



DRAFT TANZANIA STANDARD

**Food processing and manufacturing units – Code of hygiene –
General**

DRAFT FOR STAKEHOLDERS COMMENTS

TANZANIA BUREAU OF STANDARDS

Food processing and manufacturing units – Code of hygiene – General

0. Foreword

People have the right to expect the food that they eat to be safe and suitable for consumption. Foodborne illness and foodborne injury can be severe or fatal or have a negative impact on human health over the longer term. Furthermore, outbreaks of foodborne illness can damage trade and tourism. Food spoilage is wasteful, costly, threatens food security and can adversely affect trade and consumer confidence.

This code covers the hygienic practices that should be understood and followed by Food Business Operators (FBOs) at all stages of the food chain and that provide a basis for competent authorities to oversee food safety and suitability. Taking into account the stage in the food chain, the nature of the product, the relevant contaminants, and whether the relevant contaminants adversely affect safety, suitability or both.

This code of practice has been prepared to provide recommendations for all interested parties producing and handling food along the value chain to ensure its safety and quality for human consumption.

In preparation of this standard considerable help was derived from CARICP – 1: General Principles of Food Hygiene, published by the Codex Alimentarius Commission.

1. Scope

This code of practice provides a framework of hygienic practices for producing safe and suitable food for human consumption by outlining necessary Good Manufacturing Practices(GMPs) and Good Hygiene Practices(GHPs) to be implemented in production (including primary production), processing, manufacturing, preparation, packaging, storage, distribution, retail, food service operation and transport of food.

2. Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

TZS 1770, *Hazard Analysis and Critical Control Point (HACCP) System - Requirements for any organization in the food chain*

3. Terms and definitions

For the purpose of this standard the following terms and definitions shall apply:

3.1 cleaning

removal of soil, food residues, dirt, grease or other objectionable matter.

3.2 Competent Authority

Government Authority or official body authorized by the government that is responsible for the setting of regulatory food safety requirements and/or for the organization of official controls including enforcement.

3.3 contaminant

biological, chemical or physical agent, foreign matter or other substances not intentionally added to food that may compromise food safety or suitability.

3.4 Food Business Operator (FBO)

entity responsible for operating a business at any step in the food chain.

3.5 Food Handler

person who directly handles packaged or unpackaged food, equipment and utensils used for food, or surfaces that come into contact with food and that is expected, therefore, to comply with food hygiene requirements.

3.6 food hygiene

all conditions and measures necessary to ensure the safety and suitability of food at all stages of the food chain.

3.7 food safety

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

3.8 food suitability

assurance that food is acceptable for human consumption according to its intended use.

3.9 Good Manufacturing Practices(GMPs) and Good Hygiene Practices (GHPs)

fundamental measures and conditions applied at any step within the food chain to provide safe and suitable food.

4. Good Manufacturing Practices and Good Hygiene Practices

4.1 Introduction and control of food hazards

4.1.1 The development, implementation and maintenance of Good Manufacturing Practices(GMPs) and Good Hygiene Practices (GHPs) provides the conditions and activities that are necessary to support the production of safe and suitable food at all stages of the food chain from primary production through to handling of the final product.

4.1.2 Applied generally, they assist in controlling hazards in food products. Knowledge of the food and its production process is essential for the effective implementation of GMPs and GHPs. This standard provides guidance for effective implementation of GMPs and GHPs, including appropriate location, layout, design, construction and maintenance of premises and facilities, personal hygiene and should be applied in conjunction with sector and product-specific codes.

4.1.3 GMPs and GHPs manage many sources of food hazards which could contaminate food products, e.g. persons who handle food at harvest, during manufacturing, and during preparation; raw materials and other ingredients purchased from suppliers; cleaning and maintaining the work environment; storage and display.

4.1.4 As previously noted, all FBOs should be aware of and understand hazards associated with their businesses, and the control measures required to manage these hazards, as appropriate. FBOs should consider (using external resources as needed) whether the application of GMPs and GHPs alone is sufficient to manage some or all of the hazards associated with the operation through control of their sources, e.g.

- a) Control of water quality – minimizes the presence of many potential hazards (e.g. biological, chemical, physical);
- b) Control of faecal contamination – minimizes the potential for contamination with many foodborne pathogens such as *Salmonella*, *Campylobacter*, *Yersinia*, pathogenic strains of *E. coli*;

- c) Control of food handler practices and hygiene – prevents many potential communicable diseases that could be foodborne; and
- d) Control of food contact surfaces by cleaning – removes bacterial contaminants, including foodborne pathogens, and allergens.

4.1.5 After consideration of the conditions and activities in the business, it may be determined that GMPs and GHPs alone may be sufficient to manage the hazards. However, it may also be determined that it is necessary to place greater attention on some GMPs and GHPs that are particularly important for food safety (e.g. increased stringency of cleaning of a mincer for producing minced meat for raw or lightly cooked consumption compared to equipment used for producing meat to be cooked prior to consumption; increased monitoring and/or verification of disinfection of food contact surfaces).

4.1.6 Hazards that occur or are present at levels such that GHP and GMP procedures are not sufficient to provide safe food should be managed by an appropriate combination of control measures that are capable of preventing occurrence of hazards or eliminating or reducing them to an acceptable level. The control measures can be identified in one or more steps throughout the production process. In the case in which significant hazards are identified that need to be controlled after the implementation of GMPs and GHPs, it will be necessary to develop and implement a HACCP system in accordance with TZS 1770.

4.2 Primary production

The types of activities involved in primary production may make eliminating or reducing some hazards difficult. However, by applying prerequisite programmes such as Good Agricultural Practices (GAPs) GMPs and/or GHPs, steps can be taken to minimize the occurrence and levels of hazards in the food chain, e.g. at milking for dairy production, steps taken in the hygienic production of eggs, or the controls on irrigation water used for growing salad crops. Not all provisions apply for all primary production situations and consideration will need to be given by the FBO on the appropriateness of the measures to be taken.

4.2.1 Environmental control

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

4.2.2 Hygienic production

4.2.2.1 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.

4.2.2.2 Producers should as far as practicable implement measures to:

- a) control contamination from soil, water, feedstuffs, fertilizers (including natural fertilizers), pesticides, veterinary drugs or any other agent used in primary production;
- b) protect food sources from faecal and other contamination (e.g. zoonotic foodborne agents);
- c) 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

- d) manage waste and store harmful substances appropriately.

4.2.3 Handling, storage and transport

Procedures should be in place to:

- a) sort food to remove material which should not be used for human consumption;
- b) dispose of any rejected material in a hygienic manner; and
- c) 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.

4.2.4 Cleaning, maintenance and personnel hygiene

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

- a) 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
- b) an appropriate degree of personal hygiene is maintained to ensure personnel are not a source of contamination (e.g. by human faeces).

4.3 Establishment - design of facilities and equipment

4.3.1 Location and structure

4.3.1.1 Location of establishment

Food establishments should not be located where there is a threat to 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:

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

4.3.1.2 Design and layout of food establishment

4.3.1.2.1 The design 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 that cross-contamination is minimized or prevented.

4.3.1.2.2 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.

4.3.1.3 Internal structures and fittings

4.3.1.3.1 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:

- a) the surfaces of walls, partitions and floors should be made of impervious materials that are easy to clean and, where necessary, disinfect;
- b) walls and partitions should have a smooth surface up to a height appropriate to the operation;
- c) floors should be constructed to allow adequate drainage and cleaning;
- d) 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;
- e) 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
- f) doors should have smooth, non-absorbent surfaces, be easy to clean and, where necessary, disinfect.

4.3.1.3.2 Work surfaces that come into direct contact with food should be in sound condition, durable, and easy to clean, maintain and disinfect. They should be made of smooth, non-absorbent materials, and inert to the food, to detergents and to disinfectants under normal operating conditions.

4.3.1.4 Temporary/mobile food establishments and vending machines

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 far as reasonably practicable, the contamination of food and the harbouring of pests. Adequate facilities for toileting and washing hands should be provided, where appropriate.

4.3.2 Facilities

4.3.2.1 Drainage and waste disposal facilities

4.3.2.1.1 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.

4.3.2.1.2 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.

4.3.2.1.3 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.

4.3.2.1.4 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.

4.3.2.2 Cleaning facilities

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.

4.3.2.3 Personnel hygiene facilities and toilets

4.3.2.3.1 Adequate washing and toilet facilities for both sex and for disable 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:

- a) 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;
- b) 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.
- c) Handwashing basins should not be used for washing food or utensils.
- d) Notices should be posted requiring personnel to wash their hands after using the toilet.

4.3.2.3.2 Sufficient showers and changing rooms shall be provided, maintained and kept clean in every factory. Separate conveniences shall be provided for each sex. The conveniences shall always be maintained clean and in good repairs.

4.3.2.4 Staff canteens and designated eating areas

Staff canteens and designated areas for food storage and consumption shall be situated so that the potential for cross-contamination of production areas is minimized.

Staff canteens shall be managed to ensure hygienic storage of ingredients and preparation, storage and serving of prepared foods. Storage conditions and storage cooking and holding temperatures, and time limitations, shall be specified. Employees' own food shall be stored and consumed in designated areas only.

4.3.2.5 Temperature

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.

4.3.2.6 Air quality and ventilation

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

- a) minimize air-borne contamination of food, for example, from aerosols and condensation droplets;
- b) help control ambient temperatures;
- c) control odours which might affect the suitability of food; and
- d) 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.

4.3.2.7 Lighting

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.

4.3.2.8 Storage

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

Food storage facilities should be designed and constructed to:

- a) facilitate adequate maintenance and cleaning;
- b) avoid pest access and harbourage;
- c) enable food to be effectively protected from contamination, including allergen cross-contact, during storage; and
- d) 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. Separate, secure, storage facilities for cleaning materials and hazardous substances should be provided.

4.3.2.9 Laboratory facilities

In-line and on-line test facilities shall be controlled to minimize risk of product contamination.

Microbiology laboratories shall be designed, located and operated so as to prevent contamination of people, plant and products. They shall not open directly on to a production area.

4.3.3 Equipment

4.3.3.1 General

Equipment and containers coming into contact with food should be suitable for food contact; designed, constructed and located to ensure that they can be adequately cleaned (other than containers which are single-use only); disinfected (where necessary); and maintained or discarded as necessary to avoid the contamination of food, according to hygienic design principles.

Equipment and containers should be made of materials that are non-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.

4.3.3.2 Food control and monitoring equipment

Equipment used to cook, heat, 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. Monitoring equipment should be calibrated to ensure that temperatures of food processes are accurate.

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 or suitability of food.

4.4 Training and competence

4.4.1 Awareness and Responsibilities

Food hygiene training is fundamentally important to the food business. All personnel should be aware of their role and responsibility in protecting food from contamination or deterioration. Personnel should have the knowledge and skills necessary to enable them to handle food hygienically. Those who

handle cleaning chemicals or other potentially hazardous chemicals should be instructed in proper use to prevent contamination of food. Training should be provided by a competent authority.

4.4.2 Training Programmes

4.4.2.1 Elements to take into account in determining the extent of training required include:

- a) the nature of hazards associated with the food, e.g. its ability to sustain growth of pathogenic or spoilage microorganisms, the existence of potential physical contaminants or known allergens;
- b) the manner in which the food is produced, processed, handled and packed, including the likelihood of contamination;
- c) the extent and nature of processing or further preparation before consumption of the food;
- d) the conditions under which the food will be stored;
- e) the expected length of time before consumption of the food; and
- f) the use and maintenance of instruments and equipment associated with food.

4.4.2.2 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:

- a) the principles of food hygiene applicable to the food business;
- b) the measures relevant to the food business that are used to prevent contaminants in food;
- c) the importance of good personal hygiene, including proper hand washing and wearing, when needed, appropriate clothing, for food safety;
- d) the good hygiene practices applicable to the food business.
- e) 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.

4.4.3 Instruction and Supervision

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. Managers, supervisors and/or operators/workers should have sufficient knowledge of food hygiene principles and practices to be able to identify deviations and take necessary action as appropriate to their duties.

Periodic assessments of the effectiveness of training and instruction programmes should be made, as well as routine supervision and verification to ensure that procedures are being carried out effectively. 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.

4.4.4 Refresher Training

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.

4.5 Establishment maintenance, cleaning, disinfection and pest control

4.5.1 Maintenance and Cleaning

4.5.1.1 General

4.5.1.1.1 Establishments and equipment should be maintained in an appropriate condition to:

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

4.5.1.1.2 Cleaning should remove food residues and dirt which may be a source of contamination, including allergens. The cleaning methods and materials necessary 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.

4.5.1.1.3 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 and disinfection chemicals should be handled and used carefully and in accordance with manufacturers' instructions, for example, using the correct dilutions and contact times, and stored, where necessary, separated from food, in clearly identified containers to avoid contamination of food.

4.5.1.1.4 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.

4.5.1.1.5 Cleaning equipment should be kept clean, maintained and replaced periodically so as not to become a source for cross-contamination of surfaces or food.

4.5.1.2 Cleaning and disinfection methods and procedures

4.5.1.2.1 Cleaning can be carried out by the separate or the combined use of physical methods, such as heat, scrubbing, turbulent flow, and 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.

4.5.1.2.2 Wet cleaning procedures will involve, where appropriate:

- a) removing gross visible debris from surfaces;
- b) applying an appropriate detergent solution to loosen soil; and
- c) rinsing with water (hot water where appropriate) to remove loosened material and residues of detergent.

4.5.1.2.3 Where necessary, cleaning should be followed by chemical disinfection with subsequent rinsing unless the manufacturer's instructions indicate that, on a scientific basis, rinsing is not required. Concentrations and application time of chemicals used for disinfection should be appropriate for use and applied according to manufacturers' instructions for optimal effectiveness. 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.

4.5.1.2.4 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.

4.5.1.2.5 Written cleaning and disinfection procedures should be used. They should specify:

- a) areas, items of equipment and utensils to be cleaned, and, where appropriate, disinfected;

- b) responsibility for particular tasks;
- c) method and frequency of cleaning and, where appropriate, disinfection; and
- d) monitoring and verification activities.

4.5.1.3 Monitoring of Effectiveness

4.5.1.3.1 Application of cleaning and disinfection procedures should be monitored for effectiveness and periodically verified by means such as visual inspections and audits to ensure the 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.

4.5.1.3.2 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).

4.5.1.3.3 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.

4.5.2 Stray animals and Pest control systems

4.5.2.1 General

Stray animals (eg cat, dog) and 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.

4.5.2.2 Prevention

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 stray animals and 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.

4.5.2.3 Harbourage and infestation

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.

4.5.2.4 Monitoring and detection

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, FBOs 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).

4.5.2.5 Control of pest infestation

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.

4.5.3 Waste management

4.5.3.1 General

Suitable provision should be made for the removal and storage of waste. Waste should, as far as possible, be collected and stored in covered containers and should not be allowed to accumulate and overflow in food handling, food storage, and other working areas or 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 areas.

4.6 Personal Hygiene

Food businesses should establish policies or guidelines and procedures for personal hygiene. FBOs 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.

4.6.1 Health Status

4.6.1.1 Every person employed in food processing unit, shall be examined by an authorized medical practitioner. The examination shall include examination of stool for protozoal and helminthic infection for those parasites transmitted by ingestion and the presence of *Salmonella*, *Shigella* and *vibrio* species. Chest X-ray examination during the first appointment medical examination is recommended for the examination of tuberculosis, but this will be to the discretion of the medical practitioner to use any tuberculosis diagnosing means available and appropriate. Examination should be done at every six months to ensure that every employee is physically fit and free from any communicable diseases. A record of such examination shall be maintained

4.6.2 Illness and Injuries

4.6.2.1 Personnel known or suspected to be ill or carrying a disease likely to be transmitted through food; jaundice, diarrhoea, vomiting, fever, sore throat with fever, visibly infected skin lesions (boils, cuts, etc.); and discharges from the ear, eye or nose should not 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.

4.6.2.2 Personnel with cuts and wounds should, where necessary, be assigned to work in areas where they will have no direct contact with food.

4.6.3 Personal Cleanliness

4.6.3.1 Personnel should maintain a high degree of personal cleanliness. Employees shall be provided with clean protective clothing and, where appropriate, wear suitable protective clothing, head and beard covering, and footwear. Separate room or place for changing the clothes shall be provided. The clothes shall not be hung in any processing room. The uniforms shall not be worn outside the plant but put on just before starting the work and changed when leaving.

4.6.3.3 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. If gloves are worn, appropriate measures should be applied to ensure the gloves do not become a source of contamination.

4.6.3.2 Personnel, including those wearing gloves, should clean their hands regularly, especially when personal cleanliness may affect food safety. In particular, they should wash hands:

- a) at the start of food handling activities;
- b) when returning to work after breaks;
- c) immediately after using the toilet; and
- d) after handling any contaminated material, such as waste or raw and unprocessed foods where this could result in contamination of other food items.

4.6.4 Personal Behaviour

4.6.4.1 When engaged in food handling activities personnel 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.

4.6.4.2 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.

4.6.5 Visitors and other persons from outside the establishment

Visitors to food businesses, 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 for personnel. 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 issue.

4.7 Warehousing

4.7.1 General requirements

Materials and products shall be stored in clean, dry, well-ventilated spaces protected from dust, condensation, fumes, odours or other sources of contamination.

4.7.2 Warehousing requirements

Effective control of warehousing temperature, humidity and other environmental conditions shall be provided where required by product or storage specifications.

It is recommended that where products are stacked, consideration is given to measures necessary to protect the lower layers. Waste materials and chemicals (cleaning products, lubricants, and pesticides) shall be stored separately.

A separate area or other means of segregating materials identified as non-conforming shall be provided. Specified stock rotation systems (FIFO/FEFO) shall be observed. Gasoline- or diesel-powered fork-lift trucks shall not be used in food ingredient or product storage areas.

4.8 Control of operation

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.

4.8.1 Description of products and processes

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

4.8.1.1 Product description

An FBO that is producing, 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 (a_w)), process steps and/or intended purpose.

The description could include, as appropriate:

- a) 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;
- b) products intended for specific vulnerable consumer groups e.g. infant formula or food for special medical purposes;
- c) any relevant specifications e.g. ingredient composition, a_w , pH, type of preservation method used (if any), or important characteristics associated with the food, such as any allergens present;
- d) any relevant limits established for the food by the competent authority or, in the absence thereof, set by the FBO;
- e) 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);
- f) storage of product (e.g. refrigerated/frozen/shelf stable) and transport conditions required; and
- g) food packaging material used.

4.8.1.2 Process description

The FBO 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.

4.8.1.3 Consideration of the effectiveness of GMPs

Having considered the product and process descriptions, an FBO should determine (using information relevant to hazards and controls from various sources as appropriate) whether the GMPs/GHP and other programmes they have in place are sufficient to address food safety and suitability or if some GMP/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 GMP/GHPs is insufficient to ensure food safety, it will be necessary to implement a HACCP system.

4.8.1.4 Monitoring and corrective action

The FBO 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 FBO should undertake corrective action. Corrective action should consist of the following actions, as appropriate:

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

4.8.1.5 Verification

The FBO should undertake verification activities as relevant to the business, to check that GMP/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:

- a) review of GMP/GHP procedures, monitoring, corrective actions and records;
- b) review when any changes occur to the product, process and other operations associated with the business; and
- c) assessment of the efficacy of cleaning. Records of GMP/GHP verification activities should be kept, where appropriate.

4.8.2 Key aspects of GMPs

4.8.2.1 Time and temperature control

Inadequate time and temperature control, e.g. during cooking, cooling, processing and storage, are among the most common failures of operational control. These allow survival or growth of microorganisms that may cause foodborne illness or food spoilage. Systems should be in place to ensure that temperature is controlled effectively where it impacts the safety and suitability of food.

Time and temperature control systems should take into account:

- a) the nature of the food, e.g. its a_w , pH, and likely initial level and types of microorganisms, such as pathogenic and spoilage microflora;
- b) the impact on the microorganisms, e.g. time in growth/dangerous temperature zone;
- c) the intended shelf-life of the product;
- d) the method of packaging and processing; and
- e) 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, and as appropriate, monitored and recorded. Temperature monitoring and recording devices should be checked for accuracy and calibrated at regular intervals or as needed.

4.8.2.2 Specific process steps

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 a_w 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.

4.8.2.3 Microbiological, physical, chemical and allergen specifications

Where microbiological, physical, chemical 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, analytical methods, acceptable limits and monitoring procedures. Specifications can help ensure that raw materials and other ingredients are fit for purpose and contaminants have been minimized.

4.8.2.4 Microbiological contamination

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.:

- a) by direct contact or indirectly by food handlers;
- b) by contact with surfaces;
- c) from cleaning equipment;
- d) by splashing; or
- e) by airborne particles.

Raw, unprocessed food, where not considered ready-to-eat, which could be a source of contamination, should be separated from ready-to-eat foods, either physically or by time, with effective intermediate cleaning and, where appropriate, effective disinfection.

Surfaces, utensils, equipment, fixtures and fittings should be thoroughly cleaned and where necessary disinfected after raw food preparation, particularly when raw materials with a potentially high microbiological load such as meat, poultry, and fish have been handled or processed.

In some food operations, access to processing areas may need to be restricted or controlled for food safety purposes. For example, where the likelihood of product contamination is high, access to processing areas should be via a properly designed changing facility. Personnel may 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 head and beard covering, footwear, and to wash their hands and where necessary sanitize them.

4.8.2.5 Physical contamination

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).

4.8.2.6 Chemical contamination

Systems should be in place to prevent or minimize contamination of foods by harmful chemicals, e.g. cleaning materials, non-food grade lubricants, chemical residues from pesticides and veterinary drugs such as antibiotics. 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.

4.8.2.7 Allergen Management

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, crustacean, 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.

4.8.2.8 Incoming Materials

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. Raw materials or other ingredients should, where appropriate, be inspected (e.g. visual examination for packages damaged during transportation, use-by-date and declared allergens, or temperature measurement for refrigerated and frozen foods) for appropriate action before processing.

Where appropriate, 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. No incoming material 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 where appropriate. Stocks of raw materials and other 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.

4.8.2.9 Packaging

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

4.8.3 Water

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 where necessary to ensure that the water does not compromise the safety and suitability of food.

4.8.4 Documentation and Records

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

4.8.5 Recall Procedures - removal from the market of unsafe food

FBOs 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 FBO(s) and/or return to the FBO 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 FBO 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.

Provision should be made for removed or returned products to be held under secure conditions until they are destroyed, used for purposes other than human consumption, determined to be safe for human consumption, or reprocessed in a manner to reduce the hazard to acceptable levels, where

permitted by the competent authority. The cause and extent of a recall and the corrective actions taken should be retained by the FBO as documented information.

4.8 Product information and consumer awareness

4.8.1 Batch number/Lot Identification and Traceability

4.8.1.1 Batch number/Lot identification or other identification strategies are essential in product recall and also help effective stock rotation. Each container of food should be permanently marked to identify the producer and the lot.

4.8.1.2 A traceability/product tracing system should be designed and implemented specially to enable the recall of the products, where necessary.

4.8.2 Product Information

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

4.8.3 Product Labelling

Pre-packaged 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.

4.8.4 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 following any instructions accompanying products, and to 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.

4.9 Transportation

General 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.

4.9.1 Requirements

Conveyances and bulk containers should be designed and constructed so that they:

- a) do not contaminate foods or packaging;
- b) can be effectively cleaned and, where necessary, disinfected and dried;
- c) provide effective protection from contamination, including dust and fumes;
- d) 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
- e) allow any necessary temperature, humidity and other environmental conditions to be checked.

4.9.2 Use and Maintenance

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.

DRAFT FOR STAKEHOLDERS COMMENTS