

BEST PRACTICES FOR COMPLIANCE TO FOOD SANITARY CONDITIONS IN FLORIDA SKILLED NURSING FACILITIES

It is recognized that food safety is a shared responsibility between food service establishments and government. Based on this, the Agency for Health Care Administration created a Quality Council to examine this non-compliance issue and to develop best practices to educate providers to improve compliance under CFR 483.35(h)(2).

This document was created by the Quality Council to describe some of the specific non-compliance issues cited under CFR 483.35(h)(2) in Florida, and to share best practice advice for skilled nursing facility providers.

Three categories of compliance issues were identified from analysis by the Quality Council from a sample of deficiencies cited at CFR 483.35(h)(2), statewide, during the State Fiscal Year 2002-2003. These three compliance issues are:

1. Limiting Organisms of Public Health Concern (Food Holding);
2. Food Protection from Contamination; and
3. Warewashing and Equipment Sanitation.

For each category of compliance issues, the corresponding 2001 Food Code Provision and the State Food Hygiene Code will be identified, the food safety risks and outcomes will be delineated, and finally the best practice advice will be presented. The *best practice* advice is not all-inclusive and will not guarantee compliance.

FOOD CODE PROVISIONS AND FLORIDA ADMINISTRATIVE CODE

The compliance issues are found under the US Department of Health and Human Services, Public Health Service and Food and Drug Administration, Food Code, 2001 Recommendations. This Food Code “is a model for safeguarding public health and ensuring food is unadulterated and honestly presented when offered to the consumer.”¹ It represents the Food and Drug Administration’s best advice for a uniform system of provisions that address the safety and protection of food offered at retail and in food service. The corresponding Florida Administrative Code, 64E-11, Food Hygiene Code is also included to illustrate similarities and differences.² Although the Agency for Health Care Administration does not enforce the State Food Hygiene Code, Florida licensed skilled nursing facilities are required to comply with this law.

Critical

Identifies Food Code provisions which are *critical*. That is, noncompliance with these provisions is more likely than other provisions to contribute to food contamination, illness, or environmental health hazard.

Noncritical

Identifies Food Code provisions that are *noncritical* items.

Swing

Identifies Food Code provisions that *may or may not* be critical depending on the circumstances.

Compliance Issue #1

Limiting Organisms of Public Health Concern/Temperature and Time Control:

- Frozen Food
- Thawing
- Hot and Cold Food Holding
- Ready to Eat, Potentially Hazardous Food Date Marking and Disposition.

SPECIFIC EXAMPLES OF ISSUES ACTUALLY CITED

- The ambient temperature of freezer units were not maintained 0° F or below.
- Frozen foods were not properly thawed.
- Hot foods held on the steam table during tray line were not maintained at 140° F or above.
- Cold foods held during tray line were not maintained at 41° F or below.
- The ambient temperature of cold food holding equipment, such as refrigerators units was not maintained at 41° F or below.
- Refrigerated food was not date marked.
- Refrigerated food was not discarded by its marked date.

FOOD CODE PROVISIONS AND FLORIDA ADMINISTRATIVE CODE

Frozen Food

3-501.11 Frozen Food.*

Stored frozen foods shall be maintained frozen.

64E-11.004 (2) Food Protection.**

- (2) Perishable food shall be stored at such temperatures as will protect against spoilage. All potentially hazardous food shall be kept at safe temperatures, 41°F or below and 140°F or above, except during necessary periods of preparation and service.

Food Thawing

3-501.13 Thawing.*

Except as specified in ¶ (D) of this section, potentially hazardous food shall be thawed:

- (A) Under refrigeration that maintains the food temperature at 5°C (41°F) or less, or at 7°C (45°F) or less as specified under § 3-501.16(A)(2)(b); or
- (B) Completely submerged under running water:
- (1) At a water temperature of 21°C (70°F) or below,
 - (2) With sufficient water velocity to agitate and float off loose particles in an overflow, and
 - (3) For a period of time that does not allow thawed portions of ready-to-eat food to rise above 5°C (41°F), or 7°C (45°F) as specified under ¶ 3-501.16(A)(2)(b), or
 - (4) For a period of time that does not allow thawed portions of a raw animal food requiring cooking as specified under ¶ 3-401.11(A) or (B) to be above 5°C (41°F), or 7°C (45°F) as specified under ¶ 3-501.16(A)(2)(b), for more than 4 hours including:

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** Chapter 64E-11 Food Hygiene, F.S

- (a) The time the food is exposed to the running water and the time needed for preparation for cooking, or
 - (b) The time it takes under refrigeration to lower the food temperature to 5°C (41°F), or 7°C (45°F) as specified under ¶ 3-501.16(A)(2)(b);
- (C) As part of a cooking process if the food that is frozen is:
- (1) Cooked as specified under ¶ 3-401.11(A) or (B) or § 3-401.12, or
 - (2) Thawed in a microwave oven and immediately transferred to conventional cooking equipment, with no interruption in the process; or
- (D) *Using any procedure if a portion of frozen ready-to-eat food is thawed and prepared for immediate service in response to an individual consumer's order.*

64E-11.004(4) Food Protection.**

- (4) Frozen potentially hazardous food shall be thawed:
- (a) In refrigerated units at a temperature not to exceed 41 degrees Fahrenheit; or
 - (b) Under cold potable running water with sufficient water velocity to agitate and float off loosened food particles into the overflow:
 - 1. For a period of time that does not allow thawed portions of ready-to-eat food to rise above 41°F; or
 - 2. For a period of time that does not allow thawed portions of a raw animal food requiring cooking to be above 41°F for more than 4 hours including the time the food is exposed to the running water and the time needed for preparation for cooking; or
 - (c) In a microwave oven; or
 - (d) As part of the conventional cooking process.

Hot and Cold Food Holding

3-501.16 Potentially Hazardous Food, Hot and Cold Holding.* Critical

- (A) Except during preparation, cooking, or cooling, or when time is used as the public health control as specified under § 3-501.19, and except as specified in ¶ (B) of this section, potentially hazardous food shall be maintained:
- (1) At 57°C (135°F) or above, except that roasts cooked to a temperature and for a time specified under ¶ 3-401.11(B) or reheated as specified in ¶ 3-403.11(E) may be held at a temperature of 54°C (130°F); or
 - (2) At a temperature and time specified in the following:
 - (a) At 5°C (41°F) or less for a maximum of 7 days; or
 - (b) At 7°C (45°F) or between 5°C (41°F) and 7°C (45°F) for a maximum of 4 days in existing refrigeration equipment that is not capable of maintaining the food at 5°C (41°F) or less if:
 - (i) The equipment is in place and in use in the food establishment, and
 - (ii) Within 5 years of the regulatory authority's adoption of this Code, the equipment is upgraded or replaced to maintain food at a temperature of 5°C (41°F) or less.
- (B) Shell eggs that have not been treated to destroy all viable *Salmonellae* shall be stored in refrigerated equipment that maintains an ambient air temperature of 7°C (45°F) or less.

3-401.13 Plant Food Cooking for Hot Holding.*

Fruits and vegetables that are cooked for hot holding shall be cooked to a temperature of 57°C (135°F).

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** Chapter 64E-11 Food Hygiene, F.S

3-501.19 Time as a Public Health Control.* **Critical**

- (A) Except as specified under ¶ (B) of this section, *if time only*, rather than time in conjunction with temperature, is used as the public health control for a working supply of potentially hazardous food before cooking, or for ready-to-eat potentially hazardous food that is displayed or held for service for immediate consumption:
- (1) The food shall be marked or otherwise identified to indicate the time that is 4 hours past the point in time when the food is removed from temperature control,
 - (2) The food shall be cooked and served, served if ready-to-eat, or discarded, within 4 hours from the point in time when the food is removed from temperature control,
 - (3) The food in unmarked containers or packages or marked to exceed a 4 hour limit shall be discarded, and
 - (4) Written procedures shall be maintained in the food establishment and made available to the regulatory authority upon request, that ensure compliance with:
 - (a) Subparagraphs (A)(1)-(4) of this section, and
 - (b) § 3-501.14 for food that is prepared, cooked, and refrigerated before time is used as a public health control.
- (B) In a food establishment that serves a highly susceptible population, time only, rather than time in conjunction with temperature, may not be used as the public health control for raw eggs.

64E-11.004 (2) Food Protection.**

Perishable food shall be stored at such temperatures as will protect against spoilage. All potentially hazardous food shall be kept at safe temperatures, 41°F or below and 140°F or above, except during necessary periods of preparation and service.

64E-11.004 (11) Food Protection.**

The temperature requirements of this section do not apply if the department grants a variance from this section, pursuant to Section 120.542, F.S., based on a HACCP plan that:

- (A) Is submitted by the certificate holder and approved by the department;
- (B) Documents scientific data or other information that shows that a lesser time and temperature regimen results in a safe food; and
- (C) Verifies that equipment and procedures for food preparation and training of food employees at the establishment meet the conditions of the variance.

Ready to Eat, Potentially Hazardous Food Date Marking and Disposition

Section, 3-501.17 Ready-to-Eat, Potentially Hazardous Food, Date Marking.* **Critical**

On-premises preparation, prepare and hold cold

- (A) Except as specified in ¶ (D) of this section, refrigerated, ready to-eat, potentially hazardous food prepared and held in a food establishment for more than 24 hours shall be clearly marked to indicate the date or day by which the food shall be consumed on the premises, sold, or discarded, based on the temperature and time combinations specified in ¶ 3-501.16(A)(2). The day of preparation shall be counted as Day 1.

Commercially processed food, open and hold cold

- (B) Except as specified in ¶¶ (D) and (E) of this section, refrigerated, ready-to-eat, potentially hazardous food prepared and packaged by a food processing plant shall be clearly marked, at the time the original container is opened in a food establishment and if the food is held for more than 24 hours, to indicate the date or day by which the food shall be consumed on the

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** Chapter 64E-11 Food Hygiene, F.S

premises, sold, or discarded, based on the temperature and time combinations specified in ¶ 3-501.16(A)(2); and

- (1) The day the original container is opened in the food establishment shall be counted as Day 1; and
 - (2) The day or date marked by the food establishment may not exceed a manufacturer's use-by date if the manufacturer determined the use-by date based on food safety.
- (C) A refrigerated, ready-to-eat potentially hazardous food that is frequently rewrapped, such as lunchmeat or a roast, or for which date marking is impractical, such as soft serve mix or milk in a dispensing machine, may be marked as specified in ¶ (A) or (B) of this section, or by an alternative method acceptable to the regulatory authority.
- (D) Paragraphs (A) and (B) of this section do not apply to individual meal portions served or repackaged for sale from a bulk container upon a consumer's request.
- (E) Paragraph (B) of this section does not apply to the following when the face has been cut, but the remaining portion is whole and intact:
- (1) Fermented sausages produced in a federally inspected food processing plant that are not labeled "Keep Refrigerated" and which retain the original casing on the product;
 - (2) Shelf stable, dry, fermented sausages; and
 - (3) Shelf stable salt-cured products such as prosciutto and Parma (ham) produced in a federally inspected food processing plant that are not labeled "Keep Refrigerated".
- (F) A refrigerated, ready-to-eat, potentially hazardous food ingredient or a portion of a refrigerated, ready-to-eat, potentially hazardous food that is subsequently combined with additional ingredients or portions of food shall retain the date marking of the earliest-prepared or first-prepared ingredient.

Section, 3-501.18, Ready-to-Eat, Potentially Hazardous Food, Disposition.* Critical

- (A) A food specified in § 3-501.17(A) or (B) shall be discarded if it:
- (1) Exceeds either of the temperature and time combinations specified in ¶ 3-501.16(A)(2), except time that the product is frozen;
 - (2) Is in a container or package that does not bear a date or day; or
 - (3) Is appropriately marked with a date or day that exceeds a temperature and time combination as specified in ¶ 3-501.16(A)(2).
- (B) Refrigerated, ready-to-eat, potentially hazardous food prepared in a food establishment and dispensed through a vending machine with an automatic shutoff control shall be discarded if it exceeds a temperature and time combination as specified in ¶ 3-501.16(A)(2).

64E-11.004 (14) and (15) Food Protection.**

- (14) Potentially hazardous food, date marking requirements.
- (a) Refrigerated, ready-to-eat, potentially hazardous food prepared and held for more than 24 hours in a facility shall be marked with the date of preparation.
 - b) Except as specified in paragraph (C) of this section, a container of refrigerated, ready-to-eat, potentially hazardous food prepared and packaged by another food service establishment shall be marked to indicate the date, as specified under Section 64E-11.004(15) by which food shall be sold or served.
 - (c) Paragraph (B) of this section does not apply to:
 1. Cured meats and aged cheese; and
 2. Individual meal portions served or repackaged for sale from a bulk container upon a consumer's request.
- (15) Ready-to-eat, potentially hazardous food, disposition.

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** Chapter 64E-11 Food Hygiene, F.S

- (a) Refrigerated, ready-to-eat, potentially hazardous food specified in paragraph 64E-11.004(14) shall be discarded if not sold or served within 10 calendar days;
- (b) An ingredient or a container of refrigerated, ready-to-eat, potentially hazardous food specified in Section 64E-11.004(14)(a) or (b) shall be discarded if not sold or served within 10 calendar days after the original package is opened or by the manufacturer's "sell by" or "use by" date, whichever occurs first.

Related Chapters from the Florida Statutes

4-204.112 Temperature Measuring Devices.

- (A) In a mechanically refrigerated or hot food storage unit, the sensor of a temperature measuring device shall be located to measure the air temperature or a simulated product temperature in the warmest part of a mechanically refrigerated unit and in the coolest part of a hot food storage unit.
- (B) Except as specified in § (C) of this section, cold or hot holding equipment used for potentially hazardous food shall be designed to include and shall be equipped with at least one integral or permanently affixed temperature measuring device that is located to allow easy viewing of the device's temperature display.
- (C) *Paragraph (B) of this section does not apply to equipment for which the placement of a temperature measuring device is not a practical means for measuring the ambient air surrounding the food because of the design, type, and use of the equipment, such as calrod units, heat lamps, cold plates, bainmaries, steam tables, insulated food transport containers, and salad bars.*
- (D) Temperature measuring devices shall be designed to be easily readable.

4-302.12 Food Temperature Measuring Devices.

- (A) Food temperature measuring devices shall be provided and readily accessible for use in ensuring attainment and maintenance of food temperatures as specified under Chapter 3.
- (B) A temperature measuring device with a suitable small-diameter probe that is designed to measure the temperature of thin masses shall be provided and readily accessible to accurately measure the temperature in thin foods such as meat patties and fish filets.

FOOD SAFETY RATIONALE (RISKS AND OUTCOMES)

Improper holding temperatures is the single most important factor contributing to foodborne illness in the U.S. Forty percent of foodborne illness outbreaks were related to improper cooling of foods and 16% were related to improper hot holding.³ Improper holding temperatures were responsible for over half of the reported foodborne illness outbreaks. The following table shows the percentage of selected bacteria in reported foodborne illness outbreaks related to improper holding temperatures.

Bacteria	Percentage of reported outbreaks
<i>Clostridium perfringens</i>	100
<i>Streptococcus aureus</i>	100
<i>Bacillus cereus</i>	92
<i>Clostridium botulinum</i>	60
<i>Salmonellae</i>	60

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** Chapter 64E-11 Food Hygiene, F.S

Best Practices for Compliance to Food Sanitary Conditions in Florida Skilled Nursing Facilities

It is important to hold potentially hazardous food at proper temperatures to maintain food safety and quality. Food naturally contains parasites, viruses, and bacteria. Food may also be contaminated at the farm and then during processing from microorganisms, chemical and physical agents. Food contaminated with disease-causing bacteria and/or its toxins may cause food borne illness when consumed. According to the Centers for Disease Control and Prevention, bacteria are responsible for the most cases of foodborne illness in the U.S. Bacteria also cause food spoilage, which causes the food to look, smell and taste bad, but may not necessarily cause foodborne illness. It is important to control bacterial growth in food to prevent foodborne illness and spoilage. Bacteria require certain factors for growth, such as a source of food, mild acidity, temperature (between 41°F and 140°F), time, oxygen, and moisture (**F-A-T-T-O-M**).⁴ Controlling these factors to the greatest extent possible will reduce the risk of foodborne illness.

Temperature and time are the most important factors in controlling bacterial growth in potentially hazardous food. Most disease causing bacteria can grow in the “Temperature Danger Zone”, from 41°F to 140°F. Therefore, potentially hazardous food should be kept hot - 140°F or above; or cold - 41°F or below.

When food is held cold, it is frozen or refrigerated. The Food Code states that frozen food shall be maintained frozen. There is no minimum temperature specified for maintaining frozen food. If food was frozen at a processing plant, it should be frozen when delivered to the facility. As long as the food product appears solidly frozen, this requirement is met. Ideally, to maintain the best quality of the frozen food for long-term storage, it should be maintained at 0°F or below. Ice cream at 10°F or below. Freezing can destroy parasites, but does not destroy all bacteria. Freezing prevents microbial growth. If frozen food is improperly thawed, to allow the temperature to exceed 41°F, it is possible for surviving bacteria to grow to harmful numbers and/or produce toxins. By refreezing improperly thawed food, the bacteria and toxins can be preserved increasing the risk of foodborne illness. If the improperly thawed food is then not cooked to proper temperatures to destroy pathogens and/or their toxins, the risk of food borne illness is great. Therefore, it is important to thaw food so that the outer part maintains temperatures of 41°F or below. Thawing food in the refrigerator is the preferred method.

Time as well as temperature is a major factor in controlling bacterial growth. The Food Code recommends that ready-to-eat, potentially hazardous foods are date marked and limits the refrigerated storage time to 7 days. (For food held at 41°F The Florida Food Hygiene Code says 10 days). The rationale for limits on refrigerated storage time is because the growth of some bacteria, such as *Listeria monocytogenes* is significantly slowed, but not stopped by refrigeration. Food, which is prepared, and held, or prepared and frozen and thawed, must be controlled by date marking. This is to ensure its safety based on the total amount of time it was held at refrigeration temperature, and the opportunity for *Listeria monocytogenes* to multiply, before freezing and after thawing. Potentially hazardous refrigerated foods must be consumed, sold, or discarded by date marked or by the manufacturer’s “use by” or “sell by” dates.

Except when food is being prepared, cooled, or served, it should be kept under temperature control. Bacterial growth and/or toxin production can occur if potentially hazardous food remains in the temperature "Danger Zone" of 41°F to 140°F too long. Up to a point, the rate of growth increases with an increase in temperature within this zone. Beyond the upper limit of the optimal temperature range for a particular organism, the rate of growth decreases. The Food Code recommends that when food is

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** Chapter 64E-11 Food Hygiene, F.S

being prepared, cooled, or served, that the time the food is kept out of temperature control does not exceed 4 hours.

After food is cooked to proper internal temperatures, and it is held hot for extended service, it is important that it is held out of the temperature “Danger Zone”. Although cooking destroys most bacteria, some bacteria and spores, survive. To prevent further growth of bacteria or the germination of spores, potentially hazardous food should be held hot at 140°F or above.

BEST PRACTICES

- Maintaining temperature monitoring records of all refrigerators and freezers with a minimum of twice daily recordings.
- Recording and monitoring of trayline food temperatures taken prior to the start of the trayline service, in the middle of service and at the end of service.
- Inclusion of internal thermometers inside refrigerators and freezers on units with external temperature monitors. External temperature monitors on older cooling units are often inaccurate and difficult to repair.
- Routine monitoring of the operating condition of thermometers and replacement as needed.
- Placement of fragile thermometers into empty spice containers for use in reach-in milk and ice cream boxes for easy location and protection from damage.
- Routine schedule for recalibration of food temperature thermometers. (Prior to the start of each meal.)
- Ensure products are received through reputable and approved sources by validating through possible on-site inspections of the purveyors (checking delivery vehicles for appropriate temperature compliance within the scope of delivery to the end-user; observing handling procedures within the operation of the delivery agent for handling of refrigerated and frozen goods.)
- Application of dated stickers on frozen health shake supplements indicating the date the product was thawed.
- Posting of Food Date Marking and Disposition chart in refrigerator/freezer areas for staff easy reference.
- Date mark prepared, ready-to-eat, potentially hazardous food that is refrigerated and held for more than 24 hours with the date of preparation (i.e. tuna salad).
- Date mark refrigerated, commercially prepared, ready-to-eat, potentially hazardous foods with the date it shall be discarded, if not consumed. This date cannot exceed 7 days, according to the Food Code, if the food is held at 41°F, or past the “sell by” or “use by” date.
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Place ambient thermometers in refrigerator and freezer units, so that they can be read accurately. Ideally, these should be placed at directly at eye level in the warmest part of the unit.

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** Chapter 64E-11 Food Hygiene, F.S

Best Practices for Compliance to Food Sanitary Conditions in Florida Skilled Nursing Facilities

- Inspect thermometers present in refrigerators and freezers weekly or more frequently to ensure they are maintained in good condition. Discard those in which the plastic or glass covering is cracked or damaged. Also, discard the red liquid filled tube thermometers, if the liquid is broken up in the tube.
- Train staff to read all of the kitchen thermometers accurately. Have them demonstrate their ability. Make sure that they are reading the correct temperature scale, (Fahrenheit vs. Celsius), as many thermometers have both.
- Monitor and record refrigerator and freezer temperatures throughout the day and not just first thing in the morning after the kitchen opens.
- For cold food holding during meal service, use ice or cold holding equipment, such as cold counters or air curtains. “Super” chill the cold items in the freezer just before meal service; however, be careful not to freeze the food. Ensure food has good contact with the ice or cold counter. Avoid stacking individual servings of food on ice, cold counter, or air curtain.
- For hot holding, make sure that all food is held on a heat source. Avoid serving up individual portions of soup or oatmeal far in advance. Avoid stacking individual bowls of food or steam table pans on other steam table pans.
- Use a steamer to adequately heat batches of food rapidly, for best quality and nutrient retention.
- Obtain a thermocouple, if the food service department prepares thin meat patties, such as hamburgers, pork cutlets, etc. The thermocouple has a probe thin enough to insert into meat patties to achieve an accurate internal cooking and holding temperature.
- When preparing items like tuna salad, egg salad, chill the canned, or jar ingredients (tuna, mayonnaise, relish, etc.) in the refrigerator to cool them before preparation.
- Before using a thermometer, check that it is clean, sanitized and properly calibrated. When taking the temperature of the food, check that the “sensor” portion of the probe stem of the thermometer is inserted into the center or the thickest part of the food.
- Monitor temperatures of food during storage, cooking, hot-held, cold-held and reheating to ensure that food remains at a safe temperature. Keeping temperature logs at various points of food storage, preparation and distribution will assist food service managers in monitoring critical periods in the food preparation process and remind staff of the importance of keeping foods out of the “danger zone.”
- When cooling food, use stainless steel containers so heat can transfer quickly out of the product; transfer food into shallow, smaller pans; stir food while cooling and place containers of food into an ice water bath and stir the food while cooling.
- Minimize the time between hot food preparation and serving the food. Place foods on the steam table at proper hot-holding temperature; the steam table is for holding the food, not cooking it. Keep foods hot on the steam table by using hinged lids or foil that can be partially opened during food service.

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** Chapter 64E-11 Food Hygiene, F.S

- Develop a simple system for dating refrigerated foods and train employees on using the system. Color-coded dots for various days of the week or pre-stamped date stickers can save time and improve compliance with food rotation and disposal.

Delivery of Product to the Facility by Distributor

- Observe product at the point of delivery to the facility back door. Random selection of perishable food items for on-site and immediate temperature validation at the point of entry to the facility. Validate temperatures are at or below 0 degrees for frozen and 41 degrees F or less for refrigerated products. Ensure refrigerated products are not frozen during delivery.
- Question driver as to how long product has been on truck, time of departure from distributor if temperatures exceed the 0 degree or 41 degree F. threshold.
- If noncompliance of delivery temperatures is observed, request an interview with distributor representative (not salesperson, but an up-line representative) to determine if this is a distributor warehouse or driver/delivery concern.
- Ensure food is immediately placed in appropriate location within the facility upon delivery from the distributor. (Refrigerated item directly into the cooler and frozen directly into the freezer).
- Minimize time cooler and freezer doors remain open during delivery.
- Observe driver to determine if refrigerated truck doors are closed tightly during deliveries or are they left open.
- Are refrigerated and frozen items delivered by distributor in appropriately thermalized delivery vehicles? (Not in the back of an automobile or in the trunk).
- Are outside cases sealed to prevent contamination of foods. Are outer packages clean and free of evidence of damage to interior product. Are inner wrappings secure and seals not broken to allow for product contamination during delivery.
- Utilize calibrated thermometer to validate any temperatures while in front of driver. Record data obtained on invoice with driver's signature or initials if product falls out of the acceptable temperature ranges.
- Consider returning product if evidence of thawing or other mishandling procedures are evident at the point of delivery. Contact company representative immediately regarding your concerns, and document. Consider keeping a log of this type of problem to validate repeated actions, and who was contacted for remedy of the problem.

Once Inside the Facility

- Staff assigned to putting stock away are given appropriate tools to work with, (gloves, freezer coats, etc. as needed).

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** Chapter 64E-11 Food Hygiene, F.S

Best Practices for Compliance to Food Sanitary Conditions in Florida Skilled Nursing Facilities

- Cooler and freezer doors remain closed as much as possible during the delivery and while putting stock away times.
- Thermometers are maintained inside the refrigerators and freezers, (not located at the door but midway into the box to ensure accuracy). Do not hang directly below or in front of the blowing compressor units.
- Maintain temperature logs of refrigerators. Check first thing in the morning upon entry and then again during the day. Notification of appropriate department if equipment is not working appropriately or keeping foods at appropriate temperature ranges.
- Maintain a log of maintenance calls or reports of equipment not working appropriately. Indicate date, time, location of equipment, problem and person reporting malfunction.
- Validate that improperly working equipment is reported and repaired appropriately. Notify superior if not fixed timely and potential for lost food is imminent.

Production of Cold Foods

- Washing of hands is always mandatory prior to the beginning of a new food production task, and repeatedly during the production process as hands become dirty. Use of hand sanitizers during food production are not an acceptable means of cleaning hands.
- Remove only what is needed to prepare 1 item at a time. If preparing tuna salad (as an example), complete this project first, refrigerate completed items and then go on to the next item.
- Place clean, empty bowls, plates or containers into cooler or freezer prior to the start of your production. Place completed product into a cold dish and then place into refrigerator. Do not remove or pull all bowls out of refrigeration at one time during production. Remove only as many as will fit on a tray or bun pan, dish those up, put that tray into refrigerator or freezer and go to the next tray.
- Do not prepare all trays and then put entire rack into the cooler or freezer. All efforts to cool down foods prior to production, and efforts to cool bowls etc., will be brought back to room temperature if left out too long in the kitchen heat.
- Ensure use of clean and sanitized utensils, bowls and work surfaces prior to the start of your project.
- Cover all prepared food, label and date.

Service of Food

- Bring 1 tray or minimal amounts of food from refrigeration or freezer as needed for service whether trayline or dining room service.

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** Chapter 64E-11 Food Hygiene, F.S

Best Practices for Compliance to Food Sanitary Conditions in Florida Skilled Nursing Facilities

- Keep refrigerated or frozen food item prepared for resident consumption in refrigeration for as long as possible prior to actual service to the resident of customer. (Do not preset dining room tables with juices and milks, etc. more than 30 minutes prior to service.)
- Temperatures found out of compliance at the beginning of the meal should be immediately brought to the appropriate temperature prior to service.

REFERENCES

Essentials of Food Safety and Sanitation, Second Edition.

For technical information regarding the types of food thermometers to use, how to take food temperatures, and calibration, visit this website to download this information:

<http://www.fsis.usda.gov/OA/thermy/kitchen.pdf> (Technical Information on Kitchen Thermometers).

For more information regarding food product dating and holding times, visit this website to download information: <http://www.fsis.usda.gov/OA/pubs/dating.htm> (Focus on Food Product Dating)

For more information on *Listeria monocytogenes*, visit this website:

<http://www.fsis.usda.gov/OA/pubs/lmtips.htm> or the Centers for Disease Control and Prevention website: <http://www.cdc.gov/>

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Applied Food Service Sanitation Certification Course Book (ServSafe) 4th edition

Kitchindex Resource for Foodservice Professionals

Standardizing Foodservice for Quality and Efficiency

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** Chapter 64E-11 Food Hygiene, F.S

Compliance Issue #2

Food Protection From Contamination After Receiving

- Preventing Contamination by Employees
- Preventing Food and Ingredient Contamination
- Preventing Contamination from Equipment
- Preventing Contamination from the Premises and Other Sources

SPECIFIC EXAMPLES OF ISSUES ACTUALLY CITED:

- Employees touching food with bare hands
- Employees did not wash hands after wiping their nose
- Raw food not adequately separated from ready-to-eat foods in the refrigerator.
- Food not covered during refrigerated storage
- Packaged food stored on the floor in the refrigerator and/or freezer and/or in the dry storage area
- Dry foods not protected from pest infestation (packaging was not sealed after opening)
- Ice condensation drips on frozen packaged foods
- Eggs not thoroughly cooked
- Black mold growth on the heads of juice dispensers
- Storing ice scoops in ice chests or ice machine
- Containers of spices with open lids
- Dusty ceiling air vents above food preparation tables
- Stained, worn, and/or moldy cutting boards used to prepare food
- Food contact surfaces of equipment/utensils had dried food residue/particles and/or soil, dust, grease
- Can opener rusted and/or blade has metal shavings
- Inserting unsanitized thermometer probes into cooked foods

FOOD CODE PROVISIONS AND FLORIDA ADMINISTRATIVE CODE

Contamination by Employees

3-301.11 Preventing Contamination from Hands.* Critical

- (A) Food employees shall wash their hands as specified under § 2-301.12.
- (B) *Except when washing fruits and vegetables as specified under § 3-302.15 or as specified in ¶ (C) of this section, food employees may not contact exposed, ready-to-eat food with their bare hands and shall use suitable utensils such as deli tissue, spatulas, tongs, single-use gloves, or dispensing equipment.*
- (C) When otherwise approved, food employees *not serving* a highly susceptible population *may contact, ready-to-eat food with their bare hands.*
- (D) Food employees shall minimize bare hand and arm contact with exposed food that is not in a ready-to-eat form.

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** Chapter 64E-11 Food Hygiene, F.S

2-301.12 Cleaning Procedure.* **Critical**

- (A) Except as specified in ¶ (B) of this section, food employees shall clean their hands and exposed portions of their arms (or surrogate prosthetic devices for hands or arms) for at least 20 seconds, using a cleaning compound in a lavatory that is equipped as specified under § 5-202.12.
- (B) Food employees shall use the following cleaning procedure:
 - (1) Vigorous friction on the surfaces of the lathered fingers, finger tips, areas between the fingers, hands and arms (or by vigorously rubbing the surrogate prosthetic devices for hands or arms) for at least 10 to 15 seconds, followed by;
 - (2) Thorough rinsing under clean, running warm water; and
 - (3) Immediately follow the cleaning procedure with thorough drying of cleaned hands and arms (or surrogate prosthetic devices) using a method as specified under § 6-301.12.
- (C) Food employees shall pay particular attention to the areas underneath the fingernails during the cleaning procedure.
- (D) *If approved and capable of removing the types of soils encountered in the food operations involved, an automatic handwashing facility may be used by food employees to clean their hands.*

3-302.11 Packaged and Unpackaged Food - Separation, Packaging, and Segregation.* **Critical**

- (A) Food shall be protected from cross contamination by:
 - (1) Separating raw animal foods during storage, preparation, holding, and display from:
 - (a) Raw ready-to-eat food including other raw animal food such as fish for sushi or molluscan shellfish, or other raw ready-to-eat food such as vegetables, and
 - (b) Cooked ready-to-eat food;
 - (2) *Except when combined as ingredients*, separating types of raw animal foods from each other such as beef, fish, lamb, pork, and poultry during storage, preparation, holding, and display by:
 - (a) Using separate equipment for each type, or
 - (b) Arranging each type of food in equipment so that cross contamination of one type with another is prevented, and
 - (c) Preparing each type of food at different times or in separate areas;
 - (3) Cleaning equipment and utensils as specified under ¶ 4-602.11(A) and sanitizing as specified under § 4-703.11;
 - (4) Except as specified in § (B) of this section, storing the food in packages, covered containers, or wrappings;
 - (5) Cleaning hermetically sealed containers of food of visible soil before opening;
 - (6) Protecting food containers that are received packaged together in a case or overwrap from cuts when the case or overwrap is opened;
 - (7) Storing damaged, spoiled, or recalled food being held in the food establishment as specified under § 6-404.11; and
 - (8) Separating fruits and vegetables, before they are washed as specified under § 3-302.15 from ready-to-eat food.
- (B) Subparagraph (A)(4) of this section does not apply to:
 - (1) Whole, uncut, raw fruits and vegetables and nuts in the shell, that require peeling or hulling before consumption;
 - (2) Primal cuts, quarters, or sides of raw meat or slab bacon that are hung on clean, sanitized hooks or placed on clean, sanitized racks;
 - (3) Whole, uncut, processed meats such as country hams, and smoked or cured sausages that are placed on clean, sanitized racks;
 - (4) Food being cooled as specified under Subparagraph 3-501.15(B)(2); or

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** Chapter 64E-11 Food Hygiene, F.S

(5) Shellstock.

3-302.12 Food Storage Containers, Identified with Common Name of Food.*

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, and sugar shall be identified with the common name of the food *except that containers holding food that can be readily and unmistakably recognized such as dry pasta need not be identified.*

3-302.13 Pasteurized Eggs, Substitute for Raw Shell Eggs Pasteurized Eggs, Substitute for Raw Shell Eggs for Certain Recipes.* **Critical**

Pasteurized eggs or egg products shall be substituted for raw shell eggs in the preparation of foods such as Caesar salad, hollandaise or Béarnaise sauce, mayonnaise, eggnog, ice cream, and eggfortified beverages that are not:

- (A) Cooked as specified under Subparagraphs 3-401.11(A)(1) or (2); or
- (B) Included in ¶ 3-401.11(D).

3-304.11 Food Contact with Equipment and Utensils.* **Critical**

Food shall only contact surfaces of equipment and utensils that are cleaned as specified under Part 4-6 of this Code and sanitized as specified under Part 4-7 of this Code.

3-304.12 In-Use Utensils, Between-Use Storage.*

During pauses in food preparation or dispensing, food preparation and dispensing utensils shall be stored:

- (A) Except as specified under ¶ (B) of this section, in the food with their handles above the top of the food and the container;
- (B) In food that is not potentially hazardous with their handles above the top of the food within containers or equipment that can be closed, such as bins of sugar, flour, or cinnamon;
- (C) On a clean portion of the food preparation table or cooking equipment only if the in-use utensil and the food-contact surface of the food preparation table or cooking equipment are cleaned and sanitized at a frequency specified under §§ 4-602.11 and 4-702.11;
- (D) In running water of sufficient velocity to flush particulates to the drain, if used with moist food such as ice cream or mashed potatoes;
- (E) In a clean, protected location if the utensils, such as ice scoops, are used only with a food that is not potentially hazardous; or
- (F) In a container of water if the water is maintained at a temperature of at least 57°C (135°F) and the container is cleaned at a frequency specified under Subparagraph 4-602.11(D)(7).

3-304.15 Gloves, Use Limitation.*

- (A) If used, single-use gloves shall be used for only one task such as working with ready-to-eat food or with raw animal food, used for no other purpose, and discarded when damaged or soiled, or when interruptions occur in the operation.
- (B) Except as specified in § (C) of this section, slash-resistant gloves that are used to protect the hands during operations requiring cutting shall be used in direct contact only with food that is subsequently cooked as specified under Part 3-4 such as frozen food or a primal cut of meat.
- (C) *Slash-resistant gloves may be used with ready-to-eat food that will not be subsequently cooked if the slash-resistant gloves have a smooth, durable, and nonabsorbent outer surface; or if the slash-resistant gloves are covered with a smooth, durable, nonabsorbent glove, or a single-use glove.*

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

- (D) Cloth gloves may not be used in direct contact with food *unless the food is subsequently cooked as required under Part 3-4 such as frozen food or a primal cut of meat.*

3-305.11 Food Storage.*

- (A) Except as specified in ¶¶ (B) and (C) of this section, food shall be protected from contamination by storing the food:
- (1) In a clean, dry location;
 - (2) Where it is not exposed to splash, dust, or other contamination; and
 - (3) At least 15 cm (6 inches) above the floor.
- (B) Food in packages and working containers may be stored less than 15 cm (6 inches) above the floor on case lot handling equipment as specified under § 4-204.122.
- (C) Pressurized beverage containers, cased food in waterproof containers such as bottles or cans, and milk containers in plastic crates may be stored on a floor that is clean and not exposed to floor moisture.

3-305.14 Food Preparation.*

During preparation, unpackaged food shall be protected from environmental sources of contamination.

3-307.11 Miscellaneous Sources of Contamination.*

Food shall be protected from contamination that may result from a factor or source not specified under Subparts 3-301 - 3-306.

64E-11.004 Food Protection.**

- (1) Food while being transported, stored, prepared, displayed, served or sold at a food service establishment shall be protected from dust, flies, rodents or other vermin, toxic materials, unclean equipment and utensils, unnecessary handling, coughs and sneezes, flooding by sewage, overhead leakage and all other sources of contamination. Different types of raw animal products such as beef, fish, lamb, pork or poultry shall be separated during storage and processing by use of different containers, partitions, shelves, or by cleaning and sanitizing the equipment between product use. Raw food products shall be physically separated from ready-to-eat food products during display or storage by storing the raw products below ready-to-eat food products or using other approved methods.

64E-11.004 Food Protection.**

- (12) Food shall be prepared with the least possible manual contact, with suitable utensils, and on surfaces that prior to use have been cleaned, rinsed and sanitized to prevent cross contamination. Potentially hazardous foods that have been cooked and then refrigerated shall be reheated rapidly to 165 degrees Fahrenheit or higher throughout, 190°F for a microwave, before being served or before being placed in a hot food storage facility. Precooked packaged food from approved sources shall be exempt from this rapid reheating requirement when the food is initially removed from the original package and prepared for service. Steam tables, bainmaries, warmers and similar hot food holding facilities are prohibited for the rapid reheating of potentially hazardous foods.
- (13) Food, whether raw or prepared, if removed from the container or package in which it was obtained, shall be stored in a clean covered container except during necessary periods of preparation or service. Container covers shall be impervious and nonabsorbent, except that linens or napkins may be used for lining or covering bread or roll serving containers. Solid cuts of meat shall be protected by being covered in storage, except that quarters or sides of meat may be hung

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

uncovered on clean sanitized hooks if no food product is stored beneath the meat. Food and containers of food shall not be stored under exposed or unprotected sewer lines or water lines, except for automatic fire protection sprinkler heads that may be required by fire safety rules. The storage of food in toilet rooms, locker rooms, dressing rooms, garbage rooms, or vestibules is prohibited. Unless its identity is unmistakable, bulk food such as cooking oil, syrup, salt, sugar or flour not stored in the product container or package in which it was obtained, shall be stored in a container identifying the food by common name. Food not subject to further washing or cooking before serving shall be stored in a way that protects it against cross contamination from food requiring washing or cooking. Packaged food shall not be stored in contact with water or undrained ice. Food shall be stored a minimum of 6 inches above the floor, on clean shelves, racks, dollies or other clean surfaces in such a manner as to be protected from splash and other contamination provided that:

- (a) Metal pressurized beverage containers and cased food packaged in cans, glass or other waterproof containers need not be elevated when the food container is not exposed to floor moisture; or
- (b) Racks and dollies used for food storage are easily movable.

64E-11.004 Food Protection.**

- (16) All food shall be displayed and served in such a manner as to minimize contamination. To avoid unnecessary manual contact with food, suitable dispensing utensils shall be used by employees or provided to consumers who serve themselves. Clean plates are to be made available to customers for subsequent helpings at buffets or similar type operations. It shall be the responsibility of the manager or a designee to inform customers that clean plates are available for subsequent helpings. Between uses during service, dispensing utensils shall be stored:
 - (A) In the food with the dispensing utensil handle extended out of the food; or
 - (B) Clean and dry; or
 - (C) In running water; or
 - (F) In hot water wells that maintain the temperature of the water at or above 140 degrees Fahrenheit and that are cleaned frequently at scheduled intervals throughout the day.

64E-11.004 Food Protection.**

- (19) Ice for consumer use shall be dispensed only with scoops, tongs or other ice-dispensing utensils or through automatic self-service ice-dispensing equipment. Ice-dispensing utensils shall be stored on a clean surface or in the ice with the dispensing utensil's handle extended out of the ice. Between uses, ice transfer utensils shall be stored in a way that protects the utensils from contamination. Ice storage bins shall be drained through an air gap in accordance with the provisions of the applicable plumbing authority. Ice used for cooling stored food and food containers shall not be used for human consumption, except that such ice may be used for cooling tubes conveying beverages or beverage ingredients to a dispenser head.
- (20) Food while being transported between food service establishments or while being transported from a food service establishment to another location shall be in covered containers or otherwise wrapped or packaged to ensure protection from contamination. Potentially hazardous foods shall be kept at safe temperatures during all periods of transportation and delivery. Food utensils shall be completely wrapped or packaged to protect them from contamination.
- (21) No poisonous or toxic materials shall be present in food service establishments except those used for maintaining the establishment, cleaning and sanitizing equipment and utensils, and controlling insects and rodents.

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

FOOD SAFETY RATIONALE (RISKS AND OUTCOMES)

It is important to prevent food contamination, particularly in ready-to-eat food. Food may be contaminated from farm to the table from various sources. Contamination can occur by employees, by other foods and ingredients, by equipment, and from the environment (cross-contamination). During processing, the more the food is handled, the greater the risk of contamination. Twenty percent of foodborne illness outbreaks are contributed to infected persons touching food and 7% are contributed to cross contamination.⁵ Norwalk/Norwalk-like viruses, Hepatitis A, *Shigella* species, and *Staphylococcus aureus* are some of the pathogens that can cause foodborne illness from an infected person who handles food. Employees should wash their hands when appropriate, particularly after handling raw foods and toileting. Additionally, they should minimize bare hand contact with food. Since nursing homes serve a highly susceptible population, bare hand contact with ready-to-eat foods is prohibited. If employees wear disposable gloves, they should change them frequently when the gloves become contaminated. Employees must observe good personal hygiene, such as wearing clean clothing and aprons, and keep their hair effectively restrained. They should demonstrate good personal habits, such as avoiding touching the face and other parts of the body. Employees should avoid sneezing and coughing around food and should avoid smoking, eating, and chewing in the kitchen area.

Food and ingredient contamination can occur when raw foods contact ready-to-eat foods. Proper separation of raw foods and ready-to eat foods is important to prevent contamination from pathogens, such as *Salmonella* spp, *Campylobacter jejuni*, *Escherichia coli*, *Listeria monocytogenes*, *Shigella* spp., and *Vibrio* spp.

Food can also become contaminated from equipment that has not been properly washed, rinsed, and sanitized. This is especially critical for ready-to-eat foods, as they would not undergo any further food process to destroy pathogens and/or their toxins. That is why it is imperative that all food contact surfaces must be clean (free from soil and residues) and sanitary (reducing the pathogens to a safe level). Warewashing and equipment sanitation will be explained in more detail under the section “Warewashing and Equipment Sanitation”.

Although food may be protected from contamination from employees, other foods or ingredients, and unclean and unsanitized equipment, it is possible for contamination to occur from the environment or miscellaneous sources. For example, food should be stored to protect it from dust, splash and pest infestation, sewage, and toxic chemicals. To ensure this protection, food should be sufficiently covered or sealed during storage. Food must not be stored near or under dusty ventilation openings or water drips. Food must be stored 6 inches off the floor and away from the wall to facilitate cleaning and to avoid harboring pests. It is prohibited to store food in toilet rooms, locker rooms, mechanical rooms, under unprotected water and sewer lines, etc. Food storage should be separate from any chemical storage, such as cleaning and sanitizing agents. Pesticides should be stored away from food and cleaning supplies entirely. Additionally, employees’ personal items, such as purses, clothing, etc. should never be stored near food.

BEST PRACTICES

- Use of “bundt” rack covers for covering refrigerated foods stored on sheet pan racks prior to the start of service.

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

Best Practices for Compliance to Food Sanitary Conditions in Florida Skilled Nursing Facilities

- Use of color coded cutting boards: Green for vegetables and red for meat.
- Routine cleaning of walk-in and reach-in refrigerators and freezers by incorporating into the kitchen cleaning schedules.
- Ensuring all items in dry storage are properly sealed to prevent contamination from insects and/or rodents including disposable utensils, dishware and coffee filters.
- Removing damaged, spoiled, or recalled food from food storage areas.
- To prevent staff from reusing a spoon, fork when tasting foods during preparation, keep a container of spoons or disposable forks and spoons at the production area.
- Train staff on the importance of proper hand washing; explain the consequences when improper techniques are not followed. Periodically have staff demonstrate proper hand washing techniques. A simple quality assurance measure to identify if staff are washing hands would be to mark a paper towel, place it in the trash receptacle next to the hand wash sink and verify that other towels are placed on top of it within an hour.
- Sanitizer solution for washing food contact surfaces should be readily accessible and convenient for staff to use. An established time schedule should be developed and implemented as to when the solution should be changed out. Facilities may want to do sample testing for proper sanitizing techniques. A simple quality assurance survey can be done by using agar petri dishes. Allow the staff to swab an area and place it on the petri dish. Allow the dishes to set out for 4-6 hours to show staff how rapidly bacteria grow on both unclean/non sanitized surfaces and clean and sanitized food contact surfaces.
- Proper coverage of food items prior to delivery to residents may include individual lids, waxed paper, or covers that are designed to fit over the food carts.
- Foil is often used to cover steam table pans prior to meal service. Foil can fall into the food contaminate the product. Educate staff in proper removal of coverings to prevent contamination.
- To encourage employee hand washing, make sure that the hand washing sinks are easily accessible and are not blocked by equipment or garbage cans.
- To avoid employees from recontaminating their hands after washing, install paper towel dispensers designed so the employee does not have to touch a handle or knob to dispense a paper towel. In addition, install faucet handles at the hand washing sink that can be turned on and off with the employees touching the handles (i.e. wrist blades or foot pedals). Place garbage receptacles close by the hand washing sink. Use garbage receptacles that are designed to be opened without the employees touching the receptacle lid.
- Purchase sufficient dunnage racks to store food off the floor to prevent contamination. These also allow for easier cleaning of the floor underneath.

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

Best Practices for Compliance to Food Sanitary Conditions in Florida Skilled Nursing Facilities

- Purchase stainless steel can openers. These do not rust easily and are easy to clean. Use a brush to scrub the inside of the shaft once a day, if used to prevent food residue accumulation. Inspect the can opener blades periodically and change them periodically, to prevent metal shavings from contaminating food.
- Have sanitizer or alcohol wipes readily available to sanitize thermometer probes before using them to take temperatures.
- Cook all eggs to the required temperature and time to destroy *Salmonella enteritidis* (SE). This is required for nursing homes, as they serve a highly susceptible population that is more at risk for getting foodborne illness, which is often fatal. Consider using SE treated eggs for soft fried eggs, poached eggs, soft boiled eggs, or in any recipe in which eggs cannot be thoroughly cooked.
- Ensure use of hair coverings and gloves or proper utensils.
- Bare hands CANNOT be utilized for food production if the food is not going to be heated to an internal temperature of above 165 degrees F. (to kill all potential food borne organisms).
- Bare hands CANNOT be utilized for cold foods production.

REFERENCES

For more information on egg safety, visit this website: <http://www.cfsan.fda.gov/~dms/fs-eggs2.html>
(Food Service Safety Facts Information For Retail Food Stores And Food Service Operations Assuring The Safety Of Eggs And Menu And Deli Items Made From Raw, Shell Eggs).

U.S. Department of Health and Human Services, Public Health Service Food and Drug Administration
2001 Food Code.

U.S. Public Health Service 2001 Food Code Summary Chart #4-C – *Ready-to-eat, Potentially Hazardous Food Date Marking and Disposition.*

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

Compliance Issue #3

Warewashing, Equipment Sanitation:

- Equipment materials and design easily cleanable
- Mechanical hot water sanitation
- Mechanical chemical sanitation
- Manual chemical sanitation
- Air-drying equipment and utensils
- Protection of clean, sanitized equipment and utensil from further contamination

SPECIFIC EXAMPLES OF ISSUES ACTUALLY CITED

- Hot water mechanical warewashing did not maintain the minimum rinse temperature of 180°F
- Mechanical warewashing using chemical sanitizer, did not maintain the proper sanitizer concentration.
- Mechanical warewashing using chemical sanitizer did not maintain minimum wash and rinse temperature of 120°F.
- Manual warewashing, using chemical sanitizer in the three-compartment sink did not maintain proper sanitizer concentration.
- Clean and sanitized equipment was not properly air-dried, resulting in “wet-nesting”.
- Worn, chipped, stained, equipment surfaces, which were no longer easily cleanable.
- Clean equipment was not stored in a manner to protect it from further contamination during storage (dust, splash, food spatter).

FOOD CODE PROVISIONS AND FLORIDA ADMINISTRATIVE CODE

4-101.11 Characteristics.* **Critical**

Materials that are used in the construction of utensils and Food contact Surfaces of equipment may not allow the migration of deleterious substances or impart colors, odors, or tastes to food and under normal use conditions shall be:

- (A) Safe;
- (B) Durable, corrosion-resistant, and nonabsorbent; **Noncritical**
- (C) Sufficient in weight and thickness to withstand repeated warewashing; **Noncritical**
- (D) Finished to have a smooth, easily cleanable surface; **Noncritical**
and
- (E) Resistant to pitting, chipping, crazing, scratching, scoring, distortion, and decomposition. **Noncritical**

4-101.111 Nonfood-Contact Surfaces.*

Nonfood-contact surfaces of equipment that are exposed to splash, spillage, or other food soiling or that require frequent cleaning shall be constructed of a corrosion-resistant, nonabsorbent, and smooth material.

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

4-202.11 Food-Contact Surfaces.* Critical

- (A) Multiuse food-contact surfaces shall be:
- (1) Smooth;
 - (2) Free of breaks, open seams, cracks, chips, inclusions, pits, and similar imperfections;
 - (3) Free of sharp internal angles, corners, and crevices;
 - (4) Finished to have smooth welds and joints; and
 - (5) Except as specified in & (B) of this section, accessible for cleaning and inspection by one of the following methods:
 - (a) Without being disassembled,
 - (b) By disassembling without the use of tools, or
 - (c) By easy disassembling with the use of handheld tools commonly available to maintenance and cleaning personnel such as screwdrivers, pliers, open-end wrenches, and Allen wrenches.
- (B) Subparagraph (A)(5) of this section does not apply to cooking oil storage tanks, distribution lines for cooking oils, or beverage syrup lines or tubes.
- (A) CIP equipment shall meet the characteristics specified under § 4-202.11 and shall be designed and constructed so that:
- (1) Cleaning and sanitizing solutions circulate throughout a fixed system and contact all interior food-contact surfaces, and
 - (2) The system is self-draining or capable of being completely drained of cleaning and sanitizing solutions; and
- (B) CIP (clean in place) equipment that is not designed to be disassembled for cleaning shall be designed with inspection access points to ensure that all interior food-contact surfaces throughout the fixed system are being effectively cleaned.

4-202.16 Nonfood-Contact Surfaces.*

Nonfood-contact surfaces shall be free of unnecessary ledges, projections, and crevices, and designed and constructed to allow easy cleaning and to facilitate maintenance.

4-204.112 Temperature Measuring Devices.*

- (A) In a mechanically refrigerated or hot food storage unit, the sensor of a temperature measuring device shall be located to measure the air temperature or a simulated product temperature in the warmest part of a mechanically refrigerated unit and in the coolest part of a hot food storage unit.
- (B) Except as specified in & (C) of this section, cold or hot holding equipment used for potentially hazardous food shall be designed to include and shall be equipped with at least one integral or permanently affixed temperature measuring device that is located to allow easy viewing of the device's temperature display.
- (C) *Paragraph (B) of this section does not apply to equipment for which the placement of a temperature measuring device is not a practical means for measuring the ambient air surrounding the food because of the design, type, and use of the equipment, such as calrod units, heat lamps, cold plates, bainmaries, steam tables, insulated food transport containers, and salad bars.*
- (D) Temperature measuring devices shall be designed to be easily readable.
- (E) Food temperature measuring devices and water temperature measuring devices on warewashing machines shall have a numerical scale, printed record, or digital readout in increments no greater than 1°C or 2°F in the intended range of use.

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** Chapter 64E-11 Food Hygiene, F.S

4-204.113 Warewashing Machine, Data Plate Operating Specifications.*

A warewashing machine shall be provided with an easily accessible and readable data plate affixed to the machine by the manufacturer that indicates the machine's design and operating specifications including the:

- (A) Temperatures required for washing, rinsing, and sanitizing;
- (B) Pressure required for the fresh water sanitizing rinse *unless the machine is designed to use only a pumped sanitizing rinse*; and
- (C) Conveyor speed for conveyor machines or cycle time for stationary rack machines.

4-204.115 Warewashing Machines, Temperature Measuring Devices.*

A warewashing machine shall be equipped with a temperature measuring device that indicates the temperature of the water:

- (A) In each wash and rinse tank; and
- (B) As the water enters the hot water sanitizing final rinse manifold or in the chemical sanitizing solution tank.

4-302.14 Sanitizing Solutions, Testing Devices.*

A test kit or other device that accurately measures the concentration in mg/L of sanitizing solutions shall be provided.

4-402.11 Fixed Equipment, Spacing or Sealing.*

- (A) Equipment that is fixed because it is not easily movable shall be installed so that it is:
 - (1) Spaced to allow access for cleaning along the sides, behind, and above the equipment;
 - (2) Spaced from adjoining equipment, walls, and ceilings a distance of not more than 1 millimeter or one thirty-second inch; or
 - (3) Sealed to adjoining equipment or walls, if the equipment is exposed to spillage or see page.
- (B) Table-mounted equipment that is not easily movable shall be installed to allow cleaning of the equipment and areas underneath and around the equipment by being:
 - (1) Sealed to the table; or
 - (2) Elevated on legs as specified under ¶ 4-402.12(D).

4-402.12 Fixed Equipment, Elevation or Sealing.*

- (A) Except as specified in ¶¶ (B) and (C) of this section, floormounted equipment that is not easily movable shall be sealed to the floor or elevated on legs that provide at least a 15 centimeter (6 inch) clearance between the floor and the equipment.
- (B) *If no part of the floor under the floor-mounted equipment is more than 15 centimeters (6 inches) from the point of cleaning access, the clearance space may be only 10 centimeters (4 inches).*
- (C) *This section does not apply to display shelving units, display refrigeration units, and display freezer units located in the consumer shopping areas of a retail food store, if the floor under the units is maintained clean.*
- (D) Except as specified in & (E) of this section, table-mounted equipment that is not easily movable shall be elevated on legs that provide at least a 10 centimeter (4 inch) clearance between the table and the equipment.
- (E) *The clearance space between the table and table-mounted equipment may be:*
 - (1) 7.5 centimeters (3 inches) if the horizontal distance of the table top under the equipment is no more than 50 centimeters (20 inches) from the point of access for cleaning; or
 - (2) 5 centimeters (2 inches) if the horizontal distance of the table top under the equipment is no more than 7.5 centimeters (3 inches) from the point of access for cleaning.

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

4-501.11 Good Repair and Proper Adjustment.*

- (A) Equipment shall be maintained in a state of repair and condition that meets the requirements specified under Parts 4-1 and 4-2.
- (B) Equipment components such as doors, seals, hinges, fasteners, and kick plates shall be kept intact, tight, and adjusted in accordance with manufacturer's specifications.
- (C) Cutting or piercing parts of can openers shall be kept sharp to minimize the creation of metal fragments that can contaminate food when the container is opened.

4-501.12 Cutting Surfaces.*

Surfaces such as cutting blocks and boards that are subject to scratching and scoring shall be resurfaced if they can no longer be effectively cleaned and sanitized, or discarded if they are not capable of being resurfaced.

4-501.110 Mechanical Warewashing Equipment, Wash Solution Temperature.*

- (A) The temperature of the wash solution in spray type warewashers that use hot water to sanitize may not be less than:
 - (1) For a stationary rack, single temperature machine, 74°C (165°F);
 - (2) For a stationary rack, dual temperature machine, 66°C (150°F);
 - (3) For a single tank, conveyor, dual temperature machine, 71°C (160°F); or
 - (4) For a multitank, conveyor, multitemperature machine, 66°C (150°F).
- (B) The temperature of the wash solution in spray-type warewashers that use chemicals to sanitize may not be less than 49°C (120°F).

4-501.112 Mechanical Warewashing Equipment, Hot Water Sanitization Temperatures.*

- (A) Except as specified in ¶ (B) of this section, in a mechanical operation, the temperature of the fresh hot water sanitizing rinse as it enters the manifold may not be more than 90°C (194°F), or less than:
 - (1) For a stationary rack, single temperature machine, 74°C (165°F); or
 - (2) For all other machines, 82°C (180°F).
- (B) The maximum temperature specified under ¶ (A) of this section, does not apply to the high pressure and temperature systems with wand-type, hand-held, spraying devices used for the in-place cleaning and sanitizing of equipment such as meat saws.

4-501.114 Manual and Mechanical Warewashing Equipment, Chemical Sanitization - Temperature, pH, Concentration, and Hardness.* Critical

A chemical sanitizer used in a sanitizing solution for a manual or mechanical operation at exposure times specified under ¶ 4-703.11(C) shall be listed in 21 CFR 178.1010 Sanitizing solutions, shall be used in accordance with the EPA-approved manufacturer's label use instructions, and shall be used as follows:

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

- (A) A chlorine solution shall have a minimum temperature based on the concentration and pH of the solution as listed in the following chart;

Minimum Concentration	Minimum Temperature	
	pH 10 or less °C (°F)	pH 8 or less °C (°F)
mg/L		
25	49 (120)	49 (120)
50	38 (100)	24 (75)
100	13 (55)	13 (55)

- (B) An iodine solution shall have a:
- (1) Minimum temperature of 24°C (75°F),
 - (2) pH of 5.0 or less or a pH no higher than the level for which the manufacturer specifies the solution is effective, and
 - (3) Concentration between 12.5 mg/L and 25 mg/L;
- (C) A quaternary ammonium compound solution shall:
- (1) Have a minimum temperature of 24°C (75°F),
 - (2) Have a concentration as specified under § 7-204.11 and as indicated by the manufacturer's use directions included in the labeling, and
 - (3) Be used only in water with 500 mg/L hardness or less or in water having a hardness no greater than specified by the manufacturer's label;
- (D) If another solution of a chemical specified under ¶¶ (A)-(C) of this section is used, the permit holder shall demonstrate to the regulatory authority that the solution achieves sanitization and the use of the solution shall be approved; or
- (E) If a chemical sanitizer other than chlorine, iodine, or a quaternary ammonium compound is used, it shall be applied in accordance with the manufacturer's use directions included in the labeling.

4-501.116 Warewashing Equipment, Determining Chemical Sanitizer Concentration.*

Concentration of the sanitizing solution shall be accurately determined by using a test kit or other device.

4-601.11 Equipment, Food-Contact Surfaces, Nonfood-Contact Surfaces, and Utensils.* Critical

- (A) Equipment food-contact surfaces and utensils shall be clean to sight and touch.
- (B) The food-contact surfaces of cooking equipment and pans shall be kept free of encrusted grease deposits and other soil accumulations. Noncritical
- (C) Nonfood-contact surfaces of equipment shall be kept free of an accumulation of dust, dirt, food residue, and other debris. Noncritical

4-602.11 Equipment Food-Contact Surfaces and Utensils.* Critical

- (A) Equipment food-contact surfaces and utensils shall be cleaned:
- (1) Except as specified in ¶ (B) of this section, before each use with a different type of raw animal food such as beef, fish, lamb, pork, or poultry;
 - (2) Each time there is a change from working with raw foods to working with ready-to-eat foods;
 - (3) Between uses with raw fruits and vegetables and with potentially hazardous food;

* Food Code 2001, US. Public Health Service, U.S. Department of Health and Human Services

** Chapter 64E-11 Food Hygiene, F.S

- (4) Before using or storing a food temperature measuring device; and
- (5) At any time during the operation when contamination may have occurred.
- (B) Subparagraph (A)(1) of this section does not apply if the foodcontact surface or utensil is in contact with a succession of different raw animal foods each requiring a higher cooking temperature as specified under § 3-401.11 than the previous food, such as preparing raw fish followed by cutting raw poultry on the same cutting board.
- (C) Except as specified in ¶ (D) of this section, if used with potentially hazardous food, equipment food-contact surfaces and utensils shall be cleaned throughout the day at least every 4 hours.
- (F) Surfaces of utensils and equipment contacting potentially hazardous food may be cleaned less frequently than every 4 hours if:
 - (1) In storage, containers of potentially hazardous food and their contents are maintained at temperatures specified under Chapter 3 and the containers are cleaned when they are empty;
 - (2) Utensils and equipment are used to prepare food in a refrigerated room or area that is maintained at one of the temperatures in the following chart and:
 - (a) The utensils and equipment are cleaned at the frequency in the following chart that corresponds to the temperature:

Temperature	Cleaning Frequency
5.0°C (41°F) or less	24 hours
>5.0°C - 7.2°C (>41°F - 45°F)	20 hours
>7.2°C - 10.0°C (>45°F - 50°F)	16 hours
>10.0°C - 12.8°C (>50°F - 55°F)	10 hours

- ; and
- (b) The cleaning frequency based on the ambient temperature of the refrigerated room or area is documented in the food establishment.
- (3) Containers in serving situations such as salad bars, delis, and cafeteria lines hold ready-to-eat potentially hazardous food that is maintained at the temperatures specified under Chapter 3, are intermittently combined with additional supplies of the same food that is at the required temperature, and the containers are cleaned at least every 24 hours;
- (4) Temperature measuring devices are maintained in contact with food, such as when left in a container of deli food or in a roast, held at temperatures specified under Chapter 3;
- (5) Equipment is used for storage of packaged or unpackaged food such as a reach-in refrigerator and the equipment is cleaned at a frequency necessary to preclude accumulation of soil residues;
- (6) The cleaning schedule is approved based on consideration of:
 - (a) The type of food involved,
 - (b) The amount of food residue accumulation, and
 - (c) The amount of food residue accumulation, and

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

- (f) The temperature at which the food is maintained during the operation and the potential for the rapid and progressive multiplication of pathogenic or toxigenic microorganisms that are capable of causing foodborne disease; or
- (7) In-use utensils are intermittently stored in a container of water in which the water is maintained at 57°C (135°F) or more and the utensils and container are cleaned at least every 24 hours or at a frequency necessary to preclude accumulation of soil residues.
- (E) *Except when dry cleaning methods are used as specified under § 4-603.11*, surfaces of utensils and equipment contacting food that is not potentially hazardous shall be cleaned: **Noncritical**
 - (1) At any time when contamination may have occurred;
 - (2) At least every 24 hours for iced tea dispensers and consumer self-service utensils such as tongs, scoops, or ladles;
 - (3) Before restocking consumer self-service equipment and utensils such as condiment dispensers and display containers; and
 - (4) In equipment such as ice bins and beverage dispensing nozzles and enclosed components of equipment such as ice makers, cooking oil storage tanks and distribution lines, beverage and syrup dispensing lines or tubes, coffee bean grinders, and water vending equipment:
 - (a) At a frequency specified by the manufacturer, or
 - (b) Absent manufacturer specifications, at a frequency necessary to preclude accumulation of soil or mold.

4-602.12 Cooking and Baking Equipment.*

- (A) The food-contact surfaces of cooking and baking equipment shall be cleaned at least every 24 hours. *This section does not apply to hot oil cooking and filtering equipment if it is cleaned as specified in Subparagraph 4-602.11(D)(6).*
- (B) The cavities and door seals of microwave ovens shall be cleaned at least every 24 hours by using the manufacturer's recommended cleaning procedure.

4-602.13 Nonfood-Contact Surfaces.*

Nonfood-contact surfaces of equipment shall be cleaned at a frequency necessary to preclude accumulation of soil residues.

4-701.10 Food-Contact Surfaces and Utensils.*

Equipment food-contact surfaces and utensils shall be sanitized.

4-702.11 Before Use after Cleaning.* **Critical**

Utensils and food-contact surfaces of equipment shall be sanitized before use after cleaning.

4-703.11 Hot Water and Chemical.* **Critical**

After being cleaned, equipment food-contact surfaces and utensils shall be sanitized in:

- (A) Hot water manual operations by immersion for at least 30 seconds and as specified under § 4-501.111;
- (B) Hot water mechanical operations by being cycled through equipment that is set up as specified under §§ 4-501.15, 4-501.112, and 4-501.113 and achieving a utensil surface temperature of 71°C (160°F) as measured by an irreversible registering temperature indicator; or
- (C) Chemical manual or mechanical operations, including the application of sanitizing chemicals by immersion, manual swabbing, brushing, or pressure spraying methods, using a solution as specified under § 4-501.114 by providing:

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

Best Practices for Compliance to Food Sanitary Conditions in Florida Skilled Nursing Facilities

- (1) Except as specified under Subparagraph (C)(2) of this section, an exposure time of at least 10 seconds for a chlorine solution specified under ¶ 4-501.114(A),
- (2) An exposure time of at least 7 seconds for a chlorine solution of 50 mg/L that has a pH of 10 or less and a temperature of at least 38°C (100°F) or a pH of 8 or less and a temperature of at least 24°C (75°F),
- (3) An exposure time of at least 30 seconds for other chemical sanitizing solutions, or
- (4) An exposure time used in relationship with a combination of temperature, concentration, and pH that, when evaluated for efficacy, yields sanitization as defined in Subparagraph 1-201.10(B)(79).

4-901.11 Equipment and Utensils, Air-Drying Required.*

After cleaning and sanitizing, equipment and utensils:

- (A) Shall be air-dried or used after adequate draining as specified in ¶ (A) of 21 CFR 178.1010 Sanitizing solutions, before contact with food; and
- (B) May not be cloth dried *except that utensils that have been air-dried may be polished with cloths that are maintained clean and dry.*

4-903.11 Equipment, Utensils, Linens, and Single-Service and Single-Use Articles.*

- (A) Except as specified in ¶ (D) of this section, cleaned equipment and utensils, laundered linens, and single-service and single-use articles shall be stored:
 - (1) In a clean, dry location;
 - (2) Where they are not exposed to splash, dust, or other contamination; and
 - (3) At least 15 cm (6 inches) above the floor.
- (B) Clean equipment and utensils shall be stored as specified under ¶ (A) of this section and shall be stored:
 - (1) In a self-draining position that allows air drying; and
 - (2) Covered or inverted.
- (C) Single-service and single-use articles shall be stored as specified under ¶ (A) of this section and shall be kept in the original protective package or stored by using other means that afford protection from contamination until used.
- D) *Items that are kept in closed packages may be stored less than 15 cm (6 inches) above the floor on dollies, pallets, racks, and skids that are designed as specified under § 4-204.122.*

4-903.12 Prohibitions.*

- (A) Except as specified in ¶ (B) of this section, cleaned and sanitized equipment, utensils, laundered linens, and single-service and single-use articles may not be stored:
 - (1) In locker rooms;
 - (2) In toilet rooms;
 - (3) In garbage rooms;
 - (4) In mechanical rooms;
 - (5) Under sewer lines that are not shielded to intercept potential drips;
 - (6) Under leaking water lines including leaking automatic fire sprinkler heads or under lines on which water has condensed;
 - (7) Under open stairwells; or
 - (8) Under other sources of contamination.
- (B) Laundered linens and single-service and single-use articles that are packaged or in a facility such as a cabinet may be stored in a locker room.

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

4-904.11 Kitchenware and Tableware.*

- (A) Single-service and single-use articles and cleaned and sanitized utensils shall be handled, displayed, and dispensed so that contamination of food- and lip-contact surfaces is prevented.
- (B) Knives, forks, and spoons that are not prewrapped shall be presented so that only the handles are touched by employees and by consumers if consumer self-service is provided.
- (C) Except as specified under ¶ (B) of this section, single-service articles that are intended for food- or lip-contact shall be furnished for consumer self-service with the original individual wrapper intact or from an approved dispenser.

64E-11.006 Food Equipment and Utensils.**

- (1) Equipment and facilities provided – Every food service establishment shall be provided with equipment and utensils so designed, constructed, located, installed, maintained and operated as to permit full compliance with the provisions of this chapter. Equipment that is certified or classified for sanitation in accordance with American National Standards Institute/National Sanitation Foundation (ANSI/NSF) standards (Standard 2, July 1, 2002; Standard 3, July 1, 2001; Standard 4, April 26, 2002; Standard 6, December 6, 2002; Standard 7, April 1, 2001; Standard 8, December 26, 2002; Standard 12, November 1, 1992; Standard 13, August 1, 2001; Standard 18, August 29, 1996; Standard 20, July 1, 2000; Standard 25, December 26, 2002; Standard 29, November 1, 1990; Standard 36, January 1, 2002; Standard 37, April 26, 2002; Standard 51, June 14, 2002; and Standard 59, December 26, 2002) by an ANSI accredited program, will be deemed to comply with this section. The following equipment and facilities shall be provided where applicable to the operations conducted:
 - (a) Conveniently located refrigeration facilities and hot food storage and display facilities of capacity adequate to maintain all potentially hazardous foods at safe temperatures during all storage, preparation, display and serving operations. Where temperature requirements must be met, food storage facilities shall be provided with controls which ensure the maintenance of such temperatures. Each facility used for the storage of potentially hazardous foods shall be provided with a digital or numerically scaled indicating thermometer accurate to plus or minus 3 degrees Fahrenheit, located in the warmest or coldest part of the facility as may be applicable and of such type and so situated that the temperature can be easily and readily observed. Recording thermometers, accurate to plus or minus 3 degrees Fahrenheit may be used in lieu of indicating thermometers. Where it is impractical to install thermometers on equipment such as bainmaries, steam tables, steam kettles, heat lamps, calrod units or insulated food transport carriers, a metal stem-type product thermometer with a digital or numerical scale and accurate to plus or minus 3 degrees Fahrenheit shall be provided and used to check internal food temperatures.
 - (b) Conveniently located sinks with running water, waste disposal units or containers or similar equipment for the washing, trimming and similar preparation of foods. Sinks used for the preparation of food shall not be used for any other purpose.
 - (c) Cabinets, compartments or bins and utensils for storing and serving ice in a sanitary manner.
 - (d) Water dispensing devices of sanitary design.
 - (e) Sanitary facilities for storing and dispensing single-service articles.
 - (f) Unwrapped foods which are displayed or otherwise placed on counters or serving lines at cafeterias, smorgasbords, buffets or similar type operations and all unwrapped foods on tables, racks, carts, counters and shelves at any food service establishment shall be protected against contamination from customers and other sources. Such protection shall be provided by enclosures or by the installation of easily cleanable sneezeguards or other effective counter protector devices, cabinets, display cases that shall be designed to intercept direct lines

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

- between the mouth of the customer and the food. Self-service openings and counter guards shall be so designed and arranged to protect food from bare hand contact by customers.
- (g) Approved local exhaust ventilation installed at or over all cooking units such as ranges, griddles, deep-fat frying units and other units of equipment which release appreciable quantities of steam, odors, grease or smoke.
 - (h) Facilities for the storage of tableware, designed and maintained to present the handle to the employee or customer and to cover or protect the portion which may contact the customer's mouth.
 - (i) Convenient and suitable implements such as forks, knives, tongs, spoons, scoops and similar devices to prevent unnecessary handling of food at all points where food is prepared or served.
 - (j) Suitable running water dipper wells for ice cream scoops at all locations or stations where bulk ice cream is dispensed.
 - (k) Conveniently located cleaning facilities to keep all parts of the establishment and all equipment and utensils in a clean and sanitary condition. This shall include suitable space and facilities for storing clean and soiled utensils; for disposing of waste food residues; for pre-rinsing, washing and sanitizing of multi-use utensils; for cleaning pots, pans, racks and cans; and such other equipment as may be necessary for the effective, regular and periodic cleaning of the entire establishment including either a janitorial sink, can washing facility or similar approved device intended for the disposal of liquid waste resulting from cleaning operations.
 - (l) Suitable multi-use utensils or single-service articles made from non-toxic materials.
 - (m) Approved facilities for manual or mechanical dishwashing of multi-use eating and drinking utensils. Suitable facilities shall be provided for removing food scraps and food residue from utensils, including glasses, before they are placed in the wash water or wash compartment.
 1. When utensils are washed and sanitized by hand, a three compartment sink shall be provided. All sinks shall be of adequate size and depth to accommodate the utensils to be washed, shall be provided with running hot and cold water and shall be properly connected to the building drainage system. Sinks shall be provided with drainboards, easily moveable dishtables of adequate size or other approved equipment so located and so constructed that soiled and cleaned utensils are kept entirely separate and that cleaned utensils are protected against contamination from soiled utensils or dishwashing operations. Drainboards shall slope to the sinks or to suitable drains and shall be installed so as not to interfere with proper use of the sinks. Dish baskets shall be of such design as to permit complete immersion of multi-use utensils and equipment components being sanitized therein.
 2. When immersion type dishwashing machines are used, applicable requirements pertaining to manual dishwashing shall be met.
 3. When utensils are washed by spray-type dishwashing machines which depend upon a hot water spray for final rinsing or sanitizing, the hot water system shall provide water to the machine during all periods of dishwashing operations at a temperature at least equal to the final rinse temperature specified in subparagraph 64E-11.006(5)(b)7., F.A.C. Easily readable thermometers shall be installed near the discharge end of the machine, so located as to show the temperature of the final rinse water entering the manifold. Thermometers shall also be provided to indicate the temperature of water in all tanks of machines. These thermometers shall be accurate to plus or minus 3 degrees Fahrenheit. A pressure gauge shall be installed or a suitable gauge cock shall be provided in the rinse line, immediately upstream from the dishwashing machine, to permit checking the flow pressure of the final rinse water.

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

- (n) All facilities necessary for washing pots, pans and other multi-use utensils in which food is prepared. At least a two compartment sink shall be provided for washing kitchenware and equipment which does not require sanitization. All sinks shall be provided with running hot and cold water and adequate impervious drainboards or easily movable dishtables.
 - (o) Other types of devices which have been demonstrated to the satisfaction of the department to be effective in rendering all surfaces of utensils free from visible soil, wash water and detergent, leaving them clean to sight and touch and effectively subjected to sanitizing.
- (2) Design and fabrication.
- (a) Multi-use equipment and utensils shall be constructed and repaired with safe materials, including finishing materials; shall be corrosion resistant and nonabsorbent; and shall be smooth, easily cleanable and durable under conditions of normal use. Single-service articles shall be made from clean, sanitary, safe materials. Ice buckets, other containers, and scoops, shall be of a smooth, impervious material and designed to facilitate cleaning. Equipment, utensils and single-service articles shall not impart odors, color or taste nor contribute to the contamination of food.
 - (b) If solder is used, it shall comply with the standards of the 1997 Standard Plumbing Code. It shall not exceed .2% lead.
 - (c) Pewter or enamel may not be used as a food-contact surface. Galvanized metal may not be used for moist or acidic foods and beverages.
 - d) Hard maple or equivalently nonabsorbent material may be used for cutting blocks, cutting boards, salad bowls, baker's tables or rolling pins. Wood may be used for single-service articles, such as chopsticks, stirrers or ice cream spoons. Under other circumstances, the use of wood as food-contact surfaces is prohibited, unless specifically approved by the department, using the criteria listed in subsection 64E-11.006(2), F.A.C.
 - (e) Safe plastic or safe rubber-like materials that are resistant under normal conditions of use to scratching, scoring, decomposition, crazing, chipping and distortion, that are of sufficient weight and thickness to permit cleaning and sanitizing by normal dishwashing methods are permitted for repeated use.
 - (f) Mollusk and crustacea shells may be used only once as a serving container. Further reuse of such shells for food service is prohibited.
 - (g) Cutting surfaces that come into contact with food such as cutting blocks and boards that are subject to scratching and scoring shall be resurfaced if they can no longer be effectively cleaned and sanitized, or discarded if they are not capable of being resurfaced.
 - (h) Equipment containing bearings and gears requiring non-food grade lubricants shall be designed and constructed so that the lubricant cannot leak, drip or be forced into food or onto food-contact surfaces. Only food grade lubricants shall be used on equipment designed to receive lubrication of bearings and gears on or within food-contact surfaces.
 - (i) Tubing conveying beverages or beverage ingredients to dispensing heads may be in contact with stored ice provided that such tubing is fabricated from safe materials, is grommeted at entry and exit points to preclude moisture from condensation from entering the ice machine or the ice storage bin, and is kept clean. Drainage or drainage tubes from dispensing units shall not pass through the ice machine or the ice storage bin.
 - (j) Food-contact surfaces shall be easily cleanable, smooth and free of breaks, open seams, cracks, chips, pits, and similar imperfections, and free of difficult to clean internal corners and crevices. Cast iron may be used as a food-contact surface only if the surface is heated, such as in grills, griddle tops and skillets. Threads shall be designed to facilitate cleaning; ordinary "V" type threads are prohibited in food-contact surfaces, except that in equipment

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

such as ice makers or hot oil cooking equipment and hot oil filtering systems, such threads shall be minimized.

- (k) Unless designed for in-place cleaning, food-contact surfaces shall be accessible for cleaning and inspection:
 - 1. Without being disassembled; or
 - 2. By disassembling without the use of tools; or
 - 3. By easy disassembling with the use of only simple tools such as a mallet, a screwdriver or an open-end wrench kept available near the equipment.
 - (l) Equipment intended for in-place cleaning shall be so designed and fabricated that:
 - 1. Cleaning and sanitizing solutions can be circulated throughout a fixed system using an effective cleaning and sanitizing regimen; and
 - 2. Cleaning and sanitizing solutions will contact all interior food-contact surfaces; and
 - 3. The system is self-draining or capable of being completely evacuated.
 - (m) Fixed equipment designed and fabricated to be cleaned and sanitized by pressure spray methods shall have sealed electrical wiring, switches and connections.
 - (n) Sinks and drain boards shall be self-draining.
 - (o) Indicating thermometers required for immersion into food or cooking media shall be of metal stem type construction, with a digital or numerical scale and accurate to plus or minus 3 degrees Fahrenheit.
 - (p) Non-food-contact surfaces of equipment which are exposed to splash or food debris or which otherwise requires frequent cleaning, shall be designed and fabricated to be smooth, washable, free of unnecessary ledges, projections or crevices, readily accessible for cleaning and shall be of such material and in such repair as to be easily maintained in a clean and sanitary condition.
 - (q) Ventilation hoods and devices shall be designed to prevent grease or condensation from collecting on walls and ceilings and from dripping into food or onto food-contact surfaces. Filters or other grease extracting equipment, if used, shall be readily removable for cleaning and replacement if not designed to be cleaned in place.
 - (r) Equipment that was installed in a food service establishment prior to the effective date of this rule that does not fully meet all of the design and fabrication requirements of this section, shall be deemed acceptable in that establishment if it is in good repair, capable of being maintained in a sanitary condition and the food-contact surfaces are non-toxic. Replacement equipment and new equipment acquired after the effective date of this rule shall meet the requirements of this rule.
- (3) Installation and location of equipment – Equipment shall be so installed as to facilitate the cleaning thereof and of all adjacent areas with the equipment in place, unless the equipment is easily movable. Equipment placed on tables or counters, but not sealed thereto and is not easily movable, shall be mounted on legs or feet at least 4 inches high. Floor mounted equipment, unless easily movable, shall be installed on raised platforms of concrete or other smooth masonry in such manner as to prevent liquids or debris from seeping or settling underneath, between or behind in spaces not fully open for cleaning and inspection; or shall be elevated on legs or feet at least 6 inches above the floor. Such equipment shall be installed flush to the wall with the space sealed; or a sufficient, unobstructed space from the rear wall to the back of the equipment shall be provided to permit cleaning. The space between adjoining units or between the side of a unit and the adjacent wall shall be sealed unless there is sufficient space to allow for ready and thorough cleaning between, behind and beside all such equipment. Aisles or working spaces between equipment and walls shall be of sufficient width and unimpeded so that employees can readily perform their duties without contamination of food or food-contact surfaces from clothing or unnecessary personal

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

contact. All easily movable storage equipment such as pallets, racks and dollies shall be positioned to provide accessibility to working areas. Equipment intended for connection to the water supply or sewer system shall be installed in accordance with provisions of the applicable plumbing authority and shall be protected from back siphonage or backflow by use of approved air gaps, vacuum breakers or backflow preventers.

- (a) Waste piping from all refrigerators shall discharge indirectly into a floor sink, floor drain or receptor approved by the plumbing authority.
- (b) Drains in walk-in refrigerator floors shall be installed by indirect waste connections and such drains shall discharge into a floor drain located outside the walk-in refrigerator.

(4) Cleanliness of equipment and utensils.

- (a) All tableware, kitchenware and food-contact surfaces of equipment, exclusive of cooking surfaces of equipment and pots and pans that are not used to hold or store food and are used solely for cooking purposes, shall be thoroughly cleaned and sanitized after each use. Food-contact surfaces of grills, griddles and similar cooking devices and the cavities and door seals of microwave ovens shall be cleaned at least once a day; except that this shall not apply to hot oil cooking equipment and hot oil filtering systems.

The food-contact surfaces of all cooking equipment shall be kept free of encrusted grease deposits and other accumulated soil. All multi-use utensils and food-contact surfaces of equipment used in the preparation or storage of potentially hazardous food shall be thoroughly cleaned and sanitized prior to each such use. Where equipment and multi-use utensils are used for preparation of potentially hazardous foods on a continuous or production line basis, food-contact surfaces of such equipment and utensils shall be cleaned and sanitized at scheduled intervals throughout the day using a schedule approved by the department, based on food temperature, type of food and amount of food particle accumulation. Non-food-contact surfaces of equipment shall be cleaned at such intervals as necessary to keep them free of dust, dirt, food particles and otherwise in a clean and sanitary condition. After cleaning and until use, all food-contact surfaces of equipment and multi-use utensils shall be stored and handled in a manner that protects those surfaces from manual contact, splash, dust, dirt, insects and other contaminants.

- (b) All single-service articles shall be stored, handled and dispensed in a sanitary manner and shall be used only once. Food service establishments which do not have adequate and effective facilities for cleaning and sanitizing multi-use utensils shall use single-service articles only.
- (c) Detergents, cleaning components and abrasives shall be thoroughly rinsed off food-contact surfaces.
- (d) Cloths used for wiping occasional food spills on tableware, such as plates or bowls being served to the consumer, shall be clean, dry and used for no other purpose. Moist cloths or sponges used for wiping food spills on kitchenware and food-contact surfaces of equipment shall be clean and rinsed immediately prior to use and frequently during use in a sanitizing solution and used for no other purpose. Moist cloths or sponges used for cleaning non-food-contact surfaces of equipment such as counters, dining table tops and shelves shall be clean and rinsed in a sanitizing solution and used for no other purpose. If multi-use disposable towels are used in place of wiping cloths or sponges, the towels shall be discarded at least on a daily basis.

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

- (5) Methods of washing and sanitizing – Prior to washing, all equipment and multi-use utensils shall be preflushed or prescraped and, when necessary, presoaked to remove gross food particles and soil. Effective concentrations of suitable detergent shall be used in both manual and mechanical dishwashing.
- (a) Manual – For manual washing, rinsing and sanitizing of utensils and equipment, sinks, drainboards and dishtables shall be cleaned prior to use. Equipment and multi-use utensils shall be thoroughly washed in the first compartment in a hot detergent solution which is kept reasonably clean, and then shall be rinsed free of such solution in the second compartment. All multi-use eating and drinking utensils and, as described in paragraph (4)(A) of this section, the food-contact surfaces of all other equipment and multi-use utensils shall be sanitized in the third compartment by one of the following methods:
1. Immersion for a period of at least one-half minute in clean, hot water at a temperature of 170 degrees Fahrenheit or above;
 2. Immersion for a period of at least 1 minute in a clean sanitizing solution containing:
 - a. A minimum of 50 parts per million of available chlorine at a temperature not less than 75 degrees Fahrenheit; or
 - b. A minimum of 12.5 parts per million of available iodine in a solution with a pH not higher than five and a temperature not less than 75 degrees Fahrenheit;
 - c. Any other chemical sanitizing agent which has been demonstrated to the satisfaction of the department to be effective and non-toxic under use conditions and for which a suitable field test is available, as described herein. Such other sanitizing agents, in-use solutions, shall provide the equivalent sanitizing effect of a solution containing at least 50 parts per million of available chlorine at a temperature not less than 75 degrees Fahrenheit. The concentration and contact time for quaternary ammonium compounds shall be in accordance with the manufacturer's label directions.
 - d. A test kit or other device that accurately measures the parts per million concentration of the solution shall be available and used when chemicals are used for sanitization.
 3. Fixed equipment and equipment too large to treat by methods 1. and 2. above, may be treated:
 - a. With live steam from a hose, free from material or additives other than those specified in Title 21 Code of Federal Regulations 173.310; or
 - b. By boiling water rinse from a hose;
 4. When hot water is used for sanitizing, the following facilities shall be provided and used:
 - a. An integral heating device or fixture installed in, on, or under the sanitizing compartment of the sink capable of maintaining the water at a temperature of at least 170 degrees Fahrenheit; and
 - b. A digital or numerically scaled indicating thermometer, accurate to plus or minus 3 degrees Fahrenheit convenient to the sink for frequent checks of water temperature.
- (b) Mechanical – Cleaning and sanitizing may be done by spray type or immersion dishwashing or by any other type of machine or device if it is demonstrated that it thoroughly cleans and sanitizes equipment and utensils. These machines and devices shall be properly installed and maintained in good repair. Machines and devices shall be operated in accordance with the

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

manufacturer's instructions and specifications, which must be attached to the machine. Utensils and equipment placed in the machine shall be exposed to all dishwashing cycles. Automatic detergent dispensers, wetting agent dispensers, and liquid sanitizer injectors, if any, shall be properly installed and maintained. All dishwashing machines shall be thoroughly cleaned at least once a day, or more when necessary, to maintain them in a satisfactory operating condition.

1. The pressure of final rinse water supplied to spray type dishwashing machines shall not be less than 15 nor more than 25 pounds per square inch measured in the water line immediately adjacent to the final rinse control valve. A one-fourth inch IPS valve shall be provided immediately upstream from the final rinse control valve to permit checking the flow pressure of the final rinse water.
2. Machine or water line mounted digital or numerically scaled indicating thermometers, accurate to plus or minus 3 degrees Fahrenheit, shall be provided to indicate the temperature of the water in each tank of the machine and the temperature of the final rinse water as it enters the manifold.
3. Rinse water tanks shall be protected by baffles, curtains or other effective means to minimize the entry of wash water into the rinse water. Conveyors in dishwashing machines shall be accurately timed to assure proper exposure times in wash and rinse cycles in accordance with manufacturer's specifications attached to the machines.
4. Drain boards shall be provided and be of adequate size for the proper handling of soiled utensils prior to washing, and of cleaned utensils following sanitization, and be so located and constructed as not to interfere with the proper use of the dishwashing facilities. This does not preclude the use of easily movable dishtables for the storage of soiled utensils or the use of easily movable dishtables for the storage of clean utensils following sanitization.
5. Equipment and utensils shall be flushed or scraped and, when necessary, soaked to remove gross food particles and soil prior to being washed in a dishwashing machine, unless a prewash cycle is part of the dishwashing machine operation. Equipment and utensils shall be placed in racks, trays, or baskets, or on conveyors, in a way that food-contact surfaces are exposed to the unobstructed application of detergent wash and clean rinse waters and that permits free draining.
6. Machines using chemicals for sanitization may be used, provided that:
 - a. The temperature of the wash water shall not be less than 120 degrees Fahrenheit.
 - b. The wash water shall be kept clean.
 - c. Chemicals added for sanitization purposes shall be automatically dispensed.
 - d. Utensils and equipment shall be exposed to the final chemical sanitizing rinse in accordance with the manufacturer's specifications for time and concentration.
 - e. The chemical sanitizing rinse water temperature shall not be less than 75 degrees Fahrenheit nor less than the temperature specified by the machine's manufacturer.
 - f. Chemical sanitizers used shall meet the requirements of subsection 64E-11.006(5)(a), F.A.C., of this chapter.
 - g. A test kit or other device that accurately measures the parts per million concentration of the solution shall be available and used.
7. Machines using hot water for sanitizing may be used provided that wash water and pumped rinse water shall be kept clean; and the final rinse cycle achieves a utensil surface temperature of 160 degrees Fahrenheit as measured by an irreversible registering temperature indicator; and water shall be maintained at not less than the temperatures stated in sub-subparagraphs a. through e. below:
 - a. Single tank, stationary rack, dual temperature machine: Wash temperature 140°F.

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

- Final rinse temperature 180°F.
- b. Single tank, stationary rack, single temperature machine: Wash temperature 165°F. Final rinse temperature 165°F.
 - c. Single tank, conveyor machine: Wash temperature 140°F. Final rinse temperature 180°F.
 - d. Multi-tank, conveyor machines: Wash temperature 140°F. Pumped rinse temperature 160°F. Final rinse temperature 180°F.
 - e. Single tank, pot, pan, and utensil washer, either stationary or moving rack: Wash temperature 140°F. Final rinse temperature 180°F.
 - f. Final rinse temperatures in this subsection apply to temperatures at the rinse manifold.
- (c) Drying and handling – After sanitization, all equipment and utensils shall be air dried. Cleaned and sanitized equipment and utensils and all single-service articles shall be handled in a way that protects them from contamination.
- (d) Equipment and utensil storage – Cleaned and sanitized utensils and equipment and all single-service articles shall be stored at least 6 inches above the floor in a clean, dry location in a way that protects them from contamination by splash, dust and other means. The food-contact surfaces of fixed equipment shall also be protected from contamination. Equipment and utensils shall not be placed under exposed sewer lines. The storage of food equipment, utensils or single-service articles in toilet rooms or vestibules is prohibited.

FOOD SAFETY RATIONALE (RISKS AND OUTCOMES)

Although the risk of foodborne illness is less from contaminated equipment, than from improper holding and cross contamination of food, it is considered a major contributing factor. Seven percent of foodborne illness outbreaks are contributed to improper cleaning of equipment. Inadequate cleaning of equipment and cross-contamination often occur together.⁶

Equipment that is intended for use over an extended period, also known, as “multiuse” equipment must be made of durable materials, as the material may deteriorate over time. Therefore, the material surfaces must be smooth and easily cleanable. Equipment that cannot be adequately cleaned and sanitized may not remove foodborne pathogens from the material surface, which in turn can be transmitted to food. A biofilm can form, when bacteria accumulates and grows on the food contact surface of equipment, if it is not adequately cleaned and sanitized. Cracks, chips, or pits in surfaces promote biofilm formation. Biofilms are difficult to remove.

Likewise, equipment and utensils should be designed to be durable, so that they do not deteriorate and end up in food as foreign objects or present injury hazards to consumers. For example, pieces of glass that chip from a drinking glass could be an injury hazard.

Cutting boards and surfaces that have become scratched and scored may not be easily cleaned and sanitized. This can allow for pathogenic microorganisms transmissible through food to build up or accumulate. When foods are prepared on these scratched or scored surfaces, these microorganisms may be transferred to these foods.

Multiuse equipment and utensils must be effectively cleaned and sanitized to remove soil and reduce the number of foodborne pathogens to a safe level. To achieve this, equipment, dishes and utensils must be manually or mechanically washed and sanitized. Both manual and mechanical methods require

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

three steps: wash, rinse, and sanitize. During the wash step, detergents or cleaning chemicals are applied for the removal of soil. For the rinse step, clean water is used to remove any abrasives and removal or dilution of cleaning chemicals. The last step is sanitization, which involves heat or chemicals to kill bacteria. Before the washing, it may be necessary to preclean utensils and equipment to remove heavy soil accumulation, by preflushing, presoaking, or scrubbing with abrasives.

Mechanical washing involves a warewashing machine. Adequate cleaning and sanitization of dishes and utensils using this method is dependent on the exposure time during the wash, rinse, and sanitizing cycles. It is imperative that the manufacturer requirements for the cycle times are met, as this could result in failure to clean and sanitize. For example, high temperature machines depend on the buildup of heat on the surface of dishes to accomplish sanitization. If the exposure time during any of the cycles is not met, the surface of the items may not reach the time-temperature parameter required for sanitization. This is also important in warewashing machines that use a chemical sanitizer since the sanitizer must contact the items long enough for sanitization to occur. Moreover, a chemical sanitizer will not sanitize a soiled dish; therefore, the cycle times during the wash and rinse phases are essential to sanitization.

During the wash phase of mechanical warewashing, the wash solution temperature is critical to proper operation. It is necessary to remove organic matter. If the wash temperature is too low, the chemicals used may not be effective in removing soil and grease. Therefore, the manufacturer's instructions must be followed. Wash temperatures vary according to the specific equipment being used.

For mechanical warewashing that uses hot water sanitization, it is critical that the temperature of the hot water delivered to the warewasher manifold be maintained according to the equipment manufacturer's specification to ensure that the surfaces of utensils or tableware accumulate and build up enough heat to destroy pathogens that may be present on such surfaces. The surface temperature should reach at least 71°C (160°F) as measured by an irreversible registering temperature indicator.

The flow pressure of the final sanitizing rinse must be no less than 15 lbs. per square inch, or more than 25 lbs. per square inch, so that the sanitizing solution may be adequately dispersed to reach all surfaces of equipment or utensils.

Chemical sanitizers used in warewashers, must be an approved sanitizer under 21 CFR 178.1010 and used properly. The effectiveness of chemical sanitizers can be directly affected by the temperature, pH, concentration of the sanitizer solution used, and hardness of the water. Equipment sanitized by chemical sanitizers must be exposed for minimum amount of time to the sanitizing solution, as required by the manufacturer. The concentration of the sanitizer must be sufficient to destroy pathogens left on the surface after cleaning, but also must not be too high as to be toxic. Since chemical sanitizers solutions are not rinsed off, this can be a concern. When chemical sanitizing is used, a test kit or devices must be available to test the concentration of sanitizer solution, to ensure that there is enough sanitizer, but not too much.

Manual warewashing is done generally for very large pieces of equipment that cannot be washed in the warewashing machine. A three-compartment sink is optimal for manual warewashing, as it allows for the proper execution of the three-step method: wash, rinse and sanitize. Some of the same principles apply for manual warewashing as for mechanical warewashing.

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

After equipment, dishes and utensils are cleaned and sanitized, they must be allowed to drain and air-dry before being stacked or stored. Stacking wet items such as pans prevents them from drying and may allow an environment where microorganisms can begin to grow. Clean equipment, dishes, and utensils must never be dried with cloths, to prevent the possible transfer of microorganisms. When equipment, dishes, or utensils are stacked for storage, they should be inverted to protect food contact surfaces. Employees should avoid touching cleaned equipment, dishes, and utensil on food contact and lip contact surfaces.

Clean equipment and multiuse utensils that have been cleaned and sanitized must be stored in a manner to protect them from further contamination from the environment. They should be stored to protect from contamination from food splatter or debris, dust, litter, water splash, drippages, flooding, pests, toxic materials and other materials. They should be stored at least 6" off the floor. Likewise, with food, clean equipment is prohibited for storage in toilet rooms, locker rooms, mechanical rooms, under unprotected water and sewer lines, etc. Equipment storage should be separate from any chemical storage, such as cleaning and sanitizing agents. Pesticides should be stored away from equipment entirely. Additionally, employees' personal items, such as purses, clothing, etc. should not be stored on clean equipment. These same principles apply to single-service and single-use articles and laundered linens.

Not only it is important to clean and sanitize food contact surfaces, it is also important to keep non-food contact surfaces clean. Nonfood-contact surfaces should be easily cleanable, and constructed with nonabsorbent materials. This reduces the presence of moisture, debris, and pathogenic organisms and prevents the attraction of pests.

BEST PRACTICES

- Maintaining temperature logs for monitoring wash, rinse, and/or concentration of chemical sanitizer solution in automatic dishmachines for each meal.
- Availability of **appropriate** test strips needed to monitor chemical sanitizer concentration at easy access to automatic dishmachine (if applicable) and manual three compartment sink.
- Use of racks for drying and storage of plate covers and heating pellets.
- Zippered plastic covers for dish storage racks.
- Train employees about how to test the sanitizer in the warewashing machine and warewashing sink. Have them demonstrate their ability.
- Drain and refill the three compartment warewashing sinks several times a day, depending on use, to ensure the effectiveness of the chemical sanitizer. The chemical sanitizer degrades over time, and organic matter diminishes its effectiveness.
- For heat sanitization in warewashing machines, ensure that employees monitor the wash and rinse temperature throughout the warewashing process, not just at the beginning.

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

Best Practices for Compliance to Food Sanitary Conditions in Florida Skilled Nursing Facilities

- For chemical sanitization in warewashing machines, ensure that employees test the chemical sanitizer before use and ideally throughout the warewashing process. They should also monitor the wash and rinse temperature throughout the warewashing process, as temperature is one factor that effective sanitizing is dependent on.
- Train employees who perform warewashing to immediately alert the foodservice manager when the warewashing machine is not operating at the proper temperature and/or concentration of sanitizer. Make sure the employees know not to continue washing dishes if a problem is identified, as the dishes may not be properly washed and sanitized. Have a back up plan for alternative warewashing method or have single-use articles on hand.
- Post signs to remind the employees what the minimum temperatures and/or chemical sanitizer concentration should be for warewashing machines and warewashing sinks. Some of the companies who supply cleaning agents have these available in several languages.
- Purchase a rack specifically for air-drying dishes and equipment before storage. This may prevent “wet nesting” of pans, etc.
- Store equipment in a location where it will be free from splash, food spatter, dust, etc.
- Include fans and ceiling vents on the cleaning schedule to ensure that they are kept clean from dust and mold.
- Periodically check ceiling vents for dripping condensation on equipment and food.
- Regularly check the condition of dishes and equipment, such as serving trays, for wear.

REFERENCES

Mead, P.S, Slutsker, L, Dietz, V, et al, 1999. Food-Related Illness and Death in the Us. *Emerg. Infect. Dis.* 5: 607-625.

Food and Drug Administration website: <http://www.fda.gov/>

FDA/CFSAN 2002. Food and Drug Administration/Center for Food Safety and Applied Nutrition. <http://www.cfsan.fda.gov/>

For further information on food safety resources, visit this website address:

<http://www.fsis.usda.gov/OA/pubs/fstea.pdf> (Taking Care of Business: Food Safety Resources for Retail and Foodservice Establishments).

* Food Code 2001, US. Public Health Service, U.S. Department of Health and human Services

** Chapter 64E-11 Food Hygiene, F.S

FOODBORNE ILLNESS IN FLORIDA NURSING HOMES

According to the CDC surveillance database on foodborne illness outbreaks from 1990-1995, the reported foodborne illness outbreaks that occurred in nursing homes involved *E. Coli* O157:H7, *Salmonella enteritidis*, and Norwalk/Norwalk-like virus. The food vehicle was unknown for the bacterial outbreaks, but lettuce was the identified vehicle for the viral outbreak, which resulted in 76 people becoming ill. More people became ill from *Salmonella enteritidis* than *E. Coli*. One of the top 10 issues of non-compliance in Florida skilled nursing facilities is CFR 483.35(h)(2), *the facility must store, prepare, distribute, and serve food under sanitary conditions* (data tag F371). This federal Medicare requirement for skilled nursing facilities mandates that nursing home residents be protected from foodborne illness.⁷

ETIOLOGY	STATE	MONTH	YEAR	ILL	VEHICLE	LOCATION	COMMENTS
Bacterial							
<i>Escherichia coli</i> O157:H7	FL	July	93	4	Unknown Food Unknown	Nursing Home Nursing home	
<i>Salmonella Enteritidis</i>	FL	September	91	11	Unknown Food Unknown	Nursing Home Nursing home	Phage type 8
Viral							
<i>Norwalk/Norwalk-like Virus</i>	FL	December	95	76	Vegetable Lettuce	Nursing Home Nursing home	

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** Chapter 64E-11 Food Hygiene, F.S

ENDNOTES

¹ US Department of Health and Human Services, US Public Health Service, Food and Drug Administration, Food Code, 2001 Recommendations.

² Florida Administrative Code, 64E-11, Food Hygiene Code

³ Surveillance for Foodborne Disease Outbreaks – US, 1998-1992.

⁴ McSwane, D., Rue, D., Linton, R., 1998. “Essentials of Food Safety and Sanitation”, Prentice Hall, NJ.

⁵ Cody, M, Kunkel, M., 2002. “Food Safety for Professionals”, American Dietetic Association.

⁶ McSwane, D., Rue, D., Linton, R., 1998. “Essentials of Food Safety and Sanitation”, Prentice Hall, NJ.

⁷ Centers for Disease Control and Prevention website: <http://www.cdc.gov/>