best be completed with the involvement of personnel with different expertise and from different departments. Management should support such an approach and provide adequate resources, such as:

- HACCP training sessions
- personnel assigned to the task of developing the HACCP system
- time, during working hours, allotted to developing the HACCP system
- permission for personnel to participate in HACCP meetings

# APPLICATION OF HACCP

## The seven principles of HACCP

HACCP is flexible and can be implemented in establishments of any size, from the smallest to the largest, by applying the seven HACCP principles. These are:

**Principle 1:** Conduct a hazard analysis and identify control measures.

**Principle 2:** Determine the Critical Control Points (CCPs).

**Principle 3:** Establish validated critical limits.

**Principle 4:** Establish a system to monitor control of CCPs.

**Principle 5:** Establish the corrective actions to be taken when monitoring indicates a deviation from a critical limit at a CCP has occurred.

**Principle 6:** Validate the HACCP plan and then establish procedures for verification to confirm that the HACCP system is working as intended.

**Principle 7:** Establish documentation concerning all procedures and records appropriate to these principles and their application.

# APPLICATION OF HACCP

## 12-Steps for the application of HACCP

**1** Assemble the HACCP team and identify the scope.

**2** Describe product.

**3** Identify intended use and users.

**4** Construct flow diagram.

**5** On-site confirmation of flow diagram.

**6** List all potential hazards that are likely to occur and associated with each step, conduct a hazard analysis to identify the significant hazards, and consider any measures to control identified hazards (Principle 1).

**7** Determine Critical Control Points (CCP) (Principle 2).

**8** Establish validated critical limits for each CCP (Principle 3).

**9** Establish a monitoring system for each CCP (Principle 4).

**10** Establish corrective actions (Principle 5).

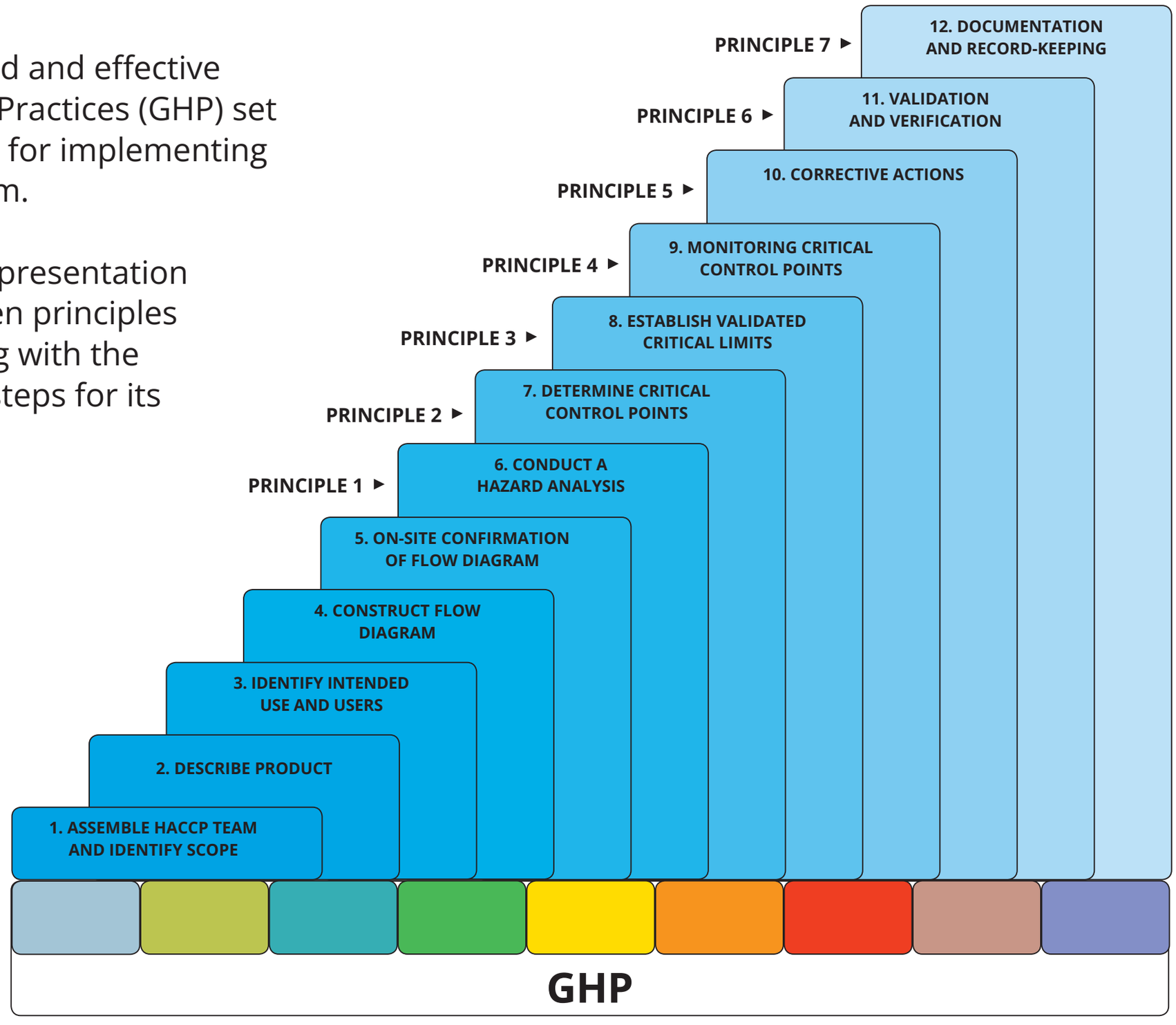
**11** Validation of the HACCP Plan and Verification Procedures (Principle 6).

**12** Establish documents and record-keeping (Principle 7).

# APPLICATION OF HACCP

Well established and effective Good Hygiene Practices (GHP) set the foundation for implementing a HACCP system.

This graphic representation shows the seven principles of HACCP along with the 12 successive steps for its application.



# APPLICATION OF HACCP

## Prerequisite programmes

Before applying HACCP principles, food businesses should have well-established prerequisite programmes, including GHP, to ensure basic environmental and operational conditions.

**These prerequisite programmes, if implemented effectively, will provide a foundation and facilitate the successful application and implementation of the HACCP system.** HACCP application will not be effective without prior implementation of prerequisite programmes.

The lack or inadequate implementation of prerequisite programmes may lead to more complex HACCP plans, with a greater number of Critical Control Points (CCPs) to be monitored due to the inclusion of hygiene aspects. More CCPs means increased difficulty in managing the plan, which may reduce its efficacy in ensuring food safety.

# APPLICATION OF HACCP

## Developing a preventive approach to food safety

Food producers must be confident about the safety of each product that leaves their production site. While a reactive system of end-product testing cannot provide such assurance, the application of HACCP provides an enhanced level of systematic controls that can provide reliable assurance of the safety of end products. The HACCP system involves:

- focusing on the control of specific hazards at CCPs; and
- applying targeted, proactive interventions before and during food production or handling processes at CCPs to control any risks.

# APPLICATION OF HACCP

## Facilitating HACCP implementation

Depending on the circumstances and capabilities of the food business, some resources can facilitate HACCP implementation. Additionally, in some cases, a more flexible approach to the application of HACCP may be needed and might be accepted by competent authorities.

Food businesses further can contract external consultants to support their HACCP implementation or consult generic HACCP plans. However, it should be noted that generic plans have to be adapted to individual operations. (These plans are often available through competent authorities, academia and industry and trade associations.)

The following external resources can facilitate HACCP implementation:

- Agrifood sector businesses involved in all stages of the supply chain and involved in continuous problem solving and prevention (rather than relying solely on periodic facility inspections by regulatory agencies).

- Government authorities provide appropriate legislation and policies that promote and enhance the adoption and implementation of HACCP principles.

- Academia, including training and research institutions provide science-based data, train HACCP experts and support businesses in their implementation of HACCP systems.

# APPLICATION OF HACCP

## HACCP implementation offers some flexibility for small and less developed bussiness (SLBDs) with limited resources:

- HACCP-based systems can be developed which are consistent with the seven HACCP principles but do not apply all the steps of the HACCP system.

- HACCP-based systems that involve recording only the monitoring results that show a deviation, rather than recording all monitoring results, thus reducing unnecessary record-keeping.

Such flexible systems should be designed considering the nature of the food operation, including human and financial resources, infrastructure, processes, knowledge and practical constraints, as well as risks associated with the food produced. These adaptations must not negatively impact the efficacy of the HACCP system nor endanger food safety.

# APPLICATION OF HACCP

## Challenges and benefits in HACCP implementation

Small and less developed businesses (SLDBs) might require support. In many countries a large share of the food sector comprises businesses that encounter difficulties in implementing HACCP because of their small size, lack of technical expertise and economic resources, or due to the nature of their work. These businesses are referred to as a small and less developed businesses (SLDBs).

SLDBs supply their products to both exporting businesses and local markets. Therefore, for both economic and public health reasons, governments and larger companies have an interest in helping SLDBs to adopt internationally recognised food safety management systems that comply with the Codex General Principles of Food Hygiene.

# APPLICATION OF HACCP

## Understanding the obstacles to applying HACCP

Despite its many benefits HACCP is still mostly applied in large companies.

In SDLBs, HACCP is less widespread due to:

- the cost of infrastructure and of upgrading facilities;
- lack of recognition that HACCP is a means to increase efficiency in controlling food safety;
- the very limited resources of small companies;
- the lack of valid data in certain food industries for developing sound HACCP models;
- limited experience with HACCP in certain sectors; and
- the lack of guidance material to help industries take the first steps towards developing a HACCP model.

# APPLICATION OF HACCP

## Support is available for helping SLDBs adopt HAACP

Different approaches to addressing the barriers SLDBs face in their attempts to implement HACCP are being tried and tested around the world. A number of strategic activities to facilitate HACCP implementation by SLDBs include overall support activities (such as financial support, guidance materials and training) and adapted regulatory requirements that allow for flexible, HACCP-based approaches to food safety management. This allows SLDBs to develop systems that fit their requirements and resources.

See **Further reading** for additional information on HACCP and the implementation of a HACCP system.

# THE HISTORY OF HACCP

## HACCP origins

- The HACCP concept originated in the 1960s, when the Pillsbury Company, NASA and the US Army developed a system to ensure the microbiological safety of foods for space travel.
- Over the next 50 years, the food industry increasingly adopted HACCP, recognizing its usefulness for moving away from end-product testing to a proactive, preventive food safety control system.
- Motivated to improve food safety, many large trading blocs now require national and exporting food businesses to have in place food management systems that apply HACCP principles.
- Over the years, governments and food businesses have gained a wealth of experience in the application of GHP/HACCP and many lessons have been learned.

# THE HISTORY OF HACCP

## Main HACCP milestones

- **1971:** The HACCP concept is publicly presented at the National Conference on Food Protection.
- **1972:** For the first time, HACCP is used to educate other food facilities in the industry, through a course entitled, Food Safety through the Hazard Analysis and Critical Control Point System – a training programme for inspectors of the Food and Drug Administration (FDA) of the United States of America for inspecting canned foods.
- **1974:** The FDA applies HACCP principles in promulgating low-acid canned foods to eliminate incidences of botulism.
- **1980s:** The HACCP approach is adopted by major food companies.
- **1991:** The National Advisory Committee on Microbiological Criteria for Foods of the United States Department of Agriculture (USDA) publishes a report setting forth the basic principles of the system as they are known today.
- **1993:** Guidelines for applying HACCP are adopted by the 20th session of the Codex Alimentarius Commission.
- **2003:** FAO and WHO are appointed to develop HACCP guidelines for SLDBs, highlighting potential obstacles and approaches to overcome them.
- **2020:** The Codex General Principles of Food Hygiene are revised and HACCP is included as an integral part of the text.

# THE HISTORY OF HACCP

## Current status of HACCP

Today, the use of systematic approaches of food hazard control, such as HACCP in combination with strong GHP, is considered to be the most effective and efficient way to ensure food safety. Many countries have recognized the necessity of such proactive, science-based food regulatory systems to reduce the risk of food-borne illness. The process-oriented food business sector, in particular, has made the greatest progress in HACCP adoption.

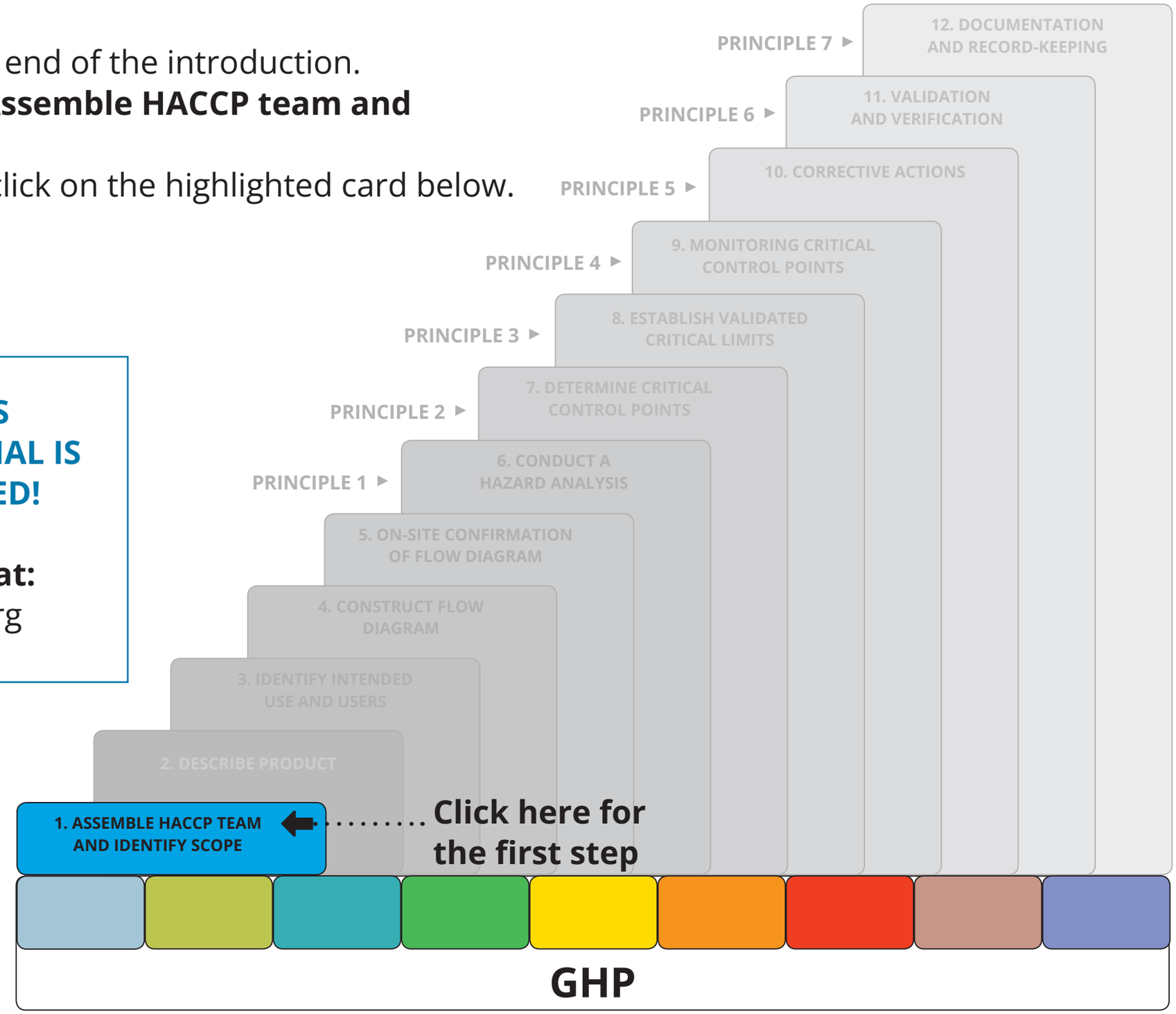
Despite the global recognition of the usefulness of HACCP, SLDBs continue to face considerable obstacles to develop fully documented HACCP system. Competent authorities acknowledge this, and flexible approaches to the implementation of HACCP are available and encouraged.

# KEEP READING

You have reached the end of the introduction.
The first step will be **Assemble HACCP team and identify scope**.
To continue reading, click on the highlighted card below.

**FEEDBACK ON THIS GUIDANCE MATERIAL IS ALWAYS WELCOMED!**

**Please contact us at:**
food-quality@fao.org



## KEEP READING

GHP and HACCP Toolbox for Food Safety
www.fao.org/good-hygiene-practices-haccp-toolbox

FOOD SYSTEMS AND FOOD SAFETY –
ECONOMIC AND SOCIAL DEVELOPMENT
www.fao.org/food-safety

**FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS**
ROME, ITALY

CC6246EN/1/06.23