

FOOD SAFETY GUIDANCE IN EMERGENCY SITUATIONS

Introduction

In emergency situations, difficult conditions can be made even worse in the event of foodborne disease outbreak. Provision of food is often carried out under crude conditions and the people available to organize and implement feeding operations may not have the necessary experience to manage food safety effectively.

This guidance document is intended to assist those responsible for planning and overseeing food operations to recognise aspects of their function that influence food safety and to guide them in minimising risk of foodborne illness.

In view of the fact that the infrastructure on the ground may be completely destroyed in many types of emergency situation, this document highlights the most critical requirements. The document also directs users to useful information sources that provide a more complete outline of food hygiene requirements, to guide operations in cases where there has been less disruption and higher standards of hygiene are feasible as well on guidance on related activities e.g. waste management.

A. Guidance on mass feeding activities

Note: Mass feeding activities could cover a number of different types of situations such as food distribution centres where the main supply of food is food aid from the UN, NGOs or the national government or alternatively, depending on local conditions, locally produced food that is being prepared and distributed at central points, or a combination of both. As the situation evolves there may be transition from food aid only to locally produced food. These guidance are the minimum that should also be applied in any mass feeding or catering activity e.g. in schools.

Preliminary Issues:

Planning

Food safety needs to be considered at the planning stage of any mass feeding or food distribution activity. In emergency situations, the following factors may have particular significance.

- Scale and demographics of operation:
 - Poor health and nutritional status may lead to increased susceptibility to foodborne illness.
 - Very young and very old people may also be more vulnerable to food related illness.
 - Preparing and handling food for large numbers of people under difficult conditions involves logistical difficulties and calls for a high degree of planning to minimise risks, particularly microbiological risks.
 - Cultural acceptability of methods of preservation or preparation (under emergency situations, people may be traumatised and more sensitive to unfamiliar products).
- Conditions on the ground: The availability of power/fuel, clean water, storage facilities, sanitation, etc. will impact the type of food that can be distributed safely. Shelf-life and the need for refrigeration or other special storage conditions of foods should be a consideration in planning the operation.
- Assembling the team: Include a team member with some food safety training who can provide rapid on the ground training/briefing to food handlers and has sufficient knowledge on food hazards, regulations and standards to accept general responsibility for food safety issues and provide advice to the operations manager on food safety concerns, issues, and necessary actions.

Interactions with other 'functions' involved in emergency situations

Mass feeding or food distribution activities are part of a larger emergency response team: the activities of other groups have important implications for effective food safety management. The person responsible for overseeing food safety issues in the mass feeding exercise should interact with groups carrying out other functions so as to ensure coordination and information flow as required. The following 'functions' have some relevance to food safety.

- Medical – To facilitate reporting of illnesses, health checks of food handlers.

- Nutritionist - To ensure that safe foods are also adequate from the nutritional perspective.
- Transportation – To ensure conditions for hygienic transport of foods.
- Power supply – To be informed on availability and / or disruptions in supply or to inform of specific power requirements
- Water management – To ensure and adequate supply of potable water for feeding stations; and adequate facilities for its hygienic storage and distribution.
- Pest control - To protect food supplies from damage and contamination from pests; and to minimise risk of chemical contamination from pesticides being used in the vicinity of food, feeding operations, water supplies, etc.
- Waste management and sanitation – To minimize risks of contamination from the environment – directly or through the harbouring of insects and other pests that can be vectors for the transmission of contamination. Relevant activities include garbage and waste disposal, control of entry or movement of animals that might pose hygiene problems and ensuring that temporary toilet facilities will not be a source of contamination of foods.
- Construction - To facilitate appropriate selection of location and construction of temporary facilities being established to house food-related operations.
- Security – To be informed on anticipated changes in the numbers of people to be fed; to ensure that there is restricted access to hygiene sensitive areas and to be informed about new emergency events and routes for evacuation of people if needed.

On-site Activities

Receiving and storing food

- Imported food / food aid should be checked to make sure that it meets agreed standards by;
 - Checking accompanying documentation against national requirements;
 - Inspection;
 - Checking conditions in which food was transported.
- Locally supplied food should be checked by
 - Checking any accompanying documentation;
 - Inspection ;
 - Checking conditions in which food was transported;
 - Requesting information from supplier, delivery people (particularly if documentation is unavailable) with regard to transport, storage, production, source, any local conditions or warnings that may indicate the potential for contamination of food / food sources etc.
- Some basic documentation and record keeping (e.g. on inspection outcome, accompanying documentation) is advised. (It may be possible to combine this with any other records already being kept at food distribution/feeding stations)

Note: Guidance on things to look for when carrying out an inspection are provided in Annex 5

Instructions for handling of rejected supplies

Supplies should be clearly labelled as rejected, separated from all other food supplies and disposed of or destroyed. Records of food rejections should be kept (what food, batch identification information, reason for rejection, date, person deciding on rejection, etc) and these should be reported to the appropriate authorities. Decisions regarding possible alternative use of rejected foods should be made in consultation with a food safety specialist.

Instructions for handling of suspect supplies

Supplies should be clearly labelled as suspect and separated from all other food supplies. The decision on whether or not to use such supplies should be taken according to the need for the food, the nature of the problem with the food and the facilities available to prepare the food (e.g. decontamination by cooking, prevent cross-contamination of other foods). Such a decision should be made in consultation with a food safety specialist. Note that national analytical services are likely to be overwhelmed in the case of an emergency and therefore it is unlikely that decisions can be based on the results of laboratory analysis.

Instructions for storage of accepted supplies

- The storage area should be dry with good ventilation (food aid may include dry grains, e.g. rice, maize lentils and dry storage is critical to prevent moisture, mould growth etc.).
- As far as possible, the structure should offer protection from entry of pests.
- Food supplies should not be in direct contact with the ground or the floor or walls. Pallets, branches, boards, bricks, concrete blocks or plastic can be used to keep supplies off the ground.
- Foods should be stored in a cool dark place but at least out of direct sunlight (foods such as oils and vitamin fortified products are highly susceptible to deterioration under unsuitable conditions of storage e.g. in sunlight).
- Food supplies should be stored in a separate area to chemical supplies (e.g. detergents, sanitizers, pest control agents).
- If possible, pest resistant containers should be used for food storage or some form of pest control/management implemented.
- Spilled food should be cleaned up immediately to discourage rodents and other pests.
- Raw foods should be stored separately from ready-to-eat foods. Furthermore, perishable foods such as fish and meat should be stored separately (either physically or by time with effective intermediary cleaning and disinfection) from other raw foodstuffs such as fruit and vegetables to prevent cross-contamination.
- If possible, perishable foods should be refrigerated. If refrigeration is not available, these foods need to be kept in as cool a place as possible out of direct sunlight and used quickly.
- Periodic checks of the storage conditions should be undertaken to ensure they are maintained. Foods, particularly those being stored for longer periods e.g. grain should also be inspected periodically for deterioration, infestation etc.

NOTE: Further information on good storage practices can be found in Annex 2.

Basic facility

While recognising that food distribution/mass feeding activities are carried out under crude conditions, the basic facility should provide for:

- Appropriate storage of food – Storage area must be protected from moisture and pests and be separate from storage of chemicals and other potential hazards (See checklist for storage areas provided in Annex 1)
- Location of the food preparation area and the storage area away from toilets, waste disposal areas, and other potential sources of contamination
- Facilities for food preparation that minimise risk of contamination including cleanable food contact surfaces, floors, walls (See checklist for food preparation area in Annex 2)
- Adequate supplies of clean and potable water
- Supplies of power/fuel to enable cooking at required temperatures and times and to facilitate related operations (cleaning, storage)

Personnel

It is unlikely that many of the food handlers involved in emergency food handling operations will have received instruction of food safety. It is therefore advised that food handlers;

- Should receive instruction / guidance in basic hygiene (personal hygiene, food hygiene and safe food preparation and handling) according to their function, including information on the important role they play in the health of the people they are feeding.
- Should show no signs of illness (symptoms to watch out for include diarrhoea, vomiting, fever, jaundice, sore throat, discharge from the nose, ears or eyes, visibly infected skin lesions (cuts, boils, etc.).
- Should, if possible, have their health status regularly checked by medical staff to minimise transmission of disease.

In addition

- The operation manager or a designated person should oversee food handling operations to identify any potential hazards and provide in-service orientation to food handlers while undertaking their activities to reinforce the food safety messages.

NOTE: Further information on Personal Hygiene can be found in Annex 6

Hygienic practice in daily operations

WATER FOR FOOD PREPARATION

Only potable water should be used in food preparation. This can be achieved through boiling and disinfection. For more information see: Environmental health in emergencies and disasters: a practical guide (WHO, 2002) Chapter 7: [Water supply](http://www.who.int/water_sanitation_health/hygiene/emergencies/em2002chap7.pdf).
http://www.who.int/water_sanitation_health/hygiene/emergencies/em2002chap7.pdf

TEMPERATURE-TIME ISSUES

Cooking food: Food should be cooked thoroughly to kill pathogenic bacteria. Most are killed above 70°C but some can survive to 100°C and above. (Some bacteria produce heat resistant spores which survive and possibly germinate at high temperatures. It is therefore important to keep hot foods hot (above 60-65°C (see *Holding Food* below)) to prevent growth of such bacteria).

The following indicators can be used to ensure food reaches a sufficiently high temperature and is well cooked.

- The food is steaming hot throughout.
 - Meat and poultry juices run clear and the meat itself contains no pink or red parts.
 - Soups, stews and other liquid based foods are held at a rolling boil for 15 minutes.
- NOTE:** Stir to ensure equal distribution of heat – this is of particular importance when large batches are being prepared. Between stirring keep spoons or other stirring utensils clean and away from sources of contamination.

Under emergency or difficult conditions and high ambient temperatures foods can have a higher level of microorganisms and so should be cooked for longer than normal to minimize the risk while also maintaining acceptable organoleptic qualities for consumption. Perishable foods that have been left at ambient temperature for prolonged periods may contain pre-formed, heat stable toxins that are not eliminated by cooking.

Holding food: The danger temperature zone for microbial growth in food is 5 – 65°C.

Before preparation/cooking:

- Holding of food within the danger zone prior to cooking will lead to increased microbial loads and possible toxin production. While increased cooking times will adequately reduce microbial loads, it will not resolve the problem of toxin accumulation.
- Minimize the time at which perishable foods are held at ambient temperatures before cooking.

After preparation:

- Food should be eaten immediately after preparation and in no case should cooked food be left at ambient temperatures for more than 2 hours before consumption.
- Hot food should be kept above 60-65°C (steaming) before serving. It should be covered to help retain heat.
- If there is no refrigeration or food storage available, food should be cooked as needed to prevent leftovers (This is an important link to the logistical management of the feeding station and information on the quantities of food to be prepared and associated scheduling).

Foods requiring refrigeration/perishable foods: In most difficult conditions it is probably better to minimise the use of foods requiring refrigeration as breaks in the 'cold chain' are probably inevitable. If such foods are used, then the following precautions are recommended:

- Use as quickly as possible
- Store in as cool a place as possible and away from direct light (Remember the danger temperature zone for microbial growth is 5 – 65°C)

Frozen foods: Facilities for frozen storage are not likely to be available in most emergency situations, and even if there are, interruptions to the 'cold chain' are very likely. In situations where frozen food is being use, the following precautions are recommended.

- Defrost at a cool temperature to minimise bacterial growth on the surface.
- Ensure that frozen block sizes facilitate defrosting within required time.
- Where the above is not feasible frozen food which is available in small pieces can be cooked directly without defrosting.
- Defrosting can be accelerated through the immersion of packaged frozen food in water with agitation (only if potable water is available).

In cases where the cold chain has been interrupted, the integrity of the frozen food should be assessed. In general the food is still safe to use if

- it still contains ice crystals or
- feels as cold as if refrigerated.

Such food should be cooked or re-frozen immediately.

AVOIDING FOOD CONTAMINATION

Food can be contaminated from the environment, personnel, food preparation surfaces and utensils, raw and uncooked food, animals, pests and waste material. To prevent contamination, control over the various operations related to food preparation need to be exercised.

Prevention of microbiological contamination is an important function in food preparation and the focus of the guidance below. However, attention also needs to be given to possible physical and chemical contamination. Physical contaminants include stones, pieces of glass, metal and may be identified in the physical inspection on receipt of food (see Section B for guidance). However, if food preparation is taking place outdoors or in temporary facilities ongoing vigilance is important to prevent physical contamination of food. All chemicals (detergent, disinfectant, sanitizer) used in the food preparation area should be removed before food preparation begins to prevent any chemical contamination of the food.

In relation to personal hygiene;

- Thorough hand washing before and during food preparation especially after using the toilet, handling raw food or waste is critical
- Soap, sanitizer and clean water should be available for hand washing at convenient locations.
- Ensure food preparation area is limited to dedicated food handlers (whose health status has been checked)

Further guidance on personal hygiene can be found in Annex 6.

Note: Food handlers are a common source of pathogenic microorganisms and can transmit these via food if good personal hygiene is not observed. One sick food handler can cause a foodborne disease outbreak particularly under difficult emergency situations.

In relation to the food preparation area including food contact surfaces, utensils etc:

- There should be separate areas for raw and cooked foods (raw foods are a source of microorganisms which can recontaminate prepared foods)
- The food preparation area should be cleaned using hot water, where possible, and detergent to remove visible soil/dirt/food particles/grease, rinsed and then sanitized. Diluted bleach (hypochlorite solution) can be used to sanitize surfaces.
- Utensils and dishes etc. should be cleaned using hot water, where possible, and detergent to remove visible soil/dirt/food particles/grease, rinsed and then sanitized using boiling water or diluted bleach. (Bleach solutions should be regularly replenished to ensure effective sanitization).
- Cloths/sponges can harbour bacteria and require regular sanitizing by boiling, or using bleach

Food particles/dirt that remain in the food preparation area present an important hygiene risk so effective cleaning routines are essential to minimize contamination.

Preparation of bleach solutions for sanitization:

For non porous surfaces: 5ml / litre

For porous surfaces: 15 ml / litre

For cloths/sponges: 60ml / litre (disinfecting solution). This can also be used to disinfect floors and waste containers. Follow with rinsing and allow to air dry.

Surfaces should be exposed to the bleach solution and utensils should be soaked in the solution for 2 minutes after cleaning. Non porous surfaces (metal, ceramic, glass hard plastic) and equipment should then be allowed to dry. Porous surfaces and utensils (wood, rubber, soft plastic), should be rinsed with clean potable water after sanitization and then allowed to air dry. Cloths/sponges should then be rinsed and allowed to air dry.

NOTE: These bleach solutions should in no way be used for human consumption. Drinking/potable water is obtained under specific treatment with much lower chlorine concentrations.

In relation to waste management

- Personnel should be assigned to ensure that waste is regularly removed from the food preparation area.
- A means of disposing of both solid and liquid waste should be available for the food preparation area.
- The waste disposal area should be located away from the food preparation area.
 - Attention should be given to pest control in the waste storage area
 - Waste containers in the food preparation area should be cleaned regularly with water and detergent and disinfected with bleach solution.
 - Every effort to be made to manage food preparation to keep waste food to a minimum to reduce the additional burden of waste disposal.

If waste is not adequately managed, including waste from toilets/latrines set in the vicinity of the food preparation area, there can be elevated levels of contamination and contaminant vectors in the environment that greatly increase the opportunity for contaminated food.

Guidance on waste management in emergencies can be found in:

- Emergency Sanitation: Assessment and Programme Design. Harvey, Baghri and Reed. Water Engineering and Development Centre, Loughborough University, UK 2002
Chapter 6 Excreta Disposal (<http://wedc.lboro.ac.uk/publications/pdfs/es/ES06CD.pdf>)
Chapter 7 Solid Waste Management (<http://wedc.lboro.ac.uk/publications/pdfs/es/ES07CD.pdf>)
- Environmental health in emergencies and disasters: a practical guide. (WHO 2002)
Chapter 8: Sanitation.
http://www.who.int/water_sanitation_health/hygiene/emergencies/em2002chap8.pdf

Food safety, nutrition and vulnerable population groups

Actions to enhance food safety must also take into account the nutritional needs and possible vulnerable condition of the consumers.

When foods require rehydration, potable water should be used to prepare and rehydrate foods, and it is important to use the correct ratio of potable water to food to ensure correct nutrient balance.

When using water purified by boiling to prepare infant formula or other fortified dried foods it is important to allow the water to cool back to about 50°C to minimise nutrient loss due to boiling water.

B. Food supply of general population

This section is intended to guide decisions regarding the use of food by the general population and to assist emergency teams in developing advice to citizens in affected areas that will promote safe food consumption. In the initial stages of an emergency, decisions will need to be made to assess the suitability and safety of existing food supply, determine appropriate means to ensure foods in the final stages of harvesting can be preserved as a future supply of foods, and whether or not certain foods are unfit for human consumption. This will require an assessment of the risks at the primary production level through processing and retail and storage facilities.

Assessment of risks at the primary production level

An assessment of the primary production is important from a food safety perspective given its importance as a source of food contamination. Flooding will increase the contamination levels through environmental contamination, destruction of infrastructure, contamination of feed and water supplies, contamination of aquaculture ponds and enhancing conditions for moisture accumulation, decay/spoilage and spread of disease. Annex 1 outlines some of the things to look out for at the primary production level with regard to food safety.

Assessment of retail and storage facilities

An assessment of food retail and storage facilities can provide an indication of the likely condition of foods that have been held there as well as possibly identifying structures that can be used for emergency food stocks. The storage facility checklist in Annex 2 provides basic guidance for the inspection and assessment of these structures. Guidance for the assessment of the actual food products is provided in Annex 5.

Assessment of food handling/ processing

Operation of existing food handling/ processing facilities may play an important role in ensuring the continuity of the food supply to the general population. Assessment of these facilities is necessary to evaluate whether they can be used or what repairs are required to make them operational. The checklist in checklist in Annex 4 provides basic guidance for the inspection and assessment of these facilities.

Considerations for the home preparation of foods

An inspection of existing or salvaged food supplies should be undertaken before consumption. Guidance for this is provided in Annex 5. Food preparation in the home should to the extent possible follow the same hygiene guidelines outlined in Section A – Hygienic Practice in Daily Operations. Further information on safe food preparation is available in the WHO 5 Keys to Safer Food <http://www.who.int/foodsafety/consumer/5keys/en/>

Annex 1:

Assessing risks at the primary production level and upstream handling activities

Fish and seafood

- Damaged wastewater and sanitation systems might have leaked into fishing grounds or aquaculture ponds, with risks of viral, bacterial and parasitic intestinal infections. In such situations only healthy-looking, properly-cleaned, and fully-cooked fish should be consumed to minimise the risks. Fish with visible signs of spoilage (see visual assessment below) should not be consumed and ensure that fish is eviscerated and well-cooked. Though current environmental conditions in the tsunami affected region are not conducive to biotoxin upsurges, algal bloom, red tides or massive fish deaths must be notified and these fishing areas need to be closed.
- If possible the quality of water used for growing fish/aquaculture, for processing and ice supplies should be monitored so as to prevent contamination of the products
- As in normal situations bivalves will present a higher risk, especially raw, as compared to finfish or crustaceans. Therefore, consumption of bivalves, especially raw, should be avoided if suspicious conditions occur.

Fresh meat and poultry and dairy and egg producers

- Disrupted infrastructure can lead to an increased risk of transmission of disease among animals and high levels of environmental contamination increase the risk of viral, bacterial and parasitic infections.
- Animal feed should be checked for contamination for examples by chemicals during flooding.
- Animals for slaughter should be checked for any signs of disease by an appropriately trained person, should be clean to minimise cross-contamination before and after slaughter of meat.
- Milk and egg producers should be carefully monitored for signs of disease and to the extent possible milk and egg products heated before use.
- Dead animals / animals killed by the disaster should not be used for human consumption.

Further guidance on primary production and ante mortem inspection can be found in

- Good practices for the meat industry. Animal Production and Health Manual 2. FAO 2004 <ftp://ftp.fao.org/docrep/fao/007/y5454e/y5454e00.pdf>
- Manual on meat inspection for developing countries. Animal Production and Health Paper, FAO 1994. <http://www.fao.org/docrep/003/t0756e/T0756E00.htm#TOC>

Fresh fruit and vegetables

Harvested: Check for signs of fungal/bacterial growth / decay. Discard any crops with visible signs of decay / deterioration microbiological contamination (or at least the part of the fruit/vegetable with visible contamination). Cook before eating. For undamaged fruit / vegetables wash thoroughly with potable water (avoid submerging fruit and vegetables in a recipient of water which can become a source of contamination) and remove the skin before consumption.

Unharvested: Have crops been flooded? If so they may be contaminated with sewage which can contain pathogenic bacteria. Such products should be washed with running potable water, peeled and cooked thoroughly prior to consumption. Delayed harvesting might, in some cases, allow a reduction in contamination (drying/ rainwater). If crops are damaged, however, delay in harvest will probably result in decay.

Cereals

The main problem associated with cereals will be mould growth and mycotoxin formation particularly when there is delayed drying in the field, difficult drying conditions post-harvest and unfavourable conditions of storage. High levels of mycotoxin contamination can lead to acute toxicity. . Avoid consumption of mouldy cereals or those products in which there are evident signals of filth.

See Annex 5 for inspection of specific foods.

Annex 2: Checklist for food storage areas

In some cases, the points below may guide the evaluation of existing structures for use as food storage facilities. In other cases, they may provide guidance for the establishment of temporary facilities to be used for food storage.

Surroundings

- Driest possible areas should be selected for designation of food storage area. Look for evidence of stagnant water; is there a good system of drainage?
- Are the immediate environs free from waste or brush that might harbour pests?
- Is the storage area located away from other potential sources of contamination?
- Is there convenient access to the storage area?
- Proximity to water supply and waste disposal areas?

Construction

- Do external walls prevent access of pests (signs of cracks or openings around pipes or vents that might allow entry to insects and other pests)?
- Are there spaces around doors or windows that could allow entry of pests?
- Are there screens at windows and doors to minimise entry of pests?
- Is the roof in condition to prevent entry of rain and pests?
- Is the structure of adequate size to safely store the required food supplies?

In cases where there are no suitable structures, the following precautions are advised:

- Place food in containers that can be tightly sealed and are pest proof (large plastics bins; flexible, hermetic cocoons; drums, etc)
- Store containers off the ground
- Take care to clear brush and debris from immediate environs to minimise pest harbourage and restrict access to animals
- Cover with plastic sheets or tarpaulins in order to offer some protection from rain, dew, bird droppings and other contamination

Internal structures

- Are internal walls free of cracks, are there signs of mould growth?
- Are floors cleanable?
- Are there signs of water, dampness on the ground?
- Is there good ventilation in the storage area?
- Are there signs of water or mould growth on the ceiling?
- Are there signs of water condensation on internal fittings?
- Is there adequate light to allow safe use of the storage area?

Storage management

- There should be no chemicals, cleaners or any other potentially hazardous material stored in the area designated for food storage
- Food supplies should be stored on pallets (wooden planks or other raised surfaces can be used) or on plastic sheets and not in direct contact with the ground
- Pallets/ food stacks should be placed at least 40 cm away from the walls
- There should be sufficient space between stacks to allow safe operation of the stores and cleaning as required
- Measures should be in place to ensure effective stock rotation
- Special storage requirements of specific food items must be taken into consideration (protection from light, shelf-life)
- Raw foods should be stored separately from ready-to-eat foods

- There should be regular cleaning of the storage area(s) and immediate clean-up in case of spills or breakage

Pest Control

- Pest resistant containers should be used for food storage or some form of pest control/management implemented. Care must be taken to ensure that any chemicals used for pest control do not contaminate food supplies and exposure of operator should be minimized through the use of protective gear.

Annex 3: Considerations for general food handling/processing operations

Access

Is the facility accessible to transport?

Environmental risks

Is drainage around facility adequate?

Can contamination of facility from waste be prevented?

Is there a means of waste disposal?

Have any other emergency activities been set up in the vicinity that might pose a contamination risk?

Can the surrounding areas be cleared of bush and debris that might harbour pests?

External Structures

Is the building still structurally sound and free of cracks and crevices that could be entry points for pests?

Is the roof in good condition?

Are windows and doors secure and well fitting?

Internal structures

Are food areas and food contact surfaces intact and amenable to cleaning?

Are there signs or water drops on ceiling or on fittings?

Supporting services

Is there light to ensure adequate cleaning and operation?

Is there an adequate supply of clean and potable water?

Is a power supply assured to run the operations?

Operational issues

Are there trained personnel or someone to train operators?

Equipment – functionality in terms of hygiene

Annex 4.

Food Preparation Area

Location

The food preparation area should be located away from potential sources of contamination and main thoroughfares. It should be separate from but near to the food storage and food serving areas.

Floors and walls

Ideally, the walls and floors should be smooth and constructed from materials that can be easily cleaned and sanitized.

In cases where there are no suitable structures:

- Special care must be taken to minimise pest harbourage in the vicinity
- Selection of location is critical to ensure that the food preparation takes place away from all possible sources of environmental contamination
- Some form of temporary roof covering should be erected to protect against bird dropping, other contaminants and extraneous matter falling into the food
- Efforts should be made to minimise the presence of loose dirt in the immediate surroundings

Food preparation furniture and equipment

Food preparation surfaces (tables etc.) should be movable so as to facilitate cleaning. Stoves and other cooking equipment should be placed with enough space around them to allow cleaning. The furniture and equipment should be organized to enable a linear flow from raw food to cooked food to minimise cross contamination.

Food contact surfaces

Food contact surfaces in food preparation commonly include; tables, cutting boards, knives and other utensils, bowls and other food containers, pots, etc

Food contact surfaces:

- should not be made of materials that could contain harmful substances that could be leached into the foods
- should be impervious and non-absorbent so that they can be easily drained and dried
- should be resistant to corrosion
- should be inert to chemicals used for cleaning and sanitizing
- should be smooth so as to allow easy and thorough cleaning
- should not have seams, sharp corners or edges that could harbour debris and impede cleaning

Washing of utensils and dishes

A separate area should be assigned for washing of cooking utensils, dishes, cutlery etc..

Annex 5:
Specific considerations for assessing (and salvaging) selected categories of foods {physical, chemical and microbiological issues}

Existing food stores may become damaged in disaster situations. It is important to inspect food stocks and make sound judgements regarding their use or their exclusion from the food supply. This might be done by an emergency team in the case of large food stores, or by households in relation to their own food supply. This guidance for inspection also applies to food used in mass distribution / mass feeding activities. Sensory evaluation (using sight, smell and touch) is an important means of food assessment.

Inspection of perishable foods

<p>Fresh meat and poultry</p>	<p>Check for discolouration. Beef should be a bright red colour, lamb light red and pork light pink, poultry. Green, brown, or purple patches are signs of spoilage and microbial contamination and such meat should not be used... Black, white and green may indicate moulds or freezer burn.</p> <p>Meat should be firm but elastic to the touch. Poultry should not have soft or flabby skin. Meat should not be dry, slimy or sticky to the touch. For poultry check for stickiness under the wings and darkened wing tips.</p> <p>Check for abnormal odours. Reject meat if it has a sour smell.</p>								
<p>Fish and seafood</p>	<p>Check any sign of deterioration / spoilage, taints (foreign odour or taste in case of contamination by grease, fuel oil, drainage and other physical and liquid wastes that might have occurred during breakdown in wastewater and sanitation systems) in fresh fish and fishery products. It is recommended that appropriate sensory evaluation criteria be used to evaluate the acceptability of fish and to eliminate fish showing loss of essential quality characteristics.</p> <ul style="list-style-type: none"> • Check in particular the change in appearance, texture and odour of the outer surface (skin/slime), the gills, and the eyes. • Look for signs of rupture of physical integrity of fish which might be an adequate entry point for micro-organisms. <p>As an example, fresh white fish species are considered unacceptable when showing the following characteristics:</p> <table border="1" data-bbox="365 1186 1269 1396"> <tr> <td style="width: 20%;">Skin / Slime</td> <td>dull, gritty colours with yellow brown dotting slime</td> </tr> <tr> <td>Eyes</td> <td>concave, opaque, sunken discoloured</td> </tr> <tr> <td>Gills</td> <td>grey – brown or bleached, slime opaque yellow, thick or</td> </tr> <tr> <td>Odour (Flesh, gills)</td> <td>ammonia, milky lactic, faecal, putrid, rancid</td> </tr> </table> <p>Of special consideration are the reception and sorting of fish species that pose a risk of biotoxins such as ciguatoxin in large carnivorous tropical and sub-tropical reef fish or scombrototoxin in scombroid species or parasites.</p> <p>Fish should be rejected if it is known that it comes from a suspected area and to contain such harmful substances or organisms which cannot be reduced or eliminated to an acceptable level by further processing.</p>	Skin / Slime	dull, gritty colours with yellow brown dotting slime	Eyes	concave, opaque, sunken discoloured	Gills	grey – brown or bleached, slime opaque yellow, thick or	Odour (Flesh, gills)	ammonia, milky lactic, faecal, putrid, rancid
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Gills	grey – brown or bleached, slime opaque yellow, thick or								
Odour (Flesh, gills)	ammonia, milky lactic, faecal, putrid, rancid								
<p>Dairy and dairy based products</p>	<p>Fresh milk should be smooth and fluid. Check the odour for souring and for signs of curdling. Milk having an "off" smell or flavour should not be used.</p> <p>Check yogurt and fermented products for mould. Products with a sour mouldy odour should not be used.</p> <p>Other dairy products such as butter should smell sweet. Reject if there is a rancid odour. Check also for chemical odours and foreign objects.</p>								
<p>Egg and egg based products</p>	<p>Check eggs for cracks and dirt. Fresh eggs should not have an odour. Dirty eggs should be cleaned before cracking open. If the egg is fresh the white clings to the yolk, and the yolk is firm. If the white is separated from the yolk, it should not be used.</p>								

Inspection of other packaged foods (cans, jars, paper and plastic cartons and wrappers)

- Integrity of package:
 - Canned foods: Check for signs of physical damage such as dents, rusting, seam integrity. Reject cans that are bloated, have bulges, are leaking, dented or rusty.
 - Glass jars and containers: Reject any broken, cracked or chipped glass containers. This is not just a question of loss of package integrity but the actual presence of glass splinters/splinters in the food. Check the integrity of the seals and reject any containers with broken or damaged seals.
 - Plastic containers: Check for tears and punctures in the containers and the integrity of the seals and reject any damaged packages.
- Signs of water damage:
 - Looks for signs of watermarks. Foods in water permeable packages such as jute or paper that have been submerged in flood water should be rejected. Water tight packages should be dried and then checked for package integrity (see above).
- Signs of mould growth
 - Particularly in the case of cereals and cereal products and other dried products such as nuts there should be a thorough examination for signs of mould growth especially in situations where wetting of the packages is likely to have occurred. Products showing mould growth should be rejected.
- Signs of insect/pest infestation
 - Dried products in particular should be checked for signs of infestation (insects, webbing, insect eggs, droppings etc.). Pests can create microenvironments that allow bacterial growth and they themselves can be a vector for contaminants and disease.
- Signs of improper handling
 - Packaged foods and dry foods should be checked for physical contaminants such as filth and foreign bodies as well as chemical contaminants such as oil, grease, fuel etc which may indicate previous improper handling/storage/transport.
- Expiry dates
 - Expiry dates and other food safety information on the label should be checked. This should only be considered when all of the other inspection criteria have been met. Products whose expiry dates have passed may present quality problems without any food safety implications. Decision on the acceptability of expired products should be taken on a case by case basis according to the nature of the product and if possible in consultation with a food safety expert. Some examples of foods that are likely to be safe beyond the expiry date include most canned foods if the can remains undamaged and the seal intact, dried cereal products that have been kept dry and well packaged, many high acid products such as pickles, fruit juices.

Annex 6. Personal Hygiene

Health status

- Food handlers should not work if they exhibit any of the following symptoms: diarrhoea, vomiting, fever, jaundice, discharge from the nose, sore throat, infected skin lesions
- Any open wounds should be covered with a suitable water-proof dressing

Cleanliness and habits

- Wash hands at the start of work and regularly thereafter, and in particular, after using the bathroom, after contact with garbage, before and after handling raw foods, between handling dirty and clean dishes, after using any cleaning chemicals, after smoking eating or drinking, after sneezing or blowing one's nose, touching one's face
- If gloves are used, the same hand washing procedures must be followed. Gloves are not a substitute for hand washing.
- Nails should be kept short and clean
- Jewellery should not be worn
- Aprons should be changed as they get dirty and should be removed before leaving the work area
- Clean clothes should be worn
- Food should not be tested using fingers. To test/taste food, ladle into a separate dish and taste with a clean spoon (which is not used for any other purpose)
- There should be no eating, drinking or smoking in the food preparation area
- There should be no spitting or chewing gum in the food preparation area
- Hair should be restrained

Hand washing

- Use dedicated hand washing stations
- Use potable water for hand washing (preferably warm) and wash with soap (preferably an antibacterial soap)
- Wash hands thoroughly by wringing hands together to work up lather for at least 10 to 20 seconds.
- Rinse hands with clean potable water.
- Dry hands properly by using clean or disposable towels dedicated for this purpose (Do not dry hands in aprons or kitchen cloths.)