Forest Service Handbook
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Forest Service Handbook 7409.11 – Sanitary Engineering and Public Health Handbook

Chapter 30 - Food Service

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30.2 - Objectives

The objective of this chapter is to provide the user with some basic data regarding sanitation standards for food service operations on National Forest lands. It is not intended to cover all the necessary details and requirements that have been developed for food service establishments. These must be obtained through cited references.

30.5 - Definitions

(FSM 7490.5.)

30.8 - References

1. Environmental Health Practice in Recreational Areas, U.S. Public Health Service, publication 1195.

2. Food Service Sanitation Manual, HEW publication (FDA) 78-2081.

3. Youth Camp Safety and Health, HEW publication (CDC) 78-8300.

31 - Foodborne Illness

31.1 - Biological Hazards

The following biological foodborne diseases can occur at food service facilities. A brief description of the common vehicle, symptoms, and incubation period is given for each.

1. Clostridium Botulinum. This is the specific agent for what is commonly called botulism food poisoning. This agent produces a toxin, which if not properly controlled, will cause food poisoning. It is caused by improperly processed canned and bottled foods containing the toxin, such as low-acid fruits and vegetables. Symptoms include gastro-intestinal pain, diarrhea or constipation, prostration, difficulty in swallowing, double vision, and difficulty in respiration. The incubation period can range from 2 hours to 8 days, but is generally 12 to 36 hours. Most cases of botulism poisoning results from undercooking home-canned foods and is usually fatal when ingested.

2. Clostridium Perfringens. This bacterium is a spore-forming organism which thrives in the absence of oxygen. It is found in soil, dust, and intestinal tracts of humans and animals; and is therefore likely to enter a food service establishment with any raw food product. Perfringens poisoning has been classified as both an infection and an intoxication. It most often occurs when food, frequently meat and poultry or large masses of food, are held for long periods at improper temperatures. Symptoms are diarrhea and abdominal pain, and incubation is 8-22 hours.

3. Staphylococcus. Certain strains of staphylococci thrive in the presence of atmospheric oxygen and a wide temperature range, and produce a toxin that causes food poisoning. The specific agents are enterotoxins, staphylococcus albus, and

staphylococcus aureus. These toxins are stable at boiling temperatures, and may cause food poisoning, even after heating. The common vehicle for the disease 1ncludes contaminated custard pastries, cooked or processed meats, poultry, egg products, hollandaise sauce, salads, and milk. Human beings are considered to be the most prevalent source of contamination, and foods held at improper temperatures are responsible for bacterial growth. Symptoms are acute nausea, vomiting, prostration, cramps, and diarrhea, followed by rapid recovery of individuals affected. The incubation period is 1-6 hours, with an average of 2-4 hours.

4. Salmonellosis. This infection results from the consumption of food contaminated with large numbers of pathogenic bacteria from one of the more than 400 types of the Salmonella family. These bacteria grow with or without the presence of oxygen, but are killed at temperatures of 140 F or higher. Source of the bacteria include pets and human beings. Many foods have been implicated, but outbreaks are most commonly associated with meat, poultry, egg products, milk products, shell fish, sliced meat, and lightly cooked foods. Symptoms include headache followed by vomiting, diarrhea, abdominal cramps, and fever; and usually occur within 6-8 hours after ingestion. Mild cases last 2-3 days, but severe infections can persist.

5. Shigellosis. This is a bacillary dysentery caused by an organism of the genus Shigella. It occurs in most prepared foods such as hams and egg salad, and milk or dairy products that usually have been contaminated with feces of an infected person. Symptoms are diarrhea and cramps, accompanied by fever and often vomiting, usually developing in 2-3 days after consuming the food containing the organism.

6. Trichinosis. This is one of the more important parasitic infections of concern to the food service worker. It is caused by a tiny worm that infects hogs and other animals used for food. These worms burrow into the muscle of animals, and when raw or insufficiently cooked meat containing the live larvae is eaten, infection and illness may occur. The initial symptoms of trichinosis which appear between 2-28 days after eating the contaminated food are vomiting, nausea, and abdominal pain. Later, muscular stiffness, fever, and rashes may develop. Although it is not often fatal, there is no known cure and full recovery is slow. The only safeguard against trichinosis is the cooking of pork until it reaches an internal temperature of 150 F. or higher.

Biological health hazards can be reduced or eliminated by a combination of preventative measures. These are discussed in further detail in sections 31.3 - .35.

31.2 - Chemical Hazards

The food service manager can reduce the risk of exposure to chemical contamination through the following actions:

1. Pesticide Contamination. Purchase food from reputable approved sources, and wash all fresh fruits and vegetables thoroughly. Properly label all chemicals, polishes, caustics, pesticides, etc., and separate them from foodstuffs.

2. Additives. Ensure additives are never used to cover up spoilage in food, and that only approved additives in limited amounts are used.

3. Metal Contamination. Store food only in those containers intended for that purpose. High-acid foods should not be stored or prepared in copper, brass, galvanized, or gray enamelware containers.

Thoroughly wash any food which may have a minor amount of pesticide residue. Discard any food with a significant risk of chemical contamination.

31.3 - Preventative Measures

31.31 - Food Care

1. Food Supplies. The sound condition, proper labeling, and safety of food are basic requirements for the protection of public health. To prevent food spoilage and to control foodborne illness which may result from improperly processed, handled, and transported food, only sources that comply with all laws relating to food supply shall be used.

2. Food Protection. If mishandled, food can become contaminated with pathogenic organisms and toxic chemicals from various sources. Food protection measures must be designed to protect food from being contaminated at all times, either during transportation or within the food service facility. Proper food protection measures include:

a. Application of good sanitation practices in the handling of food.

b. Strict observance of personal hygiene by all food service workers.

c. Keeping potentially hazardous food refrigerated or heated to temperatures that minimize the growth of pathogenic micro-organisms.

d. Inspection of food products as to their sanitary condition prior to use.

e. Provision of adequate equipment and facilities.

3. Food Storage. Proper storage of food ensures that there will be minimal contamination of the food from any source and that the natural growth of micro-organisms in the food will not result in foodborne illness. Measures to prevent the contamination of food must consider the environment in which food is stored and the potential for contamination under such conditions. These measures are divided into several basic categories:

a. Containers. Food must be covered in order to provide physical protection of the food. Such covers must be impervious and nonabsorbent to eliminate the possibility of the container being a vector for contamination.

b. Labeling. Bulk ingredients must be properly labeled to prevent confusion and inadvertent contamination of food due to possible similar appearances.

c. Temperature. Proper storage temperatures, and the availability of facilities to maintain temperatures, are the best available means to control the growth of pathogens. A means for continuously monitoring air (ambient) temperatures must be provided by thermometers in or on equipment.

d. Cooling. Since any temperatures between 45 and 140 F. present a hazard to public health in terms of microbial growth, food must remain in the critical temperature zone as little time as possible, and the cooling period shall not exceed 4 hours. Frozen food shall be kept frozen and should be stored at a temperature of 0 F. or below. If thawed, food should not be refrozen.

4. Food Preparation. Food preparation is the period during which food is least protected due to necessary manipulation. During this time, food is subjected to potential contamination from many sources. Once the food has been contaminated, improper procedures for cooking, reheating, or cooling permit the survival as well as the rapid and progressive growth of pathogenic micro-organisms.

The food preparation process should include:

a. Strict observation of personal hygiene by all food service workers.

b. Continuous application of sanitary food handling techniques.

c. Cooking and reheating procedures that ensure pathogen destruction.

d. Thorough washing of all foods to be consumed in the raw state.

e. Minimal handling of the food before, during, and after preparation.

5. Food Service. Contamination of food during service results from contaminated equipment, improper control of food temperatures, and unsanitary service procedures that fail to provide adequate protection. The sanitary requirements for service of food must address themselves to two basic areas:

a. The protection of food from external contamination by directing the efforts of employees toward sanitary practices.

b. The protection of food by requiring protective devices and equipment and operational procedures that preclude any incidental contamination.

31.32 - Food Service Personnel

1. Employee Health. Disease transmitted through food frequently originates from an infected food service employee even though the employee shows little outward

appearance of being ill. A wide range of communicable diseases and infections may be transmitted by infected personnel to other employees and to the consumer through the contamination of food and through careless food handling. Both management and staff must ensure that no person who is affected with any disease that can be transmitted by food works in any area of food service operation where there is a possibility of disease transmission.

2. Personal Hygiene. It is essential that employees observe strict standards of cleanliness and proper hygiene during their work periods and before starting work or returning to work after any interruption of their food service activities.

a. Clothing. The outer clothing of all employees shall be clean and not subject to easy soiling. Employees shall use effective hair restraints.

b. Employee Practices. Overall cleanliness and observation of good hygiene practices by employees includes not only personal cleanliness, but also the way or manner in which routine duties are performed. Smoking or eating by employees anywhere but in designated areas is prohibited. Careless handling of soiled surfaces of tableware or linens should be avoided because it unnecessarily exposes employees to health hazards. Employees must be especially careful to keep their hands clean.

31.33 - Food Service Equipment and Utensils

The materials, design and fabrication, and the installation and location requirements for food service equipment and utensils are contained in public health codes and ordinances (sec. 20.8, item 2). The primary factor to be considered in all of these areas is accessibility for cleaning and inspection.

1. Cleaning and Sanitizing. Regular cleaning and sanitizing of equipment, utensils, and work or eating surfaces minimizes the probability of food contamination. Effective cleaning will prevent the accumulation of food residues which may support the rapid development of food poisoning organisms or toxins. Use of effective sanitizing procedures destroys those organisms which may be present after cleaning and prevents the transfer of these disease organisms to consumers either directly through utensils or indirectly through food. Requirements for cleaning frequency, and cleaning and sanitizing procedures, are listed in section 20.8, item 2.

2. Storage. Storage and handling procedures for cleaned and sanitized equipment and utensils must be adapted to protective storage conditions to prevent exposure and contamination from many factors in the storage environment.

31.34 - Physical Facilities

Particular attention must be given to the materials and construction used for floors, walls, and ceiling of food service facilities. Materials should be nonabsorbent and easily cleaned to prevent unsanitary conditions. Adequate lighting for working surfaces, rooms, toilets, and hand-washing areas must be provided. Foot-candle requirements

are listed in appropriate codes. Proper ventilation is required to remove odors, steam, and smoke. Food handling operations in sleeping areas are prohibited.

31.35 - Sanitary Facilities and Controls

An adequate potable water supply must be provided (FSM 7420).

Methods of wastewater disposal must be approved FSM 7430, 7440).

Plumbing must be properly installed and maintained to ensure that no cross-connections are present and no back siphonage is possible. Toilet facilities must be provided for food service employees. Toilet rooms must be easily accessible, but cannot open into rooms where food is prepared. Lavatories must be provided with hot and cold running water, and adequate hand-drying facilities furnished.

Proper handling of garbage and refuse is necessary to minimize the development of odors, to prevent the waste from becoming an attraction or breeding place for insects and rodents, and to prevent the soiling of food preparation and food service areas. This is particularly important for kitchens and other food service operations.

Garbage and refuse shall be kept in durable, easily cleanable, insect-proof and rodent-proof containers that do not leak and do not absorb liquids. Garbage cans should be of heavy-duty plastic or galvanized metal and have tight-fitting lids. Dumpsters and compactor systems shall be provided with tight-fitting lids, doors or covers, and shall be kept covered when not in actual use.

Soiled containers shall be cleaned at a frequency to prevent insect and rodent attraction--generally, at least each time the container is emptied. Each container shall be thoroughly cleaned on the inside and outside. Adequate facilities, including hot water and detergent or steam, shall be used for washing containers.

An adequate number of containers shall be provided to properly store all garbage and refuse that accumulates between collections.

Solid-waste collection and disposal must be in accordance with established standards (FSM 7460, FSH 7409.11).

Insect and rodents (pests) are capable of transmitting diseases to man by contamination of food and food-contact surfaces. Therefore, effective measures intended to minimize the presence of rats, mice, flies, cockroaches, and other insects must be utilized.

The food service manager should concentrate on the following two areas:

1. Physically preventing pests from entering by closing off any opening in the facility.

Outside openings shall be protected by tight-fitting, self-closing doors, screening, and other means. Screening material shall not be less than 16 mesh to the inch.

2. Eliminating sources of food and water, as well as breeding and hiding places, through proper housekeeping.

If insect or rodent pests become established, it may be necessary to resort to pesticides. Poisons, however, should not be considered a substitute for good sanitation. While an insect or rodent infestation may be eliminated by use of pesticides, pests will almost certainly return unless the facility is kept clean and food supplies are protected.

Because most pesticides are toxic, these poisons must be selected and applied with great care. Proper precautions must be observed in the use, storage, and disposal of pesticides.

32 - Food Service Alternatives and Requirements

All Forest Service-operated food service facilities shall provide equipment and/or operations capable of ensuring compliance with the following criteria:

1. Food supplies shall be of sound condition with no detectable spoilage.

2. Potentially hazardous food products shall meet temperature requirements during storage, preparation, display, serving, and tranportation. Suitable facilities and equipment shall be provided to ensure this capability.

3. Potentially hazardous foods shall not be retained once they are unwrapped or otherwise served.

4. Personnel with infectious or other diseases shall not be used as food handlers.

5. All food service personnel shall employ good hygienic practices.

6. Food equipment and utensils shall be thoroughly washed after each use, including a sanitizing rinse.

7. Provisions shall be made for convenient and accessible toilet facilities, and hand-washing facilities with hot and cold water.

8. Food service facilities shall be free of insects, rodents, and other animals including domestic pets. Toxic items shall be properly labeled and stored in an area remote from food preparation, storage or service areas.

32.1 - Fixed Food Service Facility

(FSM 7490.5.) The permanent facilities and equipment at these long-term heavily used mess operations must meet the most stringent requirements for cleanliness and durability, as well as service. Special attention should be given to:

1. Construction and maintenance aspects of walls, floors, and ceilings.

2. Arrangement and design of equipment and fixtures.

3. Utility service design.

Consideration should be given to provision of health-related equipment, such as automatic dishwasher, cafeteria serving equipment; carefully designed refrigeration, freezer, and dry-storage facilities; vegetable sink; nonabsorbent food contact and cutting-board surfaces.

These facilities should always employ trained, full-time food service employees. Management and operation of the facility shall comply with all aspects of State and local food service regulations.

32.2 - Modified Food Service Facility

(FSM 7490.5.) Facilities at these seasonal mess operations generally are not as sophisticated as those for fixed facilities (sec. 32.1), but must still comply with the criteria outlined under FSM 7491.2. If certain facilities or equipment are not feasible, the mode of operation must be adjusted to compensate to provide equal protection against contamination or the facility should not be used. An example might be either the use of more canned goods, if sufficient refrigeration space cannot be provided, or the heating of water over a stove for hand washing and dishwashing, if running hot water cannot be provided. The relatively small number of crew members at some camps may dictate individual or group cooking arrangements. However, when crew size reaches 10 or more persons, every consideration shall be given to assigning trained full-time food service personnel for food service operations.

A goal for all of these types of operation should be to provide food service facilities and equipment comparable to, if not as sophisticated as, that which would be provided for a fixed food service facility. If a permanent facility is not practical, consider a well-designed mobile facility which can be moved from site to site as the workload shifts.

32.3 - Temporary Food Service Facility

(FSM 7490.5.) Short-duration transitory camps, such as fire camps, wilderness camps, and fly-in camps, all involve unique food service problems. Since it is impossible or impracticable to provide a full range of facilities and equipment at these locations, operations must be adjusted to meet FSM 7492 criteria. Maintenance of temperature requirements of potentially hazardous food products during transportation, storage, preparation, and serving is probably the most critical area of concern for these camps. This may dictate use of freeze-dried or canned products. If perishable foods, including

fire-camp, precooked, frozen field meals are utilized, knowledgeable food service personnel shall follow applicable product-handling instruction when provided, or exercise extreme care to maintain proper temperatures, if specific instructions are not provided. Additional requirements for camp cooking operations, water supply, camp sanitation, refuse disposal, etc., can be found in sections 7-5 through 7-11 of FSH 6709.11, Forest Service Health and Safety Code.

32.4 - Semiprivate Food Service Facility

(FSM 7490.5.) Facilities designed specifically as bachelor quarters which provide facilities for individual or small-group cooking are becoming more and more prevalent throughout the Forest Service. Generally, these are permanent facilities which are located at Ranger Stations or work centers. The key to satisfactory cooking operations at these facilities is competent design which provides equipment capable of meeting the FSM 7492 criteria.

Although it is not practical to monitor the actual food handling operations at these facilities, employee training in food service sanitation and periodic inspection of housekeeping by unit managers will aid in ensuring employee health.

33 - Program Compliance Procedures

33.1 - Inspections

The required frequency of inspections is given in FSM 7493.1. Federal, State, and local health agencies have developed standard report forms. These forms or a report with a similar format should be used for recording inspection findings. Inspection remarks should list the type of violation and include the corrections to be made.

Violations are generally given a weighted point value, based on the potential health hazard, within a range of 1-5. When this format is used, items which have a 4- or 5-point weight and are in violation shall be corrected as soon as possible, but in any case, within 10 days following the inspection. Followup shall be made to confirm that proper corrective actions have been taken. Violation of 1- or 2-point-weight items shall also be corrected as soon as possible but, in any event, by the time of the next routine inspection.

With this format, the overall rating score for a food service facility is based on the weighted point value of all violations, subtracted from 100. When the total rating score of a facility is less than 60, corrective action shall be initiated on all identified violations within 48 hours. One or more reinspections shall be conducted to ensure proper corrective measures have been completed. Similar actions are required if other inspection formats are used. (sec. 20.8, item 2).

33.2 - Training

The National Sanitation Clinic recommends a basic 10-hour course for food service workers covering the following topics:

1. Responsibility of the food handler.
2. Personal health and hygiene.
3. Food sources, handling and protection, and food poisoning.
4. Cleaning and sanitizing, handling and storage of equipment.
5. Housekeeping and waste disposal practices.
6. Insect and rodent control.
7. Employee cleanliness and good working habits.

It is recommended that Regions develop a training program for all food service employees based on this format. Many States provide training material, testing and issue food-handling permits to personnel who pass the required tests. Regions may wish to use these programs for the training necessary to develop qualified food service personnel.