Hazard Analysis Critical Control Point (HACCP) and International Organization for Standardization (ISO)

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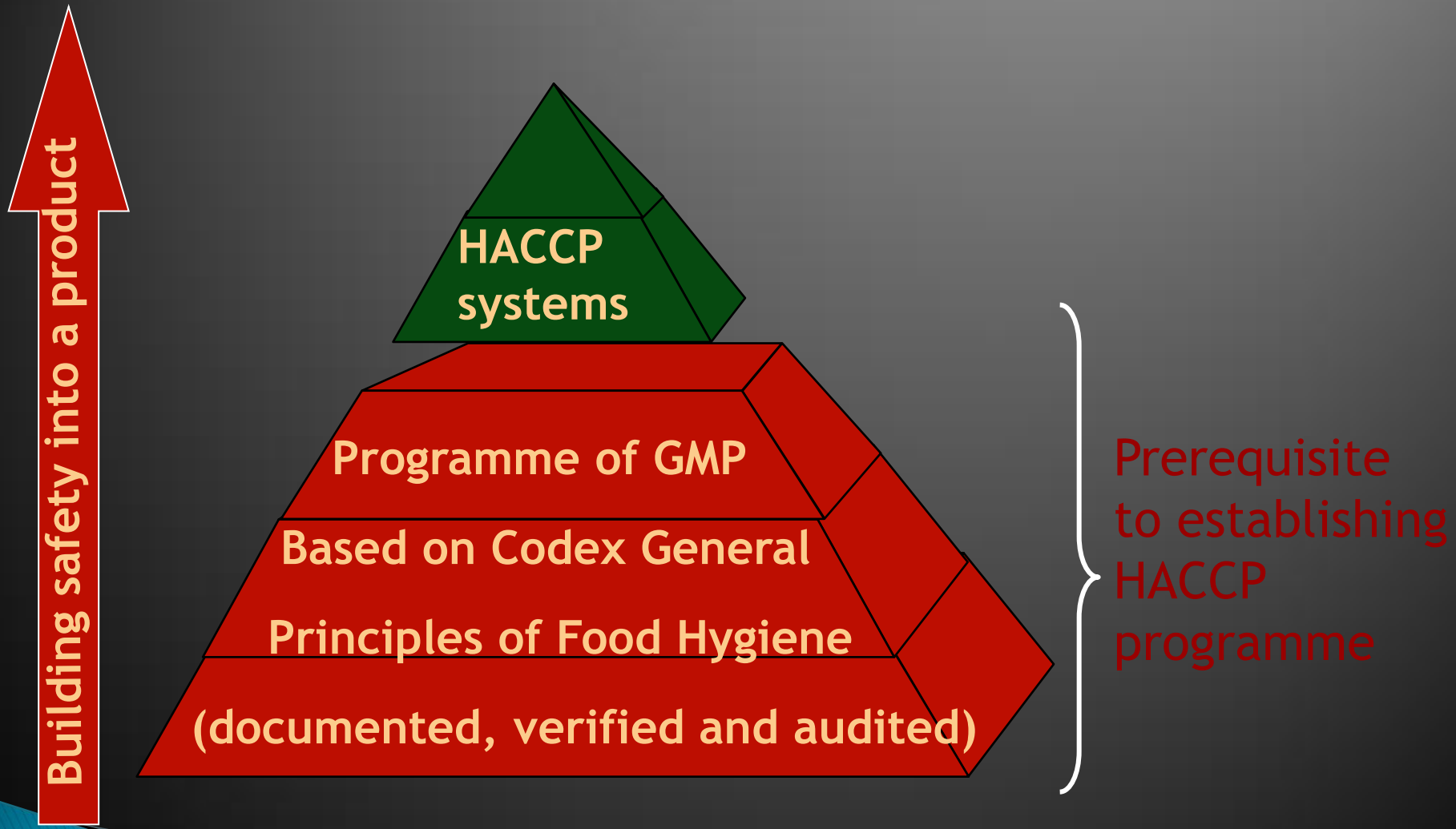
Hazard Analysis Critical Control Point (HACCP)

HACCP – Answers 3 questions

Hazard
Analysis
Critical
Control
Point

- **WHAT** hazards can enter the product?
- **Where** do these hazards occur?
- **How** can we control or eliminate these hazards?

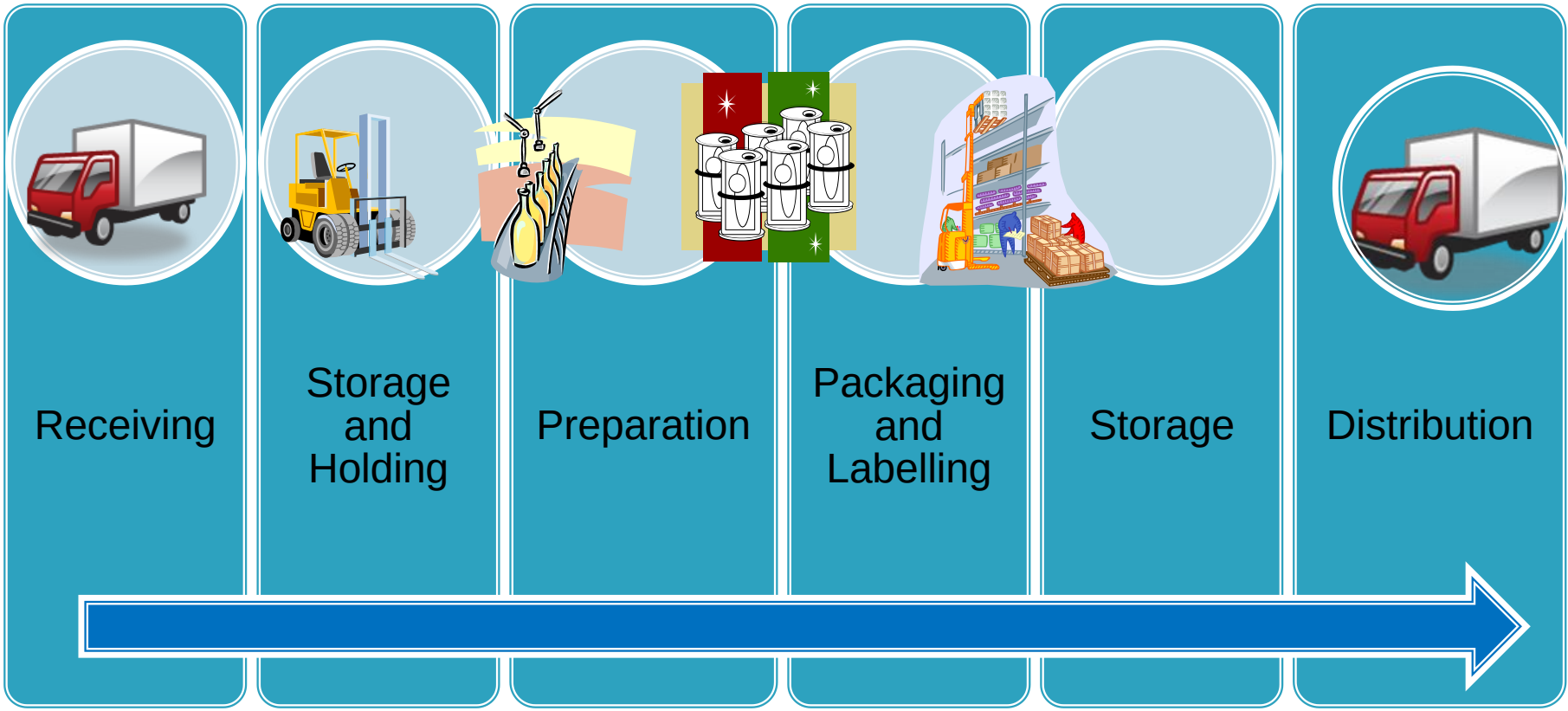
HACCP SYSTEM



HACCP

- Science based
- Step wise process:
  - Identifies hazards
  - Installs preventative measures to eliminate or reduce hazards in foods
- Proactive rather than reactive
- Risk based
- Starts from the beginning of the process
  - Receiving of ingredients, packaging
- through process steps
- to final product and shipping

Define the processing steps

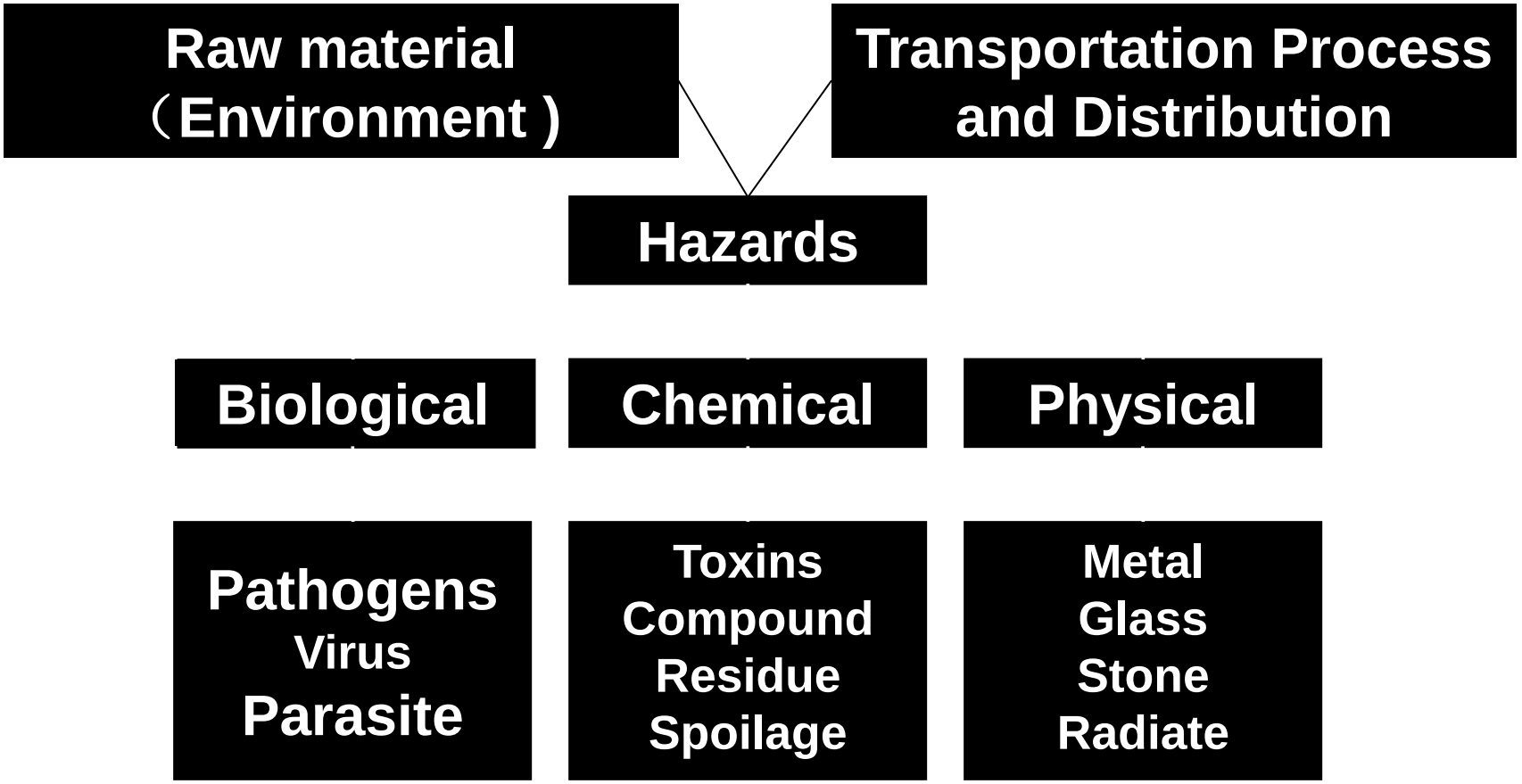


Hazard

A hazard is a biological, chemical or physical agent that is reasonably likely to cause illness or injury in the absence of its control.

In HACCP, hazards refer to the conditions or contaminants in foods that can cause illness or injury.

Food Safety Hazards



Critical Control Point (CCP)

A Critical Control Point (CCP) is an identifiable point in the production chain where a hazard may occur.

Action is taken to prevent the hazard from occurring.

This can either be a point, step or procedure at which control can be applied and is essential to prevent or eliminate a hazard or reduce it to an acceptable level.

A CCP can be used to control more than one hazard – refrigeration storage CCP.
Alternatively, several CCPs may be needed to control one hazard.

Critical Control Point (CCP)

Points may be identified as CCP when hazards can be prevented, for example:

- introduction of chemical residue can be prevented by control at the receiving stage;
- a chemical hazard can be prevented by control at the formulation or ingredient-addition stage;
- pathogenic bacteria growth can be controlled by refrigerated storage or chilling.

Critical Control Point (CCP)

CCP may be identified where hazards can be eliminated, for example:

- pathogenic bacteria can be killed during cooking;
- metal fragments can be detected by a metal detector and eliminated by removing the contaminated product from the processing line;
- parasites can be killed by freezing.

Monitoring

CCP – Monitoring : To conduct a planned sequence of observations or measurements to assess whether a CCP is under control

Purposes of Monitoring

- Facilitates tracking of the operation
- Indicates when there is a loss of control and a deviation occurs
- Provides written documentation for use in verification

Suitable Monitoring

- Visual observations
- Temperature
- Time
- pH
- Moisture level
- Salt
- Water activity

Sequence of 12 Steps

1. Assemble HACCP team
2. Describe product
3. Identity intended use
4. Construct process flow and plant schematic
5. On site verification of flow and schematic
6. List hazards associated with each process step (principle #1)

Sequence of 12 steps

7. Apply HACCP decision tree to determine CCP's (Principle #2)
8. Establish critical limits (Principle #3)
9. Establish monitoring procedures (Principle #4)
10. Establish deviation procedures (Principle #5)
11. Establish verification procedures (Principle #6)
12. Establish record keeping/documentation for principles 1 – 6 (Principle #7)

1. Assemble the HACCP Team

People chosen that have expertise in different areas:

- Production
- Shipping
- Quality Assurance
- Sanitation
- Maintenance
- Sales

2. Describe the product

- Describe the product giving detail of its composition, physical/chemical structure, packaging, safety information, processing treatments, storage and method of distribution:
  - Product Name
  - Composition
  - End Product Characteristics
  - Method of Preservation
  - Packaging – Primary
  - Packaging – Shipping
  - Storage Conditions
  - Distribution Method
  - Shelf Life
  - Special Labeling
  - Customer Preparation

3. Identify the intended use

- Identify the intended use of the product, its target consumer with reference to sensitive population
- Five sensitive groups in the population
  - Elderly
  - Infants
  - Pregnant
  - Sick; and
  - Immunocompromised

4. Construct a process flow diagram

- Details of all process activities including inspections, transportation, storage and delays in the process
- Inputs into the process in terms of raw materials, packaging, water and chemicals
- Output from the process e.g. waste – packaging, raw materials, product-in-progress, rework and rejected products.

5. On site verification of the process flow diagram

- It should be done by all members of the HACCP team during all stages and hours of operation.

- Validate process flow diagram
  - By HACCP Team
  - Observe process flow
  - Sample activities
  - Interviews
  - Routine / non routine operations

7 principles of HACCP implementation

- Hazard analysis
- Determine the Critical Control Points (CCP)
- Establish critical limits
- Critical Control Point (CCP) monitoring
- Corrective actions
- Establish verification procedures
- Record keeping procedures

1. Hazard analysis

The first step involves identifying any hazards that must be prevented, eliminated or reduced to acceptable levels.

All potential hazards, from the receipt of raw materials through to release of the finished product, must be considered.

A hazard must be controlled if it is likely to occur, and/or likely to result in an unacceptable risk to consumers.

2. Determine the Critical Control Point (CCP)

Identifying the Critical Control Point (CCP) at the steps or at which control is essential to prevent or eliminate a hazard or to reduce it to acceptable levels.

3. Establish critical limits

A critical limit is a maximum or minimum value to which a biological, chemical or physical limit must be controlled at a CCP.

This is set in order to prevent, eliminate or reduce a hazard to an acceptable level.

4. Critical Control Point (CCP) monitoring

A planned series of observations or measurements need to be taken to assess whether a CCP is within critical limits.

This also helps to produce an accurate record for future use in verification.

5. Corrective actions

Corrective actions, are procedures to be followed when a hazard is identified in the food production.

The aim is to correct and eliminate the cause of the hazard and bring CCP back under control.

The cause of problem must be identified to prevent future recurrence.

Establishing corrective actions when monitoring procedures at CCP is not under control.

5. Corrective actions

Some examples of corrective actions can include:

- isolating and holding product for safety evaluation;
- diverting the affected product or ingredients to another line where deviation would not be considered critical;
- reprocessing;
- destroying the product.

6. Verification procedures

Verification procedures are those activities, other than monitoring CCPs, that verify the HACCP plan and show the system is operating according to the plan.

This is usually completed annually or when a system fails or there is a significant change in the product or process.

Establishing procedures, which shall be carried out regularly to verify that the measure outlines in the above paragraphs.

7. Record keeping procedures

Documentation and record keeping help to demonstrate the effective implementation of the previous principles of HACCP.

This records could be of the development of the HACCP plan, CCP monitoring, corrective actions or verification activities.

7. Record keeping procedures

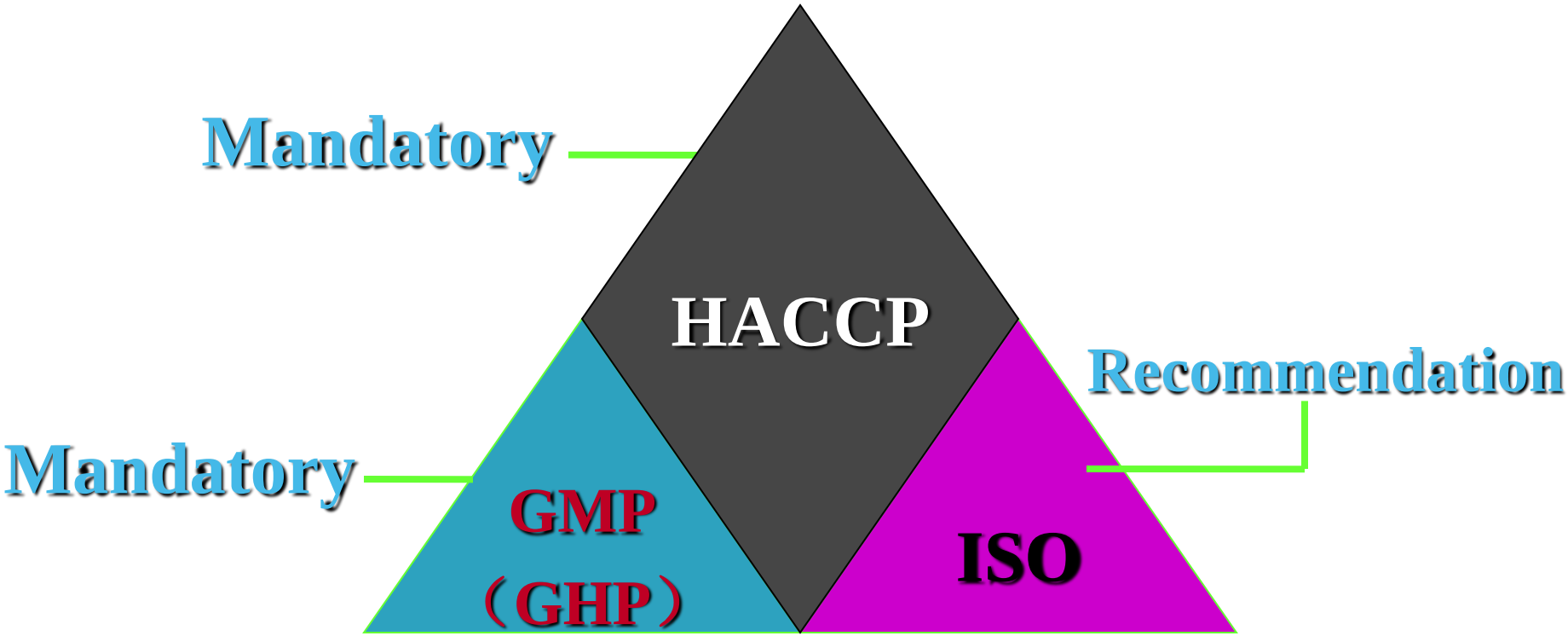
Four different types of HACCP records include:

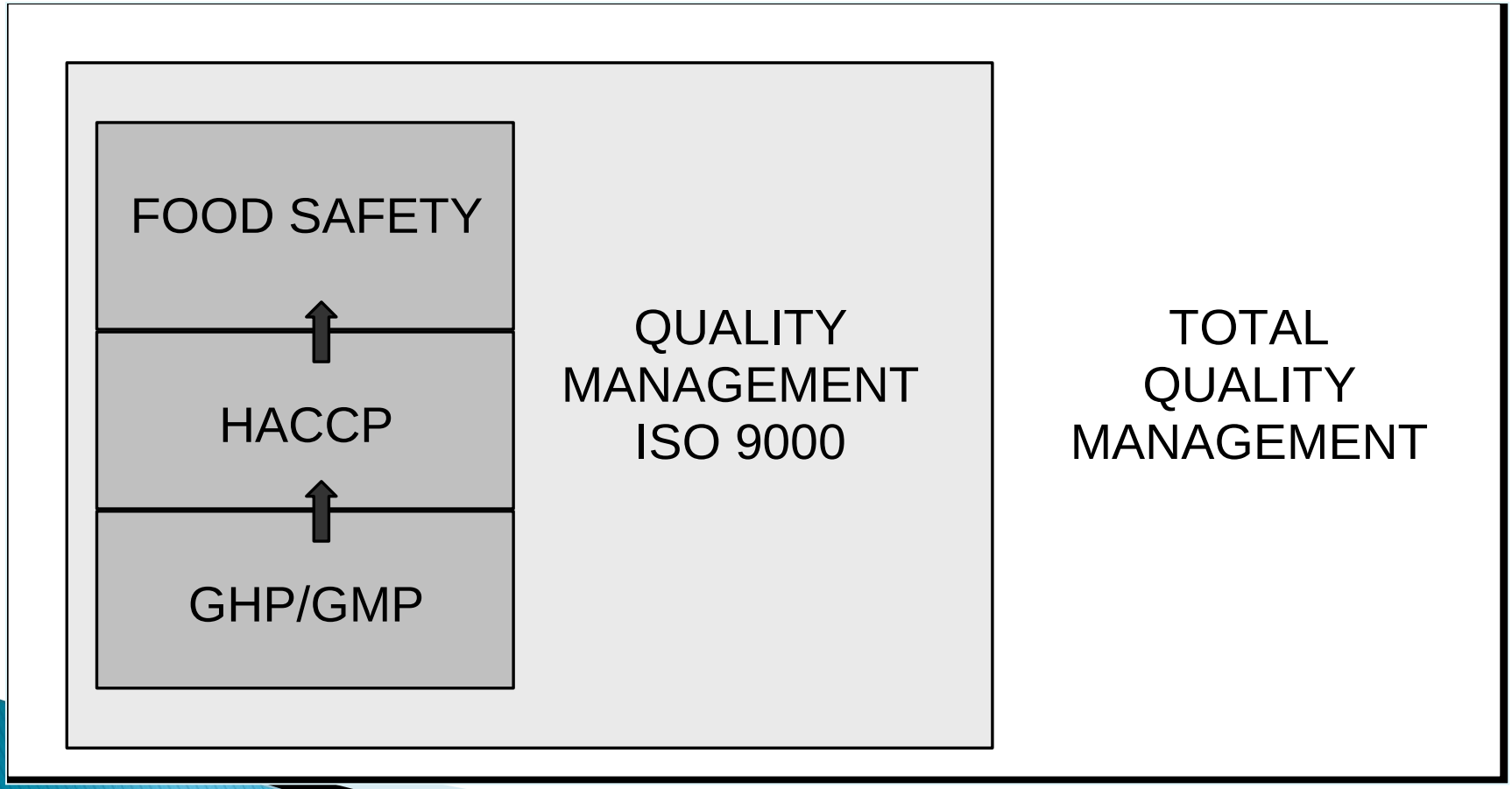
1. HACCP plan and support documentation used in developing the plan.
2. Records of CCP monitoring.
3. Records of corrective actions.
4. Records of verification activities.

Review of HACCP

The design and running of the HACCP scheme should be revised whenever the food operation is altered.

The scheme should be reviewed from time to time (e.g. once a year) even when there have been no alterations.


Mandatory
HACCP
Recommendation
Mandatory
GMP
（GHP）
ISO


FOOD SAFETY
HACCP
GHP/GMP
QUALITY MANAGEMENT ISO 9000
TOTAL QUALITY MANAGEMENT

Quality assurance in food processing

Inter-relationship

Quality Control vs Quality Assusrance

Quality Control

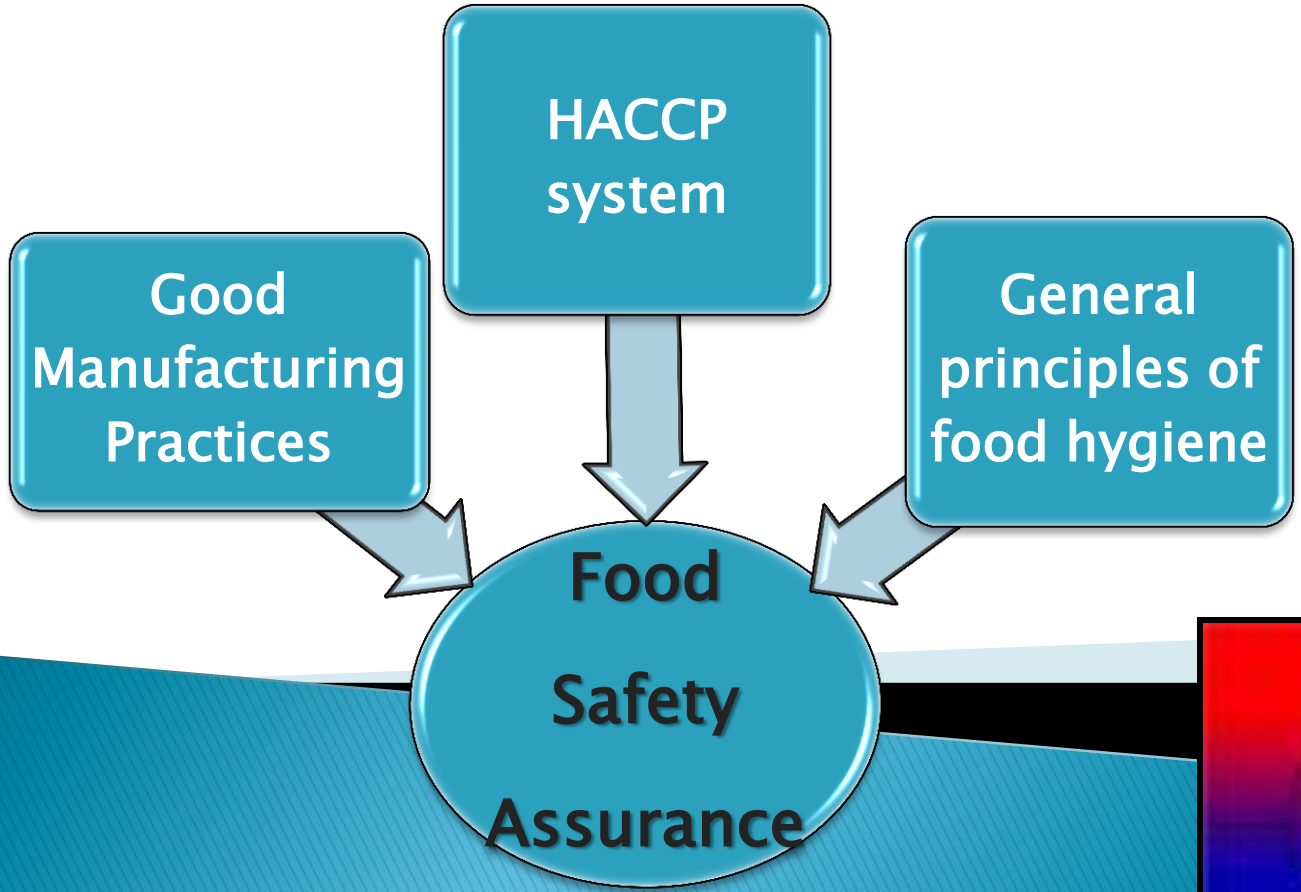
- Part of quality management focused on fulfilling quality requirements.
- Operational techniques and activities

Quality Assurance

- Provides confidence that quality requirements would be fulfilled
- Planned and systematic actions
  - Inspection
  - Audits
  - Registration
  - Certifications
  - Facilities to provide safe and quality products

Quality assurance in food processing

Food Safety Assurance: Assurance that food will not cause harm to the consumer when it is prepared and / or eaten according to its intended use



Focus on Food Safety

Total Quality Management

- The TQM approach embodies both management principles and quality concepts, including:
  - Customer focus,
  - Continual improvement (PDCA, Bench marking)
  - Employee empowerment,
  - Team approach,
  - Process management,
  - Managing supplier quality, and
  - Use of quality tools.

International Organization for Standardization

www.iso.org

The ISO 9000 family

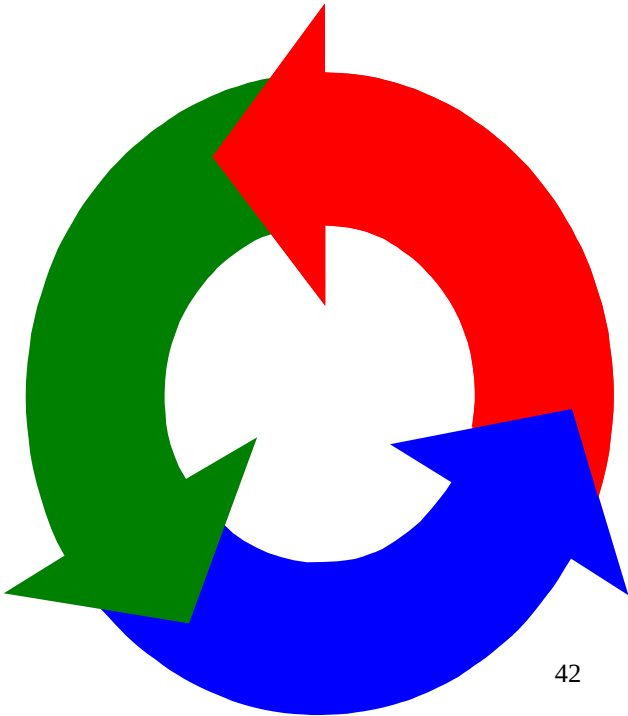
- **ISO 9001** is the standard that gives the requirements for a **quality management system**.
- **ISO 9001:2008** is the latest, improved version.
- It is the **only standard** in the ISO 9000 family that can be used for **certification**.
- There are **16 other standards** in the family that can help an organization on specific aspects such as performance improvement, auditing, training…

QUALITY MANAGEMENT PRINCIPLES

1. Customer focus
2. Leadership
3. Involvement of people
4. Process approach
5. System approach to management
6. Continual improvement
7. Factual approach to decision making
8. Mutually beneficial supplier relationships

Self-manageable P-D-C-A

- **Plan** what you do
- **Do** what you planned & r**ecord** what you did
- **Check** the results
- **Act** on the difference



Elements of a quality management system (or process management structure of ISO)

Following are the elements of a quality management system or process management structure of ISO:

1. Scope
2. Normative Reference
3. Terms and Conditions
4. Quality Management System
5. Management Responsibility
6. Resource Management
7. Product Realization
8. Measurement, Analysis and Improvement

Quality Management System

CUSTOMERS

Feedback

8.2 Monitoring Customer Satisfaction

8.2 Internal Audits

8.3 Control of Nonconforming Product

8.4 Analysis of Data (Suppliers, Process, Product, Customer)

8.5 Corrective & Preventive Action

Covering the entire QMS is:
4.2.3 DOCUMENT CONTROL AND
4.2.4 RECORDS CONTROL

8.5 CONTINUAL IMPROVEMENT

Shipping & Delivery

7.6 Monitoring & Measuring Devices

7.5 Production Control

7.4 Purchasing & Receiving

7.3 Design

7.1 Planning

8.0 MEASUREMENT, ANALYSIS AND IMPROVEMENT

7.0 PRODUCT REALIZATION

5.0 MANAGEMENT RESPONSIBILITY

6.0 RESOURCE MANAGEMENT

5.6 Management Review

5.4 Quality Objectives

5.3 Quality Policy

5.1 Management Commitment

6.2 Human Resources (Training)

6.3 Infrastructure

6.4 Work Environment

Bids, Quotations, Orders, and Contracts

CUSTOMER REQUIREMENTS

CUSTOMERS

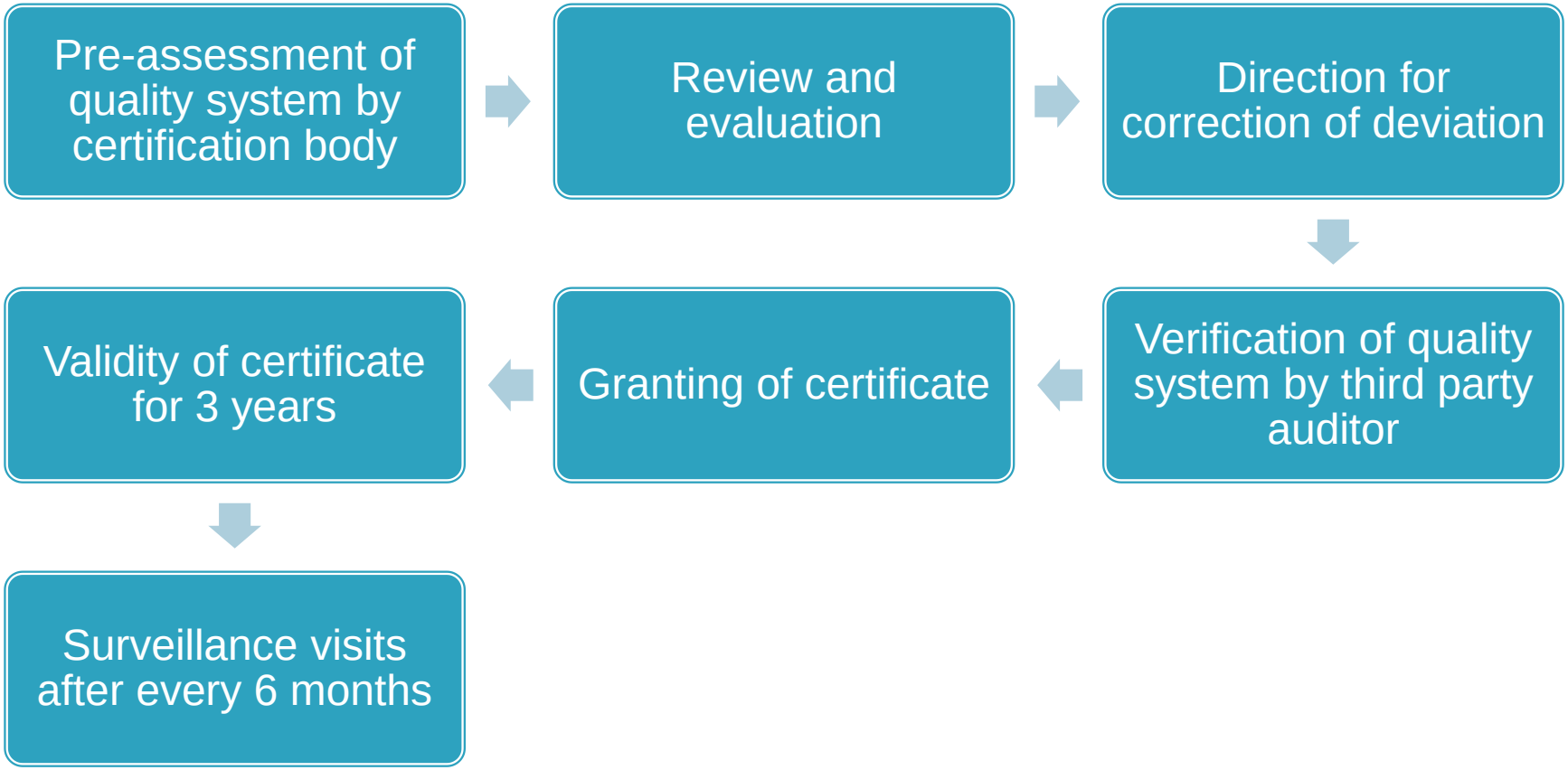
Certification and registration

- **Certification** is known in some countries as **registration**.
- It means that an **independent, external body** has audited an organization's management system and verified that it conforms to the requirements specified in the standard (ISO 9001 or ISO 14001).
- **ISO does not carry out certification** and does not issue or approve certificates,

Accreditation

- **Accreditation** is like certification of the certification body.
- It means the formal approval by a specialized body – an accreditation body – that a certification body is competent to carry out ISO 9001:2008 or ISO 14001:2004 certification in specified business sectors.
- Certificates issued by accredited certification bodies – and known as **accredited certificates** – may be perceived on the market as having increased credibility.
- **ISO does not carry out or approve accreditations.**

ISO certification process



Whom to approach for certification in Pakistan?

- Pakistan Standard Institute (PSI) under Ministry Of Science and Technology
- Maintain ISO standards
- Approach foreign accredited registrar for certification and registration
- Pre-assessment auditors are accredited to foreign accredited registrar
- Auditors in Pakistan help companies self certify themselves

International Organization for Standardization

ISO14001 CERTIFICATE

Certificate NO.: 05-2001-065

We hereby certify that

ECS Manufacturing(Shenzhen) Co.,Ltd

by reason of its

Environmental Management System

has been awarded this certificate for compliance with the standard

ISO14001:1996

The Environmental Management System applies in the following area:

The manufacture of Mother Board and Peripheral Card and interrelated management activities of ECS Manufacturing(Shenzhen) Co.,Ltd. which is located in No.20,Free Trade Zone,Shatuojiao,Shenzhen, P. R.China.

Date of issue: 30th Dec 2001
Date of expiry: 29th Dec 2004
Signed by:

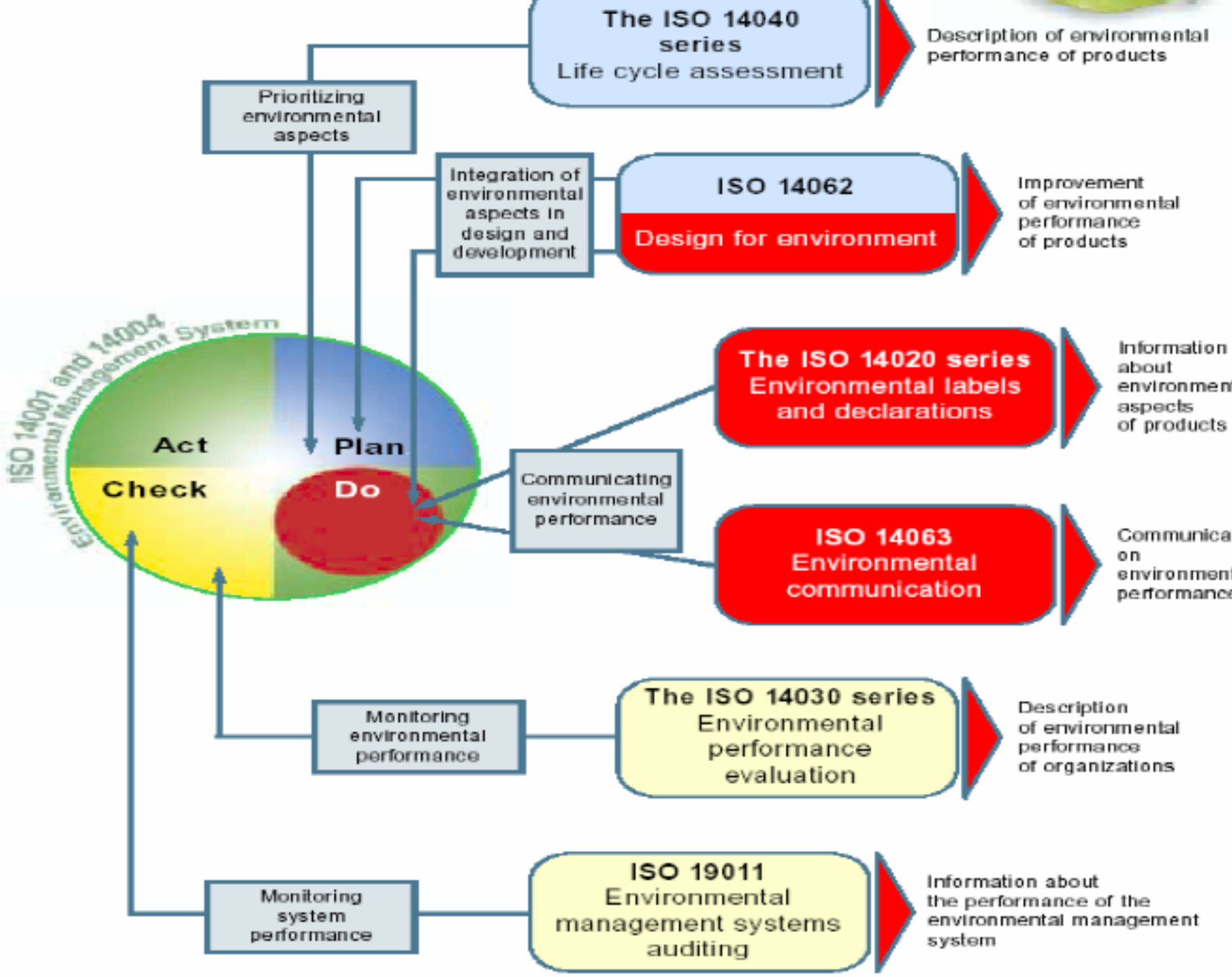
SHENZHEN ENVIRONMENTAL MANAGEMENT SYSTEM CERTIFICATION CENTER

What is ISO 14001?

- It is an Environmental Management System (EMS) that uses a continual improvement approach in achieving and demonstrating sound environmental performance.
- The goal is for organizations to control the impacts that their activities, products and services have on the environment.
- ISO 14000 is the standard, and ISO 14001 is the document containing the requirements.

The ISO 14000 family

- **ISO 14001** is the standard that gives the requirements for an **environmental management system.**
- **ISO 14001:2004** is the latest, improved version.
- It is the **only standard** in the ISO 14000 family that can be used for **certification.**
- The ISO 14000 family includes **21 other standards** that can help an organization specific aspects such as auditing, environmental labelling, life cycle analysis…


The ISO 14040 series
Life cycle assessment
Description of environmental performance of products
Prioritizing environmental aspects
Integration of environmental aspects in design and development
ISO 14062
Design for environment
Improvement of environmental performance of products
ISO 14001 and 14004
Environmental Management System
Act
Plan
Check
Do
The ISO 14020 series
Environmental labels and declarations
Information about environmen aspects of products
Communicating environmental performance
ISO 14063
Environmental communication
Communica on environmen performance
Monitoring environmental performance
The ISO 14030 series
Environmental performance evaluation
Description of environmental performance of organizations
Monitoring system performance
ISO 19011
Environmental management systems auditing
Information about the performance of the environmental management system

Benefits of ISO 14000

- Minimizes the environmental impact of products, activities, and resources.
- Promotes environmental awareness

INTRODUCTION TO ISO 22000:2005

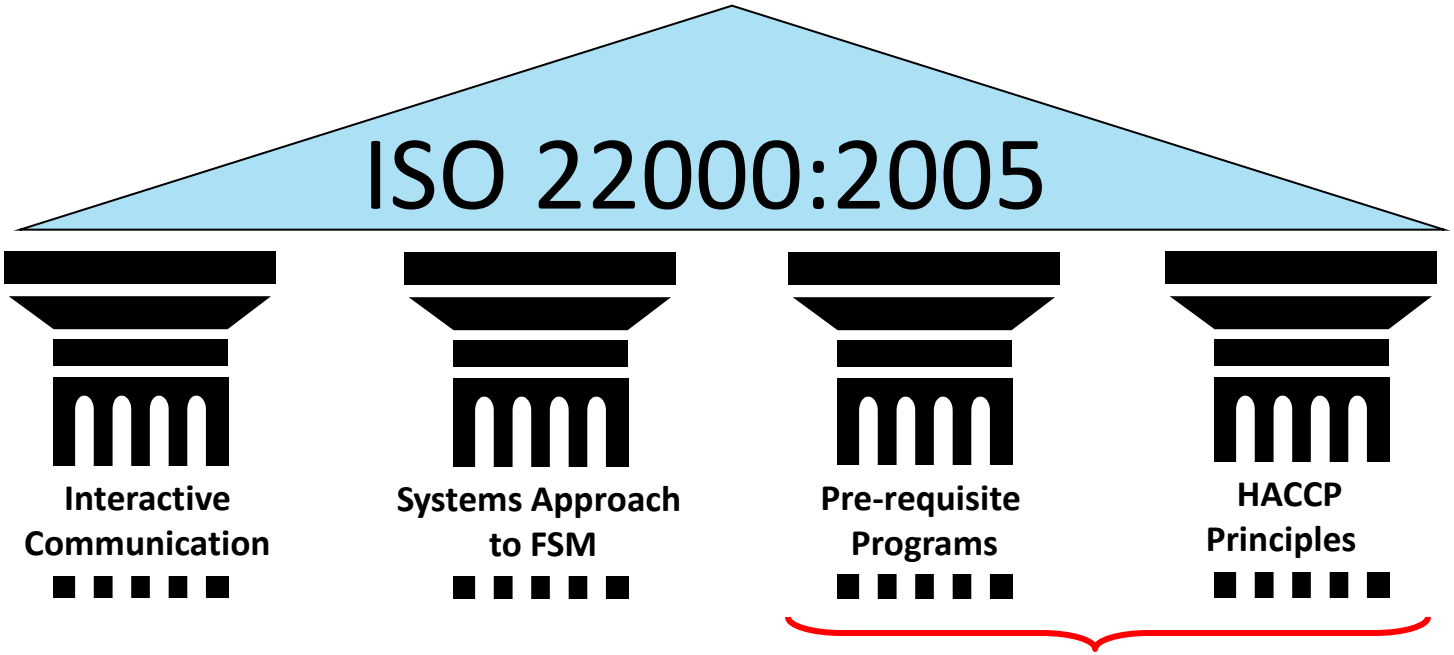
FOOD SAFETY MANAGEMENT SYSTEM

Food Safety

Assurance that food will not cause **harm** to the **consumer** when it is prepared and/or eaten according to its **intended use**.

Source: Codex Alimentarius (WHO)

Key elements

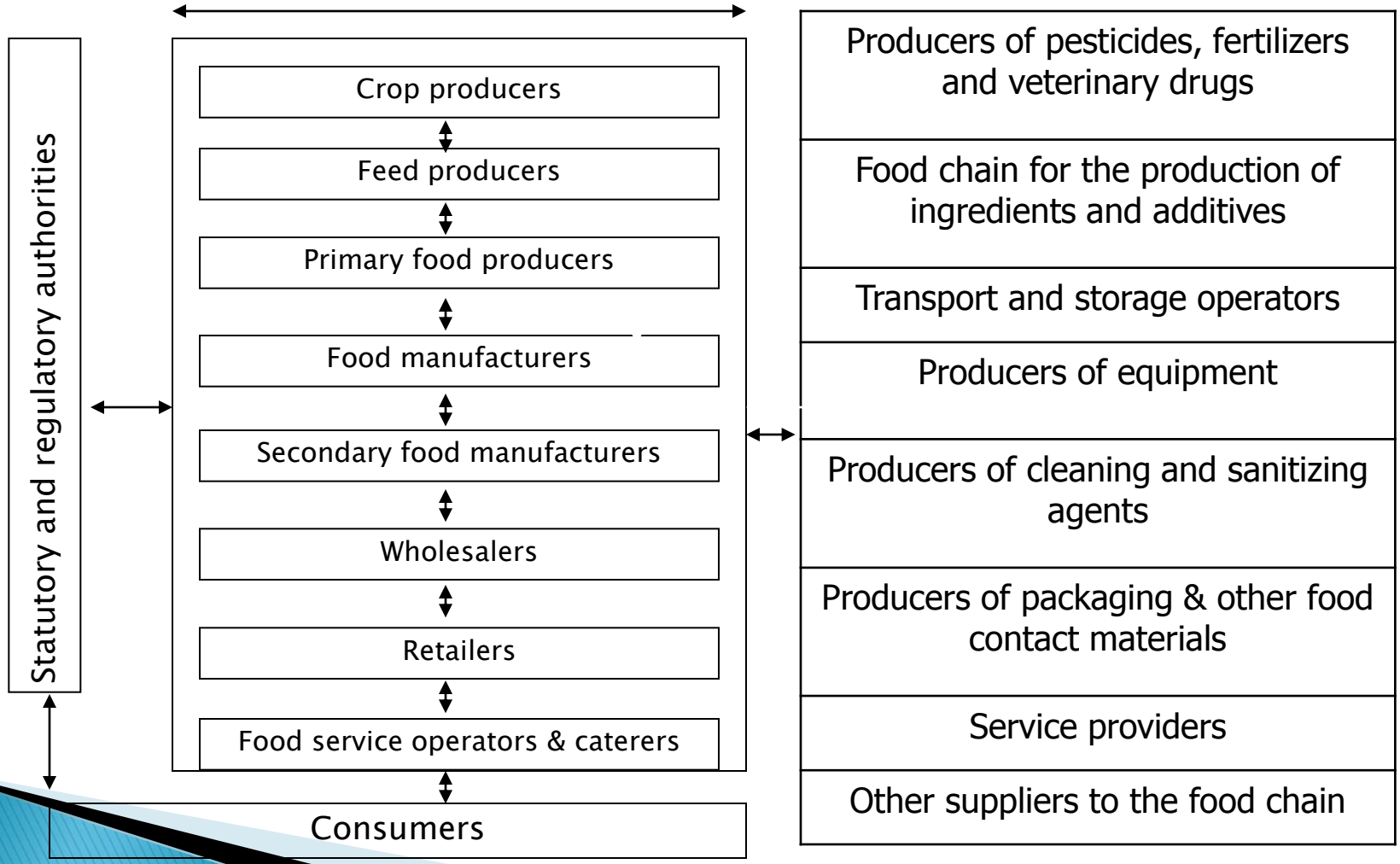


ISO 22000 standard - Requirements

- Section 4: Food Safety Management System (FSMS) – General Requirements
- Section 5: Management Responsibility
- Section 6: Resource Management
- Section 7: Planning and Realization of Safe Products
- Section 8: Validation, Verification and Improvement of the Food Safety Management System

Communication within the Food Chain

QMS



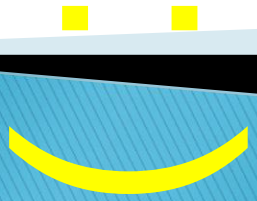
Process Approach

A desired result is achieved more efficiently when related resources and activities are managed as a process

Production to Consumption

- Boat to Throat
- Farm to Fork
- Plow to Plate
- Stable to Table

Thank you very much for your patience !!



Thank you!