

foodservice sanitation



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Foodservice Sanitation

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I. INTRODUCTION:

The foodservice industry has changed greatly in the past ten years. One of these changes has been an increased emphasis on sanitation. The increased use of convenience foods, ingredient rooms and other innovations also demands that the foodservice manager pay even closer attention to sanitation practices and procedures.

Sanitation is the responsibility not only of the foodservice manager, but all those who work in the foodservice operation. Every employee needs to be properly trained in the area of sanitation. Nothing could be worse than "almost sanitary" when it comes to foodservice sanitation. What might appear as a small error in sanitation practices can lead to an outbreak of foodborne illness which affects many children and adults.

This publication will outline the major principles of foodservice sanitation. It is, however, by no means a complete guide. In order to fully understand all aspects of foodservice sanitation, the subject requires more in depth study. A bibliography has been included for your convenience.

One point which should be clarified at the outset is the distinct difference between the terms cleanliness and sanitation. Sanitation is derived from a Latin word "sanitas" meaning health. This is really the goal of all foodservice managers, a healthy environment. The foodservice environment should be one which promotes the health and well being of all who eat there. On the other hand, it should not promote the health and well being of micro-organisms which could very easily cause illness. Cleanliness means free from visible soil, and while this is certainly a desirable goal, a clean environment may not be a sanitary one. A sanitary environment is one which is free from disease causing organisms and contaminants. The goal of all foodservice managers should be a totally sanitary environment.

II. UNDERSTANDING AND AVOIDING THE MAJOR SANITATION HAZARDS:

Biological Hazards:

While it is not the purpose of this manual to discuss food microbiology, it is important that the basics be understood. Micro-organisms are present all around us in the environment. A foodservice manager must, therefore, possess a working understanding of these micro-organisms.

Bacteria represents the single greatest concern to a foodservice manager. Bacteria are single cell organisms which need nutrients to maintain their functions. These organisms are extremely small, as a typical bacterium measures 1/25,000 inch. It would take nearly two thousand typical bacteria to reach across the head of a pin.

Growth of Bacteria:

Like any organism, bacteria grow best under ideal conditions.

These ideal conditions include:

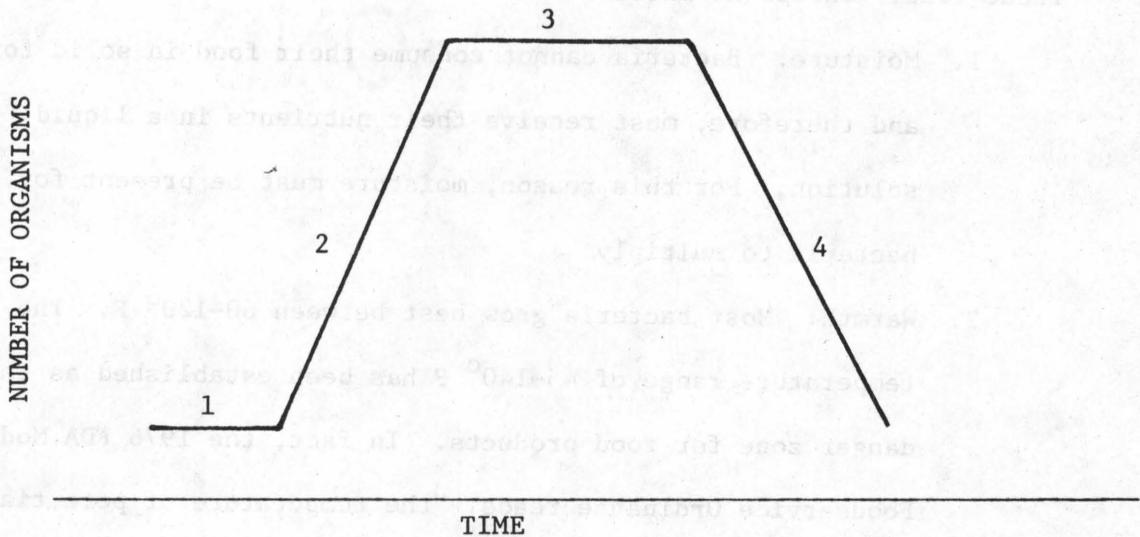
1. **Moisture:** Bacteria cannot consume their food in solid form and therefore, must receive their nutrients in a liquid solution. For this reason, moisture must be present for bacteria to multiply.
2. **Warmth:** Most bacteria grow best between 60-120° F. The temperature range of 45-140° F has been established as the danger zone for food products. In fact, the 1976 FDA Model Foodservice Ordinance reads, "the temperature of potentially hazardous food shall be 45° F or below or 140° or above at all times except as otherwise provided by the ordinance."
3. **Food:** Bacteria grow best if the food supply is neutral or slightly acidic. Many foods provide these ideal requirements including: meat, fowl, milk, eggs, fish and shellfish. Bacteria will not multiply rapidly on a highly acidic food including fresh fruits such as citrus fruits and tomatoes.

4. Oxygen: Micro-organisms have varying needs for oxygen.

Some require the presence of oxygen for growth and are called aerobes. These include molds, yeast and some bacteria. Other micro-organisms grow only without oxygen and are called anaerobes. Still other types may grow with or without the presence of oxygen and are called facultative micro-organisms.

Despite the fact that bacteria are very tiny, they multiply very rapidly under a wide variety of environmental conditions. A single bacterium can easily divide and multiply into billions of bacteria within a matter of a few hours.

The chart below illustrates the growth pattern exhibited by bacteria.



GROWTH CURVE FOR BACTERIA

1. Lag phase - no multiplication
2. Log phase - rapid multiplication
3. Stable phase - number of new cells equals the number of dying cells
4. Decline phase - cell deaths outnumber new cells

In addition to bacteria, a biological hazard is also presented by viruses and fungi. Viruses are micro-organisms which are much smaller than bacteria. They are not complete cells and must therefore depend upon a living host to provide assistance in reproducing. For this reason, they are referred to as parasites. Fungi vary in size from tiny single cell organisms to large mushrooms. The most common fungi which should concern the foodservice manager are yeasts and molds. However, not all yeasts and molds are dangerous and in fact many produce desirable benefits, such as in baking.

A foodservice manager needs to possess a basic understanding of the nature of the biological hazard, yet more importantly must know how to control this hazard. Practices which should be implemented are outlined below.

Practices for Controlling the Biological Hazard:

1. Promptly refrigerate all food products at a temperature of less than 45° F.
2. Prohibit workers with open cuts, sores or respiratory infections from handling food.
3. Avoid hand contact with food through the use of disposable plastic gloves.
4. Carefully handle leftovers, through refrigeration and reheating to an internal temperature of at least 165° F.
5. Prepare and serve all food as close to the time of consumption as possible; avoid preparing food a day in advance.
6. Quick chill foods which are left over in an ice water bath if necessary; do not cool at room temperature.
7. If a large quantity of food remains leftover, divide it into several shallow containers to promote more rapid cooling.
8. Isolate raw foods from cooked products to prevent cross contamination.

The biological hazard which a foodservice manager confronts is a unique challenge. It is extremely important that the foodservice manager possess a basic understanding of the biological hazard and thoroughly implement practices and procedures which will control this hazard.

Chemical Hazards:

As agriculture in the United States has become more industrialized, the dangers of chemical contamination have increased. The chemical hazards may be divided into three categories: (1) pesticides and cleaning agents; (2) food additives in excessive quantities and (3) contamination of food with toxic metals.

Pesticides represent a significant hazard to a foodservice manager. Because of the increased usage of pesticides in the growing and processing of food supplies, it is extremely important that the foodservice worker thoroughly wash all fresh produce, fruits, and vegetables. In addition, the individual responsible for purchasing food must be assured that the food suppliers are reputable. Finally, it is important that all pesticides and chemical agents used within a foodservice operation be stored in the original containers and away from food supplies. A separate storage facility is required for chemicals.

There is debate about the use of some food additives, and the effect that additives have on the health of individuals. For this reason make certain that only approved additives are used and that the quantities advised on the standardized recipes are followed exactly.

Some serious side effects can result when certain metals come in contact with food. For example, highly-acidic foods should never be stored in copper, brass or galvanized containers. To prevent accidental chemical reactions, be sure that containers are used only as intended for storage.

Chemicals are extremely useful substances, but they must be used with caution to be most effective. Be certain that all food products are thoroughly washed before use. Make certain that only approved food additives are used and in the quantities specified. Store food products only in approved containers.

Physical Hazards:

Foodservice managers must also be on the lookout for physical contaminants, including chips of broken glass and metal fragments caused by equipment such as worn or dirty can openers. One commonly violated sanitation rule is exhibited by the failure to use an ice scoop when filling a glass. Some employees will merely scoop the ice with the glass. This could easily chip the glass and could cause injury to a customer or employee. It is important that all foodservice employees constantly watch for physical hazards in the kitchen and dining area, because the majority of these hazards result from carelessness.

By far the most serious challenge is presented by the biological hazard. A foodservice manager needs to establish a comprehensive program to eliminate this hazard. The chemical hazard also poses a challenge and must of course be dealt with properly through food purchasing practices as well as the proper use and storage of all chemicals. Finally, the physical hazard presented by glass and other materials must be guarded against through proper training and supervision.

III. PROTECTING FOOD FROM CONTAMINATION

Storage Principles:

One of the goals of any foodservice operation is to serve the most nutritious food products possible. Following the purchase of raw food products, the key to maintaining the nutritional value of food is through proper storage. With the exception of some wines, food will not improve through prolonged storage and in fact deteriorates. Consequently, the first rule of foodservice sanitation is to keep food storage time periods to an absolute minimum. Purely and simply, food is most desirable from a quality and nutritional point of view when it is fresh.

Prior to a discussion of specific storage practices, an outline of general guidelines for storage is as follows:

1. All food should be stored using the first-in--first-out (FIFO) methods. All stock needs to be dated upon arrival and must be rotated to assure that the oldest supplies are used first.
2. Food should be stored only in designated and approved food storage areas. Food must not be stored in hallways and employee toilet areas.
3. Food should be stored in clean wrappers or containers which are air-tight and nonabsorbent.
4. A sanitation and cleaning schedule should be established to assure the proper cleaning and maintenance of storage areas.
5. When refrigerating large capacities of leftover food, break the food down in smaller quantities, preferably in shallow pans, to promote more rapid cooling.
6. Fill refrigerators and freezers only to capacity being sure to allow room for air circulation.

In addition to the general guidelines for storage, a foodservice manager should also practice the following specific storage requirements.

Dry Storage Practices:

1. Store products at least 6" off the floor on clean, dry surfaces to permit cleaning floor areas and to protect the food from contamination.
2. Do not store dry goods directly under exposed sewer pipes or water lines.
3. Store products at least 2" from the wall to permit sufficient air circulation.
4. Store all chemicals including soaps, detergents, bleach and pesticides separately from food supplies.
5. Store all opened packages in sealed and labeled containers. Do not leave opened packages unwrapped.
6. No smoking should be permitted in the dry storage area.

Refrigeration Storage Practices:

Contrary to what many individuals believe, refrigeration will not kill micro-organisms. Food placed under refrigeration will have micro-organism growth retarded, but the organisms will not be totally eliminated.

1. All food placed in the refrigerator must be kept in clean, non-absorbent, and covered containers. Labels should also be affixed to identify the product and the date of storage.
2. Do not store packaged food in contact with water or undrained ice.
3. Store food at the following ideal temperatures.

Meat	32-36° F
Fish	30-34° F
Dairy	38-40° F
Fruits/Vegetables	40-45° F
4. Do not over fill refrigeration units; make certain there is adequate room for air circulation.
5. Do not store food directly on the floor or base of the refrigeration unit.
6. Check the temperature of the refrigeration units at least twice per day to assure that food products are being maintained at the proper temperature.

Freezer Storage:

The practices which were established for refrigerated storage also apply to freezer storage. Additional practices are outlined below.

1. Store all frozen food products between 0-10° F.
2. Wrap food well to prevent freezer burn.
3. Check the freezer frequently for excessive build-up of frost and defrost as often as necessary to prevent this build-up.

Storage of food is extremely important and must be a priority concern of a foodservice manager if high quality food products are to be maintained. The palatability and nutritional value of food served in foodservice operations can only be as high as the standards which are maintained in storage. Professional foodservice management begins with the establishment and implementation of a quality storage system.

Preparation and Serving Principles:

The process of food preparation and service presents many sanitation hazards to a foodservice manager. Many sanitation violations result from improper food handling practices by employees. It is important that an organized training program provide all employees with the knowledge and skills necessary to practice proper sanitation.

The majority of food related illness results because proper sanitation practices are not applied in the following areas.

1. Mistakes can occur in preparing and combining ingredients which results in contamination.
2. Foodservice workers can fail to monitor and control proper temperature levels throughout the production process.
3. Unsanitary methods are utilized in holding, displaying and serving of food.

Temperature Danger Zone:

The major sanitation rule to remember is the time and temperature principle. Food products are most vulnerable between ³⁵45-140° F. During all phases of food storage, production, holding, display and service, food should pass through this temperature range as quickly as possible. A violation of this principle occurs when food products are thawed improperly. Large frozen items such as turkeys require long thawing periods if placed under refrigeration. Because of improper planning, it may be necessary to thaw products more quickly than the refrigeration unit would allow. Managers might be tempted to thaw food products at room temperature. This practice must be avoided because while the interior of the turkey will remain frozen, the exterior will have thawed and will be within the temperature danger zone of 45-140° F. This range promotes bacterial growth.

Proper Methods of Thawing Food:

1. Under refrigeration at a temperature of less than 45° F.
2. Under running water at a temperature of less than 70° F.
3. In a microwave oven, but only when the food will be immediately transferred to conventional cooking facilities as part of a continuous cooking process or when the entire uninterrupted cooking process takes place in the microwave oven.
4. As a part of the conventional cooking process.

Once foods are prepared it is important that they be served as quickly as possible. The longer food is held prior to service the greater the chance for a sanitation problem to occur. In addition to maintaining the holding time to a minimum prior to service, the following practices should be followed.

Food Holding and Service Practices:

1. All hot food items must be maintained at a minimum temperature of 140° F. Don't depend on the controls on the steam table, check every item with a thermometer.
2. Hold all cold food items at a maximum temperature of 45° F. Again, check the cold items with a thermometer.
3. Hold food items in as shallow a pan as possible to assure that the proper temperature is maintained throughout the entire product.
4. Keep all steam table pans covered when not serving, to help retain heat.
5. To assure that food is not contaminated by service personnel make sure that the proper service utensils are utilized.
6. Use batch cooking techniques to reduce holding times.
7. Make certain that the temperature of hot food items is at least 140° F prior to placing the item on the steam table. A steam table is designed to hold hot food, not finish the cooking process.

Cleaning and Sanitizing Principles:

Following the production and service of food, the cleaning and sanitizing of all food contact surfaces must be done. This rule applies not only to tableware and pots and pans, but also to stationary equipment

and all utensils which come in contact with food products. As mentioned earlier, cleaning is the removal of visible soil, while sanitizing involves the maintenance of the number of micro-organisms at a safe level. Sanitizing may be accomplished through the use of heat or chemicals.

Heat sanitizing normally is accomplished with the use of hot water. Items to be sanitized must be submerged in 170° F water for a minimum of 30 seconds or exposed to 180° F water in an automatic dishwasher. Live steam may also be used to sanitize equipment and utensils, but this isn't nearly as common.

Chemicals are also widely used in the sanitizing process. The most common types of chemical sanitizers are either chlorine or iodine compounds. When chemicals are used to sanitize, utensils must be submerged in chemically treated water for a minimum of one minute. The various chemical compounds provide directions for the amount of chemical to be added per gallon of water. For example, "add ½ ounce per gallon of water" is a common direction. In order to determine the number of gallons of water in a sink, use the following formula.

$$\frac{L \times W \times D}{231} = \text{Number of gallons of water in the sink}$$

L = Length of the sink, measured in inches

W = Width of the sink, measured in inches

D = Depth of the water in the sink, measured in inches

When work surfaces such as work tables are being sanitized, a chemical concentration level which is twice as strong as for submersion must be used. For example, for submersion a concentration of 100 parts per million of a chlorine is required, while a concentration of 200 parts per million is required to sanitize work surfaces.

Test kits should also be used to assure that the proper concentrations of chemicals are achieved.

Washing and Sanitizing Principles:

1. Be certain to operate automatic dish machines according to the manufacturer's instructions.
2. Properly rack all tableware and silverware so that all surfaces are exposed.
3. Allow all clean tableware and silverware to air dry. Do not towel dry.
4. Do not touch any parts of tableware or silverware which are food contact surfaces.
5. Store clean cups, glasses inverted to prevent contamination.

Developing and Utilizing A Sanitation Checklist:

It is strongly advised that every foodservice manager develop and implement a sanitation checklist as well as a maintenance plan which will provide for adequate sanitation. The National Restaurant Association publishes an excellent manual which will facilitate the development of this type of program. It is titled, Sanitation Operations Manual and is available from the National Restaurant Association, Suite 2600, One IBM Plaza, Chicago, Illinois 60611, Telephone: (312) 787-2525.

Below is a suggested beginning for a sanitation checklist which could be utilized by a foodservice manager.

XYZ Foodservice Company

Managers Daily Sanitation Checklist

Date: _____

Inspected by: _____

	ACCEPTABLE	NOT ACCEPTABLE	COMMENTS
1. steam table, top & sides & glass			
2. cold food cart, top, side & glass			
3. coffee maker			
4. milk dispenser			
5. beverage bar			
6. ice storage bin			
7. deck oven			

Managers Daily Sanitation Checklist (continued)

	ACCEPTABLE	NOT ACCEPTABLE	COMMENTS
8. convection oven			
9. range top and oven			
10. deep fryer			
11. food slicer			
12. work counters & surfaces			
13. work counters - interiors & drawers			
14. refrigerators, freezers, interior & exterior			
15. stainless steel sinks			
16. handwashing area			
17. trunnion kettle			
18. steamer			
19. mixer			
20. can opener			
21. utility carts and racks			
22. microwave oven			
23. tray cart			
24. dishmachine			
25. cabinets - exterior & interior			
26. ventilation hood			
27. dining room tables & chairs			
28. mop bucket & water			

29. dishmachine temperature recorded: wash _____ rinse _____

30. milk dispenser temperature recorded: A.M. _____ P.M. _____

31. temperature: Refrig. #1 A.M. _____ P.M. _____
 Refrig. #2 A.M. _____ P.M. _____
 Refrig. #3 A.M. _____ P.M. _____
 Refrig. #4 A.M. _____ P.M. _____
 Freezer #1 A.M. _____ P.M. _____
 Freezer #2 A.M. _____ P.M. _____

32. pot sink temperature: wash _____ rinse _____ sanitize _____

Food Temperatures on Service Line of the Last 3 Portions Remaining
 In Pan.

	FOOD	TEMPERATURE
1. entree		
2. vegetable		
3. vegetable		
4. soup		
5. gravy or sauce		
6. one item from cold table particularly a mayonnaise based salad		

IV. CONCLUSION

Sanitation Rules Make Sense:

Some practices and guidelines seem to make little sense and may or may not apply universally. This is not true of the practices for sanitation. Sanitation practices make sense. If the guidelines and practices which have been outlined are not followed, (1) you may be in violation of one or more health codes and (2) the health and well being of many customers and employees may be in jeopardy. Sanitation practices have been established because they have been proven sound over a period of many years. Close adherence to these rules makes not only good legal sense, but also it's just sound sanitation management. Below is a list of the ten most important sanitation principles.

1. When refrigerating potentially hazardous foods, make certain an internal product temperature of 45° F or less is maintained.
2. Use extreme care in storing and handling food products prepared in advance of service.
3. Cook or heat-process food to recommended temperatures.
4. Relieve infected employees of food handling duties and require strict personal hygiene on the part of all employees.
5. Make certain that steam tables and other hot food holding devices maintain food at a minimum temperature of 140° F.
6. Give special attention to inspection and cleaning of raw ingredients that will be used in foods that require little or no cooking.
7. Heat leftovers quickly to an internal temperature of 165° F.
8. Avoid carrying contamination from raw to cooked and ready-to-serve foods via hands, equipment and utensils.
9. Clean and sanitize food contact surfaces of equipment after every use.
10. Obtain foods from approved sources only.¹

¹National Institute for the Foodservice Industry, Applied Foodservice Sanitation, 2nd edition, St. Louis: D.C. Heath and Company, 1978, p. 101.

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