U.S. Department of Homeland Security

United States Coast Guard

Food Safety and Sanitation Program Tactics, Techniques, and Procedures (TTP)

U.S. Coast Guard
Force Readiness Command
(FORCECOM)

CGTTP 4-11.12A
MAY 2017

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CGTTP 4-11.12A
12 May 2017

COAST GUARD TACTICS, TECHNIQUES, AND PROCEDURES, CGTTP 4-11.12A

Subj: FOOD SAFETY AND SANITATION PROGRAM TACTICS, TECHNIQUES, AND PROCEDURES (TTP)

Ref:
(a) Safety and Environmental Health Manual, COMDTINST M5100.47 (series)
(b) Tri-Service Food Code, NAVMED P-5010-1 (series)
(c) Food Code Recommendations of the United States Public Health Service, Food and Drug Administration, 2013
(d) Coast Guard Food Service Manual, COMDTINST M4061.5 (series)
(e) Coast Guard Medical Manual, COMDTINST M6000.1 (series)
(f) National Shellfish Sanitation Program, Guide for the Control of Molluscan Shellfish, 2013
(g) Civil Engineering Manual, COMDTINST M11000.11 (series)
(h) Integrated Pest Management, Tactics, Techniques and Procedures, CGTTP 4-11.13 (series)
(i) Meat Inspection, 21 U.S.C., Chapter 12
(j) Poultry and Poultry Products Inspection, 21 U.S.C., Chapter 10

1. PURPOSE. To provide the commanding officer or officer-in-charge (CO/OIC) with Coast Guard tactics, techniques, and procedures (CGTTP) to develop, implement, and maintain an effective Food Safety and Sanitation (FSS) program.

2. ACTION. This CGTTP publication applies to all food service personnel at United States Coast Guard (USCG) units or food service facilities. Internet release authorized.

3. TTP AFFECTED. Publication CGTTP 4-11.2 is superseded by CGTTP 4-11.2A.

4. DISCUSSION. FSS is vital to mission readiness of every unit in the Coast Guard. The Centers for Disease Control and Prevention (CDC) estimates that each year roughly 48 million Americans get sick, 128,000 are hospitalized, and 3,000 die of food-borne diseases. Due to underreporting the true impact of food-borne disease outbreaks, both afloat and ashore, is likely even more significant. In the Coast Guard, outbreaks have been reported both onboard cutters and at shore units. Food-borne illness compromises the health of USCG personnel and the capability of a unit to accomplish its mission. Practicing FSS is paramount to preventing food-borne illness. An effective FSS program addresses potential hazards at critical control points, such as receiving, storing, handling and serving food.

5. DISCLAIMER. This TTP publication is not a substitute for applicable legal requirements, nor is it itself a rule. It is intended to provide guidance for Coast Guard personnel and is not intended to, nor does it impose legally binding requirements on any party outside the Coast Guard.

6. MINOR CHANGES. Appendix B: Job Aid for the Food Service Establishment, changed to align with items from CG-5145 form.

7. DISTRIBUTION. U.S. Coast Guard Force Readiness Command (FORCECOM) TTP Division posts an electronic version of this TTP publication to the CGTTP Library on CGPortal. In CGPortal, navigate to the CGTTP Library by selecting **References > TACTICS, TECHNIQUES, AND PROCEDURES LIBRARY**. FORCECOM TTP Division does not provide paper distribution of this publication.

8. USCG FORMS. The USCG electronic forms referenced in this publication are available on the CGPortal website.

9. REQUEST FOR CHANGES. Submit recommendations for TTP improvements or corrections through the TTP Request webpage on CGPortal. In CGPortal, navigate to the TTP Request webpage by selecting **References** > **FORCECOM - TTP Requests**.

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By Direction of Commander,
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Change Request

Previous No.	Revision No.	Change Type	Description of Change	Requestor	Date Submitted	Date Approved	Comments
4-11.2	4-11.2A	Minor Off-cycle rev.	Appendix B revised to align with the current Food Service Establishment Inspection Report Form (CG-5145) (05/16)	LT White	3/30/2017	4/27/2017	
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Chapter 1: Introduction

Introduction

This chapter overviews the contents of this tactics, techniques, and procedures (TTP) publication. This chapter also defines the use of notes, cautions, and warnings in this TTP publication.

In This Chapter

This chapter contains the following sections:

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Section A: Introduction

A.1. Introduction

Food Safety and Sanitation (FSS) is vital to mission readiness of every unit in the United States Coast Guard (USCG). The Centers for Disease Control and Prevention (CDC) estimates that each year roughly 48 million Americans get sick, 128,000 are hospitalized, and 3,000 die of foodborne diseases. Afloat, the World Health Organization estimates that from 1970 to 2000, more than 100 outbreaks of foodborne or waterborne diseases were reported on ships.

Due to underreporting, the true impact of foodborne disease outbreaks, both afloat and ashore, is likely even more significant. In the USCG, outbreaks have been reported both onboard cutters and at shore units. Foodborne illness compromises the health of USCG personnel and the capability of a unit to accomplish its mission. Practicing FSS is paramount to preventing foodborne illness. An effective FSS program addresses potential hazards at critical control points, such as receiving, storing, handling, and serving food.

This TTP publication incorporates guidance from these key sources:

- Reference (a), Safety and Environmental Health Manual, COMDTINST M5100.47 (series).
- Reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series).
- Reference (c), Food Code, Recommendations of the United States Public Health Service, Food and Drug Administration, 2013.

A.2. Scope

This TTP publication provides procedures to assist the commanding officer/officer-in-charge (CO/OIC) in developing, implementing, and maintaining an effective FSS program. Steps to prevent the contamination of food items by identifying and addressing critical control points are also included.

A.3. Audience

This publication is directed to unit commands and their designated food service officer (FSO) or senior food service specialist to aid them in developing and maintaining a unit FSS program. This publication provides all food service personnel guidance to maintain food service establishments and food products in a manner that protects all personnel from foodborne illness. The TTP outlined in this publication is in line with current regulatory and scientific guidance in food safety and sanitation.

A.4. Use of Best Practice

Throughout this TTP publication, the term "best practice" is defined as an innovative or modified practice that results in an improved or more effective response.

A.5. Registered Trademark Disclaimer

The use of registered trademarks in this TTP publication is not an endorsement of these products or companies by the USCG, the Department of Homeland Security (DHS), or the Federal government.

Section B: Notes, Cautions, and Warnings

B.1. Overview The following definitions apply to notes, cautions, and warnings found in TTP publications.

NOTE: **An emphasized statement, procedure, or technique.**

CAUTION: **A procedure, technique, or action that, if not followed, carries the risk of equipment damage.**

WARNING: ***A procedure, technique, or action that, if not followed, carries the risk of personnel injury or death.***

Chapter 2:
Program Elements of the FSS Program

Introduction

This chapter discusses the required elements of a FSS program as outlined in reference (a), Safety and Environmental Health Manual, COMDTINST 5100.47 (series).

In This Chapter

This chapter contains the following sections:

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Section A: General Information

A.1. General Requirements

Reference (a), Safety and Environmental Health Manual, COMDTINST M5100.47 (series), outlines the requirements for an FSS program as:

"Food service operations require careful management to protect the health and well being of patrons. Steps shall be taken to prevent the contamination of food items as they flow through the galley by identifying and addressing critical control points."

A.2. Critical Control Points Concept

The mention of "critical control points" in reference (a) is modeled after the principle of Hazard Analysis Critical Control Points (HACCP). HACCP is a central concept in reference (c), Food Code, Recommendations of the U.S. Public Health Service, FDA, 2013. HACCP emphasizes points at which biological, chemical, or physical hazards could be introduced to food. Examples include receiving, storing, handling, and serving foods.

A.3. Developing an FSS Program and Unit SOP

This publication provides authoritative best practices and instructions on how to create and sustain a unit-level FSS program as required in reference (a). Per reference (a), units are required to develop a unit-specific FSS program to comply with required elements. This publication provides guidance to meet those requirements. Do not simply adopt this publication as your unit FSS program.

Use this publication to develop a unit-specific FSS program relevant to the unit's food service operations. Contact the Health, Safety and Work-Life Service Center (HSWL SC) or Food Service Assistance and Training Team (FSAT) regarding any possible scenarios at the unit that are not covered in this publication. HSWL SC or FSAT staff reviews the unit's FSS program during inspections/assessment visits.

Per reference (d), Coast Guard Food Service Manual, COMDTINST M4061.5 (series), units must establish a standard operating procedures (SOP) document to provide a quick reference for food service personnel. SOP documents can summarize unit-specific requirements for food service personnel, including food handling, inspections, cleanliness standards, and training.

Reference (d) requires units update the SOP when there is a change in command or when conditions trigger a need to reevaluate the unit's procedures. Example conditions include:

- Foodborne illness outbreak.
- Repeat inspection violations.
- Safety mishap or near-miss.

- Alteration to physical facilities or equipment.
- Change in scope of operations.
- Change in federal, state, or local regulation that could impact the food service operations.

An example SOP is provided on the Food Safety Knowledge Repository found on CGPortal. The title on the portal page says Paperwork Management. Scroll down to SOP Resources, then click on **SOP Template**. The FSO or senior food service specialist (FS), as designated by the unit's CO/OIC, evaluates local operations to ensure compliance procedures are included in the unit SOP. See reference (d), Coast Guard Food Service Manual, COMDTINST M4061.5 (series), for guidance about including food service elements in the unit SOP (i.e., sales, receipts, invoices, etc.).

Section B: FSS Required Program Elements

B.1. Required Program Elements

The following are minimum required program elements per reference (a), Safety and Environmental Health Manual, COMDINST 5100.47 (series):

- Appoint an FSO.
- Perform weekly food service facilities inspections.
  - Inspections can be conducted by the medical department representative (MDR) or other personnel designated by the CO/OIC.
- Complete and submit the Food Service Establishment Inspection Report (CG-5145) form found on CGPortal. See Appendix B: Job Aid for The Food Service Establishment Inspection Report (CG-5145) Form for additional guidance.
- Conduct a daily walk-through inspection and observe employee practices, cleanliness, and signs of illness.
- Inspect and acquire foods from approved sources, and properly handle from receiving to serving.
- Ensure food service equipment is approved by the National Sanitation Foundation (NSF) and maintained.
- Follow cleaning and disinfection procedures.
- Report foodborne diseases using the disease alert format found in reference (e), Coast Guard Medical Manual, COMDTINST M6000.1 (series).

NOTE: **Immediately consult with HSWL SC for assistance in a foodborne illness investigation.**

- Provide annual training on food service sanitation requirements and procedures for food service personnel.

Section C: Reviewing and Updating the FSS Program

C.1. Annual Review

To meet program requirements outlined in reference (a), Safety and Environmental Health Manual, COMDTINST 5100.47 (series), an FSO and a MDR annually reviews FSS programs. The following subsections provide examples of items that need regular updates.

C.1.a. Personnel Designations

One of the most common aspects of a FSS program requiring updates is the designation of personnel. Per reference (a), use letters of designation to assign responsibilities for:

- The role of FSO.
- Weekly food service inspections, typically the unit health services technician (HS).

As a best practice, keep letters of designation on file and updated since members and personnel transfer in and out of the unit.

C.1.b. Update and Approval Process

Per reference (a), a unit establishes its own process for approving any updates to its FSS program or SOP document. It is recommended that the review and update be a collaborative process involving all those mentioned in Chapter 3: Management and Personnel, Section B: Relevant Personnel. This maximizes stakeholder involvement (unit departments, contractors, etc.) to ensure effective implementation of the unit program.

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Chapter 3: Management and Personnel

Introduction

This chapter details techniques that food service personnel apply to prevent foodborne illnesses. Food service personnel acquire these techniques through formal initial sanitation training and annual refresher sanitation training when assigned to food service establishments.

In This Chapter

This chapter contains the following sections:

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Section A: Overview

A.1. General

Food service personnel are the most important link in the prevention of transmitting foodborne illnesses. Good hygiene, health, and food service techniques of the food service worker are essential factors in the well-being of patrons.

The practice of good personal hygiene and the application of recommended food service techniques are essential in preventing foodborne illnesses. It is important to ensure all food service personnel, both military and civilian, receive formal training before assignment to duty in a food service establishment. Per reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series), civilian contractors are responsible for ensuring that their personnel are properly trained.

Section B: Relevant Personnel

B.1. Commanding Officer

Per reference (a), Safety and Environmental Health Manual, COMDTINST M5100.47 (series), the CO is responsible for ensuring that hazardous conditions are abated or controlled.

B.2. Person-in-Charge

Per reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series):

- The person-in-charge (PIC) is designated as the FSO, food service manager, or other designated individual.
- The PIC procures, receives, inspects, and stores wholesome food items within his or her respective food service activity.
- The PIC prevents foodborne illnesses at his or her establishment by ensuring the following practices occur as required by reference (b).
  - Food facility operations are not conducted in private homes or living quarters.
  - Persons unnecessary to the food establishment operation are not allowed in preparation, storage, or warewashing areas.
  - Employees follow appropriate handwashing guidance and personal hygiene practices.
  - Employees check foods as they are received to verify sanitary condition, and all discrepancies are reported to the PIC.
  - Employees follow proper cooking and holding techniques for potentially hazardous foods (PHF).
  - Employees properly sanitize equipment and prevent cross-contamination of ready-to-eat foods by wearing powder free disposable gloves when working with hands.
  - Employees are properly trained in food safety.
  - Employees are aware of their responsibility to report information about their health as it relates to diseases transferable through food.
  - Food service equipment and spaces are maintained in clean and sanitary condition.

B.3. Medical Department

Per reference (e), Coast Guard Medical Manual, COMDTINST M6000.1 (series), the medical department or assigned command representative is responsible for:

- Conducting sanitation inspections, including daily walk-through inspections and weekly full inspections of food service operations.
- Medical screening of military/civilian food service personnel upon initial assignment for disease or unclean habits that could result in foodborne illness.

Section C: Employee Health and Screening (Health Standards)

C.1. Employee Health Screening

Per reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series), the MDR establishes a determination of medical screening criteria for all personnel involved in daily galley.

- Screen all food service, military, and civil service personnel before initial assignment in food service areas to ensure they are free from communicable disease that have the potential for transmission through food preparation or serving. Use the guidelines in Section C.2.: Health Screening General Guidelines of this chapter for screening procedures.
- Document medical history via a screening using the Chronological Record of Medical Care (SF-600) form found on the Government Services Administration website. Type 'SF-600' in the search bar on the homepage. Select the link with the heading 'Form: SF600'. Click on the document link to download and open.
- Contact the contracting officer representative (COR) to verify independent contractors' screening.
- Document verification in the unit's FSS program.

C.1.a. Health Screening General Guidelines

Reference (e), Coast Guard Medical Manual, COMDTINST M6000.1 (series), establishes minimum reporting and exclusion criteria. The following guidelines are for the MDR performing the health screening:

- Inspect to observe proper personal hygiene practices. Comment or pay close attention to the presence of personnel illness or injuries (i.e., boils, infected wounds, and open sores on hands).
- Review health records to ensure all required immunizations are up to date. Refer personnel without all required immunizations to their healthcare provider to obtain required immunizations.
- Refer any food service employee who exhibits any symptoms of a communicable disease, open or draining lesions (especially those on hands, face, neck), persistent sneezing, coughing, or runny nose for evaluation by a medical authority. For contract workers, refer to a civilian practitioner as appropriate.
- Ensure a medical authority screens food service personnel before the resumption of their food service duties if they have been away due to illness involving gastrointestinal symptoms (i.e., vomiting, diarrhea, etc.), hepatitis, strep throat, or skin infection.

- The MDR can screen the employees or a note from the healthcare provider is sufficient.

- Ensure the purified protein derivative (PPD) is conducted on initial placement of civilian personnel. USCG members are required to have a baseline tuberculosis screening at call to active duty. Per reference (e), Coast Guard Medical Manual, COMDTINST M6000.1 (series), periodic screening for tuberculosis is not required.

NOTE: **See reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series), for specific Department of Defense (DOD) guidelines regarding food service employee health.**

Section D: Personnel Inspections and Personal Hygiene

D.1. Daily Hygiene Inspections

Per reference (a), Safety and Environmental Health Manual, COMDTINST M5100.47 (series), the FSO or FS conducts visual daily hygiene inspections of food service personnel. These inspections help minimize the risk of foodborne illness transmission.

Per reference (e), Coast Guard Medical Manual, COMDTINST M6000.1 (series), the MDR inspects personnel weekly during galley inspections. Check personnel during inspections based on the conditions for hair and clothing described in the following subsections during the inspections.

D.2. Personal Cleanliness (General)

Food service personnel follow hand-washing guidance in Chapter 4: Food Quality and Care, Section D.1.: Preventing Contamination from Hands. In addition, per reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series), food service personnel conduct a visual check to ensure:

- Fingernails are trimmed, filed, and maintained, so the edges and surfaces are cleanable, are not rough, and do not extend more than one-quarter inch above the fingertip.
- No fingernail polish, artificial fingernails, or fingernail jewelry is worn when working with exposed food.

NOTE:

Male and female personnel use effective hair restraints, such as properly worn hats and hairnets, to prevent contamination of food and food contact surfaces.

D.2.a. Male Personal Cleanliness (Hair)

Per reference (c), Food Code, Recommendations of the U.S. Public Health Service, FDA, 2013, food employees shall wear hair restraints to effectively keep hair from contacting exposed food, clean equipment, utensils and linens, and unwrapped single-service and single-use articles.

As a best practice for male food service personnel:

- Neatly trim sideburns so that they do not extend below the bottom of the earlobe. Ensure sideburns are of even width (not flared) and end with a clean-shaven horizontal line.
  - ➢ “Muttonchops,” “Ships’s Captain,” or similar grooming modes are considered to be merely elongated sideburns and therefore are not authorized.

- Ensure a clean-shave unless a medical shave chit is authorized, in which case beard restraints are required.
  - A neatly trimmed moustache is allowed.

D.2.b. Female Personal Cleanliness (Hair)	Per reference (c), Food Code, Recommendations of the U.S. Public Health Service, FDA, 2013, female food personnel working in food preparation storage and utensil cleaning spaces use the following best practices to effectively restrain hair: • Clean hair on a consistent basis to be free of debris and dirt. • Neatly arrange hair so that the bulk of the hair does not interfere with the proper wearing of sanitary headgear. • Remove hair ornaments such as ribbons. Pins, combs, or barrettes similar in color to the individual's hair color that do not interfere with wearing headgear are acceptable. • Remove hairpieces or wigs that interfere with proper performance of food service duties or present a safety hazard.
D.2.c. Personal Cleanliness (Clothing)	Per reference (c), food service personnel wear clean outer clothing to prevent contamination of food, equipment, utensils, linens, and single-service and single-use articles. The following are best practices for all food service personnel: ➢ Wear neat and clean clothing. Conduct a visual self-inspection to ensure you meet the standard. Do not wear food service clothing outside of the food service establishment. ➢ Choose clothing that is washable. The exception is clothing intended for one-time use and then discarded. ➢ Wear composite safety toe boots. ➢ Store clothing and change clothes outside of food preparation areas, serving areas, and utensil washing areas. • Active duty USCG food service personnel wear whites or USCG operational dress uniforms.

Section E: Health Practices

E.1. Health Practices

Per reference (c), Food Code, Recommendations of the U.S. Public Health Service, FDA, 2013:

- Consume food and beverages only in designated dining areas.
- Drinking from a closed beverage container is allowed provided the container is handled to prevent contamination of:
  - The employee's hands.
  - The container.
  - Exposed food.
  - Clean equipment.
  - Utensils and linens including unwrapped single-service and single-use articles.

NOTE: **Avoid designating an area as a dining area if consuming food or beverages might result in contamination of other food, equipment, utensils, or other items needing protection.**

- Do not use tobacco and electronic cigarettes in any form while engaged in food preparation or service, or while in equipment or utensil washing areas.
  - Designate areas for food service personnel to use tobacco and tobacco products.
- Handle soiled tableware in a way that reduces hand contamination. One best practice is to wear disposable gloves.
- Do not store personal items such as books, medication, magazines, combs, clothing, etc., in any food service preparation or serving areas, storage, or utensil cleaning spaces.
- Do not handle money and prepare or serve food at the same time.
- Do not use technology such as personal mobile phones, electronic tablets, or other such technology while in the galley.

Section F: Training and Safety Practices

F.1. Policy

Reference (a), Safety and Environmental Health Manual, COMDTINST M5100.47 (series), requires USCG food service personnel be trained annually on sanitation requirements. This section provides recommendations for developing and assessing that training.

F.2. General

Per reference (a), the CO is responsible for ensuring administration of the food service training and safety programs.

F.3. Educating Personnel

Per reference (a):

- Ensure all food service personnel are instructed in the principles of safety and sanitation through a continuous training program.
  - Thoroughly indoctrinate food service personnel in personal hygiene, as well as in the methods and importance of preventing foodborne illnesses.
- Post written instructions for equipment operation and standing sanitary rules in easily visible places. Post handwashing posters in bathrooms and other appropriate places. Procure handwashing posters from Coast Guard Supply Center by completing a Multi-use Standard Requisitioning/Issue System Document (SF-344) found on the Government Services Administration website. Type 'SF-344' in the search bar on the homepage. Select the link with the heading 'Form: SF344'. Click on the document link to download and open.

Below are posters available for posting:

- CG-3525 – Poster, Sanitation, Man Washing Hands – "Always Wash Your Hands After Using The Toilet," SN 7530-00-F01-4600, U/I EA.
- CG-3526 – Poster, Sanitation, Five Hands – "Always Wash Your Hands After Using Toilet," SN 7530-00-F01-4610, U/I EA.
- CG-3527 – Poster, Sanitation, Hands Turning Faucet – "Always Wash Your Hands After Using Toilet," SN 7530-00-F01-4620, U/I EA.
- SF-344 – Multiuse Standard Requisitioning/Issue System Document, SN 7540-00-965-2379, U/I (PD).

Appendix C: Safety Precautions Best Practices for Food Service Personnel contains a list of food service safety precautions for use by food service personnel while they are engaged in the preparation and serving of foods, and the cleaning of food service establishments.

F.4. Training Requirements

Per reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series), train all employees assigned to food service establishments before working in the establishment. Training covers the basic principles of food safety, which include but are not limited to the CDC's five foodborne illness risk factors:

- Food from unsafe sources.
- Inadequate cooking.
- Improper holding/time-temperature.
- Contaminated equipment/cross-contamination protection.
- Poor personal hygiene.

F.5. Training Sources

Private sources such as ServSafe® and the National Environmental Health Association offer Food Safety Handler and Food Safety Manager training and certification. Beyond private sources of food safety training, USCG members can participate in courses offered by the Navy Environmental Preventive Medicine Units (NEPMUs).

For a listing of NEPMU facilities and courses offered, see the Navy and Marine Corps Public Health Center website. In addition, the Food Safety Knowledge Repository also serves as a training resource.

F.6. Training for Contracting Food Service Employees

To meet the training requirements of reference (b), follow these best practices:

- Document training sessions and keep on file in the unit's FSS program. Verify training for contract personnel with the COR.
- Ensure bartenders comply with state and local laws for certification prior to selling alcohol.
- Provide food employees who do not prepare food (i.e., bartenders, hostesses, wait staff, and counter staff), with four hours of initial food sanitation and safety training within 30 days of beginning work in an establishment that serves food.
- Train temporary employees assigned for 30 days or less, including auxiliary personnel, before working in a food establishment.

- Ensure military personnel assigned additional duty as a dining facility attendant, food service assistant (FSA), or mess attendant (MA) that does not involve food handling, receive specific food service sanitation training relevant to the assigned tasks.

F.7. Refresher Training

Per reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series), provide annual refresher training for all food service personnel.

- Document all refresher training, including personnel trained and topics covered, in unit log or electronic training system.
- Provide two hours of refresher training annually to food employees who do not prepare food (i.e., bartenders, hostesses, wait staff, and counter staff).
- Provide food employees a minimum of four hours of food sanitation refresher training annually to reinforce training covered in initial training.
- As a best practice, setting an Outlook calendar reminder or scheduling training in conjunction with annual audits can assist in ensuring refresher training is completed.

F.8. Food Service Sanitation Instructor Training

Per reference (b) ensure,

- USCG members who are charged with providing sanitation training to food service employees have completed all training performance objectives of FS "A" school.
  - Trainers also must demonstrate completion of annual refresher training that is separate from the training they provide to subordinates.
- Civilians or contractors charged with providing sanitation training to food service employees have a current Food Safety Manager or equivalent certification, such as ServSafe, National Environmental Health Association (NEHA), Navy, or DOD.
  - This includes completing continuing education or refresher training as necessary to maintain the certification. A list of external training sources is provided in Chapter 3: Management and Personnel, Section F.5.: Training Sources.

F.9. COR/Non-food Employee, Supervisor

Per reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series), ensure the following:

- CORs, quality assurance evaluators, and other representatives responsible for evaluating food service contract performance or providing management or operation oversight of a food establishment complete a Food Manager Certification and recertification process.
- Individuals who are not food employees but are designated to supervise personnel detailed to food service operations receive a minimum of four hours of training in:
  - Food safety.
  - Proper food handling.
  - Equipment.
  - General sanitation.

F.10. Training Records

Document training in the training management tool (TMT) or a unit training log. Include the topics presented, the presenter's name, the names of personnel in attendance, the duration of the training, and the training date.

Ensure food employee's training records are available upon request during galley inspections.

If an employee works at more than one food establishment, ensure copies of his/her record are available at each establishment.

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Chapter 4:
Food Quality and Care

Introduction

This chapter discusses protocol and guidance for ensuring food received is wholesome and unadulterated.

In This Chapter

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Section A: Ordering from Approved Sources

A.1. Approved Source Guidance

Per reference (c), Food Code, Recommendations of the U.S. Public Health Service, FDA, 2013, the unit's FSS program ensures:

- Food is safe and unadulterated upon receipt.
- Food is visually inspected to ensure it is wholesome and free from spoilage, filth, or other contamination, and is fit for human consumption.

Per reference (d), Coast Guard Food Service Manual, COMDTINST M4061.5 (series), the unit's FSS program ensures food is obtained from sources that comply with U.S. Department of Agriculture (USDA) or an approved source from a foreign port that complies with all food quality and labeling laws.

Section B: Protecting Food from Contamination during Receipt

B.1. Specifications for Receiving

Per reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series), use the following specifications for receiving foods to protect food from contamination:

- See Appendix D: Food Inspections for specific guidance on inspecting foods upon receipt.
- Obtain whole-muscle, intact beef steaks that meet the following criteria:
  - Intended for consumption.
  - Received from an approved source in an undercooked form.
  - Do not have consumer advisory.
  - Packaged and labeled to indicate meets the definition of whole-muscle, intact beef.
- Ensure the following through procurement process and inspection upon receipt:
  - All other meat and poultry are received with appropriate packaging and labeling.
  - Food packages are in good condition and protect the integrity of the contents, so that the food is not exposed to adulteration or potential contaminants.
  - Game animals received for sale or service are commercially raised for food.
  - Fish that are received for service are commercially and legally caught or harvested. Do not use privately caught fish for service.
  - Eggs received have been treated to destroy all viable salmonellae.
  - Raw eggs are received in refrigerated equipment that maintains an ambient air temperature of 45 degrees Fahrenheit (7 degrees Celsius) or less.
    - The exception is in overseas locations when authorized by command policy through advisement by the medical representative.

  - Fluid milk is pasteurized and obtained from sources that comply with Grade A standards.
  - Food that is labeled and shipped frozen is still frozen when received.
  - Refrigerated food is at a temperature of 41 degrees Fahrenheit (5 degrees Celsius) or below when received.
  - Cooked food is received hot at a temperature of 135 degrees Fahrenheit (57 degrees Celsius) or above.
  - Food is free of evidence of previous temperature abuse upon receipt.
- Per reference (f), National Shellfish Sanitation Program (NSSP), Guide for the Control of Molluscan Shellfish, 2013, obtain molluscan shellfish based on the specified requirements.
- Do not serve fresh fruits and vegetables grown in areas where night soil (human feces) is used as a fertilizer in food establishments.
- Do not use wild mushrooms.
- Protect food from contamination by all agents, including:
  - Dust.
  - Insects.
  - Unclean equipment and utensils.
  - Unnecessary handling.
  - Coughs and sneezes.
  - Flooding.
  - Draining.
  - Overhead leakage or condensation.
- Protect food from contamination at all times, including while being:
  - Transported.
  - Stored.
  - Prepared.
  - Displayed.
  - Served.

Section C: Preventing Contamination

C.1. Definitions

Ready-to-eat foods: Any food that does not need cooking or that has already been cooked and is ready for service.

Raw animal foods: Any animal product intended for consumption that has not been cooked.

C.2. Preventing Contamination when Tasting

- Per reference (c), Food Code, Recommendations of the U.S. Public Health Service, FDA, 2013, ensure food employees use a clean sanitized utensil or single service disposable utensil to withdraw the food sample.
- Taste food at a distance and in a manner that does not risk the contamination of the food.
- Use tasting utensil only once.

C.3. Preventing Food and Ingredient Contamination

- Per reference (c), protect food from cross-contamination by separating raw animal foods from ready-to-eat foods during storage, holding, and display.
  - Store raw meats below produce or ready-to-eat foods to prevent contamination by dripping raw meat juices.
- Separate the following five raw animal foods from each other during storage, preparation, holding, and display:
  - Beef.
  - Fish.
  - Lamb.
  - Pork.
  - Poultry.
- Separate fruits and vegetables before they are washed from ready-to-eat food using separate storage containers or space to prevent contact.
- Thoroughly wash raw fruits and vegetables with potable water to remove soil and other contaminants before being cut, combined with other ingredients, cooked, served, or offered for human consumption in ready-to-eat form.

- Follow approved Food and Drug Administration (FDA) methods if the PIC determines chemical washing is necessary to disinfect fruits and vegetables. Chemical washing is only necessary when there is doubt in the quality of the produce, such as goods procured in a foreign port or goods with visible residue. Contact HSWL SC with any questions regarding chemical washing.
- Identify the common name of the food in working containers holding food or food ingredients that are removed from their original packages for use in the food establishment, such as:
  - Cooking oils.
  - Flour.
  - Herbs.
  - Potato flakes.
  - Salt.
  - Spices.

NOTE: **The exception is containers holding food that can be readily and unmistakably recognized, such as dry pasta and sugar.**

C.3.a. Ice and Food Contamination

Per reference (c), Food Code, Recommendations of the U.S. Public Health Service, FDA, 2013:

- Use potable water to make ice for use as a food or a cooling medium.
- If ice is used as a medium for cooling, do not use later for food.
- Do not store food in permeable packaging in direct contact with ice or water.
- Do not store unpackaged food in direct contact with undrained ice.
- Whole raw fruits or vegetables and tofu can be immersed in potable ice or drinking water.

C.4. Preventing Contamination from Equipment, Utensils, and Linens

- Ensure food contacts only surfaces of equipment and utensils that are clean and sanitized.
- Clean and sanitize equipment and utensils after each use.
- Use separate sanitized equipment and utensils for each type of food during storage, preparation, holding, and display to prevent cross-

contamination.

- During pauses in food preparation or dispensing, store food utensils on a clean portion of the food preparation table or cooking equipment only if they are cleaned and sanitized.
- Do not use linens and napkins in contact with food unless they are used to line a container for the service of foods and the linens and napkins are replaced each time the container is refilled for a new consumer..
- Ensure that cloths in use for wiping food spills off of tableware and containers while food is being served are dry and used for no other purpose.
- Hold cloths used for wiping counters and other equipment surfaces in a chemical sanitize solution in between uses and launder as needed. Table E-4 and Table E-5 provide instructions for sanitizing solutions of 50 and 100 ppm chlorine respectively.

NOTE: **Use new cloths and replace chemical sanitizing solution daily.**

- Keep cloths used for wiping surfaces in contact with raw animal foods separate from cloths used for other purposes.

WARNING: ***Change the sanitizing solution and cloths immediately after use with raw animal foods.***

- Use single-use disposable sanitizer wipes in accordance with U.S. Environmental Protection Agency (EPA) approved manufacturer's label use instructions.
- Use single-use gloves for only one task, such as working with ready-to-eat-food or with raw animal food. Use single-use gloves for no other purpose and discard when damaged or soiled, or when interruptions occur in the operation.
- Ensure all disposable gloves, regardless of type, are powder free.

WARNING: ***Use of latex gloves is prohibited, as the protein component in natural latex can cause an allergic reaction, ranging from sneezing to anaphylactic shock, in some people. Alternatives to latex include synthetic rubber or non-latex materials, such as neoprene, nitrile, or vinyl.***

- Do not use tableware, including single-service articles soiled by the consumer, to provide second portions or refills except when:
  - Refilling a consumer's drinking cup or container.
  - Avoiding contact between the pouring utensil and the lip-contact area of the drinking cup or container.
- Do not allow self-service consumers to use soiled tableware, including single-service articles, to obtain additional food from the display and serving equipment.
- Food employees or consumers can refill personal takeout beverage containers (e.g., thermally insulated bottles, non-spill coffee cups, promotional beverage glasses) if refilling is a contamination-free process.
  - A contamination-free process means the lip-contact area of the drinking cup or container does not come in contact with the pouring utensil.

Section D: Handwashing

D.1. Preventing Contamination from Hands

Per reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series), food employees must keep their hands and exposed portions of their arms clean, including surrogate prosthetic devices for hands and arms.

- Clean hands and exposed portions of arms immediately before engaging in food preparation, including working with exposed food, clean equipment and utensils, and unwrapped single-service and single-use articles. In addition, clean hands:
  - Before starting work.
  - After touching bare human body parts other than clean hands and exposed portions of arms. Includes face, nose, and mouth.
  - After smoking or using tobacco products, including electronic cigarettes.
  - After sneezing, coughing, or using a handkerchief or disposable tissue.
  - After eating or drinking.
  - After collecting money or cash.
  - After using toilet facilities.
  - After handling soiled equipment or utensils.
  - During food preparation, as often as necessary to remove soil and contamination, and to prevent cross-contamination when changing tasks.
  - When switching between working with raw food and working with ready-to-eat food.
  - Before donning gloves for working with food.
  - After engaging in other activities that contaminate the hands.

D.1.a. Handwashing Procedure	Handwashing procedure is as follows: 1. Clean hands in a handwashing sink or approved automatic hand-washing facility. Do not clean hands in a sink used for food preparation or warewashing, or in a service sink or a curbed cleaning facility used for the disposal of mop water and similar liquid waste. 2. Rinse hands and exposed portions of arms under potable, running warm water; apply an amount of cleaning compound recommended by the cleaning compound manufacturer. 3. Rub together vigorously for at least 10 to 15 seconds. Pay particular attention to removing soil from underneath the fingernails. Recommended method is to create friction on the following: a. Hands and arms or surrogate prosthetic devices for hands and arms. b. Fingertips. c. Under the fingernails and cuticles. d. Areas between the fingers and exposed areas on the forearm. 4. Thoroughly rinse hands and exposed portions of arms under potable, running warm water. 5. Immediately follow the cleaning procedure with thorough drying methods using individual disposable paper towels.
D.1.b. Hand Antiseptics	Per reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series), use antiseptics approved by the PIC for topical application, hand dip, or as a soap.

Section E: Storage and Labeling

E.1. Food Storage General Information

Correct storage procedures play a major part in preventing foodborne illness. Per reference (c), Food Code, Recommendations of the U.S. Public Health Service, FDA, 2013, the maintenance of proper temperatures, air circulation, and humidity is necessary to preserve food items from spoilage and growth of pathogenic organisms.

- Maintain high standards of sanitation in storerooms and refrigerated spaces.
- Store dry food items under controlled conditions of temperature, humidity, and air circulation.
- Inspect canned goods and dry food items for correct can labeling, condition of exterior can, signs of rusting, and other conditions such as swellers, springers, and flippers with the exception of coffee and molasses.
- Store food items away from bulkheads where steam or other heated pipes are located. Stack food items in a manner to permit adequate air circulation.
- Protect supply storage buildings against insect and rodent invasion.
- Place food items on pallets to facilitate cleaning, prevent insect and rodent harborage, and aid in air circulation.
- Store food items with a regard to safety, accessibility, and orderliness. Age is a contributing factor in food spoilage. Use "first in, first out" (FIFO), except when the condition of the newer items is such that it must be given priority.
- Store only food items in food storage spaces (storerooms, reefers, refrigerators, etc.).

NOTE: **Storage of non-food items such as medications, vaccines, batteries, glue, greases, urine samples, etc., in reefer spaces can lead to contamination.**

- Keep stored foods, whether raw or prepared, in the clean container or package in which they were obtained or in a clean covered container. Use of a cloth towel as a container cover is insufficient to prevent contamination.
- Store food 6 inches above the floor or deck on clean surfaces and

protect food to prevent contamination by splash or other means.

- Do not store packaged food in contact with water or undrained ice.
- Store ready-to-eat food away from food requiring washing or cooking before serving to protect against food contamination.
- Do not store food items under exposed sewer or non-potable water lines.
- Store bulk food in a container and identify the food by common name, unless its identity is unmistakable, if it is not stored in the original container or packaging.
- Sort decayed items out and remove from fresh fruits and vegetables. Do not store food items, such as eggs and butter, that absorb odors with seafood, fruits, or vegetables.
- Store pressurized beverage containers, cased food in waterproof containers, such as bottles or cans, and milk containers in plastic crates on a floor that is clean and not exposed to floor moisture.
- Protect food on display from contamination by the use of counter, service line or salad bar food guards, display cases, or other effective means.
- Do not store food in the following:
  - Locker rooms, toilet rooms, dressing rooms, or mechanical rooms.
  - Near garbage.
- Do not store food under:
  - Sewers/sewage lines.
  - Leaking water lines.
  - Open stairwells.
  - Other sources of contamination.

E.2. Refrigerated Storage

Per reference (c), Food Code, Recommendations of the U.S. Public Health Service, FDA, 2013:

- Provide enough conveniently located refrigeration facilities or effectively insulated facilities to maintain food at required temperatures during storage.
- Ensure refrigerators and freezers are constructed per current NSF standards and bear the NSF seal.

- Provide two thermometers for each cold food storage unit with a numerically scaled indicating thermometer, accurate to plus or minus two degrees Fahrenheit. Place in the warmest part of the facility to measure the air temperature. Mount one thermometer on the unit's exterior, so it is easy to read, and place the other inside the unit.
- Maintain daily temperature logs on all cold storage spaces and accurate entries. Report any deviations from recommended storage temperatures immediately to the PIC and MDR.
- Maintain PHF requiring refrigeration at a temperature at or below 41 degrees Fahrenheit (5 degrees Celsius), except during necessary periods of preparation.
- Maintain and store frozen foods at a temperature of 0 degrees Fahrenheit (minus 17.8 degrees Celsius) or below.
- Do not use of ice not intended for human consumption to cool stored foods, food containers, or food utensils.
- Do not store anything but ice in ice machines.
- Store all items in a manner that provides adequate air circulation.

E.3. Hot Storage

Per reference (c), Food Code, Recommendations of the U.S. Public Health Service, FDA, 2013:

- Provide conveniently located hot food storage facilities to assure the maintenance of food at the required temperature.
- Provide each hot food storage facility with a numerically scaled indicating thermometer, accurate to plus or minus 2 degrees Fahrenheit, located in the coolest part of the facility and in a location where the thermometer is easy to read.
- Maintain PHF requiring hot storage at or above 135 degrees Fahrenheit (60 degrees Celsius), except during necessary periods of preparation.

E.4. Dry and Liquid Milk Storage and Use

- Provide milk and milk products for drinking to the consumer in unopened, commercially filled packages not exceeding 1 pint in capacity or served from a bulk milk dispenser.
- Consume milk by the "best by" date or expiration date, whichever is listed and comes first.
- Refrigerate single-service containers of milk and liquid milk products at or below 41 degrees Fahrenheit (5 degrees Celsius) until served. Keep tops of containers clean and do not submerge in water or cover with ice to cool per reference (c).

- Pasteurize all milk and milk products dispensed from bulk milk.
- Maintain temperature in the dispenser cabinet within the range of 32 degrees Fahrenheit (0 degrees Celsius) to 41 degrees Fahrenheit (5 degrees Celsius) while milk containers are stored within. Ensure a metal-stem type thermometer is a part of the dispenser cabinet.
- Do not use multi-use dispenser tubes. Cut single service tubes (other than precut tubes) with a clean cutting instrument at a point no more than one inch beyond the termination of the dispensing mechanism and at a 45-degree angle.
- Do not expose milk to contact from personnel, droplets, infection, dust, flies, or other sources of contamination.
- Defrost dispenser cabinets at frequent intervals to prevent accumulation of more than 3/16th inch of ice.
- Ensure that pitchers are clean and sanitized before use when the pitcher method of milk reconstitution is used.
- Sanitize and clean long-handled, corrosion-resistant spoons or electric beaters that are used for reconstituting milk.

E.5. Ground Food Storage

- Prepare only the quantity of ground food for consumption at each meal period.
  - Grinding or chopping food increases the surface area for possible contamination and growth of harmful bacteria. The grinding process warms chilled food to temperature where microbial growth can occur.
- Immediately refrigerate ground or chopped food at a temperature of 41 degrees Fahrenheit (5 degrees Celsius) or below in shallow pans filled to a depth of not more than 3 inches. Keep covered until cooked.

E.6. Pastries Storage

- Prepare cream puffs, custard-filled pies and cakes, éclairs, and similar products, including those containing synthetic fillings, under strict sanitary conditions.
  - Cover these items, cool quickly, and refrigerate at 41 degrees Fahrenheit (5 degrees Celsius) or below until served.
  - Ensure the items remain under refrigeration at 41degrees Fahrenheit (5 degrees Celsius) or below on the serving line.
  - Dispose any leftover items after each meal.

- Prepare or procure only the quantity of food needed for consumption for the day.

E.7. Condiment Dispensing Storage

- Provide sugar, condiments, seasonings, and dressings for self-service only in individual packages or from approved dispensers.
- Protect condiments considered PHF, such as mayonnaise, other than those dispensed in individual packages, by:
  - Holding at temperatures below 41 degrees Fahrenheit (5 degrees Celsius).
  - Place on the line in small amounts and replenish frequently.
  - Dispose of any portion remaining at the end of a meal period in the garbage.

E.8. Food Display and Service

- Keep PHF at either 41 degrees Fahrenheit (5 degrees Celsius) or below, or 135 degrees Fahrenheit (60 degrees Celsius) or above during display and service by periodically checking the temperature located on the display.
- Protect food displayed on salad bars, steam tables, and other serving lines from consumer contamination by using easily cleanable counter protector devices, such as sneeze guards and display cases. Provide enough utensils to ensure elimination of cross contamination between foods.
- Do not reuse soiled tableware.
- Ensure suitable utensils are used by employees and provided to consumers who serve themselves to avoid unnecessary contact with food.
- Between uses:
  - Store utensils in food containers with the food they are being used to serve. Store in a position to ensure the handles will not come into contact with the food item.
  - Store utensils clean and dry.
- Store utensils used in serving frozen desserts, including ice cream scoops, in running water, dipper wells, or clean and dry. Do not immerse utensils in a pan or container of water left at room temperature. Ensure dippers immersed in water have potable water continuing to flow to waste.

Section F: Cooking, Holding, and Thawing

NOTE:

Per reference (c), Food Code, Recommendations of the U.S. Public Health Service, FDA, 2013, the primary temperatures of concern for the holding of PHF are between 41 degrees Fahrenheit (5 degrees Celsius) to 135 degrees Fahrenheit (60 degrees Celsius). This range, known as the temperature danger zone, favors the growth of harmful microbes that can cause foodborne illness.

F.1. Raw Animal Foods

Use one of the following methods for temperature and time to cook raw animal foods such as eggs, fish, poultry, meat (except roast beef), and foods containing these raw animal foods.

Food	Minimum Temperature	Minimum Holding Time at the Specified Temperature
• Raw eggs prepared for immediate service. • Commercially raised game animals and exotic species of game animals. • Fish, pork, and meat.	145°F (63°C)	15 seconds
• Raw eggs not prepared for immediate service. • Comminuted commercially raised game animals and exotic species of game animals. • Comminuted fish and meats. • Injected meats.	158°F (70°C)	less than 1 second
	155 °F (68°C)	15 seconds
	150 °F (66°C)	1 minute
	145 °F (63°C)	3 minutes
• Poultry. • Stuffed fish; stuffed meat. • Stuffed pasta. • Stuffed poultry; stuffed ratites. • Stuffing containing fish. • Meat, poultry, or ratites. • Wild game animals.	165°F (74° C)	15 seconds
• Food cooked in a microwave oven.	165°F (74° C)	Hold for 2 minutes after removing from microwave oven

Table 4-1 Summary chart for minimum food cooking temperature and time

Oven Type	Oven Temperature Based on Roast Weight	
	Less than 10 lbs (4.5 kg)	10 lbs (4.5 kg) or greater
• Still Dry	350°F (177°C) or greater	250°F (121°C) or greater
• Convection	325°F (163°C)	250°F (121°C) or greater
• High humidity[1]	165°F (74° C)	250°F (121°C) or greater

[1] Relative humidity greater than 90% for at least 1 hour as measured in the cooking chamber or exit of the oven; or in a moisture impermeable bag that provides 100% humidity.

Table 4-2: Prescribed oven temperatures for corresponding roasting weights

F.2. Microwave Cooking

Per reference (c), Food Code, Recommendations of the U.S. Public Health Service, FDA, 2013, follow these guidelines for raw animal foods cooked in a microwave:

- Rotate or stir throughout or midway during cooking to compensate for uneven distribution of heat.
- Cover to retain surface moisture.
- Heat to a temperature of at least 165 degrees Fahrenheit (74 degrees Celsius) in all parts of the food.
- Allow to stand covered for two minutes after cooking to obtain temperature equilibrium.

F.3. Plant Food Cooking for Hot Holding

Per reference (c), cook fruit and vegetables intended for hot holding to a temperature of 135 degrees Fahrenheit (57 degrees Celsius).

F.4. Safe Holding Temperatures for Cooked Food

- Per reference (c), rapidly chill PHFs that are not served immediately after cooking to a temperature of 41 degrees Fahrenheit (5 degrees Celsius) or below. Otherwise hold at a temperature at 135 degrees Fahrenheit (57 degrees Celsius) or above.

WARNING:

Per reference (c), growth of harmful bacteria and the development of toxins (poisons) formed by bacteria occur rapidly in protein foods when held at temperatures between 41 degrees Fahrenheit (5 degrees Celsius) and 135 degrees Fahrenheit (57 degrees Celsius).

- Per reference (c), Food Code, Recommendations of the U.S. Public Health Service, FDA, 2013,dispose of PHF held at temperatures between 41 degrees Fahrenheit (5 degrees Celsius) and 135 degrees Fahrenheit (57 degrees Celsius) longer than four hours. If the product is refrigerated at intervals and then permitted to warm, do not allow the total time of the various periods between 41 degrees Fahrenheit (5 degrees Celsius) and 135 degrees Fahrenheit (57 degrees Celsius) to exceed four hours.
- Before preparation, chill potentially hazardous ingredients in foods to 41 degrees Fahrenheit (5 degrees Celsius) or below. This includes salads, sandwiches, filled pastry products, and reconstituted foods.

F.5. Reheating for Hot Holding

- Per reference (c), reheat PHF that is cooked, cooled, and reheated for hot holding to a temperature of at least 165 degrees Fahrenheit (74 degrees Celsius), so that all parts of the food reach proper temperature for 15 seconds.
- Reheat food in a microwave oven, so that all parts of the food reach a temperature of at least 165 degrees Fahrenheit (74 degrees Celsius). Rotate, stir, cover, and allow the food to stand covered for two minutes after reheating.
- Heat ready-to-eat food taken from a commercially processed, hermetically sealed container to a temperature of at least 135 degrees Fahrenheit (57 degrees Celsius) for hot holding.
- Rapidly reheat food for hot holding. Do not allow food to stay between the temperature of 41 degrees Fahrenheit (5 degrees Celsius) and 165 degrees Fahrenheit (74 degrees Celsius) for more than two hours.

F.6. Reconstituting or Fortifying Food

- Per reference (c), pre-chill the ingredients and the container to 41 degrees Fahrenheit (5 degrees Celsius) or below before reconstituting or fortifying a PHF with the addition of an ingredient such as:
  - Dry milk or milk product.
  - A dessert mix or similar product if the container is larger than one gallon.
- Follow these guidelines for a PHF that has been reconstituted or fortified by the addition of a dry ingredient such as dried milk, eggs, soup, sauce, dessert mix, or similar product if not used immediately:
  - Hold at 41 degrees Fahrenheit (5 degrees Celsius) or below if intended for cold service.
  - Place immediately into either a frozen dessert machine or other

liquid product refrigeration unit after mixing.

  - Hold at 135 degrees Fahrenheit (57 degrees Celsius) or above if intended for hot service.

- Discard a reconstituted or fortified PHF held between 41 degrees Fahrenheit (5 degrees Celsius) and 135 degrees Fahrenheit (57 degrees Celsius) for longer than four hours.

F.7. Thawing Frozen Foods

Per reference (c), Food Code, Recommendations of the U.S. Public Health Service, FDA, 2013, use one of the following sanitary methods for thawing frozen foods:

- Do not use excessive heat or warm air currents to thaw frozen foods. The ideal procedure is to place frozen foods under controlled thawing temperatures in their original wrappers or containers. Controlled thawing temperatures are 36 degrees Fahrenheit (2 degrees Celsius) to 38 degrees Fahrenheit (3 degrees Celsius).
- Thaw frozen food in microwave ovens provided they are immediately cooked thereafter as a part of a continuous cooking process.
- Thaw frozen foods completely by submerging under running water following these guidelines:
  - At a water temperature of 70 degrees Fahrenheit (21 degrees Celsius) or below.
  - With sufficient water velocity to agitate and float off loose particles in an overflow.
  - For a period of time that does not allow thawed portions of ready-to-eat food to rise above 41 degrees Fahrenheit (5 degrees Celsius).
  - For a period of time that does not allow thawed portions of a raw animal food requiring cooking to be above 41 degrees Fahrenheit (5 degrees Celsius) for more than four hours, including:
    - The time the food is exposed to the running water and the time needed for preparation for cooking.
    - Or the time it takes under refrigeration to lower the food temperature to 41 degrees Fahrenheit (5 degrees Celsius).

F.8. Cooling Methods

Per reference (c), cool food per the time and temperature criteria specified in this section. Use one or more of the following methods based on the type of food being cooled:

- Place food in shallow pans no deeper than 3 inches or smaller containers 1 gallon or less.

- Separate the food into smaller or thinner portions.
- Stir the food in a container placed in an ice water bath.
- Use containers that facilitate heat transfer.
- Add ice from a potable water source as an ingredient.
- Use prechilled pans and containers for portioning products.
- Use ice paddles.
- Ensure chopped or ground foods and leftovers are cooled to 41 degrees Fahrenheit (5 degrees Celsius) or below within a four-hour period.

F.9. Consumer Advisory

Per reference (c), Food Code, Recommendations of the U.S. Public Health Service, FDA, 2013, if an animal food is served or sold raw, undercooked, or without otherwise being processed to eliminate pathogens, the permit holder shall inform consumers of the significantly increased risk of consuming such foods. This must be done by way of a disclosure and reminder. Such animal foods include beef, eggs, fish, lamb, milk, pork, poultry, or shellfish. This applies to animal foods either in ready-to-eat form or as an ingredient in another ready-to-eat food. The disclosure and reminder can be by deli case or menu advisories, label statements, table tents, placards, or other effective written means.

- Ensure the disclosure includes:
  - A description of the animal-derived foods, such as "oysters on the half shell (raw oysters)," "raw-egg Caesar salad," and "hamburgers (can be cooked to order)."
  - Or an identification of the animal-derived foods by asterisking a footnote that states the items are served raw or undercooked, or contain (or could contain) raw or undercooked ingredients.
- Include one of the following footnote reminders indicating that certain animal-derived foods require an appropriate disclosure:
  - "Regarding the safety of these items, written information is available upon request."
  - "Consuming raw or undercooked meats, poultry, seafood, shellfish, or eggs could increase your risk of foodborne illness."
  - "Consuming raw or undercooked meats, poultry, seafood, shellfish, or eggs could increase your risk of foodborne illness, especially if you have certain medical conditions."

Use mollusk and crustacean shells only once as a food container, then discard them.

Section G: Leftovers

G.1. Leftover Food Guidance

Per reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series), do not save PHF as leftovers that have been previously reheated for service.

Use the guidelines below to retain leftover foods:

- Retain leftover foods for up to 72 hours chilled at 41 degrees Fahrenheit (5 degrees Celsius) or below,
- Retain leftover food for five hours if maintained hot at135 degrees Fahrenheit (57 degrees Celsius) or above.

The time limit(s) for leftovers begins when the food is removed from hot holding. No temperature logs are required, but food must not be in the "danger zone" between 41 degrees Fahrenheit (5 degrees Celsius) and 135 degrees Fahrenheit (57 degrees Celsius) for more than four total hours from time of preparation until discarded.

Label potentially hazardous leftovers with a label indicating, "Leftover – Use within the specific date and time," with the date and time of original preparation, and the discard date and time.

Do not freeze leftovers. The following provisions apply for potentially hazardous leftovers:

- The PHF was not placed on the serving line.
- Do not retain PHF as leftovers if removed from temperature control for longer than four hours.

G.2. Prohibited Leftovers

- Per reference (b), do not use foods as leftovers that are composed of ingredients that have been peeled, sliced, or diced by hand after cooking. That's because the four-hour time limit between temperatures of 41 degrees Fahrenheit (5 degrees Celsius) and 135 degrees Fahrenheit (57 degrees Celsius) is taken up in preparing, chilling, and serving the food.
  - These foods include potato salad, chicken salad, turkey salad, macaroni salad, shrimp salad, egg salad, and similar items. Also included are foods that have been creamed or handled a great amount (e.g., hashes, most gravies and dressings, and creamed meats) and items that are highly perishable (e.g., most seafood).
- Do not keep nonpackaged or unwrapped PHF recovered from a self-service line as leftovers.

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Chapter 5:
Equipment and Utensils

Introduction

This chapter discusses procedures to prevent food contamination and foodborne illness from equipment and utensils.

In This Chapter

This chapter contains the following sections:

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C	Warewashing	5-7
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Section A: Equipment and Utensil Design and Construction

A.1. Introduction

Per reference (c), Food Code, Recommendations of the U.S. Public Health Service, FDA, 2013, all equipment and utensils used in food service facilities must be made of sanitary, nontoxic, corrosion-resistant materials and so designed, constructed, and installed as to provide for ease of cleaning. Minimum sanitary standards for equipment and utensils are promulgated by the NSF.

Per reference (c), ensure food contact surfaces are smooth and free of breaks, open seams, cracks and similar imperfections. Additionally, ensure they are easily accessible for cleaning and inspection without being disassembled or by easily disassembling with simple or no tools.

A.2. Wood

Per reference (c), do not use cutting boards and food contact surfaces made of wood, which is porous and difficult to disinfect appropriately. As a best practice, use hard rubber or plastic cutting boards.

A.3. Plastics

Use only plastic, rubber, or rubberlike materials that are safe, resistant to scratching, decomposition, and other distortion under normal conditions of use in food service establishments.

- Ensure the materials are of sufficient weight and thickness to permit cleaning and sanitization by normal machine dishwashing methods.
- Replace material items as soon as significant scratching of the surface is taking place.

A.4. Equipment Design

To meet the requirements of reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series):

- Visually assess all equipment for the following to maintain a sanitary food service environment:
  - Bears the seal of the NSF.
  - Corners in equipment manufacture and installation are rounded with all exposed surfaces accessible for cleaning.
  - Jointures are tight, and fasteners are easy to clean and free from snags.
  - Equipment containing bearings and gears requiring lubrication is designed and installed so the lubricant cannot leak or drip onto food contact surfaces. Use safe, nontoxic lubricants on equipment designed to receive lubrication of bearings on or within food contact surfaces.

  - Sinks, dish tables, and drain boards are self-draining to prevent condensation or other foreign matter from dropping on equipment or food.
- Consult reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series), for more information or contact HSWL SC if there is uncertainty regarding the appropriate use or certification of a piece of equipment.

A.5. Equipment Location

- Seal table-mounted equipment, unless intended to be portable, to the table or counter or mounted on legs at least 4 inches high to facilitate cleaning the equipment and adjacent areas.
- Unless easily movable, follow these guidelines for floor-mounted equipment:
  - Seal to the floor.
  - Install on a raised platform to prevent liquids or debris from seeping or settling underneath, between, or behind equipment.
  - Elevate on legs at least 6 inches off the floor for cleaning access. Equipment can be elevated as little as 4 inches if no part of the floor underneath is more than 6 inches laterally from cleaning access.
  - Place 6 inches (shipboard) and 9 inches (shore units) away from adjacent equipment and walls. If equipment must be directly adjacent, close or seal spaces if exposed.
- Ensure aisles and working spaces are unobstructed and of sufficient width to permit employees to perform their duties without contamination of food or food contact surfaces.
- Do not obstruct employee movement through aisles and working spaces with portable equipment, which includes equipment light enough to be moved by one person.

A.6. Thermometers

Ensure thermometers required for immersion into food are made of metal-stem type construction, numerically scaled, accurate to plus or minus 2 degrees Fahrenheit, and sanitized between uses.

Section B: Cleaning and Sanitizing

B.1. Introduction

The following subsections provide recommendations and guidance regarding design, use, limitations, cleaning, and storage for utensils and equipment in USCG galleys. See reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series), for additional information, including specific design and construction guidance.

B.2. Cleaning Frequency

Per reference (b), clean and sanitize:

- Tableware after each use.
- Kitchenware and food contact surfaces of equipment after each use and following any interruption of operations.
- Utensils and food contact surfaces ongoing throughout the day whenever used for the preparation of PHF.
  - ➢ Base cleaning on food temperature, type, and amount of particle accumulation.
- All galley equipment thoroughly after each meal.
  - ➢ This includes slicing machines, mixers, can openers, milk machines, toasters, etc. Sanitizing methods are discussed in Chapter 5: Equipment and Utensils, Section C.2.: Sanitizing Methods.

Clean:

- Food contact surfaces of grills, griddles, and similar cooking devices, and the cavities of microwave ovens after each use.
  - ➢ Keep these free of encrusted grease deposits and other accumulated soil.
- Tables after each meal and thoroughly scrub after the evening meal to remove all food residue.
- Exterior of all condiment dispensers (sugar spices, salt, and pepper) after each meal.

Follow these guidelines when inspecting refrigerated storage spaces:

- Observe any accumulation of frost on refrigerator coils and units.

NOTE: **A thick layer of frost or ice reduces the efficiency of the system and can result in overloading the compressors.**

- Defrost before frost thickness reaches one-fourth of an inch.
- Frequently defrost non frost-free refrigerators and freezer spaces according to operating instructions. Clean and sanitize after defrosting.

B.2.a. In-Place Cleaning

If equipment is designed for in-place cleaning, follow manufacturer's guidelines for maintaining equipment, including any connected pipes, tubes, and valves.

B.3. Ice Machines

Per reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series), maintain ice machines in sanitary condition:

- Refrigeration personnel clean and inspect the ice machine periodically to ensure proper operation.
  - Inspect the motor area and insulation panels weekly for evidence of pest infestation, such as cockroaches and beetles.
  - Ensure the absence of submerged non-potable water inlets.
  - Provide air gaps per Chapter 6: Construction and Maintenance of Facilities, in drains from the ice storage bin.
  - Provide overflow pipes for defrosting tanks to prevent contamination of the ice with water used for defrosting.
  - Provide sanitary racks or stowage for hoses or lines used to fill freezing trays and follow safe handling for ice used in food service establishments.
- Change water and air filters at a frequency recommended by the manufacturer or at least every six months.
- Document filter changes in a maintenance log or on the filter itself.
- Empty, drain, clean, and sanitize the machine and dispenser every 30 days or more frequently if deemed appropriate by the PIC to prevent mold and mildew growth.
- Use scoops, tongs, other ice-dispensing utensils, or automatic self-service ice-dispensing equipment to dispense ice for consumer use.
- Between uses, store ice-dispensing utensils and ice receptacles in a way that protects them from contamination.
- Do not store dispensing utensils in ice-making machines.

B.4. Beverage Dispensing Machines

Per reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series), maintain beverage dispensing machines in sanitary condition:

- Ensure dispensing equipment is designed to prevent contact with lip-contact surface of cups or glasses.
- Sample water quality of water lines connecting to beverage dispensing machines at least weekly.
- Clean all parts of beverage dispensing machines at a frequency specified by the manufacturer. Absent manufacturer specifications, clean at a frequency necessary to prevent accumulation of soil or mold and insect attraction.
- If tubing to dispensing heads is in contact with stored ice, the ice is rendered non-potable and not for human consumption.

Section C: Warewashing

C.1. Manual Cleaning and Sanitizing

Follow these recommendations for manually cleaning and sanitizing tableware:

- A three-compartment sink is optimal for manual cleaning. Ensure sinks are large enough to permit complete immersion, and each compartment is supplied with hot and cold potable running water.
- Ensure dish tables or drain boards are appropriately located as to not interfere with use of the dishwashing facilities.
- Clean sinks prior to each use.
- Scrape and when necessary pre-soak tableware to help remove food particles and soil.
- Thoroughly wash dishware and utensils in a hot detergent solution that is kept clean, then rinse free of detergent and abrasives.
- Do not use steel wool for cleaning equipment or utensils.

C.2. Sanitizing Methods

Per reference (c), Food Code, Recommendations of the U.S. Public Health Service, FDA, 2013, sanitize tableware and food contact surfaces by immersing for at least seven seconds in a solution with temperature and chlorine concentrations according to Table 5-1.

Minimum Chlorine Concentration [milligrams (mg)/liter (L)] parts per million (ppm)	Minimum Water Temperature (degrees Fahrenheit) for pH 10 or less
25	120
50	100
100	55

Table 5-1: Chlorine concentration and water temperature ranges for sanitizing tableware and food contact surfaces

See Appendix E: Chlorine Solutions for guidance on preparing chlorine solution for sanitizing.

NOTE: **A chlorine solution at a concentration of 100 ppm is prepared by mixing 1 ounce of household liquid bleach (5 percent sodium hypochlorite) in 2 gallons of cool, potable water.**

- Immerse for at least 30 seconds in clean, hot water at least 171 degrees Fahrenheit (77 degrees Celsius).
  - Use dish baskets if needed to allow full immersion to maximize sanitizing power.
  - Use an integral heating device if needed in or under the sanitizing compartment of the sink to reach appropriate water temperatures.
  - Frequently check temperature using a numerically scaled thermometer and allow full immersion to maximize sanitizing power.
- Immerse for at least one minute in a clean solution containing 12.5 to 25 ppm of available iodine, a pH not higher than 5.0 and having a temperature of at least 75 degrees Fahrenheit (23.8 degrees Celsius).
- Rinse, spray, or swab with a chemical sanitizing solution of at least twice the usual recommended strength if the ware is too large to be sanitized by immersion.

WARNING:

When chemicals are used for sanitizing, ensure concentrations are not higher than maximums per guidance from the FDA. If there is uncertainty in the concentration, use test kits or other devices that measure ppm and pH of solutions to periodically verify concentrations.

C.3. Mechanical Cleaning and Sanitizing

- Properly install and maintain in good repair all components of dishwashing machines. This includes:
  - Baffles or other effective means to minimize the entry of wash water into the rinse water.
  - Conveyors accurately timed to assure proper exposure times in wash and rinse cycles.
  - Booster heaters, if required by manufacturer's directions.
- Ensure the pressure of water supplied to spray-type dishwashing machines is not less than 15 or more than 25 pounds per square inch (psi) on the water line at the machines and not less than 10 psi at the rinse nozzle. A pressure gauge located immediately upstream from the final rinse control valve permits checking the flow pressure of the final rinse water.
- Use a numerically scaled thermometer to indicate the temperature of the rinse water as it enters the manifold.

- Ensure machines are configured according to manufacturer specifications.
- Scrape, flush, or soak tableware to remove food particles and soil, and place in racks or on conveyors, so food contact surfaces are subject to unobstructed application of detergent wash and clean rinse waters.
  - ➢ Load racks or conveyors to permit complete rinsing and free draining.
- Clean dishwashing machines following each washing period.

C.4. Mechanical Hot Water Sanitizing

Follow this guidance for water temperatures in warewashing machines:

- Wash: 140-160 degrees Fahrenheit (60-71.1 degrees Celsius).
- Pumped rinse: 165-180 degrees Fahrenheit (73.8 – 82.2 degrees Celsius).
- Final rinse: 180-194 degrees Fahrenheit (82.2 -90 degrees Celsius).
- Wash and pumped rinse temperatures are measured in the respective tanks, and final rinse is measured at the manifold.
- Ensure utensil surfaces reach at least 160 degrees Fahrenheit (71.1 degrees Celsius).

C.5. Drying

Air drying is the best way to dry equipment and utensils. Do not use fans or forced air to dry equipment and utensils.

Section D: Linens and Laundering

D.1. Introduction

It is important to ensure cloths and linens are kept free of food residue, soil, and soiling matter. Per reference (c), Food Code, Recommendations of the U.S. Public Health Service, FDA, 2013, keep soiled linens in a clean, closed receptacle or clean, washable laundry bag. Store receptacle or laundry bag in a way that prevents contamination with food, food service equipment and utensils, and food contact surfaces.

D.2. Wiping Cloths and Sponges

Per reference (c), apply the guidelines below to maintain wiping cloths in sanitary condition:

- Ensure cloths used for wiping food spills are used for that purpose only.
- Store wet wiping cloths in a sanitizing solution according to guidelines in Table 5-1.
- Use wet wiping cloths with a freshly made sanitizing solution and dry wiping cloths free from debris and visible soil.
- Keep cloths used with raw animal foods separate from other cloths and linens.
- Discard cloths when odors or soil can no longer be removed.

NOTE: **Do not use sponges for food service areas because they are difficult to keep clean and can harbor harmful microbes.**

D.3. Cleaning Frequency

Follow recommendations for cleaning frequency per reference (c).

Type	Cleaning Frequency
Linens not in contact with food	Between operations
Cloth gloves	Before being used with a different type of PHF
Linens and napkins	Between each use
Wet wiping cloths	Daily
Dry wiping cloths	As necessary to prevent contamination

Table 5-2: Linen cleaning frequency recommendations

D.4. Laundry Facilities

Provide a mechanical washer and dryer if linens and cloths are laundered on the premises of a food service establishment.

Section E: Storage

E.1. Handling

Handle clean and sanitized equipment and utensils in a way that protects them from contamination.

- Touch spoons, knives, and forks by their handles.
- Handle cups, glasses, and bowls without contacting inside surfaces or surfaces that contact the user's mouth.

E.2. Storage

Use these storage best practices to help maintain optimal sanitary conditions for clean and sanitized utensils, linens, and equipment:

- Store above the floor in a clean, dry location in a way that protects them from contamination by splash, dust, and other means.
- Do not place in toilet rooms, garbage rooms, locker rooms, or under exposed sewer lines, non-potable water lines, stairwells, or other means of contamination.
- Provide a metal dropless trough that slopes to drain away from food areas if waste disposal lines pass over food preparation, storage, or service areas.
- Air dry utensils before storage or store in a self-draining position on hooks or racks.
- Cover or invert stored utensils whenever practical.
- Ensure utensils are washed in containers with handles down and then inverted to storage containers to present the handle to the employee or consumer.
- Store cups, bowls, glasses, plates, etc., in the inverted position in racks or closed cabinets.

E.3. Pre-Set Tableware

If pre-setting tableware for a meal is desired, ensure glasses and cups are inverted, and utensils are wrapped or covered. Collect all unused pre-set tableware for washing and sanitizing after the meal.

E.4. Single-Service Articles

Ensure single-service articles are used only once. In addition:

- Store single-service articles on clean shelves and in closed containers to protect from contamination.
- Provide commercially packaged single-service articles to the consumer. If packaged single-service articles are not available, use a dispenser that prevents contamination of surfaces that contact food or the user's mouth.
- Handle bulk single-service articles in a way that protects them from contamination.

E.5. Cleaning Gear

The following best practices help maintain cleaning gear in a sanitary condition:

- Store cleaning gear and supplies in an area specifically designated for that purpose, and away from food service and preparation areas.
- Disinfect swabs weekly, and do not store them in food preparation or service areas or outside.
  - ➢ Allow swabs to air dry in racks or on hangers off the deck with head down.

Section F: Poisonous and Hazardous Materials

F.1. Introduction

Poisonous or toxic materials are necessary in food service establishments to maintain sanitary conditions for food preparation areas, equipment, or utensils. Per reference (c), Food Code, Recommendations of the U.S. Public Health Service, FDA, 2013, only those poisonous or toxic materials that are required for the operation and maintenance of a food establishment is allowed in a food establishment.

The following tactics promote the safe handling and use of poisonous or toxic materials in food service establishments to minimize harm due to involuntary contact.

F.2. Labeling

To promote easy identification of contents, prominently and distinctly label containers of chemicals. Maintain Safety Data Sheets (SDS) for chemicals in a location easily accessible to personnel who use them.

Federal regulatory requirements for types of chemicals used in food service establishments (sanitizers, additives, lubricants, etc.) can be found in the Poisonous or Toxic Materials chapter in reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series).

F.3. Storage

To meet the poisonous and toxic material storage guidance in reference (c):

- Store toxic materials in locked cabinets and/or separate from areas where food is stored, prepared, displayed, or served.
- Separate bactericides and cleaning compounds from pesticides, herbicides, or other toxic chemicals.
- Separate strong oxidizers, such as chlorine compounds, from petroleum-based products to prevent fire hazards.
- Ensure personal medications are not stored in any food preparation, storage, or service areas.
- Store first aid supplies in a way that does not contaminate food or food contact surfaces.

F.4. Use

To maximize safe usage of hazardous materials:

- Avoid leaving chemical residues on food contact surfaces when using bactericides, cleaning compounds, or other chemicals.
- Avoid using hazardous materials in areas where open food is present.
- Use hazardous materials in compliance with their labeling requirements and not in a way that contaminates equipment or utensils, or presents a health hazard to employees or consumers.

Chapter 6:
Construction and Maintenance of Facilities

Introduction

This chapter discusses construction and maintenance needs for food establishments to maintain proper food handling and to prevent foodborne illnesses. Construction and maintenance for food establishments may be under the responsibilities of public works or facilities engineering department; however, food service personnel can help ensure these requirements are met by pointing out issues to the appropriate department.

In This Chapter

This chapter contains the following sections:

Section	Title	Page
A	Water, Plumbing, and Waste	6-2
B	Ventilation and Lighting	6-4
C	Facilities	6-6

Section A: Water, Plumbing, and Waste

A.1. Overview

Shore units contact the Shore Infrastructure Logistics Center (SILC) with questions regarding on-site water and wastewater disposal systems, such as septic or supplemental treatment unit applications and projected increased wastewater flows. Vessel's can contact the Surface Forces Logistics Center (SFLC).

A.2. Water Supply

Per reference (c), Food Code, Recommendations of the U.S. Public Health Service, FDA, 2013, for potable water:

- Provide an adequate, pressurized, potable supply of hot water at least 120 degrees Fahrenheit (49 degrees Celsius) measured from the faucet.
- Protect the potable water supply with appropriate backflow or back-siphon devices according to applicable local plumbing codes.
- Ensure no cross-connections between the potable water supply and sources of pollution or contamination.

A.3. Plumbing, Gas, and Electric

- Install all plumbing fixtures, gas lines, and gas-operated equipment in compliance with local plumbing ordinances.
- Maintain fixtures, gas lines, and gas-operated equipment to prevent any contamination. Keep the items clean, fully operative, and in good repair.
- Dispose liquid wastes through the plumbing system. Ensure the plumbing system discharges into the public sewage or into an approved private sewage disposal system.
- Provide dipper wells plumbed with cold running water for ice cream dipping cabinet or other similar scooping operations.
- Ensure the following are drained to prevent standing water:
  - Steam tables.
  - Ice machines and bins.
  - Food preparation sinks.
  - Warewashing sinks.
  - Display cases.
  - Walk-in refrigerators.

  - Dipper wells for scooping ice cream.
  - Other similar equipment that discharge liquid waste by means of indirect waste pipes.
- Discharge all wastes drained through an air gap into a floor sink, drain, or other approved type of receptor.
  - Ensure air gaps are at least twice the diameter of the water supply inlet and not less than 1 inch.
  - Do not allow waste lines to cross any aisle, traffic area, or door opening.
- Ensure plumbing is sized, installed, and maintained. Contact the unit's facilities department for further information.

A.4. Waste (Sewage Disposal, Grease Traps and Interceptors)

- Do not locate a grease trap or grease interceptor in food or utensil handling areas unless specifically approved by the PIC.
- Ensure grease trap or grease interceptor is easily accessible for servicing. Contact the unit's facilities department regarding special sewerage, grease trap, and grease interceptor requirements.

Section B: Ventilation and Lighting

B.1. Ventilation

- Provide ventilation to remove toxic gases, odor, steam, heat, grease, vapors, or smoke from the food facility, including food preparation, scullery, toilet, janitorial, garbage, and change rooms.
- Ensure all areas of a food facility have sufficient ventilation to facilitate proper food storage and to provide a reasonable condition of comfort for each employee, consistent with the job performed by the employee.
- Maintain on file manufacturer specification sheets for exhaust fan, make-up air fan, and hood filters along with the static pressure calculations.
- Vent toilet rooms to the outside air by means of an operable (open and close) screened window, an air shaft, or a light-switch activated exhaust fan consistent with requirements of local building codes.
- Contact the unit's facilities engineering for standards or questions regarding ventilation. Ensure ventilation plans for each system include front and side elevation of exhaust hood, and duct details to the roof fans (both exhaust and make-up air).

B.2. Lighting

- Provide sufficient natural or artificial light in every room and area in which food is prepared, processed or packaged, or in which utensils are cleaned to produce the following light intensity while the area is in use:
  - At least 10-foot candles at a distance of 30 inches above the floor in walk-in refrigeration units and dry food storage areas.
  - At least 20-foot candles in areas:
    - Where food is provided for consumer self-service.
    - Where fresh produce or prepackaged foods are sold or offered for consumption.
    - Inside equipment such as reach-in and under-counter refrigerators.
    - Used for handwashing and warewashing.
    - Used for equipment and utensil storage.
    - Used for bathrooms.

- At least 50-foot candles at surfaces:
  - Where a food employee is working with food.
  - Where a food employee is working with utensils or equipment such as knives, slicers, grinders, or saws where employee safety is a factor.
  - In the rooms during period of cleaning.

- Ensure light bulbs are shielded, coated, or otherwise shatter-resistant in areas where there are non-prepackaged, ready-to-eat foods, clean equipment, utensils, linens, or unwrapped single-use articles.

Section C: Facilities

C.1. Overview

Refer to reference (b), Tri-Service Food Code, NAVMED P-5010-1, and NSF for more guidance on facilities. Shore units can also refer to reference (g), Civil Engineering Manual, COMDTINST M11000.11 (series) and contact SILC with questions on facilities. Vessel's can contact SFLC.

C.1.a. Premises

- Keep food service establishments and all parts of the property used in connection with operation of the establishments free of litter.
- Ensure all walls, ceilings, and floors are non-porous and easily cleanable. Ensure floors are skid-resistant and meet NSF standards. Carpet is prohibited in food preparation areas.
- Ensure the working and driving surfaces of all exterior areas of food service establishments are surfaced with concrete, asphalts, gravel, or similar material. Effectively treat surfaces to facilitate maintenance and to minimize dust. Drain and ensure surfaces are kept clean.
- Only store articles necessary to the operation and maintenance of the food services establishment on the premises.
- Avoid unnecessary persons in the food preparation and utensil washing areas.
- Ensure utility service lines and pipes are not unnecessarily exposed. Maintain exposed lines, pipes, and junctures in a way that does not obstruct cleaning.
- Ensure a self-closing door separates food service operations from any living, dressing, or laundry areas.

C.1.b. Bathroom Facilities

- Ensure bathrooms are installed per reference (g).
- Per reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series), ensure bathrooms are adequate in number, conveniently located, and accessible to employees.
- Design toilets and urinals to be easily cleaned.
- Completely enclose bathrooms and ensure they have tight-fitting, self-closing solid doors (except for ventilation grilles), which should be closed except during cleaning and maintenance.
- Keep bathrooms and vestibules clean, and in good repair and free of objectionable odors. Provide a supply of toilet tissue at each toilet. Provide easily cleanable receptacles for waste material, and ensure they are covered.

- Do not store food, equipment, utensils, or single-service articles in the bathrooms or vestibules.

C.1.c. Sinks

- Per reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series), ensure sinks are of sanitary design, easily cleanable, adequate in number, and located to permit convenient use by all employees in food preparation areas, utensil washing areas, and bathrooms or vestibules.
- Do not use sinks designated for utensils, equipment, or food preparation for handwashing.
- Provide each sink with hot and cold running water or running water tempered by means of a mixing valve. Ensure any slow-closing or metered faucet provides a flow of water for at least 30 seconds without the need to reactivate the faucet. Do not use steam-mixing valves.
- Keep sinks, soap dispensers, hand-drying devices, and all related facilities clean and in good repair.
- Provide sufficient handwashing sinks, and maintain handwashing facilities in good repair.
- Ensure handwashing facilities are located to permit easy use by food service personnel in food preparation areas. No food handler should have to walk a distance of more than 25 feet to reach a handwashing sink.
- Ensure a supply of hand-cleaning soap or detergent is available at each handwashing sink. Place a supply of single-use, sanitary towels conveniently near each sink.
- Do not use common soap bars, towels, and rotating cloth towels. If disposable towels are used, locate waste receptacles conveniently near the handwashing facilities, and fit with tight-fitting covers, doors, or lids.

C.1.d. Garbage and Refuse

- Keep garbage and refuse in covered, durable, insect resistant, and rodent-proof containers that do not leak and do not absorb liquids. Plastic bags and wet strength paper bags can be used to line these containers.
- Use easily cleanable containers, compactors, and compactor systems with tight-fitting covers, doors, or lids. Keep covered when not in use, and ensure drain plugs are in place except during cleaning.
- Ensure a sufficient number of containers are available to hold all accumulations of garbage and refuse.
- Thoroughly clean the inside and outside of each container after being emptied.
  - Ensure cleaning method does not contaminate food, equipment, utensils, or food preparation areas.

	➢ Provide and use suitable facilities and cleaning gear, including hot water and detergent when washing containers. • Dispose of liquid waste from compacting or cleaning operations. • Ensure used cooking oil is stored in a covered container and not permitted to accumulate in the galley. Do not pour used oil down the drain. • Construct garbage or refuse storage rooms of easily cleanable, non-absorbent, and washable materials. • Keep garbage or refuse storage rooms clean, protect against insects and rodents, and ensure the rooms are large enough to store all garbage and refuse containers. • Ensure outside storage areas or enclosures are large enough to store the garbage or refuse containers. Keep the outside storage areas clean. • Store garbage and refuse containers and compactor systems located outside on or above a smooth surface of non-absorbent material, such as concrete or machine-laid asphalt, that is kept clean and maintained in good repair. • If possible, locate garbage or refuse storage areas at least 100 feet away from the nearest entrance to the food service establishment.
C.1.d.(1). Disposal	• Dispose of garbage and refuse often enough to prevent the development of odor and the attraction of insects and rodents. • Keep areas around controlled incineration or mechanical compaction clean and orderly if used to minimize garbage on the premises. • Follow local air quality regulations when burning garbage or refuse. • Dispose of garbage aboard all cutters per current regulations and USCG directives.
C.1.e. Cleaning Physical Facilities	• Keep floors, mats, duckboards, walls, ceilings, attached equipment, and decorative materials clean. ➢ Use only dustless methods to clean floors and walls, such as vacuum cleaning; wet cleaning (swabbing with warm soap and water), or the use of dust-arresting sweeping compounds and push brooms. • Thoroughly clean all floors after each meal. • Clean floors and walls during periods when the least amount of food is exposed, such as between meals and after closing. Emergency cleaning of floors is the exception.

C.1.f. Insect and Rodent Control	• Per reference (a), Safety and Environmental Health Manual, COMDINST 5100.47 (series), maintain an adequate integrated pest management (IPM) program to ensure elimination of pests within and around the food service establishment. ➢ See reference (h), Integrated Pest Management, Tactics, Techniques and Procedures (TTP), CGTTP 4-11.13 (series), for specific guidance on pest management. • Conduct frequent inspections and take effective measures to ensure the elimination of rodents, flies, roaches, and other vermin on the food service premises. • Effectively protect building openings to the outside against the entrance of insects by tight fitting, self-closing doors, closed windows, screens, controlled air currents, and other means.
C.1.g. Clubs, Messes, and Exchanges	Ensure clubs, messes, and exchanges comply with the sanitary standards in reference (a).

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Chapter 7:
Inspections and Compliance

Introduction

This chapter discusses guidelines for performing regular self-assessments to ensure food service establishments are operating in a safe and sanitary manner.

In This Chapter

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Section A: Inspections and Compliance

A.1. General

Per reference (e), Coast Guard Medical Manual, COMDTINST 6000.1 (series), the MDR performs weekly inspections for food service establishments.

A food facility requires various inspections depending on complexity of the food service processes. Types of inspections include:

- Routine (weekly).
- Complaint.
- Follow-up.
- Pre-opening for new establishments.
- Change of ownership inspections.

Inspections cover sanitary aspects of messes, water supplies, sewage and refuse disposal, disease vectors, occupational hazards, and other environmental factors affecting health.

The MDR or other personnel designated as inspectors is permitted to enter the food service establishment at any time to complete inspections.

A.2. Food Inspection Report Form

- Use the Food Service Establishment Inspection Report (CG-5145) form found on CGPortal to document food service establishment inspections. Refer to Appendix B: Job Aid for The Food Service Establishment Inspection Report (CG-5145) Form to complete this form.
- Train the food inspector to understand and select the appropriate violation on the inspection report.
- Ensure the food inspector submits completed inspection report forms to the CO and the food service PIC.
- Specify on the form a time period for correction of violations per:
  - Chapter 7: Inspection and Compliance, Section A.2.a.: Correction of Violations.
  - Chapter 7: Inspection and Compliance, Section A.2.b.: Ceasing Operations.
  - Chapter 7: Inspection and Compliance, Section A.2.c.: Maintaining Records.

A.2.a. Correction of Violations	Per instructions on the Food Service Establishment Inspection Report (CG-5145) form, correct violations noted with an asterisk on the form as these violations are the most severe. • Re-inspect within 24 hours when severe violations occur. • Correct any violation on site when identified by inspectors. • Ensure all violations are corrected by the next inspection.
A.2.b. Ceasing Operations	Per reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series), the CO reserves the right to cease operations at the food service establishment if inspection results or recommendations from MDR suggest that the operations present serious risk to the health and safety of the crew. The establishment can resume operations only when a re-inspection determines the hazardous conditions no longer exist. For both permanent and temporary food service establishments, severe violations not corrected within 24 hours are sufficient to recommend ceasing operations until corrected.
A.2.c. Maintaining Records	Maintain records of food inspection reports for two years at the unit as a best practice.
A.3. Galley Staff Knowledge Base	• Ask the PIC open-ended questions pertaining to cooling, reheating, hot holding, cold holding, and how long ago the food was prepared and stored in the refrigeration unit. • Validate that the food facility accepts only foods coming from an approved source (especially for seafood, bivalve) or foods having a letter of guarantee. • Point out observations of cross-contamination regarding proper food storage (raw meats stored above ready-to eat-foods), mold on food surfaces, residue buildup inside ice machine/equipment, cleaning chemical storage above food, date marking label, etc. • During galley inspection, observe day-to-day procedures and double-check staff's knowledge by asking staff to demonstrate food cooling processes, thermometer calibration process, hot and cold holding temperature processes, and reviewing the SOP. If staff does not exhibit knowledge of these processes, verbalize the discrepancy and suggest a remedial action. • If food is identified as contaminated, it is recommended that the galley staff voluntarily discard the contaminated foods and remove it from inventory to prevent foodborne illness. Document the type of food, at what temperature it was stored, how long it was stored at location/unit, the quantity, and names of the person-in-charge. Follow additional guidance in Chapter 9: Foodborne Illness and Outbreak Protocol if personnel consume the contaminated food.

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Chapter 8:
Mobile and Temporary Food Service

Introduction This chapter discusses the guidelines for mobile and temporary food units.

In This Chapter This chapter contains the following sections:

Section	Title	Page
A	Temporary Food Service	8-2
B	Mobile Food Operations	8-4

Section A: Temporary Food Service

A.1. General

Temporary food service establishments operate at a fixed location for a period of time not more than 14 days (e.g., event concession booth, hot dog stand, celebration cookout, etc.). Where applicable, use the guidance in this TTP publication for temporary food establishments to ensure compliance with the requirements of reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series), and reference (c), Food Code, Recommendations of the U.S. Public Health Service, FDA, 2013. This chapter provides minimum guidelines for a temporary establishment.

A.2. Food Items

- Do not serve PHF, except those that require only limited preparation such as seasoning and cooking, i.e., hamburgers, frankfurters, etc. This includes:
  - Pastries filled with cream or synthetic cream.
  - Custards (or similar products).
  - Salads containing meat, poultry, egg, or fish.
  - Sandwiches containing meat, poultry, egg, or fish.

NOTE: **This does not apply to any PHF prepared and packaged per this chapter if it is obtained in individual servings stored at a temperature of either 41 degrees Fahrenheit (5 degrees Celsius) or below, or 135 degrees Fahrenheit (57 degrees Celsius) or above.**

- Serve all packaged food items directly in the unopened container in which it was packaged.

A.3. Equipment

- Per reference (b), locate and install equipment that facilitates cleaning the establishment and prevents food contamination.
- Protect food contact surfaces of equipment from contamination by consumers and other contaminating agents. When helpful to prevent contamination, provide effective shields for equipment.

A.4. Water

- Ensure enough potable water is available in the establishment for cleaning, sanitizing utensils and equipment, and for hand washing.
  - Provide a heating facility located on the premises and capable of producing enough hot water for these purposes.

	• If potable water is inadequate for full cooking and food service operations, only sell canned/packaged foods and individual serving sodas, juices and other beverages.
A.5. Ice	• Purchase ice from an approved source in sealed, food-grade bags if unable to make ice under sanitary conditions using potable water. • Handle and use ice in a way that protects it from contamination. Do not store packaged food in contact with undrained ice.
A.6. Sewage	• Dispose of liquid waste. Temporary food service operations can use non-water sewage disposal methods, such as composting toilets or waste bladders, upon approval from the CO/OIC.
A.7. Handwashing	• Provide a facility for employee hand washing to allow convenient use by employees in food preparation and food dispensing. • Where hand washing sinks are not conveniently available, employees can use chemically treated towelettes for handwashing upon approval from the CO/OIC.
A.8. Sanitary Facilities	• When feasible, provide temporary food establishments with plumbed toilets and urinals. If approved by the CO/OIC, use portable toilets provided that hand washing facilities are available.
A.9. Floors, Walls, and Ceilings	• Ensure floors are made of concrete, tight wood, asphalt, or other similar cleanable materials. Use dirt or gravel floors if graded to preclude the accumulation of liquids and covered with removable, cleanable platforms and duckboards. • Ensure walls and ceilings of food preparation areas are constructed to prevent the entrance of insects. Ensure ceilings are made of wood, canvas, or other materials that protect the interior of the establishment from the weather. Use screening material for walls at least 16 mesh per inch. • Ensure counter service openings are not larger than necessary for the particular operation conducted. These openings could be provided with tight windows or could be provided with fans installed and operated to restrict the entrance of flying insects. Doors and windows, if any, need to be kept closed, except when food is being served.
A.10. Pest Management	Implement IPM principles within food operations and adjacent areas per reference (h), Integrated Pest Management, Tactics, Techniques and Procedures (TTP), CGTTP 4-11.13 (series).

Section B: Mobile Food Operations

B.1. Mobile Food Units – General

Mobile food units are food service establishments designed to be readily moveable, including enclosed trailers, cans, pushcarts, recreational vehicles, or similar units. Use the guidance in this TTP publication for mobile food establishments to ensure compliance with the requirements of reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series), and reference (c), Food Code, Recommendations of the U.S. Public Health Service, FDA, 2013. This section provides minimum guidelines for mobile food operations.

B.2. Mobile Food Unit Restricted Operation

- Transportation of food from a centralized kitchen to a satellite dining facility poses special hazards that increase in proportion to distance and time.
  - Transport all foods in covered containers or completely wrapped or packaged to protect from contamination.
  - Per reference (c), maintain all PHF at 41 degrees Fahrenheit (5 degrees Celsius) or below or 135 degrees Fahrenheit (57 degrees Celsius) or above during transportation.
- Only serve food prepared and packaged in individual servings, transported, and stored under sanitary conditions.
- Avoid dispensing potentially hazardous beverages from covered urns or other protected equipment.
- Ensure all food service equipment in mobile vans meets applicable design and performance standards of the NSF.

B.3. High-risk Environments and Highly Susceptible Populations

Field feeding operations, afloat operations, and tactical training, especially in high-risk environments, can increase risk of foodborne diseases. Alternative practices could be necessary in field feeding operations. Per reference (b), ensure modifications to meet circumstances associated with field operations follow these guidelines:

- Coordinate between the PIC, the command, and HSWL SC to assess risks of modifications.
- Ensure monitoring is conducted to identify when deviations exceed controls and where potential hazards still exist.
- If necessary, impose additional requirements to protect against health hazards related to the conduct of the field food service.

B.4. Minimum Operational Requirements

- Ensure hand washing facilities are provided at food preparation and serving areas.
- Provide a sanitation center or dishwashing line that is capable of cleaning and sanitizing field feeding components, equipment, and utensils.
- Provide a safe and adequate supply of drinking water through an approved system.
- Collect, store, and dispose of solid waste in a manner to minimize insect and rodent attraction.
- Collect, store, and dispose of liquid wastewater.
- Protect food during storage.
- Provide adequate mechanical refrigeration or ice chests to maintain proper food temperature of perishable rations.
- Use designated ration breakpoint areas for thawing frozen food at safe temperatures, or provide adequate refrigeration support at the field feeding site.
- Transport food to remote feeding sites in clean, covered vehicles that will not subject the food to adulteration or contamination.
- Mobile food units provide only single-service articles for use by the consumer.

B.5. Location

Establishing and selecting a site for a field kitchen requires careful consideration of traffic flow; location of sleeping areas, toilets, and hand-washing facilities; drainage; and potential insect and rodent control issues.

Per reference (b), Tri-Service Food Code, NAVMED P-5010-1 (series), unless operational requirements prohibit, ensure field food operations are at least:

- 300 feet (100 yards) from latrines, waste storage, and disposal areas, taking into account the gradient and the predominant wind direction (e.g., uphill and upwind).
- At least 90 feet (30 yards) from sleeping areas and bodies of water.

B.6. Facilities	• Maintain in a serviceable condition field kitchen walls, floors, and ceilings. • Ensure field food operations conducted in a structure or shelter other than a field kitchen meet the standards for temporary food establishments. • Ensure a facility supplied with permanent utilities, such as water, electricity, and sewage, is treated as a food establishment. • Store potable water servicing equipment in a way that protects the water and equipment from contamination. • Thoroughly flush and drain the mobile food unit liquid waste during servicing operations. • Discharge all liquid waste to a sanitary disposal system. • Separate the flushing and draining area for liquid waste from the area for loading and unloading of food and related supplies.
B.6.a. Hand Washing Facilities	At minimum, provide field-expedient hand washing facilities at these locations: • Field latrines and toilet facilities. • Cleaning and sanitizing areas of the field food service establishment. • Food preparation and food serving areas. • The customer entrance to the serving line.
B.6.b. Floors, Walls, and Ceilings	• Keep floor surfaces as dry as possible for food operations conducted under a tent or similar shelter and on dirt or another unpaved surface. • Ensure walls and ceilings are free of dirt, cobwebs, peeling paint, and other contaminants that can fall into food or onto food contact surfaces.
B.6.c. Water Systems	• Ensure a mobile food unit requiring a water system has a potable water system under pressure. • Ensure the water system has sufficient capacity to furnish enough hot and cold water for food preparation, utensil cleaning, sanitization, and hand washing. • Locate the water inlet in such a position that it won't be contaminated by waste discharge, road dust, oil, or grease, and provide a transition connection of a size or type that prevents its use for any other service.

B.6.d. Wood Pallets	Ensure wood pallets authorized for storage of food and supplies in field food operations and operations afloat are: • Placed in areas where the ground is firm and the weight of the pallets and contents will not lead to the food or supplies coming into direct contact with the ground or standing water. • Exchanged when new supplies are delivered. • Covered, when used as a subfloor, with an impermeable and easily cleanable material to prevent accumulation of food debris and liquid and pest harborage. ➢ Limit duration that pallets are used to create a subfloor. Improve facilities (and flooring) over time.
B.6.e. Hand Washing Facilities	• Ensure field-expedient hand-washing facilities include soapy water, rinse water, paper towels, and a covered receptacle for paper waste.
B.6.f. Ventilation	• Operate ventilation systems per manufacturer technical manual. • Consult with facility unit engineering to improve ventilation for field food service conducted in a trailer or permanent structure to control grease and humidity.
B.6.g. Lighting	• Provide adequate lighting to allow proper food storage, preparation, serving, cleaning, and sanitizing of equipment and utensils. • Consider serving foods that require minimal or no preparation (e.g., meals-ready-to-eat, heat-and-eat foods, or other ready-to-eat foods) during tactical blackout conditions or periods when evening lighting is inadequate.
B.6.h. Premises Cleaning, Frequency and Methods	• Keep field food service operations as clean as possible. Consider available facilities and equipment, and the anticipated length of stay for the operation. • Keep floors, walls, ceilings, food consumption areas, food preparation, and storage areas free of accumulated food waste, trash, and standing water.
B.6.i. Equipment and Utensils	• Maintain equipment and utensils in a state of good condition and repair. • Ensure field food service equipment procured using a commercial item description meets NSF International standards. • Ensure replacement components for field kitchens conform to applicable military specifications for field kitchens.

	• Evaluate design and construction using inspection conducted by the PIC and/or MDR.
B.6.j. Pest Management	• Implement IPM principles within food operations and adjacent areas. • Conduct daily inspections of the food operations area. • Request IPM actions beyond the unit or food establishment's capability from the supporting medical command or preventive medicine unit.
B.7. Food	• Obtain food from approved sources as specified in Chapter 4: Food Quality and Care. • Operate mobile food units from a commissary or other fixed food service establishment that is constructed and operated following all safety and sanitation procedures. • Do not thaw frozen foods at ambient temperature or in standing water. • Ensure frozen foods are stored at 0 degrees Fahrenheit (-17.7 degrees Celsius) and thawed at a ration breakpoint and maintained at 41 degrees Fahrenheit (5 degrees Celsius) or below. • Ensure field food service equipment procured using a commercial item description meets NSF International standards.

Chapter 9:
Foodborne Illness and Outbreak Protocol

Introduction

This chapter discusses investigation procedures and outbreak protocols in the event of a suspected foodborne illness outbreak, including disease alert reporting. This chapter also describes highly susceptible populations at increased risk for acquiring foodborne illness.

In This Chapter

This chapter contains the following sections:

Section	Title	Page
A	Foodborne Illnesses	9-2

Section A: Foodborne Illnesses

A.1. Introduction

Foodborne illnesses can incapacitate large numbers of personnel within a short time. Epidemiological investigations show that more than half of all reported outbreaks of foodborne illnesses are the result of gross carelessness and deficiencies in food service sanitation. The five most common risk factors leading to foodborne illness are listed in Chapter 3: Management and Personnel, Section F.4.: Training Requirements. For the most common foodborne illnesses, see Appendix F: Organisms of Concern and Types of Foodborne Illnesses.

A.2. Early Detection

When suspected cases of foodborne illness occur, early detection is critical to avoiding a worsening outbreak. To recognize potential foodborne illness systems, refer to Appendix F: Organisms of Concern and Types of Foodborne Illnesses.

- Cease and desist food service establishment operations until the source of illness is identified and controlled.
- When a specific food item is suspected, halt serving the food and preserve a sample of the food.
- Modify or correct procedures for acquiring, processing, and handling the implicated food.

A.3. Notification

When a foodborne illness outbreak is suspected or confirmed, ensure the appropriate stakeholders are engaged to respond quickly and effectively. Notify as soon as possible:

- The MDR.
- The nearest HSWL SC Safety and Environmental Health [HSWL SC (se)] Division or Office.

A.4. General Outbreak Protocol

HSWL SC (se) maintains an SOP for addressing foodborne illness outbreaks and provides case-specific guidance to units upon notification of an outbreak. In general, the outbreak protocol is:

- Verify the diagnosis.
- Identify cases associated with the outbreak.
- Determine the agent causing the outbreak.
- Determine the factor or combination of factors that permitted the outbreak to occur.

A.5. Highly Susceptible Populations

Some people are more likely than others in the general population to experience foodborne disease because they:

- Are immune-compromised, including preschool-age children and older adults.
- Obtain food at a facility that provides custodial care, health care, or assisted living services.
- Operate in a field training exercise, deployment setting, or shipboard operations that could reduce immune system capability due to increased physical or emotional stress and sleep deprivation.

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Appendix A:
Glossary and Acronyms

Approved Sources	Reputable suppliers that obtain their food products from sources that meet all local, state, and federal regulations. and operate under government inspection.
Best Practice	An innovative or modified practice that results in an improved or more effective response.
CDC	Centers for Disease Control and Prevention.
CGTTP	Coast Guard tactics, techniques, and procedures.
Cleaning Gear and Supplies	A category of materials that includes swabs, brushes, rags, brooms, cloths, buckets, detergents, disinfectants, and other hazardous materials (floor wax, brass metal polish, etc.).
CO_2	Carbon dioxide.
CO/OIC	Commanding officer/officer-in-charge.
Consumer	A person who takes possession of food, is not functioning in the capacity of an operator of a food establishment, and does not offer the food for resale.
COR	Contracting officer representative.
Disclosure (for food)	A written statement that clearly identifies the animal-derived food that is, or can be, ordered as, raw, undercooked, or without otherwise being processed to eliminate pathogens; or items that contain an ingredient that is raw, undercooked, or without otherwise being processed to eliminate pathogens.
Dry Food Items	Dry food items, other than canned goods, are such foods as cereals, sugar, dried fruits, vegetables, flour, and meal.
EPA	Environmental Protection Agency.

Equipment	An article used in the operation of a food establishment, including a freezer, grinder, hood, ice maker, meat block, mixer, oven, reach-in refrigerator, scale, sink, slicer, stove, table, temperature measuring device for ambient air, vending machine, or ware-washing machine.
FC-P	FORCECOM TTP Division.
FDA	Food and Drug Administration.
FIFO	First in, first out.
Food	A raw, cooked, or processed edible substance, ice, beverage, or ingredient used or intended for use or for sale in whole or in part for human consumption.
Food Employee	An individual working with unpackaged food, food equipment or utensils, or food contact surfaces.
Food Establishment	An operation that stores, prepares, packages, serves, vends food directly to the consumer, or otherwise provides food for human consumption.
FORCECOM	USCG Force Readiness Command.
FS	Food service specialist.
FSA	Food service assistant.
FSAT	Food service assistance and training team.
FSO	Food service officer.
FSS	Food safety and sanitation.
HACCP	Hazard analysis critical control points.

Hazardous Materials	Substances not intended for ingestion. These materials fall into four categories: 1. Cleaners and sanitizers, which include cleaning and sanitizing agents and agents such as caustics, acids, drying agents, polishes, and other chemicals. 2. Pesticides, which include substances such as insecticides and rodenticides. 3. Some substances, although not normally considered hazardous (e.g., personal care items and non-food-grad lubricants), can be harmful to health in a food service or storage area. 4. Substances that are not necessary for the operation and maintenance of the establishment, and are on the premises for retail sale, such as petroleum products and paints.
Hermetically Sealed Container	A container designed and intended to be secure against the entry of microorganisms and, in the case of low-acid canned foods, to maintain the commercial sterility of its contents after processing.
HS	Health services technician.
HSWL SC	Health, Safety and Work-Life Service Center.
HSWL SC (se)	Health, Safety and Work-Life Service Center, Safety and Environmental Health Division.
IPM	Integrated pest management.
Leftovers	Any unserved food remaining at the end of the meal period for which it is prepared. Leftovers are categorized as potentially hazardous food and non-potentially hazardous food.
MA	Mess attendant.
MDR(s)	Medical department representative member(s) or personnel designated by the command as charged with sanitation inspection for food service establishments and medical screening of food service personnel.
mg/L	Milligrams per liter.

Mechanically Tenderized	Manipulating meat with deep penetration by processes that could be referred to as "blade tenderizing," "jaccarding," "pinning," "needling," or using blades, pins, needles, or any mechanical device.
NAVMED	Navy Medical Department.
NEHA	National Environmental Health Association.
NEPMU	Navy Environmental Preventive Medicine Unit.
NSF	National Sanitation Foundation.
NSSP	National Shellfish Sanitation Program.
PHF	Potentially hazardous foods. Require time/temperature control for safety to limit pathogenic microorganism growth or toxin formation.
PIC	Person-in-charge, the individual at a food establishment who is in charge for all operations.
Potentially Hazardous Leftovers	Potentially hazardous leftovers include any potentially hazardous food prepared for a specific meal period and then retained for a later meal period.
PPD	Purified protein derivative.
ppm	Parts per million.
psi	Pounds per square inch.
Sanitize	The application of cumulative heat or chemicals on cleaned food contact surfaces that, when evaluated for efficacy, is sufficient to yield a 99.999 percent reduction of representative disease microorganisms of public health importance.
SFLC	Surface Forces Logistics Center.

SDS	Safety Data Sheet.
SILC	Shore Infrastructure Logistics Center.
SOP	Standard operating procedure.
Shellfish Control Authority	A state, federal, foreign, tribal, or other government entity legally responsible for administering a program that includes certification of molluscan shellfish harvesters and dealers for interstate commerce.
Single-use articles	Utensils and bulk food containers designed and constructed to be used once and discarded.
Tableware	Eating, drinking, and serving utensils for table use, such as flatware, including forks, knives, and spoons; hollowware, including bowls, cups, serving dishes, and tumblers; and plates.
TMT	Training management tool.
TTP	Tactics, techniques, and procedures.
U.S.C.	United States Code.
UHT	Ultra-high-temperature processing.
Unadulterated	Not mixed or diluted with any different or extra elements; complete and absolute.
USCG	United States Coast Guard.
USDA	United States Department of Agriculture.
Utensils	A food-contact implement or container used in the storage, preparation, transportation, dispensing, sale, or service of food, such as kitchenware or tableware that is multiuse, single service, or single use; gloves used in contact with food; temperature-sensing probes of food temperature measuring devices; and probe-type price or identification tags used in contact with food.

Warewashing	The cleaning and sanitizing of utensils and food contact surfaces of equipment.
Whole-muscle Intact Beef	Whole-muscle beef that is not injected, mechanically tenderized, reconstructed, or scored and marinated, from which beef steaks can be cut.

Revision Appendix B: Job Aid for the Food Service Establishment Items From CG-5145

ITEM	DESCRIPTION	STANDARDS FOR INSPECTION
APPROVED SOURCE		
*1	Food obtained from approved source.	Food is obtained from sources that comply with USDA or an approved source from a foreign port that complies with all food quality and labeling laws.
2	Food received at proper temperature.	Refrigerated food is at a temperature of 41°F (5°C) or below. Raw eggs are received in refrigerated equipment that maintains an ambient air temperature of 45°F (7°C) or less. Cooked food is received hot at a temperature of 135°F (57°C) or above. Food that is labeled and shipped frozen is still frozen when received.
3	Food in good condition, safe and unadulterated.	Food is safe and unadulterated upon receipt. All food is wholesome and free from spoilage, filth, or other contamination and is fit for human consumption.
4	Required source records available for selected foods (e.g., shellstock tags).	Shellstock is obtained in containers bearing source identification tags or labels as specified in the National Shellfish Sanitation Program Guide.
FOOD PROTECTION		
*5	Proper date marking and handling for leftovers.	Potentially hazardous leftovers are labeled with the date and time of original preparation and the discard date and time. Retain leftover foods for up to 72 hours chilled (41°F or below) or for 5 hours if maintained hot (135°F or above).
*6	Food protection during storage, preparation, display service, transportation.	Food items are only stored in food spaces (storerooms, reefers, refrigerators, etc.). Food protected on display from contamination by the use of counter, service line or salad bar food guards.
7	Handling of food and ice is minimized.	Ice for use as a food or a cooling medium is made from drinking water. Packaged food is not stored in direct contact with ice or water. Unpackaged food is not in direct contact with undrained ice.
8	Food and ice dispensing utensils properly stored.	Utensils are stored above the floor in a clean, dry location in a way that protects them from contamination by splash, dust and other means.
9	Consumer advisory provided for raw/undercooked food.	Inform consumers of the significantly increased risk of consuming such foods by way of a disclosure and reminder, as specified by using brochures, deli case or menu advisories, label statements, table tents, placards, or other effective written means.

ITEM	DESCRIPTION	STANDARDS FOR INSPECTION
TIME/TEMPERATURE CONTROL FOR SAFETY		
*10	Proper cooking time and temperatures.	Raw animal foods and foods containing raw foods are cooked per Table 4-1 Summary chart for minimum food cooking temperature and time.
11	Proper reheating procedures for hot holding.	Potentially hazardous food that is cooked, cooled, and reheated for hot holding to a temperature of at least 165˚F (74˚C) is reheated to a point food reaches proper temperature for 15 seconds.
12	Proper cooling time and temperature.	Food is cooled per the time and temperature criteria specified in Chapter 4: Food Quality and Care, Section F.8.: Cooling Methods.
*13	Proper hot/cold holding temperatures.	Potentially hazardous foods do not hold temperatures between 41°F to 135°F.
14	Approved thawing methods used.	The ideal procedure is to place frozen foods under controlled thawing temperatures in their original wrappers or containers. Controlled thawing temperatures are 36°F (2°C) to 38°F (3°C).
PERSONNEL		
*15	Personnel with infections restricted.	Comment or pay close attention to presence of personnel illness or injuries, i.e., boils, infected wounds, and open sores on hands.
*16	Hand washed and clean, good hygienic practices.	Food employees must keep their hands and exposed portions of their arms clean, including surrogate prosthetic devices for hands and arms.
17	Clean clothes and hair restraints.	All clothing worn by food service personnel is neat and clean. Food service personnel, military, and civilian use effective hair restraints such as properly worn hats and hair nets to prevent contamination of food and food contact surfaces.

<table>
<tr><th>ITEM</th><th>DESCRIPTION</th><th colspan="2">STANDARDS FOR INSPECTION</th></tr>
<tr><th colspan="4">FOOD EQUIPMENT AND UTENSILS</th></tr>
<tr><td>18</td><td>Food and ice contact surfaces properly: designed, constructed, maintained, installed, located.</td><td colspan="2">All equipment and utensils are made of sanitary, nontoxic, corrosion-resistant materials and so designed, constructed, and installed as to provide for ease of cleaning and inspection.</td></tr>
<tr><td>19</td><td>Dishwashing facilities properly: designed, constructed, maintained, installed, located, and operated.</td><td colspan="2">Dishwashing facilities and all dishwashing components are installed, located, and maintained in good repair.</td></tr>
<tr><td>*20</td><td>Thermometers provided and accurate.</td><td colspan="2">Thermometers required for immersion into food are made of metal- stem type construction, numerically scaled, accurate to plus 3°F and sanitized between uses.</td></tr>
<tr><td>21</td><td>Single-service articles, storage dispensing.</td><td colspan="2">Single-service articles are stored on clean shelves and in closed containers.</td></tr>
<tr><td>22</td><td>No reuse of single-service articles.</td><td colspan="2">Single-service articles are only used once.</td></tr>
<tr><td>23</td><td>Pre-flushed, scraped, and soaked.</td><td colspan="2">Utensils are pre-soaked, scraped, and thoroughly washed to help remove gross food particles and soil.</td></tr>
<tr><td>24</td><td>Wash rinse water and clean proper temperature.</td><td colspan="2">Warewashing machines reached and maintained proper temperatures for:</td></tr>
<tr><td rowspan="5">*25</td><td rowspan="5">Sanitization rinse: clean, temperature concentration.</td><td>Minimum Chlorine Concentration mg/L (ppm)</td><td>Minimum Water Temperature</td></tr>
<tr><td>25</td><td>120</td></tr>
<tr><td>50</td><td>100</td></tr>
<tr><td>100</td><td>55</td></tr>
<tr><td colspan="2">Follow sanitation methods.</td></tr>
</table>

ITEM	DESCRIPTION	STANDARDS FOR INSPECTION
26	Wiping cloths: clean, use restricted.	Wiping cloths used for wiping food spills are used for that purpose only. Cloths used with raw animal foods are kept separated from other cloths and linens. Cloths where odor and soil can no longer be removed are properly discarded.
27	Food-contact surfaces of equipment and utensils clean, free of abrasives and detergents.	All food contact surfaces of equipment and utensils are kept cleaned and sanitized; free of abrasives and detergent.
28	Storage, handling of clean equipment and utensils.	Cleaned and sanitized equipment and utensils are handled by their handles (spoons, knives and forks) and without contacting inside surfaces or surfaces that contact the user's mouth (cups, glasses, and bowls). All equipment and utensils are stored above the floor and in a clean, dry location.
WATER		
*29	Water source, safe: Hot and cold under pressure.	Potable water supply is pressurized; hot water reaches at least 49°C (120°F) measured from the faucet.
SEWAGE		
*30	Sewage and waste water properly disposed.	Sewage and waste water discharges into the public sewage or into an approved private sewage disposal system.
PLUMBING		
31	Installed, maintained.	Plumbing is sized, installed, and maintained per reference (g), Civil Engineering Manual, COMDTINST M11000.11 (series).
*32	Cross connection backflow prevented..	No cross connections between water supply and source of pollution. See Chapter 6: Construction and Maintenance of Facilities, Section A.2.: Water Supply. CGTTP 4-11.12, Ch. 6-A.1
TOILET AND HANDWASHING FACILITIES		
*33	Hand washing and toilet facilities properly constructed, supplied, and cleaned.	Adequate number of heads and conveniently located. Heads and vestibules are kept cleaned and in good repair. Supply of toilet tissue is provided at each toilet.

ITEM	DESCRIPTION	STANDARDS FOR INSPECTION
34	Containers or receptacles, covered: adequate number, insect/rodent proof, emptied and cleaned frequently.	Adequate number of containers or receptacles, covered, insect resistant, and rodent proof; cleaned.
35	Garbage and refuse properly disposed; facilities maintained.	Garbage and refuse are disposed often enough; no odor or attraction of insects and rodents.
INSECT, RODENT, AND ANIMAL CONTROL		
*36	Presence of insect/rodent – outer openings protected, no dogs, cats, or other animals.	Outer openings to the outside protected by tight fittings, self-closing doors, closed windows, screens, controlled air currents, and other means.
37	Integrated Pest Management Program up-to-date.	Insect and rodent control program is maintained to ensure elimination of pests in and around the food service establishment.
FLOORS, WALLS, AND CEILINGS		
38	Floors: constructed, drained, and cleaned, in good repair, covering installation, dustless cleaning methods.	Floors cleaned.
39	Walls, ceiling, attached equipment properly: constructed, good repair, clean, surfaces, dustless cleaning methods.	Walls and surfaces cleaned.
LIGHTING AND VELTILATION		
40	Adequate ventilation and lighting in food service, storage and sanitary areas.	Adequate ventilation to remove odor and vapors and sufficient natural or artificial lighting is provided.
41	Range exhaust hood: free of grease buildup, and manufacturer specifications kept on file.	Sufficient ventilation is provided, and manufacturer specification sheets are maintained on file for exhaust fans and hood filters.
42	Ventilation hoods provided and maintained, lighting fixtures shielded or shatter resistant.	Ventilation hoods provided; light bulbs are shielded, coated, or otherwise shatter-resistant.

ITEM	DESCRIPTION	STANDARDS FOR INSPECTION
OTHER OPERATIONS		
*43	Toxic items properly stored, labeled, and used.	Toxic items stored in locked cabinets. Chemicals are identified and labeled; Safety Data Sheets for chemicals are located and accessible. Chemicals used for their purpose and appropriate areas.
44	Premises: maintained free of litter/unnecessary articles, cleaning/maintenance equipment properly stored, authorized personnel only.	Premises are free of litter; articles necessary to the operation and maintenance of the food service establishment are properly stored; traffic of unnecessary persons through food preparation and utensil washing areas is prohibit.
45	Complete separation from living/sleeping quarter and laundry.	A self closing door separates food service operations from any living, dressing, or laundry areas.
46	Clean, soiled linen properly stored.	Clean, soiled linens kept and stored in a closed receptacle or clean, washable laundry bag.

Appendix C:
Safety Precautions Best Practices for Food Service Personnel

- The correct way to do a job is the safe way. Make safety a part of your everyday food service operation.
- Do not handle electrical appliances of any kind when feet or hands are wet.
- Use extreme care with electrical extension cords and avoid if at all possible. When damage or fraying occurs, discard cords.
- Use proper hand tools to remove nails, metal straps, and wire bands when opening containers boxes. Exercise care to avoid getting foreign matter into foodstuffs.
- Use knives and cleavers only for the purpose intended. Do not use a knife as a screwdriver. Do not use a cleaver to open cans, crates, or boxes.
- Do not open cans with anything except a can opener. Remove cover completely as the jagged edge could cause a serious cut. Keep blade and gears of can opener clean to avoid grounding tin into foods.
- Do not carry knives unnecessarily. If carrying a knife, hold it by the handle with its point toward the deck and the cutting edge away from you. Hold knife close and walk carefully.
- Do not grab for a falling knife. Step to one side and let it fall.
- Do not soak or put knives in soapy or discolored water where they cannot be seen, and you could grasp the blade.
- Place knives in drawers, cabinets, and racks with the handle facing outward.
- Keep the handles of all meat tools free of grease to assure a good, safe grip. Otherwise, your hand could slip forward onto the blade. Hold handles firmly.
- When using a sharpening stone, be sure your guiding hand rides on the back of the knife blade.
- Remove all tools before placing meat on blocks or benches. The “hidden” tools are dangerous. If you put a piece of meat on top of a sharp knife, you could forget the knife is there and cut yourself when you pick up the meat.
- Be extremely careful when using a boning knife. Always keep your hand behind the knife. Use a hand meat hook when boning meat to provide a firm hold. Wear a mail apron for stomach protection.
- Be careful when using the cleaver. The chopping action is difficult to control. Keep your other hand away from the striking area. Wear a mail glove to protect fingers of holding hand.

- After using and sanitizing, return tools such as cleavers, saws, and knives to the place provided for them. Reduce the risk of cutting yourself by storing them properly.
- When using a handsaw, do not force the saw blade. Forcing it through a bone can cause it to "jump" and tear your fingers. Let the saw do the work. As an added precaution, always place your index finger over the back of the blade.
- Wear a mail glove in dangerous butchering or meat-cutting operations to prevent hand injuries.
- Ensure safety devices and guards are in proper place, in proper operating condition, and securely fastened when food choppers, meat slicers, or mechanical meat saws are in operation.
- Instruct all food service personnel in the lighting-of characteristics of galley ranges. Open the doors of gas or oil-fired ovens at least one minute before lighting. Report all leaking valves or joints immediately to the PIC.
- Turn handles of cooking utensils parallel to the front of the range, so they don't protrude into passageways.
- Report all defective galley equipment to the PIC, such as stove lids, oven doors, pilot lights, thermostats, electrical appliances, and pan handles immediately.
- Be careful of sharp, pointed meat hooks in the chill box and refrigerator(s). Do not use them in the galley as hooks for hanging up utensils.
- Test alarm systems on walk-in refrigerators daily and report any malfunction immediately to the food service establishment supervisor.
- Do not block approaches to fire-fighting equipment.
- Clean accumulations of grease and soot on ranges, ducts, and filters in range hoods at frequent intervals as a fire prevention measure. Grease filters in range hoods must be in place at all times while range is in use.
- Maintain at least one 15-pound carbon dioxide (CO_2) or 6-pound cartridge-type dry chemical fire extinguisher in an easily accessible location near each galley range.
- Keep decks as clean and dry as possible. Keep them free from spilled food, grease, and other substances. Take precautions to avoid swabbing or scrubbing deck areas that are in use. Limit cleaning to a small area, then swab this area dry before proceeding. Do not wet the entire deck at one time.
- Do not leave flat-bottom trucks or any other type of food conveyor unattended in aisles, corridors, passageways, or any place where they could become a tripping or collision hazard or an obstruction to normal work functions.
- Keep supply rooms in an orderly condition at all times.
- Keep aisles clear.

- Place food items in all spaces on pallets or gratings to permit easy cleaning and to facilitate air circulation.
- Do not attempt to lift heavy objects without sufficient help.
- Keep garbage sheds or screened enclosures clean at all times.
- Do not permit accumulations of refuse from day-to-day.
- Do not attempt to handle large, filled garbage containers alone without sufficient help.
- Use caution when cleaning containers with a steam hose. Be sure the nozzle of the steam hose is securely fastened before turning steam into the hose. Cover hands with cloth or wear gloves when handling a steam line. Avoid horseplay with a steam line.
- Maintain wire-screened enclosures in good condition to prevent entrance of insects and rodents.
- Insecticides, rodenticides, poisonous chemicals, and detergents shall be plainly labeled and segregated from foodstuffs and food service equipment.
- Obtain immediate first aid for scratches and cuts. This is the safest, surest way of preventing infections.
- Do not carry pencils, pens, combs, cigarettes or other tobacco products, matches, or other items in shirt pockets, breast pockets of coats or jackets, caps, hats, or behind the ears.
- Do not use hands to force food products into food choppers. Use a pusher-stick.
- Before removing containers of hot liquids from the range, be sure that no one is passing. Decide in advance where you are going to put such containers.
- Handle pots or pans containing hot liquids or grease with great care.
- Assume that all pots, pans, stoves, steam tables, coffee urns, and pipes are hot before touching them.
- Use extreme care when working around steam cookers and coffee urns. Stand to one side when opening steam kettles, steam cabinets, and ovens. Use a safe, non-collapsible platform to stand on when pouring hot water into the coffee bag at the top or urn.
- Cover hands with a dry cloth before handling hot containers or before opening steam vessels or roasters. Wet cloths transmit heat readily and can cause burns.
- Do not have deep-fat pans more than two-thirds to three-fourths full of hot fat. Unless due allowance is made, the roll or pitch of a vessel could splash fat onto the range and cause a serious fire and bad burns. Do not leave deep-fat fryers unattended.
- Immediately repair splintery work tables, faulty mess benches, sharp metal edges, loose handles, or other defective equipment.
- When lifting heavy boxes, bend your knees to distribute the weight.
- Do not climb ladders with food or utensils unless you can hold onto a guardrail with one hand. Make another trip if necessary, or get someone to help you.

- Do not carry food trays and other serving equipment in such a manner as to obstruct your vision.
- Fill and carry hot liquid containers on serving equipment so that liquid does not spill on you or the persons you are serving. Place hot liquid containers aboard vessels underway in a secure position at all times.
- Do not leave glassware or glass containers near food preparation areas. If glass breaks near foodstuffs, immediately notify the commanding officer of the food service establishment, so that a decision can be made regarding the food suitability.
- Do not use broken, cracked, or chipped glassware or china.
- Do not throw broken glass into waste baskets or other refuse.
- Wash hands thoroughly with soap and water before leaving toilets. Report unsanitary toilet or washroom conditions to the food service establishment supervisor and/or medical department.
- All food service personnel must wear safety toes shoes with a strong support and closed toe.
- Food service personnel working with grinders and mixers must not wear loose shirt sleeves, ties, or aprons.
- Most accidents are due to one cause: inattention. Do not take chances. Concentrate on what you are doing and be safe.

Appendix D:
Food Inspections

D.1. General Information

All food items procured for USCG dining facilities undergo rigid inspection and are subject to various federal and military specifications established to cover sizes, grades, appearances, and types. These inspections are performed by technically qualified personnel of the military veterinary services, Defense Personnel Support Center quality assurance representatives, and United States Department of Agriculture (USDA) inspectors.

Per reference (e), Coast Guard Medical Manual, COMDTINST M6000.1 (series), the medical department representative (MDR) or other qualified personnel designated by the commanding officer is responsible for inspecting all foodstuffs to determine fitness for human consumption and to ensure receipt from approved sources. Occasionally, food items are procured and received that have not been inspected by qualified personnel.

- Accept and inspect all food items including fresh bakery and fresh dairy products, other than milk and milk products, which are delivered directly to the food service establishment by vendors.
- Reject any food found not to be in compliance with USDA regulations and specifications as unfit for human consumption.
- Ensure food inspections are conducted by the MDR in company with the food service officer, food service manager, or other individual designated, where a combination of knowledge and training can result in an effective inspection program. Usually, foul odor and an unnatural appearance are causes for rejection. Never taste test suspected foods.
- Conduct dockside inspections of food items before taking them aboard to avoid recurring infestation in shipboard storage areas.

WARNING:

Never eat or taste any food items that are considered abnormal in appearance or odor. Discard per survey procedures per reference (d), Coast Guard Food Service Manual, COMDTINST M4061.5A (series). Where large quantities are involved, submit a representative package to a laboratory for bacteriological analysis.

D.2. Inspections of Meat and Poultry

Per reference (i), Meat Inspection, 21 U.S.C., Chapter 12 and reference (j), Poultry and Poultry Products Inspection, 21 U.S.C., Chapter 10, all meat products prepared in the United States and purchased by the Armed Forces shall be marked with the stamp of approval of an agency of the USDA.

Purchase meats, meat products, poultry, and poultry products destined for resale or for use in non-appropriated fund activities from approved plants operating under the supervision of an agency of the USDA or under an acceptable state inspection system. To be acceptable, ensure a state inspection system affords health protection and safeguards to the consumer which at least equal those provided by the federal systems.

The military veterinary services do not duplicate the inspections performed by federal and state agencies; however, they do complete for the military the inspections at the point of issue or sale.

D.3. Inspection of Fish and Shellfish

- Obtain shellstock in containers bearing legible source identification tags or labels that are affixed by the harvester or dealer that depurates, ships, or reships the shellstock, as specified per reference (f), National Shellfish Sanitation Program (NSSP), Guide for the Control of Molluscan Shellfish, 2013.
- Ensure the harvester's tag or label contains the information below:
  - The harvester's identification number that is assigned by the Shellfish Control Authority including the:
    - Date of harvesting.
    - Most precise identification of the harvest location or aquaculture site that is practicable based on the system of harvest area designations that is in use by the Shellfish Control Authority.
  - The type and quantity of shellfish.
  - The following statement in bold and capitalized : "**THIS TAG IS REQUIRED TO BE ATTACHED UNTIL CONTAINER IS EMPTY OR RETAGGED AND THEREAFTER KEPT ON FILE FOR 90 DAYS**".
- Ensure fresh and frozen shucked shellfish is packed in nonreturnable packages identified with the name and address of the original shell stock shipper, shucker, packer, or repacker, and the official certificate number issued according to the law of the jurisdiction of its origin.
- Ensure shellstock and shucked shellfish is kept in the container in which they were received until they are used.

- Check fish carefully. Do not use refrozen fish (fish that have been frozen, thawed, and then refrozen again). Fish that have been refrozen may have soft, flabby flesh, a sour odor, and an off color. The wrapping paper may become moist, slimy, or discolored. The bottom of the box may be distorted. Fresh fish has bright red gills, prominent clear eyes, and firm elastic flesh. Stale fish are dull in appearance, have cloudy and red-bordered eyes, and soft flesh; finger impressions are made easily and remain when digital pressure is released.
- Do not consume fish caught over the side at sea unless there is absolute certainty that they are not poisonous, as cooking does not destroy the poisonous alkaloid found in some fish (such as barracuda), and violent illness and even death may result.
- Only accept fresh crustaceans (mollusk, lobster, crab, clams, etc.) that are alive. Quality whole lobster cannot be obtained after any period of storage. Purchase lobster as a live product. Lobster remains satisfactory as long as they are alive and the flesh is not shrunken. When inspecting crab, lobster, or shrimp, examine the edible portion to determine fitness for human consumption.

D.4. Inspection of Fruits and Vegetables

Inspection of fresh fruits and vegetables is based on USDA grades and standards. Due allowances, however, are made for differences in these grades of standards, but minimum requirements are defined for the various grades.

- Fruits: Generally speaking, the choice of any particular fruit is influenced by appearance and quality. Consider the following factors when inspecting fruits: Appearance (absence of blemishes), size and taste. Appearance is an indication of quality but must not be used as the sole standard in inspecting. Blemishes indicate poor quality or the beginning of decay. Larger fruit is usually more woody and coarse. Taste, however, is the best indicator of quality. Occasionally, fruits may have surface blemishes and the quality still may be high. Only by tasting can this quality be determined. Standards for inspecting fruits are applied in the following descriptions:
  - Apples: The best grades of apples are firm, and have good color (bright and unspotted) and flavor. Immature apples have a poor color, lack flavor and shrivel after storage. Over ripe apples have a dull and extra-yellowish appearance and in advanced stages of over ripeness, wilt and begin to show decay. When apples have been severely injured by freezing or bruising, the skin appears brown and water soaked and is often tough and leathery.

- Bananas: The color and condition of the peel are good indications of the use that should be made of bananas. When the skin is all yellow, the banana is firm enough and ripe enough to be eaten. If the peel is yellow but flecked with brown, the banana is fully ripe and should be used immediately. Fruit with a moldy skin that has turned black is of poor quality, although some bananas with a dark skin are very ripe but still good.

- Cantaloupe: There should be no trace of a stem at the blossom end of cantaloupes. If the netting covers the cantaloupe thickly and stands out like whipcord, the melon is generally good. An apparent softness at the blossom end is no sure indication of maturity, as repeated pressure from handling produces this condition. Fully ripe cantaloupes have a delicate aroma. When shaken, an audible rattling of the seeds in the melon is another sign of maturity. The skin beneath the netting usually has a yellow tinge. Too deep a yellow indicates over ripeness.

- Cherries: High quality in cherries is denoted by plumpness with a bright appearance and good color. Immature cherries have a peculiar bitter tang and are undesirable. Inspect cherries for wormy fruit. Cut several cherries in each container because worm damage is not always apparent on the outside. Reject soft, over ripe, or shriveled fruit.

- Grapefruit: Fine juicy grapefruits are well rounded in shape and heavy for their size. They are firm but springy to the touch, not soft, wilted, or flabby. A coarse skin, puffiness, or sponginess indicates lack of juice and taste. Fruits decayed in any degree are not desirable. Usually the flavor is affected. Decay sometimes appears as a soft, discolored area on the peel at the stem or button end of the fruit or it may appear as a water-soaked area with much of the natural yellow color within the area being lost and the peel being so soft that it breaks easily on pressure of a finger.

- Grapes: Color is a good guide to ripeness of grapes. The darker varieties should be free of a green tinge; white grapes should have a decided amber coloring. The fruit should be plump and each grape firmly fastened to the stem. Decay is indicated by wetness or the presence of mold.

- Honey Ball Melons: Prime quality honey ball melons have a thick, green-colored, sweet, fine-flavored flesh with a distinct pleasant aroma. The rind has a light-yellowish color and yields slightly to pressure. Decay is generally indicated by mold or dark, sunken, watery areas.

- Lemons: The best lemons have a greenish-yellow color with a smooth, fine-textured skin, and are heavy for their size. Mold or soft spots at the end indicate decay. If too springy, they may be decayed in the center.

- Nectarines: Nectarines look and taste like small peaches but they do not have "peach fuzz." They are red, white, or yellow fleshed in color and are chosen for their plumpness and firmness.

- Oranges: The skins of good oranges are yellowish-orange, smooth, and fine textured. Avoid those that have badly creased skins or a puffy, spongy condition and are light in weight for their size. When inspecting for quality, be sure that the crate does not contain decayed fruit.

- Peaches: Quality in peaches is indicated by the general appearance and firmness of the flesh. They should be smooth skinned and well filled out. The color on the underside should be creamy white or yellow, blushed with red. Over ripeness is indicated by deeper reddish-brown color and softness of the fruit.

- Pears: Good quality pears are firm and shiny. Pears are packed and shipped green because they develop a fine flavor and smoother texture when ripened off the tree. They should be fully ripe for fresh use. If they are hard and unyielding to the touch at the time of receipt, allow them to stand at room temperature until the flesh responds readily to a gentle pressure of the hand. They are then in prime condition for eating.

- Pineapples: Fully ripe pineapples are slightly soft to the touch, golden yellow in color, and have a "piney" aroma. Fruit that is too green may not ripen well. Over-maturity is shown by slight decay at the base or on the sides by dark, soft, water spots.

- Plums: Good plums are full colored and soft enough to yield to slight pressure. Some varieties are fully ripe when the color is yellowish-green, others when the color is purplish-blue or black. If hard, poor in color and flavor, the fruit is immature. Over ripe fruit is soft and usually leaky.

- Strawberries: Quality in strawberries is indicated by the general appearance. They should be firm, plump, and bright red in color. Over ripe strawberries are leaky, dull in color, and should not be used. Mold at the surface indicates decay.

- Tangerines: Tangerines are small, yellowish-red oranges with easily removable skins and loosely adhering sections. Quality is based mainly on weight for size and deep yellow or orange color of the skin.

- Watermelons: A fully ripe watermelon has a thin outer skin that peels easily when scraped with the fingernail. The underside changes from white to a yellow tinge with maturity. The safest way to determine watermelon quality is by "plugging."

- Vegetables: Standard grades for vegetables have been developed by the USDA, and military inspections are based on those standards. Because of their perishability, fresh vegetables must be handled with care. Do not pinch, squeeze, or handle them unnecessarily because bruising leads to decay and results in early spoilage.

  - Asparagus: Asparagus stalks should be straight fresh appearing, crisp, and tender, with compact pointed ends and only one inch or so of tough woody base to remove.

  - Beans: Green or waxy yellow (wax-beans) beans should have long, straight pods, crisp enough to snap easily. When the beans start to ridge and bulge the pods, they usually are old, tough, and leathery.

  - Beets: Beets should be globular shaped with smooth, firm flesh. Medium-sized beets are less likely to be tough than very large ones.

  - Broccoli: Broccoli should have plenty of green color in the heads as well as the leaves and stems. Stalks should be tender and firm with compact, dark green or purplish-green buds in the head.

  - Brussels sprouts: Good brussels sprouts are hard, compact, and of an attractive green color. Puffiness wilted appearance, or yellow color indicate poor quality.

  - Cabbage: Well-trimmed, solid heads which are heavy for their size and show no discolored veins are usually of good quality.

  - Carrots: Carrots should be bright colored, well shaped, and medium sized. Poor color in carrots indicates poor quality. Wilted, flabby, soft, or shriveled carrots lack flavor.

  - Cauliflower: A jacket of bright green denotes freshness. The head should be white or creamy white, clean, and solidly formed. If the flower clusters are spread or open, the vegetable will be of poor quality.

- Celery: Quality characteristics for both the bleached and the green celery are the same. Leaf stems or stalks should be brittle enough to snap easily and of medium length and thickness. The inside of the stem should be smooth. If it feels rough or puffy to the touch, the celery is likely to be pithy.

- Corn: Corn may be either white or yellow. The husk is a fresh green color, while the kernels are tender, milky, and sufficiently large to leave no space between the rows. Ears generally should be filled to the tips, with no rows of missing kernels.

- Cucumbers: The best cucumbers are firm in texture and bright green in color. Cucumbers of less than 7 inches in length and about 2 inches in diameter are best. Over-maturity is indicated by a generally overgrown puffy appearance. The color of over-mature cucumbers is generally dull and not infrequently yellow, the flesh is tough, seeds are hard, and the flesh in the seed cavity is almost jellylike.

- Eggplant: Purple eggplants should be of a clear, dark, glossy color that covers the entire surface. Heaviness and firmness of flesh are important. Choose pear-shaped eggplant from 3 to 6 inches in diameter. Decay shows up in dark brown spots. Discard wilted, soft, or flabby eggplants.

- Endive: Curly endive grows in a bunched head with narrow, ragged-edged leaves which curl at the ends. The center of the head is a yellowish-white and has a mild taste while the dark green outer leaves have a bitter taste. Tough, coarse-leaved plants are undesirable. Toughness can be determined by breaking or twisting a leaf.

- Escarole: Escarole is a variety of endive. The leaves are broad and do not curl at the end. Crispness, freshness, and tenderness are the essential factors of quality.

- Garlic: Garlic, Dry, U.S. No. 1 Grade is the garlic authorized for use. Good quality garlic must be white or red skinned with firm, dry bulbs with no rotted spots or sprouting.

- Greens: Collards, kale, mustard, spinach, and turnip tops are the greens authorized for general mess use. Good quality greens must be fresh, young, green, and tender. Poorly developed, dry, or yellow leaves or insect-eaten leaves are not good. Coarse stems indicate poor quality.

- Lettuce: “Iceberg” lettuce is tightly headed lettuce, medium green on the outside with a very pale green heart. Discolored areas on the leaves indicate decay. Soft rot sometimes penetrates to the center of the head.

- Onions: Spanish and American types of onions, both grown in the United States, are used by the military. Dry onions should be bright, clean, hard, well shaped, and dark skinned. Moisture around the neck indicates decay.

- Onions, green: Green onions should be fresh in appearance, should have fresh green tops and medium-sized necks which are blanched for at least 2 or 3 inches from the root, and young, crisp, and tender. Bruised, yellow, wilted tops indicate poor quality and may indicate poor quality necks. The condition can be ascertained by puncturing with the thumbnail.

- Parsnips: Young parsnips, 1 1/2 to 2 inches thick and free from rust spots, are the best. Withered parsnips are old, tough, and have a strong flavor.

- Peppers: Peppers should be well shaped, thick walled, and firm, with a uniform glossy color. Pale color and soft seeds are signs of immaturity, while sunken, blister-like spots on the surface indicate that decay may set in rather quickly.

- Potatoes: Good quality white potatoes are generally clean, firm, and free from cuts, growth cracks, and other knobs or surface defects. Frost damaged potatoes generally have a watery appearance or show a black ring near the surface when cut across.

- Sweet Potatoes: Thick, chunky, medium-sized sweet potatoes which taper toward the end are the best. Avoid those with any sign of decay; as such deterioration spreads rapidly, affecting the taste of the entire potato, even in portions not immediately adjacent to the decayed area.

- Radishes: Good quality is indicated by the root which should be smooth, crisp, and firm, never soft or spongy.

- Rhubarb: Fresh, large, crisp, and straight stalks of red or cherry color are best. Condition of the leaves is a reliable guide in judging the freshness.

- Rutabagas: Good quality rutabagas should be smooth skinned, firm, and heavy for their size.

- Squash: Avoid hard rinds on the following: buttercup-shaped somewhat drum-like with sides slightly tapered near the apex, zucchini-cylindrical straight, with fairly square ends, skin color moderately dark green over a ground color of pale yellow, yellow straight-necked or crooked-necked very brilliant light yellow color. Hard tough rinds are desirable, however, on the following as soft rinds are apt to have a watery flesh which is flat to the taste: acorn-shaped and very dull, blackish-green with dull orange interior; Hubbard - medium to large size best.

- Tomatoes: Tomatoes should be firm, plump, fairly well formed, of good color (green out of season and bright red in season), and free from blemishes. The tomato is one of the most tender products. Handle tomatoes with care. Misshapen, angular, ribbed, or scarred tomatoes are of poor quality.

- Turnips: Smooth skin, firmness, and heavy for size are indications of good quality.

D.5. Inspection of Canned Products

Ensure canned products have intact readable labels. Take the following points into consideration when inspecting canned products, such as meats, fish, poultry, vegetables, fruits and juices:

- Can labels – Check the information stamped on the end of each can to ensure that contents and date of pack are indicated.
- Can exterior – Examine the exterior of the can for general appearance, dents, swelling, rust, and pinholes. Dents, unless so severe as to cause leakage, do not indicate that the contents are in an unsatisfactory condition. However, if the dent is on the seam or so severe as to cause two metal planes to touch, the can should be discarded. Rust does not injure the *FOOD* unless it penetrates the can. Pinholes are found only by careful inspection.
- Can interior – Remove the contents and check the inside of a sample can very carefully.
- Contents of can - Odor and taste indicate the condition of the *FOOD*. Fading of color, loss of flavor, and softening of contents are due to chemical action and natural aging processes. Discoloration is another defect caused by a chemical action found usually in products containing sulfur compounds, such as corn, peas, and meat products.

Except for coffee and molasses, which are discussed in Springers, foods contained in the following types of cans are unsatisfactory. Survey and discharge the types of cans below:

- Pinholes - Cans with tiny holes caused by the action of acid.
- Swells or swellers - Both ends of the can bulge out and remain that

way. The condition is caused by action of bacteria (microorganisms) in the *FOOD*s which result in the freeing of a gas (hydrogen sulfide). This gas cannot escape and gains room only by bulging out the ends of the can. Molasses is an exception. Cans of molasses that bulge at the ends are not unusual, particularly in tropical climates. This condition is normal and should not be grounds for ejection. Microorganisms cannot exist and multiply in an environment so high in sugar content.

Springers - The ends of these cans are also bulged out, but they will yield to pressure of the fingers or thumb. When the pressure is relieved, the ends bulge out again. This condition might be caused by over-filling the can or by chemical or bacterial action on the *FOOD* freeing gas which causes the swelling condition. Coffee is an exception. Care must be taken NOT to reject cans of roasted and ground coffee showing swell or springer characteristics. Swellers that develop in coffee are usually an indication of a properly sealed container that has retained its natural gases. The gas expands, replacing the original vacuum created in the can. When coffee in a sweller or springer can is of uncertain quality, report it to the food service officer.

- Flippers – This term describes a can, the ends of which are flat. However, one end might be forced into a convex condition when the other end of the can is brought down sharply on a flat surface. It indicates a loss of vacuum in the can from formulation of gas by bacteria or by chemical action on the metal of the can. Regardless of the cause, do not use the contents.

D.6. Inspection of Dry Food Items

- Store dry food items under controlled conditions of temperature, humidity, and air circulation.
- When inspecting dry food items, remember that USDA standards were followed at the time of packaging. Outward appearance of the food or food containers and condition of the food itself are items to observe on inspection. For example, flour and meal bags might have been torn and the food exposed to insects or rodents. Rolled oats or other cereal containers might have been broken and the food contaminated. Dried vegetables might be damp and moldy.
- Insects such as cockroaches are regularly transported from one area to another in such items as bags of potatoes or onions, cans, and cartons of dry stores.

D.7. Inspection of Butter, Cheese, and Eggs

Butter, cheese, and eggs spoil quickly under improper storage conditions. The method of handling and the storage temperature must be correct. Check these products carefully upon delivery, and frequently thereafter until consumed.

Butter - Ensure butter is received in clean, unbroken cases. For quality, taste samples for sweetness and freshness. Ensure color is uniform and the

texture firm with no specks or foreign substances present.

Cheese - Check the rind, color, flavor and texture of cheese. Cheese might be received in either natural or processed form. Ensure the rind is clean and free form mold or wrinkles. The flavor of good cheese is clean and "nutty" with a compact and solid texture with no surface breaks or holes. For cheddar cheese, ensure color is evenly distributed. This can be determined by holding a thin slice in front of a light.
Eggs - Procure only shell (fresh), frozen, and dehydrated eggs to meet the various conditions, temperatures, and uses. Shell eggs not over 30 days old, which have been held at a temperature of 45 degrees Fahrenheit (7.2 degrees Celsius) or below (do not freeze) in a dry, ventilated place are preferred. Ensure shell eggs are clean, have the shell intact and have no cracks. Eggs stored at room temperature or allowed to remain at room temperature rapidly lose their quality.

D.8. Inspection of Milk and Milk Products

Strict compliance with all sanitary requirements is mandatory due to the perishability of milk and milk products. Of prime importance to medical and food service personnel is the maintenance of recommended temperatures in storage and dispensing and the enforcement of approved sanitary methods in the handling of milk or milk products.

Activities or ships can use several types of milk depending upon geographic location, weather, shipping facilities, storage space, refrigeration or freezer space, maintenance of equipment and personnel available. Types of pasteurized milk grouped according to recommended uses are:

- For beverage use:
  - Milk, whole, fresh, homogenized.
  - Milk, skim and low fat, homogenized.
  - Milk, frozen, homogenized.
  - Milk, concentrated, whole, or skim fresh or frozen.
  - Flavored milk (chocolate) and flavored dairy milk.
  - Milk, recombined.
  - Milk, whole, dry fat, instantized.
  - Milk, dry, nonfat, conventional style B.
  - Milk, low fat, shelf stable, 1, or 2 percent milk fat content, homogenized, fortified with protein, vitamins A and D added, pint (8.000 fluid ounces) or 250 milliliters (8.453 fluid ounces),

aseptically processed and packaged long shelf life (ultra-high temperature processing [UHT]), hermetically sealed in a foil laminated polyethylene coated flexible paperboard container, not more than 54 units per case.

- Milk, chocolate flavored, shelf stable, homogenized, vitamins A and D added, 1 quart (32 fluid ounces) or 1 liter (33.8 fluid ounces), aseptically processed and packaged (UHT long shelf life), hermetically sealed in a foil laminated polyethylene coated flexible paperboard container, not more than 54 units per case.

- For baking and cooking use:
  - Milk, dry, nonfat, conventional style A, (recommended for bread baking).
  - Milk, dry, nonfat, conventional style B.
  - Milk, evaporated, canned.
- Ensure milk and milk products are from an approved source and delivered in containers which are in good condition and properly sealed when performing delivery inspections.
- Ensure that milk and milk products are organoleptically acceptable and that the temperature of the product on delivery is 45 degrees Fahrenheit (7.2 degrees Celsius), or less.
- Ensure vehicles used in transportation of milk in its final delivery container is constructed with permanent tops and sides, clean, and its refrigeration maintained at 45 degrees Fahrenheit (7.2 degrees Celsius), or less.
- The use of block or crushed ice on top of milk containers for refrigeration or cooling during delivery or when on the service line is prohibited.

Appendix E:
Chlorine Solutions

Preparation of Chlorine Solutions

The manufacturer's instructions might specify use of a particular type of chlorine solution in their equipment. However, use any of the following solutions if properly prepared.

- Sodium Hypochlorite:
  - Sodium hypochlorite requires no preparation. Use as directed by the manufacturer.
- Chlorinated Lime:
  - Follow the appropriate column from Tables E-1 through E-5 for the proper amount of chlorinated lime to be mixed in a in a clear, dry container.
  - Add a small amount of water and mix with the chlorinated lime to form a thick paste.
  - Dilute the paste gradually adding water (warm water is better than cold water).
  - Stir the solution constantly after the chlorinated lime is dissolved, allow the solution to stand for 30 minutes so that the undissolved residue can settle to the bottom.
  - Carefully pour off the clear liquid and discard the residue. If the liquid remains turbid, filter it through muslin or several layers of cheesecloth.
- Calcium Hypochlorite:
  - Follow the appropriate column from Tables E-1 through E-5 for the proper amount of calcium hypochlorite in a clean dry container.
  - Add water and stir until the powder is dissolved.
  - Allow the solution to stand for a few minutes so that any undissolved particles can settle to the bottom.
  - Pour off the clear liquid and discard the residue.
  - Disregard slight turbidity in the water.

Chlorine Solution Preparation Tables

- Tables E-1 through E-5 show the amount of each common chlorine compound or solution to add to water to produce the most commonly used chlorine concentrations. These tables show the amounts needed to produce a specific initial chlorine concentration. The amount of chlorine which remains after a given time depends on the amount of organic matter and other foreign material in the water. The actual amount of chlorine present can be determined only by sampling and testing the water.
- Preparation of stock solutions:
  - To prepare a nominal 0.25 percent stock solution of chlorine, add: 0.5 ounces (15 grams) (1 heaping tablespoon) of high test calcium hypochlorite, or 1.3 ounces (40 grams) (3 heaping tablespoons) of chlorinated lime to 1 gallon (3.8 liter) of water.
  - To prepare a nominal 2 percent stock solution of chlorine, add: 3.8 ounces (118 grams) (2/3 cup or 8 heaping tablespoons) of high test calcium hypochlorite or 11 ounces (342 grams) (2 cups or 22 heaping tablespoons) of chlorinated lime to 1 gallon (3.8 liter) of water.

Chlorination Tables

The following tables give the amount of each stock solution or chlorine compound to be added to water to produce an initial chlorine concentration of 1, 2, 5, 50 and 100 parts per million (PPM). The quantities of 0.25 percent and 2.0 percent stock solution and sodium hypochlorite listed in the tables are given in U.S. Liquid Measure (fluid ounces, pints, quarts, and gallons). The quantities of calcium hypochlorite and chlorinated lime listed are given in Avoirdupois Weight (ounces and pounds).

	0.25%	To Produce 2.0%	Initial 5 ppm Calcium	(5mg/1) Chlorine Chlorinated	Concentration Sodium	
System Capacity (Gal)	*Stock Solution*	*Stock Solution*	*Hypochlorite (HTH) 70%*	*Lime 25%*	*Hypochlorite 5%*	*10%*
5	0.3 oz.					
10	0.5 oz.	0.1 oz.				
25	1.3 oz.	0.2 oz.			0.1 oz.	
50	2.6 oz.	0.3 oz.			0.2 oz.	0.1 oz
100	5.1 oz.	0.7 oz.			0.3 oz.	0.2 oz.
200	10 oz.	1.3 oz.		0.1 oz.	0.5 oz.	0.3 oz.
500	1 pt., 10 oz.	3.2 oz.	0.1 oz.	0.3 oz.	1.3 oz.	0.7 oz.
1000	1 pt., 1 pt. 3 oz.	6.4 oz.	0.2 oz.	0.6 oz.	2.6 oz.	1.3 oz.
2000	3 qt., 6 oz.	13.0 oz.	0.4 oz.	1.1 oz.	5.2 oz.	2.6 oz.
5000	2 gal.	1 qt.	1.0 oz.	2.7 oz.	13.0 oz.	6.4 oz.

Table E-1 To produce an initial 1 ppm (1mg/1) chlorine concentration

	0.25%	To Produce 2.0%	Initial 2 ppm Calcium	(2mg/1) Chlorine Chlorinated	Concentration Sodium	
System Capacity (Gal)	*Stock Solution*	*Stock Solution*	*Hypochlorite (HTH) 70%*	*Lime 25%*	*Hypochlorite 5%*	*10%*
5	0.5 oz.					
10	1.1 oz.	0.1 oz.				
25	2.6 oz.	0.3 oz.			0.2 oz.	
50	5.1 oz.	0.7 oz.			0.3 oz.	0.2 oz.
100	11 oz.	1.3 oz.		0.1 oz.	0.5 oz.	0.3 oz.
200	1 pt., 5 oz.	2.6 oz.	0.1 oz.	0.5 oz.	1 oz.	0.5 oz.
500	1 qt., 1 pt., 3 oz.	6.4 oz.	0.2 oz.	1.1 oz.	2.6 oz.	1.3 oz.
1000	3 qt., 6 oz.	13 oz.	0.4 oz.	0.2 oz.	5.1 oz.	2.6 oz.
2000	1 gal., 2 qt., 1 oz.	1 pt.	0.8 oz.	2.1 oz.	10 oz.	5.1 oz.
5000	4 gal.	2 pt.	1.9 oz.	5.3 oz.	1 pt., 10.0 oz.	13 oz.
10000	8 gal.	1 gal.	3.8 oz.	11 oz.	1 qt., 1.0 oz., 2 pt.	

Table E-2 To produce an initial 2 ppm (2mg/l) chlorine concentration

	0.25%	To Produce 2.0%	Initial 5 ppm Calcium	(5mg/1) Chlorine Chlorinated	Concentration Sodium	
System Capacity (Gal)	*Stock Solution*	*Stock Solution*	*Hypochlorite (HTH) 70%*	*Lime 25%*	*Hypochlorite 5%*	*10%*
5	0.3 oz.	0.2 oz.				
10	0.6 oz.	0.3 oz.			0.1 oz.	
25	6.4 oz.	0.8 oz.		0.1 oz.	0.3 oz.	0.2 oz.
50	13.0 oz.	1.6 oz.		0.2 oz.	0.7 oz.	0.3 oz.
100	1 pt., 10 oz.	3.2 oz.	0.2 oz.	0.3oz.	1.3 oz.	0.7 oz.
200	1 qt., 1 pt., 3 oz.	6.4 oz.	0.2 oz.	0.6 oz.	2.6 oz.	1.3 oz.
500	1 gal.	1 pt.	0.5 oz.	1.4 oz.	6.4 oz.	3.2 oz.
1000	2 gal.	1 pt.	1.0 oz.	2.7 oz.	13.0 oz.	6.4 oz.
2000	4 gal.	2 qt.	1.9 oz.	5.4 oz.	1 pt., 10.0 oz.	13.0 oz.
5000	10 gal.	1 gal. 1 qt.	4.8 oz.	13.0 oz.	2 qt.	1 qt.
10000	20 gal.	2 gal. 2 qt.	9.6 oz.	1 lb., 11.0 oz.	1 gal.	2 qt.

Table E-3 To produce an initial 5 ppm (5mg/l) chlorine concentration

	0.25%	To Produce 2.0%	Initial 5 ppm Calcium	Chlorine Chlorinated	Concentration Sodium	
System Capacity (Gal)	*Stock Solution*	*Stock Solution*	*Hypochlorite (HTH) 70%*	*Lime 25%*	*Hypochlorite 5%*	*10%*
5	13.0 oz.	1.6 oz.		0.2 oz.	0.7 oz.	0.3 oz.
10	1 pt.	3.2 oz.	0.1 oz.	0.3 oz.	1.3 oz.	0.7 oz.
25	2 qt.	8.4 oz.	0.3 oz.	0.7 oz.	3.2 oz.	1.6 oz.
50	1 gal.	1 pt.	0.5 oz.	1.4 oz.	6.4 oz.	3.2 oz.
100	2 gal.	1 pt.	1.0 oz.	2.7 oz.	13.0 oz.	6.4 oz.
200	4 gal.	2 qt.	1.9 oz.	5.4 oz. 1 pt.	10.0 oz.	13 oz.
500	10 gal.	1 gal., 1 qt.	4.8oz.	13.0 oz.	2 qt.	1 qt.
1000	20 gal.	2 gal., 2 qt.	10.0 oz.	1 lb.	1 gal.	2 qt.
2000		5 gal.	1 lb., 3.0 oz.	3 lb., 5.0 oz.	2 gal.	1 gal.
5000		12 gal. 2 qt.	3 lb.	8 lb., 6.0 oz.	5 gal.	2 gal.
10000		25 gal.	6 lb.	17 lb.	10 gal.	5 gal.

Table E-4 To produce an initial 50 ppm (50mg/l) chlorine concentration

	0.25%	To Produce 2.0%	Initial 5 ppm Calcium	Chlorine Chlorinated	Concentration Sodium	
System Capacity (Gal)	*Stock Solution*	*Stock Solution*	*Hypochlorite (HTH) 70%*	*Lime 25%*	*Hypochlorite 5%*	*10%*
5	1 pt., 10 oz.	3.2 oz.	0.1 oz.	0.3 oz.	1.3 oz.	0.7 oz.
10	1 qt., 1 pt.	6.4 oz.	0.2 oz.	0.6 oz.	2.6 oz.	1.3 oz.
25	1 gal.	1 pt.	0.5 oz.	1.4 oz.	6.4 oz.	3.2 oz.
50	2 gal.	1 qt.	1.0 oz.	2.7 oz.	13.0 oz.	6.4 oz.
100	4 gal.	2 qt.	1.9 oz.	5.4 oz.	1 pt., 10.0 oz.	13.0 oz.
200	8 gal.	1 gal.	3.8 oz.	11 oz.	1 qt., 1.0 qt.	2 pt.
500	20 gal.	2 gal., 2 qt.	10.0 oz.	1 lb.	1 ga.	2 pt.
1000		5 gal.	1 lb.	3 lb.	2 gal.	1 gal.
2000		10 gal.	2 lb.	6 lb., 11.0 oz.	4 gal.	2 gal.
5000		25 gal.	12 lb.	32 lb.	20 gal.	10 gal.

Table E-5 To produce an initial 100 ppm (100mg/l) chlorine concentration

Appendix F:
Organisms of Concern and Types of Foodborne Illnesses

Pathogens that cause foodborne illness are classified into three categories: viruses, bacteria, and parasites.

- Viruses. Are very small pathogens that require a living host to survive. They reproduce by taking over the infected cell's reproductive mechanism. Instead of producing healthy cells, they produce viruses that go on to infect other cells.
- Bacteria. Are complete organisms that can reproduce on their own. Bacteria can survive outside and inside the body. An infection is caused by consuming bacteria that have multiplied in the food. An intoxication is caused by consuming foods in which bacteria have produced a toxin. A toxical infection is caused by consuming foods with bacteria that produce a toxin inside your body.
- Parasites. Like viruses, require a host but only to complete their life cycle. Parasites can cause foodborne illness but to a lesser extent than viruses and bacteria.

Foodborne illnesses that are the result of these pathogens are described below.

- Natural poisons. Poisons in these foods tend to attack the nervous system, resulting in such symptoms as weakness or paralysis, numbness, tingling of the ears, apprehension, and even death. Naturally poisonous foods include varieties of mushrooms, shellfish, and tropical fish (e.g., toadfish, puffer fish).
- Chemical poisons. Chemical poisoning can be caused by arsenic as residue of spray on fruits or vegetables, or cadmium or zinc dissolved by acid foods such as lemonade or tomatoes. Antimony poisoning can be caused from gray-enameled cooking utensils. Copper poisoning can be caused from copper pipes and utensils. Chemical poisonings generally are evidenced by violent nausea, vomiting, and diarrhea shortly after ingestion.
- Food intoxication.
    - Botulism. This disease is caused by Clostridium botulinum; bacteria that produce a fatal toxin. Outbreaks have been associated with low-acid canned foods, garlic and oil preparations, foiled wrapped baked potatoes improperly cooled and then used to make potato salad, and from the use of home canned foods. Ingestion of the toxin containing food, frequently as a result of sampling by an individual prior to cooking, leads to nerve paralysis manifested by symptoms of weakness, headaches, dizziness, followed by death due to respiratory or cardiac failure.

  - Staphylococcal intoxication. This disease is one of the most frequently reported foodborne illness; caused by Staphylococcus Aureus bacteria. This bacteria produces a toxin that is heat stable, it is not a fatal toxin. Outbreaks have been associated with cold protein salads, meats, and cream pastries. This disease is characterized by abrupt onset (1 to 6 hours, usually 2 to 4 hours) with symptoms of severe nausea, projectile vomiting, diarrhea, and prostration with little or no fever.

- Food infection.

  - Norovirus. Previously known as Norwalk virus, can result from fecal contamination of food and water. Food contamination can occur at the source (e.g., seafood harvested from locally contaminated waters) or by an infected food handler through poor personal hygiene. The major cause of Norovirus outbreaks has been attributed to person-to-person spread.

  - Leftovers disease. It is caused by the Clostridium perfringens bacteria; commonly associated with meats, gravies, and stews, particularly beef. Many outbreaks have resulted from the reheating of leftovers. This infection has a longer incubation period than those experienced with food intoxication, usually commencing from 6 to 24 hours or longer after ingestion. Symptoms may include fever, headache, nausea, vomiting, diarrhea, abdominal pain or distress, and prostration.

  - Salmonellosis. It is caused by the Salmonella bacteria. Infections due to Salmonella are frequently associated with poultry products, particularly turkey.

  - Vibrio parahaemolyticus. This bacteria has been reported as the cause of illness due to improperly prepared shellfish.

  - Hepatitis A virus. Hepatitis occurs when food or water are contaminated by feces. This contamination can occur at the source (e.g., sewage contamination of shellfish beds). The contamination could also come from food handler. The reservoir for Hepatitis A is humans.

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