TÜV NORD CERT Certification Scheme - HACCP Food Safety System Certification based on General Principles of Food Hygiene CXC 1-1969 Rev.6 2022

CONTENT

This document has been approved according to CERT-401-VA-007. Details are available from the QM-Department.

APPLICATION

This Certification Scheme is intended for use by all companies throughout the food chain from primary production to the final consumer. It is developed to set out the necessary hygiene conditions to be implemented in production (including primary producers, importers, processors, manufacturers, food warehouse/logistics operators, retailers, food service operators and traders of food which is safe and suitable for consumption protect consumers from illness, injury, or death caused by consumption of food and competent authorities as appropriate;

Competent authorities are responsible for deciding how these general principles are best applied through legislation, regulation or guidance to:

- Protect consumers from illness, injury, or death caused by consumption of food;
- Ensure companies implement an effective control system so that food is safe and Suitable for consumption;
- Maintain confidence in domestically and internationally traded food; and
- Provide information that effectively communicates the principles of food Hygiene to companies and consumers.

Companies should apply the hygienic practices and food safety principles set out in this document to:

- Develop, implement, and verify processes that provide food that is safe and suitable for its intended use;
- Ensure personnel are competent as appropriate to their job activities;
- Build a positive food safety culture by demonstrating commitment to providing safe and suitable food and encouraging appropriate food safety practices;
- Contribute to maintaining confidence in domestically and internationally traded food; and
- Ensure that consumers have clear and easily understood information to enable them to identify the presence of food allergens, protect their food from contamination, and prevent the growth/survival of foodborne pathogens by storing, handling, and preparing food correctly.

The Certification Scheme covers a process approach of a Food Safety System with attention on:

- Consumer protection
- Food/ Feed safety requirements
- Good manufacturing practice / Good agriculture practice
- continual improvement of food/feed safety management system
- Effectiveness of food/feed safety system

REFERENCES

The following referenced documents in whole or in part are normatively referenced in this document and are indispensable for the application ISO/IEC 17065:2012 Requirements for bodies certifying products, processes and services General Principles of Food Hygiene CXC 1-1969 Rev. 2022.

OBJECTIVES (2. IN CODEX)

The general principles of food hygiene: GHPs and the HACCP system aim to:

- Provide principles and guidance on the application of GHPs applicable throughout the food chain to provide food that is safe and suitable for consumption;
- Provide guidance on the application of HACCP principles;
- Clarify the relationship between GHPs and HACCP; and
- Provide the basis on which sector and product-specific codes of practice can be established.

TERMS AND DEFINITIONS

- Terms and Definitions outlined in Chapter 6 of CXC 1-1969 Rev. 2022 and in ISO/IEC 17065:2012

REQUIREMENTS

CHAPTER ONE GOOD HYGIENE PRACTICES

General Principles (5. In CODEX)

- Food safety and suitability should be controlled using a science-based preventive approach, for example a food hygiene system. GHPs should ensure that food is produced and handled in an environment that minimizes the presence of contaminants.
- Properly applied prerequisite programmes, which include GHPs, should provide the foundation for an effective HACCP system.
- Each company should be aware of the hazards associated with the raw materials and other ingredients, the production or preparation process, and the environment in which the food is produced and/or handled, as appropriate to the food business.
- Depending on the nature of the food, food process, and the potential for adverse health effects, to control hazards it may be sufficient to apply GHPs, including, as appropriate, some that require more attention than others, as they have a greater impact on food safety. When the application of GHPs alone is not sufficient, a combination of GHPs and additional control measures at CCPs should be applied.
- Control measures that are essential to achieve an acceptable level of food safety should be scientifically validated.

- The application of control measures should be subject to monitoring, corrective actions, verification, and documentation, as appropriate to the nature of the food product and the size of the food business.
- Appropriate communication about the food and food process should be maintained among all relevant parties to ensure food safety and suitability across the entire food chain.

1. MANAGEMENT AND COMMITMENT TO FOOD SAFETY (NOW 5.1 IN CODEX)

1.1. Leadership Commitment to Food Safety

Fundamental to the successful functioning of any food hygiene system is the establishment and maintenance of a positive food safety culture, acknowledging the importance of human behaviour in providing safe and suitable food. The following elements are important in cultivating a positive food safety culture:

- commitment of the management and all personnel to the production and handling of safe food;
- leadership to set the right direction and to engage all personnel in food safety practices;
- awareness of the importance of food hygiene by all personnel in the food business;
- open and clear communication among all personnel in the food business, including communication of deviations and expectations; and
- the availability of sufficient resources to ensure the effective functioning of the food hygiene system.

Management shall ensure the effectiveness of the food hygiene systems in place by:

- ensuring that roles, responsibilities, and authorities are clearly communicated in the food business;
- maintaining the integrity of the food hygiene, system when changes are planned and implemented;
- verifying that controls are carried out and working and that documentation is up to date;
- ensuring that the appropriate training and supervision are in place for personnel;
- ensuring compliance with relevant regulatory requirements; and
- encouraging continual improvement, where appropriate, considering developments in science, technology and best practice.

1.2. Policy, Objectives and Supervision

The type of control and supervision needed will depend on the size of the business, the nature of its activities and the types of food involved. Management and supervisors should have enough knowledge of food hygiene principles and practices to be able to judge potential risks (identify deviations), take appropriate preventive and corrective action, and ensure that effective monitoring and supervision takes place.

The Management shall:

- Establish a food safety policy including objectives that clearly state the companies obligation to food safety culture as well as produce safe and legal food products;
- Communicate the policy throughout the organization;
- Provide necessary resources for fulfilment of the food safety policy ;
- Appoint a HACCP team and team leader;
- Review the organization's food hygiene system to determine if modifications are needed at planned intervals to ensure its continuing suitability, adequacy and effectiveness. This review shall include assessing the need for change to the food hygiene system and whenever there is a significant change that could impact the potential hazards and/or the control measures (e.g. new process, new ingredient, new product, new equipment, new scientific knowledge) associated with the food business. Records of management reviews shall be maintained.

The input to the management review shall include:

a) the status of actions from previous management reviews,
b) changing circumstances that can affect food safety,
c) emergency situations, accidents and withdrawals.

The output to the management review shall include decisions and actions related to:

a) assurance of food hygiene,
b) improvement and of the effectiveness of the food hygiene system, evaluate the effectiveness of these actions
c) revisions of the organization's food hygiene policy and related objectives.
d) The effectiveness of defined decisions and actions shall be evaluated.

2. PRIMARY PRODUCTION (NOW 8 IN CODEX)

Primary production should be managed in a way that ensures that food is safe and suitable for its intended use. Where necessary, this will include:

- an assessment of the suitability of water used where it may pose a hazard, for example, crop irrigation, rinsing activities, etc.
- avoiding the use of areas where the environment poses a threat to the safety of food; (e.g. contaminated sites);
- controlling contaminants, pests and diseases of animals and plants in such a way as not to pose a threat to food safety; (e.g. appropriate use of pesticides and veterinary drugs);
- adopting practices and measures to ensure food is produced under appropriate hygienic conditions. (e.g. cleaning and maintaining harvest equipment, rinsing, hygienic milking practices).

RATIONALE:
To reduce the likelihood of introducing a hazard which may adversely affect the safety of food, or its suitability for consumption, at later stages of the food chain.

Certain processes within primary production can pose challenges when it comes to fully eliminating or significantly reducing specific hazards. Nonetheless, the implementation of prerequisite programmes—such as Good Agricultural Practices (GAPs) and/or Good Hygiene Practices (GHPs)—can effectively help lower both the frequency and intensity of such hazards throughout the food supply chain. Examples include hygienic procedures during milking in dairy farming, sanitary handling in egg production, or monitoring the quality of irrigation water used for leafy vegetables. It is important to note that not every measure is universally applicable; companies must assess which practices are suitable and proportionate for their specific production context.

2.1. Environmental Control (now 8.1 in Codex)

Potential sources of contamination from the environment should be identified. In particular, primary production should not be carried on in areas where the presence of contaminants would lead to an unacceptable level of such contaminants in food, e.g. using polluted areas, location near facilities emitting toxic of offensive odours which could taint foodstuffs or near sources of contaminated water such as discharge of waste water from industrial production of runoff from agricultural land with high faecal material or chemical residues, unless there is a measure to reduce or prevent the contamination of food.

2.2. Hygienic Production (now 8.2 in Codex)

The potential effects of primary production activities on the safety and suitability of food should be considered at all times. In particular, this includes identifying any specific points in such activities where a high probability of contamination may exist and taking specific measures to minimize and, if possible, eliminate that probability.

- Producers should as far as practicably implement measures to:
- control contamination from air, soil, water, feedstuffs, fertilizers (including natural fertilizers), pesticides, veterinary drugs or any other agent used in primary production;
- protect food sources from feacal and other contamination (e.g. zoonotic foodborne agents);
- control plant and animal health so that it does not pose a threat to human health through food consumption, or adversely affect the suitability of the product (e.g. observe the withdrawal period of veterinary drugs and pesticides, keeping records where applicable); and
- manage waste and store harmful substances appropriately.

2.3. Handling, Storage and Transport (now 8.3 in Codex)

Procedures should be in place to:

- sort food and to remove material which should not be used for human consumption;
- dispose of any rejected material in a hygienic manner; and
- Protect food from contamination by pests, or by chemical, physical or microbiological contaminants or other objectionable substances during handling (e.g. sorting, grading, washing), storage and transport. Care should be taken to prevent deterioration and spoilage through appropriate measures which may include controlling temperature, humidity, and/or other controls.

2.4. Cleaning, Maintenance and Personnel Hygiene at Primary Production (now 8.4 in Codex)

Appropriate facilities and procedures should be in place to ensure that:

- cleaning and maintenance are carried out effectively and do not compromise food safety (e.g. ensuring equipment used in harvest is not a source of contamination); and
- an appropriate degree of personal hygiene is maintained to ensure personnel are not a source of contamination (e.g. human faeces)

3. ESTABLISHMENT - DESIGN OF FACILITIES AND EQUIPMENT: (NOW 9 IN CODEX)

Depending on the nature of the operations, and the risks associated with them, premises, equipment and facilities should be located, designed and constructed to ensure that:

- contamination is minimized;
- design and layout permit appropriate maintenance, cleaning and disinfections and minimize airborne contamination;
- surfaces and materials, in particular those in contact with food, are non-toxic for their intended use,
- where appropriate, suitable facilities are available for temperature, humidity and other controls; and
- there is effective protection against pest access and harborage; and
- there are sufficient and appropriate washroom facilities for personnel.

RATIONALE:
Attention to good hygienic design and construction, appropriate location, and the provision of adequate facilities, is necessary to enable contaminants to be effectively controlled.

3.1. 3.1 Location and structure (now 9.1 in Codex)

3.1.1. Location of establishment (now 9.1.1 in Codex)

Food establishments should not be located where there is a threat for food safety or suitability and hazards cannot be controlled by reasonable measures. The location of an establishment, including temporary/mobile establishments, should not introduce any hazards from the environment that cannot be controlled. In particular unless sufficient safeguards are provided. establishments should normally be located away from:

- environmentally polluted areas and industrial activities which reasonably likely to contaminate food;
- areas subject to flooding;
- areas prone to infestations of pests; and
- areas where wastes, either solid or liquid, cannot be removed effectively.

3.1.2. Design and layout of food establishment (now 9.1.2 in Codex)

The Desing and layout of food establishments should permit adequate maintenance and cleaning. The layout of premises and the flow of operations, including the movements of personnel and material within the buildings, should be such as cross-contamination is minimized or prevented.
Areas having different levels of hygiene control (e.g. the raw material and finished product areas) should be separated to minimize cross-contamination through measures such as physical separation (e.g. walls, partitions) and/or location (e.g. distance), traffic flow (e.g. one-directional production flow), airflow, or separation in time, with suitable cleaning and disinfection between uses.

3.1.3. Internal structures and fittings (now 9.1.3 in Codex)

Structures within food establishments should be soundly built of durable materials, which are easy to maintain, clean and, where appropriate, easy to disinfect. They should be constructed of non-toxic and inert materials according to intended use and normal operating conditions. In particular, the following specific conditions should be satisfied where necessary to protect the safety and suitability of food:

- the surfaces of walls, partitions and floors should be made of impervious materials that are easy to clean and, where necessary, disinfect;
- walls and partitions should have a smooth surface up to a height appropriate to the operation;
- floors should be constructed to allow adequate drainage and cleaning;
- ceilings and overhead fixtures (e.g. lighting) should be constructed to be shatterproof where appropriate, and finished to minimize the build-up of dirt and condensation and the shedding of particles;
- windows should be easy to clean, be constructed to minimize the build-up of dirt and, where necessary, be fitted with removable and cleanable insect-proof screens; and
- doors should have smooth, non-absorbent surfaces, be easy to clean and, where necessary, disinfect.

Surfaces that come into direct contact with food should be structurally intact, resistant to wear, and designed for straightforward cleaning, maintaining, and disinfection. They should consist of smooth, non-porous materials that do not absorb substances and remain chemically stable when exposed to food, cleaning agents, or disinfectants during routine operations.

3.1.4. Temporary/mobile food establishments and vending machines (now 9.1.4 in Codex)

Establishments and structures covered here include market stalls, street vending vehicles, vending machines and temporary premises such as tents and marquees.
Such premises and structures should be located, designed and constructed to avoid, as fare as reasonably practicable, the contamination of food and the harbouring of pests. Adequate facilities for toileting and washing hands should be provided, where appropriate

3.2. Facilities (now 9.2 in Codex)

3.2.1. Drainage and waste disposal facilities (now 9.2.1 in Codex)

Adequate drainage and waste disposal systems and facilities should be provided and well maintained. They should be designed and constructed so that the likelihood of contaminating food or the water supply is avoided. For plumbing, steps should be taken to prevent backflow, cross-connections, and backup of sewer gases. It is important that drainage does not flow from highly contaminated areas (such as toilets or raw production areas) to areas where finished food is exposed to the environment.
Waste should be collected, disposed of by trained personnel and, where appropriate, disposal records maintained. The waste disposal site should be located away from the food establishment to prevent pest infestation. Containers for waste, by-products and inedible or hazardous substances should be specifically identifiable, suitably constructed and, where appropriate, made of impervious material. Containers used to hold hazardous substances prior to disposal should be identified and, where appropriate, be lockable to prevent intentional or accidental contamination of food.

3.2.2. Cleaning facilities (now 9.2.2 in Codex)

Adequate, suitably designated facilities should be provided for cleaning utensils and equipment. Such facilities should have an adequate supply of hot and/or cold water, where required. A separate cleaning area should be provided for tools and equipment from highly contaminated areas like toilets, drainage and waste disposal areas. Where appropriate, facilities for washing food should be separate from facilities for cleaning utensils and equipment, and separate sinks should be available for hand washing and food washing.

3.2.3. Personnel hygiene facilities and toilets (now 9.2.3 in Codex)

Adequate washing and toilet facilities should be available so that an appropriate degree of personal hygiene can be maintained and to avoid personnel contaminating food. Such facilities should be suitably located and should not be used for other purposes such as storage of food or items that contact food. They should include:

- adequate means of washing and drying hands, including soap (preferably liquid soap), wash basins and, where appropriate, a supply of hot and cold (or suitably temperature controlled) water;
- hand washing basins of an appropriate hygienic design, ideally with taps not operated by hands; where this is not possible, appropriate measures to minimize contamination from the taps should be in place; and

- suitable changing facilities for personnel, if needed.

Handwashing basins should not be used for washing food or utensils

3.2.4. Temperature (now 9.2.4 in Codex)

Depending on the nature of the food operations undertaken, adequate facilities should be available for heating, cooling, cooking, refrigerating and freezing food, for storing refrigerated or frozen foods, and, when necessary, controlling ambient temperatures to ensure the safety and suitability of food.

3.2.5. Air quality and ventilation (now 9.2.5 in Codex)

Adequate means of natural or mechanical ventilation should be provided, in particular to:

- minimize air-borne contamination of food, for example, from aerosols and condensation droplets;
- control ambient temperatures;
- control odours which might affect the suitability of food; and
- control humidity to ensure the safety and suitability of food (e.g. to prevent an increase in moisture of dried foods that would allow growth of microorganisms and production of toxic metabolites).

Ventilation systems should be designed and constructed so that air does not flow from contaminated areas to clean areas; the systems should be easy to maintain and clean.

3.2.6. Lighting (now 9.2.6 in Codex)

Adequate natural or artificial lighting should be provided to enable the food business to operate in a hygienic manner. Lighting should be such that it does not adversely impact the ability to detect defects of, or contaminants in, food or the examination of facilities and equipment for cleanliness. The intensity should be adequate to the nature of the operation. Light fittings should, where appropriate, be protected to ensure that food is not contaminated by breakages of lighting elements.

3.2.7. Storage (now 9.2.7 in Codex)

Adequate and, where necessary, separate facilities for the safe and hygienic storage of food products, food ingredients, food packaging materials and non-food chemicals (e.g. including cleaning materials, lubricants, fuels) should be provided. Storage should allow for segregation of raw and cooked food of allergenic and non-allergenic food.
Food storage facilities should be designed and constructed to:

- facilitate adequate maintenance and cleaning;
- avoid pest access and harbourage;
- enable food to be effectively protected from contamination during storage including allergen cross-contact, during storage; and
- where necessary, provide an environment which minimizes the deterioration of food (such as by temperature and humidity control).

The type of storage facilities required will depend on the nature of the food. Where necessary, separate, secure storage facilities for cleaning materials and hazardous substances should be provided.

3.3. Equipment (now 9.3 in Codex)

3.3.1. General (now 9.3.1 in Codex)

Equipment and containers coming into contact with food, should be designed and constructed and located to ensure that they can be adequately cleaned (other than containers which are single-use only); disinfected (where necessary) and maintained of discarded as necessary to avoid the contamination of food, according to hygienic design principles. Equipment and containers should be made of materials with no toxic according to intended use. Where necessary, equipment should be durable and movable or capable of being disassembled to allow for maintenance, cleaning, disinfection, and to facilitate inspection for pests.

3.3.2. Food control and monitoring equipment (now 9.3.2 in Codex)

Equipment used to cook, heat treat, cool, store or freeze food should be designed to achieve the required food temperatures as rapidly as necessary in the interests of food safety and suitability, and to maintain food temperatures effectively.
Such equipment should also be designed to allow temperatures to be monitored, where necessary, and controlled. Where appropriate, monitoring equipment should be calibrated to ensure that temperatures of food processes are accurate.
Where necessary, such equipment should have effective means of controlling and monitoring humidity, air flow and any other characteristics likely to have an effect on the safety of suitability of food.

4. TRAINING AND COMPETENCE (NOW 10 IN CODEX)

Those engaged in food operations who come directly or indirectly into contact with food should be trained, and/or instructed in food hygiene to a level appropriate to the operations they are to perform.
RATIONALE:
Training is fundamentally important to any food hygiene system.
Adequate hygiene training, and/or instruction and supervision of all people involved in food related activities pose a potential threat to the safety of food and its suitability for consumption.

4.1. Awareness and Responsibilities (Now 10.1 in Codex)

Food hygiene training is fundamentally important. All personnel should be aware of their role and responsibility in protecting food from contamination or deterioration. Food handlers should have the necessary knowledge and skills to enable them to handle food hygienically. Those who handle strong cleaning chemicals or other potentially hazardous chemicals should be instructed in proper use to prevent contamination of food.

4.2. Training Programmes (Now 10.2 in Codex)

Factors to take into account in assessing the level of training required include:

- the nature of hazards associated with the food, in particular its ability to sustain growth of pathogenic or spoilage micro-organisms; the existence of potential physical contaminants or known allergens;
- the manner in which the food is produced, processed, handled and packed, including the probability of contamination;
- the extent and nature of processing or further preparation before final consumption;
- the conditions under which the food will be stored; and
- the expected length of time before consumption.
- The use and maintenance of instruments and equipment associated with food

Training programmes should also consider the knowledge and skill levels of the personnel being trained. Topics to be considered for training programmes could include the following as appropriate to a person's duties:

- the principles of food hygiene applicable to the food business;
- the measures relevant to the food business that are used to prevent contaminants in food;
- the importance of good personal hygiene, including proper hand washing and wearing, when needed, appropriate clothing, for food safety;
- the good hygiene practices applicable to the food business.
- appropriate actions to take when food hygiene problems are observed.

In addition, for retail and food service operations, whether personnel have direct customer interaction is a factor in training, since it may be necessary to convey certain information about products (such as allergens) to customers.

4.3. Instruction and Supervision (now 10.3 in codex)

The type of instruction and supervision needed will depend on the size of the business, the nature of its activities and the types of food involved. Periodic assessments of the effectiveness of training and instruction programmes should be made, as well as routine supervision and checks to ensure that procedures are being carried out effectively.
Managers and supervisors of food processes should have the necessary knowledge of food hygiene principles and practices to be able to identify deviations and take necessary action as appropriate to their duties.
Personnel tasked to perform any activities used in food control should be trained adequately to ensure that they are competent to perform their tasks and are aware of the impact of their tasks on the safety and suitability of the food.
Training and instruction programmes should be regularly reviewed to assess their effectiveness. In parallel, routine oversight and verification activities are essential to confirm that procedures are being implemented as intended. Personnel involved in any aspect of food control shall receive adequate

training to ensure they are competent in their assigned duties and fully understand how their actions influence both the safety and the suitability of the food.

4.4. Refresher Training (Now 10.4 in Codex)

Training programmes should be routinely reviewed and updated where necessary. Systems should be in place to ensure that food handlers and personnel associated with the food business, such as maintenance staff, remain aware of all procedures necessary to maintain the safety and suitability of food. Records should be kept of training activities.

5. ESTABLISHMENT MAINTENANCE, CLEANING AND DISINFECTION, AND PEST CONTROL (NOW 11 IN CODEX)

To establish effective systems to:

- ensure adequate and appropriate maintenance;
- ensure cleanliness and, when necessary, adequate disinfection;
- control pests;
- manage waste; and
- monitor effectiveness of cleaning and disinfection, pest control and waste management procedures

RATIONALE:
To facilitate the continuing effective control of food contaminants, pests, and other agents likely to compromise food safety and suitability

5.1. Maintenance and Cleaning (Now 11.1 in Codex)

5.1.1. General (Now 11.1.1 in Codex)

Establishments and equipment should be kept in an appropriate state of repair and condition to:

- facilitate all cleaning and disinfection procedures;
- function as intended, and
- prevent contamination of food, e.g. from pests, metal shards, flaking plaster, debris and chemicals, wood, plastic, glass, paper.

Cleaning should remove food residues and dirt which may be a source of contamination including allergens. The necessary cleaning methods and materials will depend on the nature of the food business, the food type and the surface to be cleaned. Disinfection may be necessary after cleaning, especially for food contact surfaces
Attention should be paid to hygiene during cleaning and maintenance operations so as not to compromise food safety and suitability. Cleaning products suitable for food contact surfaces should be used in food preparation and storage areas.

Cleaning chemicals should be handled and used carefully and in accordance with manufacturers' instructions and stored, where necessary, separated from food, in clearly identified containers to avoid the risk of contaminating food.
Separate cleaning equipment and utensils, suitably designated, should be used for different hygiene zones e.g. food and non-food contact surfaces.
Cleaning equipment should be stored in an appropriate place and in such a manner to prevent contamination. Cleaning equipment should be kept clean, maintained and replaced periodically so as not to become a source for cross-contamination of surfaces or food.

5.1.2. Cleaning and disinfection procedures and methods (restructured) (Now 11.1.2 in Codex)

Cleaning can be carried out by the separate or the combined use of physical methods, such as heat, scrubbing, turbulent flow, vacuum cleaning or other methods that avoid the use of water, and chemical methods using solutions of detergents, alkalis or acids. Dry cleaning or other appropriate methods for removing and collecting residues and debris may be needed in some operations and/or food processing areas where water increases the likelihood of microbiological contamination. Care should be taken to ensure cleaning procedures do not lead to contamination of food, e.g. spray from pressure washing can spread contamination from dirty areas, such as floors and drains, over a wide area and contaminate food contact surfaces or exposed food.
Wet Cleaning procedures will involve, where appropriate:

- removing gross debris from surfaces;
- applying a detergent solution to loosen soil and bacterial film and hold them in solution or suspension;
- rinsing with water (hot water where appropriate) to remove loosened material and residues of detergent;

where necessary, cleaning should be following chemical disinfection with subsequent rinsing unless the manufacturers' instructions indicate on scientific basis that rinsing is not required. If cleaning is not done effectively to remove soil to permit the disinfectant to contact microorganisms or if sub-lethal concentrations of the disinfectant are used, the microorganisms may persist. Cleaning and disinfection procedures should ensure that all parts of the establishment are appropriately clean.Where appropriate, programmes should be drawn up in consultation with relevant experts.
Written cleaning and disinfection procedures should be used, where appropriate. They should specify:

- areas, items of equipment and utensils to be cleaned, and, where appropriate, disinfected;
- responsibility for particular tasks;
- method and frequency of cleaning and, where appropriate, disinfection; and
- monitoring and verification activities.

5.1.3. Monitoring of Effectiveness (Now in 11.1.3 in Codex)

Application of cleaning and disinfection procedures should be monitored for effectiveness, periodically verified by means such as visual inspections and audits to ensurethe procedures have been applied

properly. The type of monitoring will depend on the nature of the procedures, but could include pH, water temperature, conductivity, cleaning agent concentration, disinfectant concentration, and other parameters important to ensure the cleaning and disinfection programme is being implemented as designed and verify its effectiveness.
Microorganisms can sometimes become tolerant to disinfecting agents over time. Cleaning and disinfection procedures should follow the manufacturers' instructions. Periodic review with disinfectant manufacturers/suppliers, where feasible, should be conducted to help ensure the disinfectants used are effective and appropriate. Rotation of the disinfectants could be considered to ensure inactivation of different types of microorganisms (e.g. bacteria and fungi).
While effectiveness of cleaning and disinfecting agents and instructions for use are validated by their manufacturers, measures should be taken for sampling and testing the environment and food contact surfaces (e.g. protein and allergen test swabs, or microbiological testing for indicator organisms) to help verify that cleaning and disinfection programmes are effective and being applied properly.
Microbiological sampling and testing may not be appropriate in all cases and an alternative approach might include observation of cleaning and disinfection procedures, including the correct disinfectant concentration, to achieve the necessary results and to make sure protocols are being followed. Cleaning and disinfection and maintenance procedures should be regularly reviewed and adapted to reflect any changes in circumstances and documented as appropriate.

5.2. Pest Control Systems (Now in 11.2 in Codex)

5.2.1. General (Now in 11.2.1 in Codex)

Pests (e.g. birds, rodents, insects etc.) pose a major threat to the safety and suitability of food. Pest infestations can occur where there are breeding sites and a supply of food. GHPs should be employed to avoid creating an environment conducive to pests. Good building design, layout, maintenance, and location, along with cleaning, inspection of incoming materials and effective monitoring, can minimize the likelihood of infestation and thereby limit the need for pesticides.

5.2.2. Prevention (Now 11.2.2 in Codex)

Establishments should be kept in good repair and condition to prevent pest access and to eliminate potential breeding sites. Holes, drains and other places where pests are likely to gain access should be covered. Roll up doors should close tightly against the floor. Wire mesh screens, for example on open windows, doors and ventilators, will reduce the problem of pest entry. Animals should, wherever possible, be excluded from the grounds of food processing establishments.

5.2.3. Harbourage and infestation (Now 11.2.3 in Codex)

The availability of food and water encourages pest harbourage and infestation. Potential food sources should be stored in pest-proof containers and/or stacked above the ground and preferably away from walls. Areas both inside and outside food premises should be kept clean and free of waste. Where appropriate, refuse should be stored in covered, pest-proof containers. Any potential harbourage, such as old and unused equipment, should be removed.

Landscaping surrounding a food establishment should be designed to minimize attracting and harbouring pests

5.2.4. Monitoring and detection (Now 11.2.4 in Codex)

Establishments and surrounding areas should be regularly examined for evidence of infestation. Detectors and traps (e.g. insect light traps, bait stations) should be designed and located so as to prevent potential contamination of raw materials, products or facilities. Even if monitoring and detection are outsourced, Companies should review monitoring reports and, if necessary, ensure they or their designated pest control operators take corrective action (e.g. eradication of pests, elimination of harbourage sites or invasion routes).

5.2.5. Control of pest infestation (Now 11.2.5 in Codex)

Pest infestations should be addressed immediately by a qualified person or company and appropriate corrective action taken. Treatment with chemical, physical or biological agents should be carried out without posing a threat to the safety or suitability of food. The cause of infestation should be identified and corrective action taken to prevent a problem from reoccurring. Records should be kept of infestation, monitoring and eradication.

5.3. Waste Management (Now 11.3 in Codex)

5.3.1. General (Now 11.3.1 in Codex)

Suitable provision must be made for the removal and storage of waste. Waste should, as far as possible, be collected and stored in covered containers and must not be allowed to accumulate in food handling, food storage, and other working areas and the adjoining environment in a manner that compromises food safety and suitability. Personnel responsible for waste removal (including hazardous waste) should be properly trained so they do not become a source of cross-contamination.Waste storage areas should be easily identifiable, be kept appropriately clean, and be resistant to pest infestation. They should also be located away from processing areasMonitoring Effectiveness.

6. PERSONAL HYGIENE (NOW 12 IN CODEX)

To ensure that those who come directly or indirectly into contact with food are not likely to contaminate food by:

- maintain appropriate personal health;
- maintaining an appropriate degree of personal cleanliness;
- behaving and operating in an appropriate manner.

RATIONALE:
People who do not maintain an appropriate degree of personal cleanliness, who have certain illnesses or conditions or who behave inappropriately, can contaminate food and transmit illness to consumers.

Companies should establish policies and procedures for personal hygiene. Companies should ensure all personnel are aware of the importance of good personal hygiene and understand and comply with practices that ensure food safety and suitability

6.1. Health Status (Now 12.1 in Codex)

Personnel known, or suspected to be ill or to be a carrier of a disease or illness likely to be transmitted through food, should not be allowed to enter any food handling area if there is a likelihood of their contaminating food. Any person so affected should immediately report illness or symptoms of illness to the management.
It may be appropriate for personnel to be excluded for a specific time after symptoms resolve or, for some illnesses, to get medical clearance before returning to work.

6.2. Illness and Injuries (Now 12.2 in Codex)

Some symptoms of illnesses that should be reported to management so that any need for medical examination and/or possible exclusion from food handling and/or medical examination can be considered, include:

- jaundice;
- diarrhoea;
- vomiting;
- fever;
- sore throat with fever;
- visibly infected skin lesions (boils, cuts, etc.);
- discharges from the ear, eye or nose.

Personnel with cuts and wounds should, where necessary, be assigned to work in areas where they will have no direct contact with food. Where personnel are permitted to continue working, should be covered by suitable waterproof dressings. Appropriate measures should be applied to ensure plasters do not become a source of contamination (e.g. plasters of contrasting colour compared to the food and/or detectable using a metal detector or x-ray detector).

6.3. Personal Cleanliness (Now 12.3 in Codex)

Personell should maintain a high degree of personal cleanliness and, where appropriate, wear suitable protective clothing, head and beard covering, and footwear. Measures should be implemented to prevent cross-contamination by personnel through adequate hand washing and, where necessary, the wearing of gloves. If gloves are worn, appropriate measures should be applied to ensure the gloves do not become a source of contamination.
Personnel, including those wearing gloves, should always wash their hands when personal cleanliness may affect food safety. In particular they should wash hands:

- at the start of food handling activities;
- when returning to work after breaks;
- immediately after using the toilet; and
- after handling any contaminated material, such as waste or raw and unprocessed foods where this could result in contamination of other food items; they should avoid handling ready-to-eat food, where appropriate.

In order not to contaminate food, personnel should wash hands with soap and water and rinse and dry them in a manner that does not recontaminate the hands. Hand sanitizers should not replace hand washing and should be used only after hands have been washed.

6.4. Personal Behaviour (Now 12.4 in Codex)

People engaged in food handling activities should refrain from behaviour which could result in contamination of food, for example:

- smoking or vaping;
- spitting;
- chewing,eating or drinking;
- touching the mouth, nose or other places of possible contamination; and
- sneezing or coughing over unprotected food.

Personal effects such as jewellery, watches, pins or other items such as false nails/eye lashes should not be worn or brought into food handling areas if they pose a threat to the safety and suitability of food.

6.5. Visitors and other persons from outside the establishment (Now 12.5 in Codex)

Visitors to food companies, including maintenance workers, in particular to food manufacturing, processing or handling areas should, where appropriate, be instructed and supervised, wear protective clothing and adhere to the other personal hygiene provisions in this section. Visitors should be guided through a hygiene policy of the business prior to visits and encouraged to report any type of illness/injury that may pose cross- contamination issues.

7. CONTROL OF OPERATION OBJECTIVE (NOW 13 IN CODEX)

To produce food which is safe and suitable for human consumption by:

- formulating design requirements with respect to raw materials and other ingredients, composition/formulation, production, processing, distribution, and consumer use to be as appropriate to the food business
- designing, implementing, monitoring and reviewing effective control systems.

RATIONALE:
If operations are not controlled appropriately, food may become unsafe or unsuitable for consumption. Control of operation is achieved by having an appropriate food hygiene system in place. The following section describes practices that can assist in the identification and application of appropriate controls, as well as activities that should take place to ensure the operation is under control.

7.1. Description of products and processes (Now 13.1 in Codex)

After consideration of the conditions and activities of the food business it may be necessary to pay greater attention to some GHPs that are particularly important for food safety. In this case, the following provisions could be considered.

7.1.1. Product description (Now 13.11 in Codex)

A company that produces, storing or otherwise handling food should have a description of the food. Products may be described individually or in groups in a manner that does not compromise the awareness of hazards or other factors such as suitability of the products for the purpose intended. Any grouping of food products should be based on them having similar inputs and ingredients, product characteristics (such as pH, water activity (aw)), process steps and/or intended purpose.
The description could include, as appropriate:

- the intended use of the food, e.g. whether it is ready-to-eat or whether it is intended for further processing either by consumers or another business for example raw seafood to be cooked;
- poducts intended for specific vulnerable consumer groups e.g. infant formula or food for special medical purposes;
- any relevant specifications e.g. ingredient composition, aw, pH, type of preservation method used (if any), or important characteristics associated with the food, such as any allergens present;
- any relevant limits established for the food by the competent authority or, in the absence thereof, set by the company;
- instructions provided for further use, for example keep frozen until cooking, cook to a specified temperature for a specified length of time, product shelf-life (use-by date);
- storage of product (e.g. refrigerated/frozen/shelf stable) and transport conditions required;
- and food packaging material used.

7.1.2. Process description (Now 13.1.2 in Codex)

The company should consider all steps in the operation for a specific product. It may be helpful to develop a flow diagram, which shows the sequence and interaction of all processing steps in the operation, including where raw materials, ingredients and intermediate products enter the flow and where intermediate products, by- products and waste are released or removed. The flow diagram could be used for a number of similar food products that are produced using similar production or processing steps, to ensure all steps are captured. The steps should be confirmed as accurate by an on-site review

of the operation or process. For example, for restaurants the flow diagram could be based on the general activities from the receipt of ingredients/raw material, storage (refrigerated, frozen, room temperature), preparation before use (washing, defrosting), and cooking or preparation of food.

7.1.3. Consideration of the effectiveness of GHPs (Now 13.1.3 in Codex)

Having considered the product and process descriptions, a company should determine (using information relevant to hazards and controls from various sources as appropriate) whether the GHPs and other programmes they have in place are sufficient to address food safety and suitability or if some GHPs need greater attention. For example, a cooked meat slicer may require specific and more frequent cleaning to prevent the build-up of Listeria spp. on its meat contact surfaces, or a conveyor belt used in direct contact with the food, such as in sandwich production, may require an increased frequency of cleaning or a specific cleaning programme. When such increased attention on GHPs is insufficient to ensure food safety, it will be necessary to implement a HACCP system (see hazard analysis and critical control point [HACCP] system and guidelines for its application).

7.1.4. Monitoring and corrective action (Now 13.1.4 in Codex)

The company should monitor the hygienic procedures and practices as relevant to the business and as applicable to the hazard being controlled. Procedures could include defining methods of monitoring (including defining responsible personnel, frequency and sampling regime if applicable) and monitoring records to be kept. The frequency of monitoring should be appropriate to ensure consistent process control.
When monitoring results indicate a deviation, the company should undertake corrective action.
Corrective action should consist of the following actions, as appropriate:

- bringing the process back into control by, for example, altering temperature or timing, or concentration of disinfectant;
- isolating any affected product and evaluating its safety and/or suitability;
- determining proper disposition of affected product that is not acceptable to market;
- identifying the cause that resulted in the deviation; and
- taking steps to prevent reoccurrence.

Records of corrective actions should be retained.

7.1.5. Verification (Now 13.1.5 in Codex)

The company should undertake verification activities as relevant to the business, to check that GHP procedures have been implemented effectively, monitoring is occurring, where planned, and that appropriate corrective actions are taken when requirements are not met. Examples of verification activities could include the following, as appropriate:

- review of GHP procedures, monitoring, corrective actions and records;

- review when any changes occur to the product, process and other operations associated with the business; and
- assessment of the efficacy of cleaning.

Records of GHP verification activities should be kept, where appropriate.

7.2. Key aspects of GHPs (Now 13.2 in Codex)

Some key aspects of GHPs such as those described in Sections 7.2.1. and 7.2.2, could be considered as control measures applied at CCPs in the HACCP system

7.2.1. Time and temperature control (Now 13.2.1 in Codex)

Inadequate food temperature control is one of the most common causes of foodborne illness or food spoilage. Such controls include time and temperature of cooking, cooling, processing and storage. Systems should be in place to ensure that temperature is controlled effectively where it is critical to the safety and suitability of food.

Temperature control systems should take into account:

- the nature of the food, e.g. its water activity, pH, and likely initial level and types of microorganisms, such as pathogenic and spoilage microflora;
- the impact on the microorganisms, e.g. time in the growth/dangerous temperature zone;
- the intended shelf-life of the product;
- the method of packaging and processing; and
- how the product is intended to be used, e.g. further cooking/processing or ready-to-eat.

Such systems should also specify tolerable limits for time and temperature variations. Temperature control systems that impact safety and suitability of food should be validated, monitored and recording. Temperatures monitoring and recording devices should be checked at regular intervals or as needed.

7.2.2. Specific process steps (Now 13.2.2 in Codex)

There are many individual processing steps for specific foods which contribute to the production of safe and suitable food products. These vary depending on the product and can include key steps such as cooking, chilling, freezing, drying and packaging.
The composition of a food can be important in preventing microbial growth and toxin production, e.g. in its formulation by adding preservatives, including acids, salts, food additives or other compounds. When formulation is used to control foodborne pathogens (e.g. adjusting the pH or aw to a level that prevents growth), systems should be in place to ensure that the product is formulated correctly and that the controlling parameters are monitored.

7.2.3. Microbiological, physical, chemical and allergen specifications (Now 13.2.3 in Codex)

Where microbiological, chemical or physical and allergen specifications are used for food safety or suitability such specifications should be based on sound scientific principles and state, where appropriate, sampling parameters monitoring procedures, analytical methods and acceptable limits. Specifications can help ensure that raw materials and other ingredients are fit for purpose and contaminants have been minimized.

7.2.4. Microbiological contamination (13.2.4 in Codex)

Systems should be in place to prevent or minimize contamination of foods by microorganisms. Microbiological contamination occurs through a number of mechanisms, including the transfer of microorganisms from one food to another, e.g.:

- by direct contact or indirectly by food handlers;
- by contact with surfaces;
- from cleaning equipment;
- by splashing; or
- by airborne particles.

Raw, unprocessed food, where not considered ready-to-eat, which could be a source of contamination should be effectively separated, either physically or by time, from ready-to-eat foods, with effective intermediate cleaning and where appropriate disinfection.
In some companies, access to processing areas may need to be restricted or controlled for food safety purposes. Where the likelihood of product contamination risks are particularly high, access to processing areas should be only via a changing facility. Personnel may need to be required to put on clean protective clothing (which may be of a differentiating colour from that worn in other parts of the facility), including footwear and wash their hands and where necessary sanitize them before entering.
Surfaces, utensils, equipment, fixtures and fittings should be thoroughly cleaned and where necessary disinfected after raw food preparation, particularly when raw materials with potentially high microbiological load such as meat, poultry and fish has been handled or processed.

7.2.5. Physical contamination (Now 13.2.5 in Codex)

Systems should be in place throughout the food chain to prevent contamination of foods by extraneous materials, such as personnel belongings, especially any hard or sharp object(s), e.g. jewellery, glass, metal shards, bone(s), plastic, wood fragments, that could cause injury or present a choking hazard. In manufacturing and processing, suitable prevention strategies such as maintenance and regular inspection of equipment, should be undertaken. Detection or screening devices which are appropriately calibrated should be used where necessary (e.g. metal detectors, x-ray detectors). Procedures should be in place for personnel to follow in the case of breakages (e.g. breakage of glass or plastic containers).

7.2.6. Chemical contamination (Now 13.2.6 in Codex)

Systems should be in place to prevent or minimize contamination of foods by harmful chemicals, e.g. cleaningmaterials, non-food grade lubricants, chemical residues from pesticides and veterinary drugs such asantibiotics. Toxic cleaning compounds, disinfectants, and pesticide chemicals should be identified, safely stored and used in a manner that protects against contamination of food, food contact surfaces, and food packaging materials. Food additives and food processing aids that may be harmful if used improperly should be controlled so they are only used as intended.

7.2.7. Allergen Management (Now 13.2.7 in Codex)

Systems should be in place to take into account the allergenic nature of some foods, as appropriate to the food business. Presence of allergens, e.g. tree nuts, milk, eggs, crustacea, fish, peanuts, soybeans and wheat and other cereals containing gluten and their derivatives (not an inclusive list; allergens of concern differ among countries and populations), should be identified in raw materials, other ingredients and products. A system of allergen management should be in place at receipt, during processing and storage to address the known allergens. This management system should include controls put in place to prevent the presence of allergens in foods where they are not labelled. Controls to prevent cross-contact from foods containing allergens to other foods should be implemented, e.g. separation either physically or by time (with effective cleaning between foods with different allergen profiles). Food should be protected from unintended allergen cross-contact by cleaning and line change-over practice and/or product sequencing. Where cross-contact cannot be prevented despite well-implemented controls, consumers should be informed. Where necessary food handlers should receive specific training on allergen awareness and associated food manufacturing/processing practices and preventive measures to reduce the risk to allergic consumers.

7.2.8. Incoming Material Requirements (Now 13.2.8 in Codex)

Only raw materials and other ingredients that are fit for purpose should be used. Incoming materials including food ingredients should be procured according to specifications, and their compliance with food safety and suitability specifications should be verified where necessary. Supplier quality assurance activities, such as audits, may be appropriate for some ingredients. No raw material or ingredient should be accepted by an establishment if it is known to contain chemical, physical or microbiological contaminants which would not be reduced to an acceptable level by controls applied during sorting and/or processing.
Raw materials or ingredients should (e.g. visual examination for packages damaged during transportation, use-by-date and declared allergens, or temperature measurement for refrigerated and frozen foods), where appropriate, be inspected and sorted before processing. Where necessary, laboratory tests could be conducted to check food safety and suitability of raw materials or ingredients. These tests may be conducted by a supplier that provides a Certificate of Analysis, the purchaser, or both.
Stocks of raw materials and ingredients should be subject to effective stock rotation. Documentation of key information for incoming materials (e.g. supplier details, date of receipt, quantity etc.) should be maintained.

7.2.9. Packaging (Now 13.2.9 in Codex)

Packaging design and materials should provide adequate protection for products to minimize contamination, prevent damage, and accommodate proper labelling. Packaging materials or gases where used must be non-toxic and not pose a threat to the safety and suitability of food under the specified conditions of storage and use. Where appropriate, reusable packaging should be suitably durable, easy to clean and, where necessary, disinfect.

7.3. Water (Now 13.3 in Codex)

Water, as well as ice and steam made from water, should be fit for its intended purpose based on a risk-based approach. They should not cause contamination of food. Water and ice should be stored and handled in a manner that does not result in their becoming contaminated, and the generation of steam that will contact food should not result in its contamination. Water that is not fit for use in contact with food (e.g. some water used for fire control and for steam that will not directly contact food) should have a separate system that does not connect with or allow reflux into the system for water that will contact food.
Water recirculated for reuse and water recovered from e.g. food processing operations by evaporation and/or filtration, should be treated to ensure that the water does not compromise the safety and suitability of food.

7.4. Documentation and Records (Now 13.4 in Codex)

Appropriate records for the food company should be retained for a period that exceeds the shelf-life of the product or as determined by the competent authority.

7.5. Recall Procedures - removal from the market of unsafe food (Now 13.5 in Codex)

Companies should ensure effective procedures are in place to respond to failures in the food hygiene system. Deviations should be assessed for the impact on food safety or suitability. Procedures should enable the comprehensive, rapid and effective identification, and removal from the market by the involved company(s) and/or return to the company by the consumers of any food that may pose a risk to public health. Where a product has been recalled because of the likely presence of hazards that may represent an immediate health risk, other products which are produced under similar conditions which may also present a hazard to public health should be evaluated for safety and may need to be recalled. Reporting to the relevant competent authority should be required and public warnings considered where product may have reached consumers and when return of product to the company or removal from the market is appropriate. Recall procedures should be documented, maintained, and modified where necessary based on the findings of periodic field trials.
Recalled products should be held under supervision until they are destroyed, used for purposes other than human consumption, determined to be safe for human consumption, or reprocessed in a manner to ensure their safety. The cause and extent of a recall and the corrective actions taken should be retained by the company as documented information.

8. PRODUCT INFORMATION AND CONSUMER AWARENESS (NOW 14 IN CODEX)

Products should bear appropriate information to ensure that:

- adequate and accessible information is available to the next company in the food chain of the consumer to enable them to handle, store, process, prepare and display the product safely and correctly;
- the consumers can identify allergens presens in foods; and
- the lot or batch can be easily identified and removed/returned if necessary.

Consumers should have enough knowledge of food hygiene to enable them to:

- be aware of the importance of reading and understanding the label;
- make informed choices appropriate to the individual including about allergens; and
- prevent contamination and growth or survival of foodborne pathogens by storing, preparing and using it correctly.

RATIONALE:
Insufficient product information, and/or inadequate knowledge of general food hygiene, can lead to products being mishandled at later stages in the food chain. Such mishandling can result in illness, or products becoming unsuitable for consumption, even where adequate hygiene control measures have been implemented earlier in the food chain. Insufficient product information about the allergens in food can also result in illness or potentially death for allergic consumers.

8.1. Lot Identification and Traceability (Now 14.1 in Codex)

Lot identification or other identification strategies are essential in product recall and also helps effective stock rotation. Each container of food should be permanently marked to identify the producer and the lot. Codex General Standard for the Labelling of Prepackaged Foods (CODEX STAN 1-1985) applies.
A traceability/product tracing system should be designed and implemented according to the Principles for Traceability/Product Tracing as a Tool within a Food Inspection and Certification System (CXG 60-2006), especially to enable the recall of the products, where necessary.

8.2. Product Information (Now 14.2 in Codex)

All food products should be accompanied by or bear adequate information to enable the next company in the food chain or the consumer to handle, display, store and/or prepare and use the product safely and correctly.

8.3. Product Labelling

Prepackaged foods should be labelled with clear instructions to enable the next person in the food chain to handle, display, store and use the product safely. This should also include information that identifies food allergens in the product as ingredients or where cross-contact cannot be excluded. The General Standard for the Labelling of Prepackaged Foods (CXS 1-1985) applies.

8.4. Consumer Education

Consumer education programmes should cover general food hygiene. Such programmes should enable consumers to understand the importance of any product label information and to follow any instructions accompanying products, and make informed choices. In particular consumers should be informed of the relationship between time/temperature control, cross contamination and foodborne illness and of the presence of allergens. Consumers should also be informed of the WHO 5 Keys to Safer Food and educated to apply appropriate food hygiene measures (e.g. proper hand washing, adequate storage and cooking and avoiding cross contamination) to ensure that their food is safe and suitable for consumption.

9. TRANSPORTATION (NOW 15 IN CODEX)

During transportation measures should be taken where necessary to:

- protect food from potential sources of contamination, including allergens cross-contact;
- protect food from damage likely to render the food unsuitable for consumption; and
- provide an environment which effectively controls the growth of pathogenic or spoilage
- micro-organisms and the production of toxins in food.

RATIONALE:
Food may become contaminated or may not reach its destination in a suitable condition for consumption, unless effective hygiene practices are taken prior to and during transport, even where adequate hygiene practices have been taken earlier in the food chain.

9.1. General (Now 15.1 in Codex)

Food should be adequately protected during transport. The type of conveyances or containers required depends on the nature of the food and the most appropriate conditions under which it should be transported.

9.2. Requirements (Now 15.2 in Codex)

Where necessary, conveyances and bulk containers should be designed and constructed so that they:

- do not contaminate foods or packaging;
- can be effectively cleaned and, where necessary, disinfected and dried;
- permit effective separation of different foods or foods from non-food items that could cause contamination where necessary during transport;
- provide effective protection from contamination, including dust and fumes;
- can effectively maintain the temperature, humidity, atmosphere and other conditions necessary to protect food from harmful or undesirable microbial growth and deterioration likely to render it unsafe or unsuitable for consumption; and
- allow any necessary temperature, humidity and other environmental conditions to be checked.

9.3. Use and Maintenance (Now 15.3 in Codex)

Conveyances and containers for transporting food should be kept in an appropriate state of cleanliness, repair and condition. Containers and conveyances for bulk food transport should be designated and marked for food use and used only for that purpose, unless controls are taken to ensure that the safety and suitability of the food are not compromised. Where the same conveyance or container is used for transporting different foods, or non-foods, effective cleaning and, where necessary, disinfection and drying should take place between loads.

10. SYSTEM REVIEW, CORRECTIVE ACTIONS AND IMPROVEMENT PROCESS

10.1. Internal audits

The organization shall conduct internal audits at planned intervals to provide information on whether the quality management system conforms the organization's own requirements, especially to the food hygiene system.
The organization shall plan, establish, implement and maintain an audit programme(s) including the frequency, methods, responsibilities, planning requirements and reporting, taking into consideration the importance of the processes and areas to be audited, as well as any updating actions resulting from previous audits.
The responsibilities and requirements for planning and conducting audits, and for reporting results and maintaining records, shall be defined in a documented procedure.
Appropriate corrective actions regarding food safety are taken without undue delay.
Selection of auditors and the conduct of audits shall ensure the objectivity and impartiality of the audit process.

10.2. Nonconformity and corrective action:

For any occured nonconformity, including any arising from complaints, with an impact on food safety or the HACCP- system, the organization shall:

a) react to the nonconformity and, as applicable:
   - take action to control and correct it;
   - deal with the consequences;

b) evaluate the need for action to eliminate the cause(s) of the nonconformity, in order that it does not recur or occur elsewhere, by:
   - reviewing and analysing the nonconformity;
   - determining the causes of the nonconformity;
   - determining if similar nonconformities exist, or could potentially occur;

c) implement any action needed;
   - review the effectiveness of any corrective action taken;
   - make changes to the quality HACCP-system, if necessary.

10.3. Complaints handling:

Effective arrangements for communicating with customers and other relevant organizations is established, implemented and maintained to ensure sufficient information on food safety issues is available. This shall include:

- obtaining customer feedback relating to products and services, including customer complaints;
- establishing specific requirements for contingency actions, when relevant.

In order to maintain the effectiveness of the food hygiene system, the organization shall ensure that the food safety team is informed in a timely manner of issues regarding:

- complaints indicating food safety hazards associated with the product;
- other conditions that have an impact on food safety.

10.4. Progress of planned activities aimed at continual improvement:

The management shall ensure that the organization continually improves the effectiveness of the food hygiene system through the use of:

- communication,
- management review,
- internal audit,
- evaluation of individual verification results,
- analysis of results of verification activities,
- validation of control measure combinations,
- corrective actions and
- food hygiene system updating.

A continually updating of the food hygiene system is ensured by management. In order to achieve this, the food safety team shall evaluate the food hygiene system at planned intervals. The team shall then consider whether it is necessary to review the HACCP system. Updating activities shall be recorded and reported, in an appropriate manner, as input to the management review.

CHAPTER TWO

HAZARD ANALYSIS AND CRITICAL CONTROL POINT (HACCP) SYSTEM AND GUIDELINES FOR ITS APPLICATION

INTRODUCTION

The first section of this Chapter sets out the seven principles of the Hazard Analysis and Critical Control Point (HACCP) system.
The second section sets out the seven principles of the HACCP System. Provides general guidance for the application of the HACCP system, while recognizing that the details of application may vary and a more flexible approach to application may be appropriate depending on the circumstances and the capabilities of the company.
The HACCP system, which is science- based and systematic, identifies specific hazards and measures for their control to ensure the safety of food. HACCP is a tool to assess hazards and establish control systems that focus on control measures for significant hazards along the food chain, rather than relying mainly on end-product testing. Development of a HACCP system may identify the need for changes in processing parameters, in processing steps, in manufacturing technology, in end product characteristics, in method of distribution, in the intended use or in the GHPs applied. Any HACCP system should be capable of accommodating change, such as advances in equipment design, processing procedures or technological developments.
While applying HACCP directly at the primary production level may not always be practical, certain principles can still be integrated into good practice programmes such as GAPs. It is acknowledged that some businesses may face difficulties in implementing HACCP. Nevertheless, the principles offer flexibility and can be tailored to suit individual operations. Businesses may rely on external expertise—such as consultants—or adapt standardized HACCP plans developed by competent authorities, academic institutions, or recognized organizations like trade and industry associations to fit their specific site conditions. Beyond improving food safety, HACCP implementation offers additional advantages, including streamlined processes through detailed capability analysis, optimized resource allocation by targeting critical control points, and reduced product recalls by identifying issues before release. Furthermore, HACCP systems support regulatory review and foster international trade by strengthening trust in food safety standards.
The successful application of HACCP requires the commitment and involvement of management and personnel and the knowledge and/or training in its application for the particular type of food business.
A multi- disciplinary approach is strongly recommended; this multi-disciplinary approach should be appropriate to the company and may include, for example, expertise in primary production, microbiology, public health, food technology, environmental health, chemistry and engineering, according to the particular application.

SECTION 1: PRINCIPLES OF THE HACCP SYSTEM

The HACCP system is designed, validated and implemented in accordance with the following seven principles:

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.

SECTION 2: GENERAL GUIDELINES FOR THE APPLICATION OF THE HACCP SYSTEM (NOW 18 IN CODEX)

2.1 Introduction (Now 18.1 in codex)

Prior to application of a HACCP system by any company in the food chain, that company should have in place prerequisite programmes, including GHPs established in accordance with Chapter One of this document, the appropriate product and sector-specific Codex Codes of Practice, and in accordance with relevant food safety requirements set by competent authorities. HACCP application will not be effective without prior implementation of prerequisite programmes including GHPs.

For all types of food companies, management awareness and commitment to food safety are necessary for implementation of an effective HACCP system. The effectiveness will also rely upon management and personnel having the appropriate HACCP training and competency. Therefore, ongoing training is necessary for all levels of personnel, including managers, as appropriate to the food companies.
A HACCP system identifies and enhances control of significant hazards, where necessary, over that achieved by the GHPs that have been applied by the establishment. The intent of the HACCP system is to focus control at Critical Control Points (CCPs). By specifying critical limits for control measures at CCPs and corrective actions when limits are not met, and by producing records that are reviewed before product release, HACCP provides consistent and verifiable control beyond that achieved by GHPs. A HACCP approach should be customized to each company.
A HACCP system should be tailored to the specific needs and conditions of each individual company. The identification of hazards, the selection of control measures at critical control points (CCPs), the establishment of critical limits, as well as procedures for monitoring, corrective actions, and verification, may vary depending on the specific context. The measures outlined in Codex codes of practice or other relevant guidelines may not always be exhaustive or may differ in nature from those required in a given situation. It is essential that the HACCP system undergoes periodically review, especially when significant changes occur—such as the introduction of new processes, ingredients, products, or equipment—that could influence potential hazards or the effectiveness of control measures. Additionally, periodic reassessment is necessary in cases where the application of HACCP principles has led to the conclusion that no CCPs are required, to determine whether this conclusion remains valid over time.

2.2 Control of Food Hazards (HACCP)

Companies should control food hazards through the use of systems such as HACCP.
They should:

- **identify** any steps in their operations which are critical to the safety of food;
- **implement** effective control procedures at those steps;
- **monitor** control procedures to ensure their continuing effectiveness; and
- **review** control procedures periodically, and whenever there is a significant change that could impact the potential hazards and/or the control measures (e.g. new process, new ingredient, new product, new equipment) associated with the food business.

2.3 Flexibility for small and/or less developed food businesses (Now 18.2 in Codex)

The application of the HACCP principles to develop an effective HACCP system should be the responsibility of each individual business. However, it is recognised by competent authorities and Companies that there may be obstacles that hinder the effective application of the HACCP principles by individual food businesses. This is particularly relevant in small and/or less developed food businesses. Barriers to the application of HACCP in small and less developed businesses (SLDBs) have been acknowledged and flexible approaches to the implementation of HACCP in such businesses are available and encouraged.
This flexibility should take into account the nature of the operation, including the human and financial resources, infrastructure, processes, knowledge and practical constraints, as well as the risk associated with the produced food. Applying such flexibility, e.g. recording only monitoring results when there is a deviation instead of every monitoring result to reduce unnecessary burden of record keeping for certain types of companies, is not intended to impact negatively on the efficacy of the HACCP system and should not endanger food safety.
Small and/or less developed food businesses do not always have the resources and the necessary expertise on site for the development and implementation of an effective HACCP system. In such situations, expert advice should be obtained from other sources, which may include trade and industry associations, independent experts and competent authorities.
HACCP literature and especially sector-specific HACCP guides can be valuable. HACCP guidance developed by experts relevant to the process or type of operation may provide a useful tool for businesses in designing and implementing a HACCP plan. Where businesses are using expertly developed HACCP guidance, it is essential that it is specific to the foods and/or processes under consideration. A comprehensive explanation of the basis for the HACCP plan should be provided to the companies. The company is ultimately responsible for elaboration and implementation of the HACCP system and the production of safe food. The efficacy of any HACCP system will nevertheless rely on management and personnel having the appropriate HACCP knowledge and skills, therefore ongoing training is necessary for all levels of personnel, including managers, as appropriate to the food business.

SECTION 3: APPLICATION (NOW 19 IN CODEX)

3.1 Assemble HACCP team and Identify Scope (Step 1) (Now 19.1 in Codex)

The company should assure that the appropriate product specific knowledge and expertise is available for the development of an effective HACCP plan. Optimally, this may be accomplished by assembling a multidisciplinary team, responsible for different activities within the operation, e.g. production, maintenance, quality control, cleaning and disinfection. The HACCP team is responsible for developing the HACCP plan.
Where such expertise is not available on site, expert advice should be obtained from other sources, such as, trade and industry associations, independent experts, regulatory authorities, HACCP literature and HACCP guidance (including sector-specific HACCP guides). It may be possible that a well-trained individual with access to such guidance is able to implement HACCP in house. A generic HACCP plan developed externally may be used by Companies where appropriate but should be tailored to the food operation.
The scope of the HACCP plan and applicable prerequisite programmes should be identified. The scope should describe which segment of the food chain is involved and the general classes of hazards to be addressed (e.g. does it cover all classes of hazards or only selected classes).

3.2 Describe product (Step 2) (Now 19.2 in Codex)

A full description of the product should be drawn up, including relevant safety information such as: composition, physical/chemical structure (including Aw, pH, preservatives, allergens etc), microcidal/static treatments (heattreatment, freezing, brining, smoking, etc), packaging, durability and storage conditions and method of distribution. Within businesses with multiple products, it may be effective to group products with similar characteristics or processing steps, for the purpose of development of the HACCP plan. Any limits relevant to the food product already established for hazards should be considered and accounted for in the HACCP plan, e.g. limits for food additives, regulatory microbiological criteria, maximum allowed veterinary medicines residues, and times and temperatures for heat treatments prescribed by competent authorities.

3.3 Identify intended use (Step 3) (Now 19.03 in Codex)

Describe the use intended by the company and the expected uses of the product by the next company in the food chain or the consumer. the description may be influenced by external information, e.g. from the competent authority or other sources on ways in which consumers are known to use the product other than those intended by the company. In specific cases (e.g. hospitals), vulnerable groups of the population, e.g. institutional feeding, may have to be considered. Where foods are being produced specifically for a vulnerable population, it may be necessary to enhance process controls, monitor control measures more frequently, verify controls are effective by testing products, or conduct other activities to provide a high level of assurance that the food is safe for the vulnerable population.
3.4 Construct flow diagram (Step 4) (Now 19.04 in Codex)
A flow diagram that covers all steps in the production of a specific product, including any applicable rework, should be constructed. The same flow diagram may be used for a number of products that are manufactured using similar processing steps. The flow diagram should indicate all inputs, including those

of ingredients and food contact materials, water and air if relevant. Complex manufacturing operations can be broken down into smaller, more manageable modules and multiple flow diagrams that link together can be developed. The flow diagrams should be used when conducting the hazard analysis as a basis for evaluating the possible occurrence, increase, decrease or introduction of hazards. Flow diagrams should be clear, accurate and sufficiently detailed to the extent needed to conduct the hazard analysis. Flow diagrams should, as appropriate, include but not be limited to the following:

- the sequence and interaction of the steps in the operation;
- where raw materials, ingredients, processing aids, packaging materials, utilities and intermediate products enter the flow;
- any outsourced processes;
- where applicable reworking and recycling take place;
- where end products, intermediate products, waste and by-products are released or removed.

3.4 On-site confirmation of flow diagram (Step 5) (Now 19.5 in Codex)

Steps must be taken to confirm the processing operation against the flow diagram during all stages and hours of operation and amend the flow diagram where appropriate. The confirmation of the flow diagram should be performed by a person or persons with sufficient knowledge of the processing operation.

3.5 List all potential hazards that are likely to occur and associated with each step, conduct a hazard analysis to identify significant hazards, and consider measures to control identified hazards (Step 6/ Principle 1) (Now 19.06 in Codex)

Hazard analysis consists of identifying potential hazards and evaluating these hazards to determine which of them are significant for the specific company. The HACCP team (see “assemble HACCP team” above) should list all of the hazards that may be reasonably expected to occur at each step according to the scope of the company. Hazards should be specific, e.g. metal fragments, and the source or reason for presence should be described, e.g. metal from broken blades after chopping. The hazard analysis can be simplified by breaking down complex manufacturing operations and analysing steps in the multiple flow diagrams described in step 4.
The HACCP team should next conduct a hazard analysis to identify for the HACCP plan, which hazards are of such a nature that their elimination or reduction to acceptable levels is essential to the production of a safe food.
In conducting the hazard analysis, wherever possible the following should be included:

- hazards associated with producing or processing the type of food, including its ingredients and process steps (e.g. from surveys or sampling and testing of hazards in the food chain, from recalls, from information in the scientific literature or from epidemiological data);
- the likelihood of occurrence of hazards, taking into consideration prerequisite programs, in the absence of additional control;

- the likelihood occurrence of hazards and severity of their adverse health effects associated with the hazards in the food in the absence of control;
- the nature of the facility and the equipment used in making the food product;
- identified acceptable levels of the hazards in the food e.g. based on regulation, intended use, and scientific information;
- survival or multiplication of pathogenic micro-organisms of concern;
- production or persistence in foods of toxins, (e.g. mycotoxins), chemicals (e.g. pesticides, drug residues, allergens) or physical agents (e.g. glass, metal);
- conditions leading to the above.

The hazard analysis should consider not only the intended use, but also any known unintended use (e.g. a soup mix intended to be mixed with water and cooked but known to commonly be used without a heat treatment in flavouring a dip for chips) to determine the significant hazards to be addressed in the HACCP plan.
In some cases, it may be acceptable for a simplified hazard analysis to be carried out by Companies. This simplified process identifies groups of hazards (biological, physical, chemical) in order to control the sources of these hazards without the need for a comprehensive hazard analysis that identifies the specific hazards of concern.
There can be drawbacks to such an approach, as the controls can differ for hazards within a group, e.g. controls for pathogenic spore-formers versus vegetative cells of microbial pathogens. Generic HACCP-based tools and guidance documents provided by external sources, for example, by industry or competent authorities, are designed to assist with this step and mitigate concerns about different controls needed for hazards within a group.
Hazards that are reasonably likely to occur if not controlled—and that could result in illness or injury—should be identified and managed through appropriate measures aimed at preventing, eliminating, or reducing them to acceptable levels, as they are critical to ensuring food safety. In some situations, this can be accomplished through the application of Good Hygiene Practices (GHPs), particularly when these practices are designed to address specific hazards for instance, cleaning procedures to prevent contamination of ready-to-eat foods with *Listeria monocytogenes*, or to avoid cross-contact of allergens between foods. In other cases, it may be necessary to implement control measures directly within the production process, such as at designated Critical Control Points (CCPs).
Consideration should be given to what control measures, if any exist, can be applied to each hazard. More than one control measure may be required to control a specific hazard(s) and more than one hazard may be controlled by a specified control measure. For example, to control *L. monocytogenes*, a heat treatment may be needed to kill the organism in the food and cleaning and disinfection may be needed to prevent transfer from the processing environment.

3.6 Determine Critical Control Points (Step 7/ Principle 2) (Now 19.7 in Codex)

The company should consider which among the available control measures listed during step 6, Principle 1 should be applied at a CCP. Critical Control points are to be determined only for hazards identified as significant as of the result of a hazard analysis. CCPs are established at steps where control is essential and where a deviation could result in the production of a potentially unsafe food. The control

measures at CCPs should result in an acceptable level of the hazard being controlled. There may be more than one CCP at which control is applied to address the same hazard (e.g. the cook step may be the CCP for killing the vegetative cells of a pathogenic spore-former, but the cooling step may be a CCP to prevent germination and growth of the spores). Similarly, a CCP may control more than one hazard (e.g. cooking can be a CCP that addresses several microbial pathogens). Determining whether or not the step at which a control measure is applied is a CCP in the HACCP system can be helped by using a decision tree. The determination of a CCP in the HACCP system can be facilitated by the application of a decision tree, which indicates a logic reasoning approach. Application of a decision tree should be flexible, given whether the operation is for production, slaughter, processing, storage, distribution or other. It should be used for guidance when determining CCPs. This example of a decision tree may not be applicable to all situations. Other approaches may be used. Training in the application of the decision tree is recommended.
To identify a CCP, whether using a decision tree or other approach, the following should be considered:.

- Assess whether the control measure can be used at the process step being analysed:
  - If the control measure cannot be used at this step, then this step should not be considered as a CCP for the significant hazard.
  - If the control measure can be used at the step being analysed, but can also be used later in the process, or there is another control measure for the hazard at another step, the step being analysed should not be considered as a CCP.
- Determine whether a control measure at a step is used in combination with a control measure atanother step to control the same hazard; if so, both steps should be considered as CCPs.

The CCPs identified could be summarized in tabular format. If a hazard has been identified at a step where control is necessary for safety, and no control measure exists at that step, or any other, then the product or process should be modified at that step, or at any earlier or later stage, to include a control measure.

3.7 Establish validated critical limits for each CCP (Step 8/ see principle 3) (Now 19.8 in Codex)

Critical limits establish whether a CCP is in control, and in doing so they can be used to separate acceptable products from unacceptable ones. These critical limits should be measurable or observable.In some cases more than one critical limit will be elaborated at a particular step (e.g. heat treatments commonly include critical limits for both time and temperature). Criteria often used include measurements of temperature, contact time, moisture level, pH, Aw, available chlorine contact time, conveyor belt speed, viscosity, conductance, flow rate, or, where appropriate, parameters that can be observed, such as a pump setting. A deviation from the critical limit indicates that it is likely that unsafe food has been produced.
Critical limits for control measures at each CCP should be specified and scientifically validated to obtain evidence that they are capable of controlling hazards to an acceptable level if properly implemented. Validation of critical limits may include conducting studies (e.g. microbiological inactivation studies). Companies may not always need to conduct or commission studies themselves to validate critical limits. Critical limits could be based on existing literature, regulations or guidance from competent authorities,

or studies carried out by a third party e.g. studies conducted by an equipment manufacturer to determine the appropriate time, temperature and bed depth for dry roasting tree nuts. Validation of control measures is further described more fully in the Guidelines for the Validation of Food Safety Control Measures (CXG 69 – 2008).

3.8 Establish a monitoring system for each CCP (Step 9/Principle 4) (Now 19.9 in Codex)

Monitoring of CCPs is the scheduled measurement or observation at a CCP relative to its critical limits. The monitoring procedures should be able to detect a deviation at the CCP. Further, the monitoring method and frequency should be capable of timely detection of any failure to remain within critical limits, to allow timely isolation and evaluation of the product. Where possible, process adjustments should be made when monitoring results indicate a trend towards loss of control at a CCP. The adjustments should be taken before a deviation occurs.
Monitoring procedures for CCPs should be capable of timely detection of a deviation from the critical limit to allow isolation of the affected products. The method and frequency of monitoring should take into account the nature of the deviation (e.g. a drop in temperature or a broken sieve, rapid drop in temperature during pasteurization, or a gradual increase in temperature in cold storage). Where possible, monitoring of CCPs should be continuous. Monitoring of measurable critical limits such as processing time and temperature can often be monitored continuously. Other measurable critical limits such as moisture level and preservative concentration cannot be monitored continuously. Critical limits that are observable, such as a pump setting or applying the correct label with appropriate allergen information are rarely monitored continuously. If monitoring is not continuous, then the frequency of monitoring should be sufficient to ensure to the extent possible the critical limit has been met and limit the amount of product impacted by a deviation. Physical and chemical measurements are often preferred to microbiological testing because they may be done rapidly and can often indicate the microbiological control of the product.
The personnel doing the monitoring should be instructed on appropriate steps to take when monitoring indicates the need to take action. Data derived from monitoring must be evaluated by a designated person with knowledge and authority to carry out corrective actions when indicated. All records and documents associated with monitoring CCPs should be signed or initialled by the person performing the monitoring and should also report the results and timing of the performed activity.

3.9 Establish corrective actions (Step 10/ Principle 5) (Now 19.10 in Codex)

Specific corrective actions should be developed for each CCP in the HACCP system in order to deal with deviations when they occur. When critical limits at CCPs are monitored continuously and a deviation occurs, any product being produced at the time the deviation occurs is potentially unsafe. When a deviation in meeting a critical limit occurs and monitoring was not continuous, then the company should determine what product may have been impacted by the deviation.
The corrective actions taken when a deviation occurs should ensure that the CCP has been brought under control and food that is potentially unsafe is handled appropriately and does not reach consumers. Actions taken must also include proper disposition of the affected product and analyzing its sfety to ensure proper disposition.

External experts may be needed to conduct evaluations regarding the safe use of products when a deviation occurs. It may be determined that the product could be reprocessed (e.g. pasteurized) or the product could be diverted to another use. In other situations, the product may need to be destroyed (e.g. contamination with Staphylococcus enterotoxin). A root cause analysis should be conducted where possible to identify and correct the source of the deviation in order to minimize the potential for the deviation to reoccur. A root cause analysis could identify a reason for the deviation that limits or expands the amount of product impacted by a deviation.
Details of the corrective actions, including the cause of the deviation and product disposition procedures, should be documented in the HACCP records. Periodic review of corrective actions should be undertaken to identify trends and to ensure corrective actions are effective.

3.10 Validation of the HACCP Plan and Verification procedures (Step 11/ Principle 6)

3.10.1 Validation of the HACCP Plan (Now 19.11.1 in Codex)

Before the HACCP plan can be implemented, its validation is needed; this consists of making sure that the following elements together are capable of ensuring control of the significant hazards relevant to the food business: identifying the hazards, critical control points, critical limits, control measures, frequency and type of monitoring of CCPs, corrective actions, frequency and type of verification and the type of information to be recorded.
Validation of control measures and their critical limits is performed during the development of the HACCP plan. Validation could include a review of scientific literature, using mathematical models, conducting validation studies, and/or using guidance developed by authoritative sources.
Where HACCP guidance developed by external experts, instead of the HACCP team, has been used to establish the critical limits, care should be taken to ensure that these limits fully apply to the specific operation, product or groups of products under consideration.
During the initial implementation of the HACCP system and after verification procedures have been established, evidence should be obtained in operation to demonstrate that control can be achieved consistently under production conditions.
Any changes having a potential impact on food safety should require a review of the HACCP system, and when necessary a revalidation of the HACCP plan.

3.10.2 Verification of the HACCP Plan (Now 19.11.2 in Codex)

Establish procedures for verification. Verification and auditing methods, procedures and tests, including random sampling and analysis, can be used to determine if the HACCP system is working correctly. These include procedures to verify that the HACCP plan is being followed and controlling hazards on an ongoing basis, as well as procedures that show the control measures are effectively controlling the hazards as intended. Verification also includes reviewing the adequacy of the HACCP system periodically and, as appropriate, when changes occur.
Verification activities should be performed on an ongoing basis to ensure the HACCP system functions as intended and continues to operate effectively. Verification, which includes observations, auditing (internal and external), calibration, sampling and testing, and records review, can be used to determine if the HACCP system is working correctly and as planned. Verification of the implementation of control

measures should be conducted with sufficient frequency to determine that the HACCP plan is being implemented properly.
Examples of verification activities include:

- Review of the HACCP system and including the hazard analysis and the HACCP plan (e.g. internal and/or third-party audits);
- observing that control measures are being conducted in accordance with the HACCP plan;
- sampling and testing, e.g. for microorganisms (pathogens or their indicators), chemical hazards such as mycotoxins, or physical hazards such as metal fragments, to verify product safety;
- calibrating or checking the accuracy of instruments used for monitoring and/or verification
- Review of corrective action records, including specific deviations, product dispositions and any analysis to determine the root cause of the deviation;
- sampling and testing the environment for microbial contaminants and their indicators, such as Listeria; and
- Reviewing monitoring records that CCPs are kept under control.

Verification should be carried out by someone other than the person who is responsible for performing the monitoring and corrective actions. Where certain verification activities cannot be performed in house, verification should be performed on behalf of the business by external experts or qualified third parties. Verification should include a comprehensive review (e.g. reanalysis or an audit) of the HACCP system periodically, as appropriate, or when changes occur, to confirm the efficacy of all elements of the HACCP system.This review of the HACCP system should confirm that the appropriate significant hazards have been identified, that control measures and critical limits are adequate to control the hazards, that monitoring, and verification activities are occurring in accordance with the plan and are capable of identifying deviations, and that corrective actions are appropriate for deviations that have occurred. This review can be carried out by individuals within a food business or by external experts. The review should include confirmation that various verification activities have been executed as intended.

3.11 Establish Documentation and Record Keeping (Step 12/Principle 7) (Now 19.12 in Codex)

Efficient and accurate record keeping is essential to the application of a HACCP system. HACCP procedures should be documented. Documentation and record keeping should be appropriate to the nature and size of the operation and sufficient to assist the business to verify that the HACCP controls are in place and being maintained. Expertly developed HACCP guidance materials (e.g. sector-specific HACCP guides) may be utilised as part of the documentation, provided that those materials reflect the specific food operations of the business.
Documentation examples are:

- HACCP Team composition;
- Hazard analysis and the scientific support for the hazards included or excluded from the plam;
- CCP determination;
- Critical limit determination and the scientific support for the limits set;

- validation of control measures; and
- modifications made to the HACCP plan

Record examples are:

- CCP monitoring activities;
- Deviations and associated corrective actions;
- Verification procedures performed;

A simple record-keeping system can be effective and easily communicated to personnel. It may be integrated into existing operations and may use existing paperwork, such as delivery invoices, and checklists to record, for example, product temperatures. Where appropriate, records can also be maintained electronically.

3.12 Training (Now 19.13 in Codex)

Training of personnel in companies, government and academia in HACCP principles and applications is an essential element for the effective implementation of HACCP. As an aid in developing specific training to support a HACCP plan, working instructions and procedures should be developed which define the tasks of the operating personnel in charge of each Critical Control Point. Training programmes should be designed to address the concepts at a level appropriate for the knowledge and skill level of the personnel being trained. Training programmes should be reviewed periodically and updated where necessary. Re-training may be needed as part of corrective actions for some deviations.
Cooperation between companies, trade groups, consumer organisations, and competent authorities is vitally important. Opportunities should be provided for the joint training of food business operators and competent authorities to encourage and maintain a continuous dialogue and create a climate of understanding in the practical application of HACCP.
(Advise Annexes from Codex)

Table 1 Comparison of control measures with examples

	Control measures applied as good hygiene practices (GHPs)	Control measures applied at critical control points (CCPs)
Scope	General conditions and activities for maintaining hygiene, including creating the environment (inside and outside the food business) so as to ensure production of safe and suitable food. Generally, not specific to any hazard but results in reduction of likelihood of hazards occurring. Occasionally a GHP activity may target a specific hazard, and this may be a GHP that requires greater attention (e.g. cleaning and disinfection of food contact surfaces for control of *Listeria monocytogenes* in a ready-to-eat food processing environment).	Specific to production process steps and a product or group of products, and necessary to prevent eliminate or reduce to acceptable level a hazard determined as significant by the hazard analysis.
When identified?	After consideration of the conditions and activities necessary to support the production of safe and suitable food.	After a hazard analysis has been completed, for each hazard identified as significant, control measures are established at steps (CCPs) where a deviation would result in the production of a potentially unsafe food.
Validation of the control measures	Where necessary, and generally not carried out by FBOs themselves (*Guidelines for the Validation of Food Safety Control Measures* CXG 69-2008).[2] Validation data provided by competent authorities, published scientific literature, information provided by manufacturers of equipment/food processing technology etc. is adequate e.g. cleaning compounds/products/equipment should be validated by the manufacturer and it is generally sufficient for the FBO to use cleaning compounds/products/equipment according to manufacturers' instructions. The FBO should be able to demonstrate it can follow manufacturers' instructions.	Validation should be carried out (*Guidelines for the Validation of Food Safety Control Measures* CXG 69-2008).[2]
Criteria	GHPs may be observable (e.g. visual checks, appearance) or measurable (e.g. ATP tests of equipment cleaning, concentration of disinfectant), and deviations may require an evaluation of the impact on safety of the product (e.g. whether the cleaning of complex equipment such as meat slicers is adequate).	Critical limits at CCPs which separate acceptability from unacceptability of the food: • measurable (e.g. time, temperature, pH, a_w); or • observable (e.g. visual checks of conveyor belt speed or pump settings, ice covering product).
Monitoring	When appropriate and necessary, to ensure procedures and practices are applied properly. Frequency dependent on the impact on the product's safety and suitability.	Necessary to ensure critical limit is met: • continuously during production; or • if not continuous, at appropriate frequency that ensures to the extent possible the critical limit has been met.
Corrective actions when deviation has occurred	• For procedures and practices: necessary • For products: usually not necessary. Corrective action should be considered on a case- by-case basis, as failure to apply some GHPs, such as failure to clean between products with different allergen profiles, not rinsing after cleaning and/or disinfecting (where needed) or post maintenance equipment checks indicating missing machinery parts, may result in action on product.	• For products: necessary pre-determined actions. • For procedures and practices: necessary corrective actions to restore control and prevent reoccurrence. • Specific written corrective actions should be developed for each CCP in the HACCP plan in order to effectively respond to deviations when they occur. • The corrective actions should ensure that the CCP has been brought under control and food that is potentially unsafe is handled appropriately and does not reach consumers.
Verification	When appropriate and necessary, usually scheduled (e.g. visual observation that equipment is clean before use).	Necessary: scheduled verification of implementation of control measures, e.g. through record review, sampling and testing, calibration of measuring equipment, internal audit.
Record keeping (e.g. monitoring records)	When appropriate and necessary, to allow the FBO to assess whether GHPs are operating as intended.	Necessary to allow the FBO to demonstrate ongoing control of significant hazards.
Documentation (e.g. documented procedures)	When appropriate and necessary to ensure GHPs are properly implemented.	Necessary to ensure the HACCP system is properly implemented.

Figure 1 Logic sequence for application of HACCP

Figure 1 Example of a CCP decision tree – apply to each step where a specified significant hazard is identified