

FAQ Food Systems 3. What measures should be taken to ensure proper food hygiene in Ebola Treatment Units (ETUs)?

Foodborne illness is caused by consuming contaminated food or beverages. Even though anyone can get a foodborne illness, those with compromised immune systems are at greater risk of getting sick or developing more serious conditions. Common symptoms of foodborne illness are diarrhoea, nausea, cramping or vomiting – symptoms that also common with EVD.

Food hygiene includes all conditions and measures necessary to ensure the safety and suitability of food at all stages of the food chain. In the case of ETUs, this involves steps from the procurement of food through to its consumption. Whether food preparation is outsourced or managed at the ETU site, food hygiene is crucial and needs to be closely monitored and adjusted when needed.

In as much as is possible, national regulations on food hygiene and quality control systems should be consulted. Coordination with the local authorities is also recommended to ensure that correct standards are implemented and followed.

Whether food preparation is outsourced or not, the following measures can help to ensure that patients receive safe and nutritious foods and drinks:

- Ensure food is stored properly and safely; monitor regularly (see Appendix 1 for checklist).
- Apply proper food hygiene measures during preparation; monitor regularly to ensure that quality control measures are being followed (see Appendix 2 for checklist).
- Apply correct food hygiene while transporting food and drinks to and within the ETU (see FAQ FS4).
- Ensure that food and drinks are consumed within the appropriate timing (see below under point 4.).

1. Food and drink storage (including special nutrition products)

Whether immediately perishable or not, all food and drinks must be stored properly prior to preparation and consumption. Follow manufacturer guidance wherever possible. Foods and drinks must be kept at appropriate temperatures and be protected from weather elements (extreme hot or cold), moisture and pests. Special care must also be taken to ensure that ingredients are used prior to spoiling or reaching their expiry date.

Extra meals or drinks that are not immediately served to patients after preparation must be stored in airtight containers¹ at the appropriate temperature.

Specialized nutritional products are particularly sensitive to high temperatures and humidity, which can affect their quality. Although product packaging has been specifically designed to protect the products against contamination, infestation, moisture and oxygen from the air, rancidity, loss of nutrient value, etc., quality issues may still occur when products are not properly stored.² Specialized nutrition products should therefore be stored in a cool and dry area, where temperature is maintained at less than 30°C. This can be a well-ventilated area without direct sunlight in or near the ETU green zone, ideally near the food preparation and tray assembly line stations. Additional product-specific storage instructions are provided on individual product packaging.

All locations where food is stored must be checked regularly to ensure basic quality control measures are respected. See Appendix 1 for an inspection checklist.

2. Food hygiene during preparation

WHO has outlined five keys to ensure food safety and prevent foodborne illness (see Figure 1); these should be strictly adhered to during ETU food preparation.

The following measures have also been proposed for ETUs:³

- Kitchen staff must perform hand hygiene at critical points in the food preparation process:
 - Before handling food
 - After handling raw food
 - After handling rubbish
 - After coughing or sneezing
 - After going to the toilet
 - After cleaning equipment and utensils
- Kitchen staff must wear clean aprons and hair coverings at the beginning of each shift; these are removed at the end of the shift and are taken to the laundry.
- All food preparation activities take place on pre-cleaned, non-porous cleanable surfaces.
 - Surfaces should be cleaned before and after food preparation and packaging with 0.5 per cent chlorine solution.

All sites where food and drinks are prepared should be inspected regularly to ensure that essential measures are in place and being followed correctly. This applies to sites within or alongside the ETU, as well as those that are offsite where outsourced meals are prepared (if applicable).

See Annex 2 for an inspection checklist.

3. Food hygiene during transportation

See FAQ FS4 for details regarding transportation of food and drinks to and within the ETU.

Figure 1. WHO: Five keys to safer food⁴

Five keys to safer food

Keep clean

- ✓ Wash your hands before handling food and often during food preparation
- ✓ Wash your hands after going to the toilet
- ✓ Wash and sanitize all surfaces and equipment used for food preparation
- ✓ Protect kitchen areas and food from insects, pests and other animals

Why?
While most microorganisms do not cause disease, dangerous microorganisms are widely found in soil, water, animals and people. These microorganisms are carried on hands, wiping cloths and utensils, especially cutting boards and the slightest contact can transfer them to food and cause foodborne diseases.

Separate raw and cooked

- ✓ Separate raw meat, poultry and seafood from other foods
- ✓ Use separate equipment and utensils such as knives and cutting boards for handling raw foods
- ✓ Store food in containers to avoid contact between raw and prepared foods

Why?
Raw food, especially meat, poultry and seafood, and their juices, can contain dangerous microorganisms which may be transferred onto other foods during food preparation and storage.

Cook thoroughly

- ✓ Cook food thoroughly, especially meat, poultry, eggs and seafood
- ✓ Bring foods like soups and stews to boiling to make sure that they have reached 70°C. For meat and poultry, make sure that juices are clear, not pink. Ideally, use a thermometer
- ✓ Reheat cooked food thoroughly

Why?
Proper cooking kills almost all dangerous microorganisms. Studies have shown that cooking food to a temperature of 70°C can help ensure it is safe for consumption. Foods that require special attention include minced meats, rolled roasts, large joints of meat and whole poultry.

Keep food at safe temperatures

- ✓ Do not leave cooked food at room temperature for more than 2 hours
- ✓ Refrigerate promptly all cooked and perishable food (preferably below 5°C)
- ✓ Keep cooked food piping hot (more than 60°C) prior to serving
- ✓ Do not store food too long even in the refrigerator
- ✓ Do not thaw frozen food at room temperature

Why?
Microorganisms can multiply very quickly if food is stored at room temperature. By holding at temperatures below 5°C or above 60°C, the growth of microorganisms is slowed down or stopped. Some dangerous microorganisms still grow below 5°C.

Use safe water and raw materials

- ✓ Use safe water or treat it to make it safe
- ✓ Select fresh and wholesome foods
- ✓ Choose foods processed for safety, such as pasteurized milk
- ✓ Wash fruits and vegetables, especially if eaten raw
- ✓ Do not use food beyond its expiry date

Why?
Raw materials, including water and ice, may be contaminated with dangerous microorganisms and chemicals. Toxic chemicals may be formed in damaged and mouldy foods. Care in selection of raw materials and simple measures such as washing and peeling may reduce the risk.

4. Timely food and drink consumption

It is important to monitor the time that perishable food and drinks remain at the patient’s bedside (red/high-risk zone); they should generally not be left longer than 1-2 hours. Food and drinks that are not consumed within the specified time period should be removed and discarded as infectious material.

Cooked food (including soup and porridges) should generally be consumed within 2 hours after preparation. Depending on where meals are prepared, and the system in place for getting food to patients, a large part of this time may be taken up in transportation (see FAQ FS4). However, it is essential to ensure that food that is intended to be eaten hot is still hot/warm when it reaches the patient to increase palatability and the likelihood that the patient will want to consume the food. Use containers that can keep food hot and try to reduce transport time from cooking to bedside as much as possible.

Special nutrition product drinks should generally be consumed within 1 or 2 hours after opening (for ready to drink products) or after reconstitution.

Ready-to-use therapeutic food and ready-to-use supplementary food (RUTF/RUSF) are among the foods that can be left longest at bedside. The paste form can be left for up to 12 hours once opened, if left in its original package, but it must be sealed (e.g., using a clip) and stored in an airtight container/bag.

Non-perishable food/drink can be stored at room temperature and left at the bedside for days if untouched and protected against insects and rodents.³

See Table 1 and FAQ PC4 for additional information regarding specialized nutrition products.

Table 1. Recommended time limit for consuming special nutrition products after opening or preparing

Product	Time limit for consuming after opening
Ready-to-use infant formula (RUIF)	1 hour at room temperature ⁵
Powdered infant formula (PIF)	<i>Unprepared (powder):</i> 1 month <i>Prepared (reconstituted):</i> 1 hour at room temperature ⁵ , 24 hours in refrigerator
Ultra-high temperature (UHT) milk	2 hours at room temperature, 7 days in refrigerator
F75 and F100 therapeutic milk	<i>Unprepared (powder):</i> 1 week <i>Prepared (reconstituted):</i> 2 hours at room temperature
RUTF and RUSF in paste form (e.g., Plumpy'nut, EezeePaste)	12 hours at room temperature (opened and still in original packaging, but sealed or in an airtight container) ⁶
High energy drinks (sip feeds)	2 hours at room temperature, 24 hours in refrigerator (recapped) ⁷

ANNEXES

Annex 1. Food storage checklist (Source: Adapted from Food and Agriculture Organization (FAO)⁸ and South Dakota Department of Public Health checklists⁹)

Date:

Observer(s):

Note: Ensure a person with water, sanitation and hygiene expertise is included in the inspection.

Warehouse or site of food storage for dry unprepared ingredients

Food

- All food supplies are 15–20 cm off the floor
- All food supplies are stored at least 1 meter away from the walls
- All food is labelled with name and delivery date
- The FEFO (first expired, first out) method of inventory is practiced
- Expiry dates are respected
- There are no bulging or leaking canned goods
- Food is protected from contamination and no food sacks or cans are open or uncovered

Pest control

- Storage is rodent proof
- Doors are in good condition
- Windows that can be opened have intact screens
- No evidence of pests or raw material residues
- No cracks in walls
- Roof is intact
- No open or leaking water source; drainage functions properly

Garbage storage and disposal

- Garbage cans are emptied as necessary
- Boxes and containers are removed from site

Miscellaneous

- All surfaces and floors are clean
- Chemicals (e.g., chlorine, pesticides, insecticides) and products such as fuel and soap are stored away from food and other food related supplies
- All food scales function properly

Refrigerators/coolers for perishable food/drinks (unprepared and/or prepared)

- For each unit a thermometer is present, clear and accurate and accompanied by a logbook to record temperatures each day (1-2 times per day)
- All food is properly wrapped, labelled and dated
- The FEFO (first expired, first out) method of inventory is being practiced
- Units are clean

Criteria that are not fulfilled:

Corrective action(s):

Annex 2. Food hygiene during preparation checklist (Source: Adapted from Food and Agriculture Organization (FAO)⁸ and South Dakota Department of Public Health checklists⁹)

Date:

Observer(s):

Note: Ensure a person with water, sanitation and hygiene expertise is included in the inspection.

Personal dress and hygiene

- Employees wear proper and clean clothing
- Hair restraints are worn
- Fingernails are short, unpolished and clean
- Jewelry is limited to watch, simple earrings and plain rings
- Open sores, cuts or splints and bandages on hands are completely covered while handling food
- Hands are washed thoroughly using proper hand-washing procedures (and/or gloves are changed) at critical points
- A non-smoking policy is observed near preparation, storage and washing areas
- Employees cough into their elbow and wash hands thoroughly with soap and water after coughing or sneezing
- Employees wash their hands with soap after toilet use, before food preparation and after touching raw foods
- Disposable tissues are used and disposed of when coughing/blowing nose and wash their hands with soap and water after coughing /blowing nose
- Employees are in good health; sick employees are not permitted to work in or near the kitchen
- A person is dedicated to monitoring hygiene during food preparation

Utensils and equipment (applies to utensils used within the kitchen only)

- A minimum of two-compartment sink is properly set up for cleaning and sanitizing (rinse/wash, sanitize)
- Reusable towels are used only for cleaning and sanitizing equipment surfaces and not for drying hands, utensils, floor, etc.
- All small equipment and utensils, including cutting boards, are sanitized between uses
- Small equipment and utensils are air dried
- Work surfaces are clean to sight and touch
- Work surfaces are washed and sanitized between uses

- Food thermometers are washed and sanitized between each use
- Can opener is clean to sight and touch
- Drawers and racks are clean
- Small equipment is inverted, covered or otherwise protected from dust, insects or contamination when stored
- All other pieces of equipment are clean to sight and touch – equipment on serving lines, storage shelves, cabinets, ovens, etc.

Food handling

- Vegetables and fruits are washed according to proper protocol
- Food is never at risk of cross-contamination (raw and prepared food are always separated)
- Food is handled with utensils, clean gloved hands or clean hands
- Utensils are handled in a manner that avoids touching parts that will be in direct contact with food
- When cooking food, at least one 'kill step' is used to remove potential pathogens (e.g., heating food to at least 70°C)
- Food is tasted hygienically (e.g., using clean utensils)
- Perishable and prepared food is not allowed to be in the "temperature danger zone" (5°C to 60°C) for more than 2 hours
- Food is labelled properly and with correct patient code (no patient names are used) before distribution

Hot holding

- Unit is clean
- Food is heated to 70°C before being placed in hot holding
- Temperature of food being held is above 60°C
- Food is protected from contamination

Garbage/rubbish

- Kitchen garbage cans are clean
- Garbage cans are emptied as necessary

Criteria that are not fulfilled:

Corrective action(s) to be taken:

References

1. Save the Children. *ETC Nutrition Protocol - Kerry Town Ebola Treatment Centre*. V2 ed.; 2015.
2. Ministry of Health and Social Welfare, Republic of Liberia. *Guidelines on Nutritional Care and Support for EVD Patients in Treatment Units and Care Centers - A Practical Guide for Implementing Agencies Involved in the Management and Treatment of EVD in Liberia.*; 2014.
3. GOAL. *International Package of Tools and Protocols for Ebola Treatment Units.*; 2014.
4. World Health Organization. Five keys to safer foods manual. Published online 2006.
5. CDC. Infant Formula Preparation and Storage. Centers for Disease Control and Prevention. Published July 13, 2022. <https://www.cdc.gov/nutrition/infantandtoddlernutrition/formula-feeding/infant-formula-preparation-and-storage.html>
6. World Health Organization, World Food Programme, United Nations Children's Fund (UNICEF). *Interim Guideline: Nutritional Care of Children and Adults with Ebola Virus Disease in Treatment Centres*. World Health Organization; 2014.
7. Peptamen® Vanilla Liquid Sip Feed | Nestlé Health Science. <https://www.nestlehealthscience.co.uk/brands/peptamen/peptamen-vanilla-bottles#:~:text=Shelf%20life%209%20months%20from%20date%20of%20manufacture>.
8. Codex Alimentarius Commission, Joint FAO WHO Food Standards Programme, eds. *Food Hygiene: Basic Texts ; Codex Alimentarius*. 4. ed. FAO [u.a.]; 2009.
9. South Dakota Department of Public Health. Food Service Manager Self-Inspection Checklist. <https://doh.sd.gov/documents/Food/Checklist.pdf> (Accessed 4 August 2021).