

4.0 Maintenance and Sanitation

A food establishment shall have effective systems in place to:

- i) ensure adequate and appropriate maintenance and cleaning of the facilities and equipment;
- ii) control pests;
- iii) remove wastes; and
- iv) monitor and record the effectiveness of maintenance and sanitation procedures.

Rationale

Buildings, materials, utensils and all equipment in a food establishment, including wastewater and refuse collection systems, all present a potential source of contamination of food and food products. These areas should be kept clean, free of pests and maintained in good order.

Equipment, materials and utensils that come into contact with foods, especially raw products (fish, meat, vegetables, and poultry) are generally considered to be contaminated by microorganisms. These microorganisms could contaminate other products. For this reason, it is necessary to have well established programs in place to ensure that physical structures, including equipment and utensils, are maintained in a clean and sanitary condition. In order to achieve thorough sanitation, equipment may require dismantling, cleaning and sanitizing at the end of each day or more frequently to prevent microbiological proliferation.

4.1 Equipment

4.1.1 Location

- a) Equipment used in a food establishment should be located so that it:
 - i) is not exposed to any sources of contamination unrelated to the normal operations of the food establishment;
 - ii) may be maintained, cleaned and sanitized;
 - iii) may be inspected;
 - iv) may be properly vented when required; and
 - v) functions in accordance with its intended use.
- b) Equipment used in processing, handling and storage of foods (including single-service and single-use articles) should not be located in staff locker rooms; toilet rooms; garbage storage rooms; mechanical rooms; under sewer or water lines not shielded to intercept leakage/condensate; under open stairwells; or any area where the equipment may become contaminated.

Rationale

Equipment used in a food establishment should be kept in a clean and sanitary condition to minimize the risk of contamination of food by equipment surfaces. Therefore, when considering the location of equipment, several factors should be taken into account, including ease of cleaning, the intended use of equipment, and the prevention of contamination of the equipment. Special care should be taken in the placement of food equipment that will be used to process, handle or store food. Such equipment should not be located in areas where it may become contaminated, since the surfaces of the equipment will be coming in direct contact with food.

4.1.2 Fixed Equipment

Equipment that is fixed (i.e., not easily moved) should be either:

- i) sealed to adjoining walls, floors and equipment; or
- ii) spaced in such a manner to allow for cleaning under and around equipment.

4.1.3 Design

- a) Equipment and utensils should be designed and constructed to be durable and to retain their characteristic qualities under normal use and conditions.
- b) Ideally, food service equipment and utensils should comply with international sanitation standards such as those administered by third parties such as NSF International (NSFI) and Underwriters' Laboratories of Canada (ULC).

Rationale

The food contact surfaces on equipment must be maintained in a clean and sanitary condition to prevent contamination of food. Therefore, these surfaces should be designed so that they are smooth, non-absorbent and easily cleanable to eliminate harbourage for microorganisms and other contaminants.

4.1.4 Food Contact Surfaces

Food contact surfaces of equipment should be:

- i) made of materials that are corrosion resistant;
- ii) made of materials that do not pass on colours, odours or tastes to food and do not allow migration of unsafe substances into food;
- iii) smooth and non-absorbent;
- iv) free from breaks, cracks, open seams, chips, pits and similar imperfections, should these be shown to impede effective cleaning and sanitizing;
- v) free from sharp internal angles, corners and crevices;

- vi) finished to have smooth welds and joints; and
- vii) accessible for cleaning and inspection (by disassembly, if necessary).

Rationale

Furthermore, food contact surfaces should not introduce substances into food, which are harmful or change food characteristics. Examples of surfaces which can be of concern include copper (due to copper migration into acidic foods or beverages), cast iron (due to heavy metals migration into the food), lead glazed utensils and galvanized metal.

4.1.5 Use of Wooden Food Contact Surfaces

- a) Wood is not recommended for cutting, especially meat and poultry.
- b) Wood is not normally acceptable as a food contact surface, except hard maple or an equivalently hard, close-grained wood may be used for:
 - i) cutting boards; cutting blocks; bakers' tables; and utensils such as rolling pins, doughnut dowels; and
 - ii) wooden paddles, which are used in confectionery operations for pressure scraping kettles when manually preparing confections at a temperature of 110⁰C (230⁰F) or above.
- c) Whole, uncut, raw fruit and vegetables and nuts in the shell may be kept in the wooden shipping containers in which they were received until these foods are used.

Rationale

The limited acceptance of wood as a food contact surface is determined by the nature of the food and the type of wood used. Moist foods may cause the wood surface to deteriorate and the surface may become difficult to clean. In addition, wood that is treated with preservatives may lead to illness due to the migration of the preservative chemicals in the wood, into the food. Therefore, only approved preservatives are allowed.

4.1.6 Non-Food Contact Surfaces

In order to minimize the likelihood of food contamination, non-food contact surfaces of food equipment should be:

- i) free from unnecessary ledges, projections and crevices; and
- ii) designed and constructed to allow easy cleaning and to facilitate maintenance.

4.1.7 Clean In Place Equipment (CIP)

Equipment that is intended to be "Clean In Place (CIP)" should be designed and constructed so

that:

- a) Cleaning and sanitizing solutions circulate through a fixed system and contact all interior food contact surfaces.
- b) The system is self-draining or capable of being completely drained of cleaning and sanitizing solutions.
- c) There are inspection access points to ensure all interior food contact surfaces throughout the fixed system are being effectively cleaned.
- d) It is maintained as it was originally intended.

Rationale

The interior food contact surfaces of CIP equipment should be cleaned and sanitized to prevent contamination of food passing through the equipment. The equipment design should allow for interior surfaces to be inspected verifying that these surfaces are clean.

4.1.8 Filters and Grease Extraction Equipment

- a) Filters or other grease extracting equipment should be:
 - i) designed to be readily removable for cleaning and replacement if not designed to be cleaned in place; and
 - ii) cleaned regularly.
- b) Exhaust ventilation hood systems in food preparation and ware washing areas, including components such as hoods, fans, guards, and ducting, should be designed to prevent grease or condensation from draining or dripping onto food, food contact surfaces, equipment, utensils, linens, and single-service and single-use articles.
- c) Ventilation hood systems and devices should be sufficient in number and capacity to prevent grease or condensation from collecting on walls and ceilings.

Rationale

Dripping grease can contaminate food being prepared on the cooking surface below. Grease buildup in food preparation areas can lead to pest infestation and contamination. Both the National Building Code and the National Fire Prevention Act 96 deal with ventilation and grease extraction in commercial premises.

4.1.9 Maintenance

Equipment shall be maintained in good repair, so that it functions in accordance with its intended

use.

4.1.10 Maintenance of Cutting Surfaces

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

Rationale

Inadequately maintained equipment could result in food being held at unsafe temperatures (e.g., malfunctioning refrigeration equipment) or in food becoming contaminated (e.g., chipped or cracked equipment).

4.1.11 Heating and Cooling Equipment

- a) Equipment used to cook, heat treat, cool, store or freeze potentially hazardous food shall be designed and operated to achieve the required food temperatures as described in Section 3.3 of this *Code*.
- b) Equipment in the food establishment must be sufficient in capacity to maintain all potentially hazardous food at the temperatures specified in Section 3.3 of this *Code*.
- c) Heating and cooling equipment that impacts on food safety must be equipped with devices to monitor and control temperatures.
- d) Temperature measuring devices shall be easily readable and accurate to $\pm 1.0^{\circ}\text{C}$ ($\pm 2.0^{\circ}\text{F}$) in the operating range, and calibrated on a regular basis to ensure correct functioning. Calibration records should be maintained for each piece of equipment, and records of corrective action taken as required.

Rationale

Maintaining all potentially hazardous foods at the required temperatures is an essential component of keeping food free from spoilage and disease-causing microorganisms. Equipment used to store potentially hazardous foods at safe temperatures must have the capacity to raise or lower the temperature of the food to safe levels as rapidly as possible.

4.1.12 Glass Temperature Monitoring Equipment

Food temperature measuring devices should not have sensors or stems constructed of glass unless they are encased in a shatterproof sleeve.

Rationale

Temperature measuring equipment that has a glass stem should be encased in a shatterproof sleeve to prevent the contamination of food in the event that the device breaks.

4.1.13 Containers for Waste and Inedible Substances

Containers for waste, by-products, and inedible substances should be:

- i) specifically and properly labeled to identify the contents;
- ii) leak-proof;
- iii) constructed of an impervious material which is easy to clean or disposable;
- iv) covered; and
- v) securely closeable, if appropriate.

Rationale

To prevent foods from becoming contaminated, wastes, by-products and inedible substances should be stored in containers clearly identified to prevent these substances from being mistakenly used as food. The container should be easy to clean to prevent the build-up of contaminants, and must be covered and securely closeable (if appropriate) to minimize objectionable odours and discourage pests such as insects, rodents and birds.

4.2 Cleaning and Sanitation

4.2.1 Written Sanitation Program

Food establishment shall have a written sanitation program in place to monitor and control all elements in Section 4.0 of this *Code*, which generally should:

- a) Outline the parameters to be controlled in the food establishment to ensure safety of the food product.
- b) Include sanitation procedures for equipment, utensils or refrigeration units that impact on food safety, which should specify:
 - i) areas, items of equipment and utensils to be cleaned;
 - ii) the designated food handler(s) responsible for the cleaning and sanitizing;
 - iii) the chemicals and/or cleaning products (including concentrations) and process to be used;
 - iv) the procedures used;
 - v) the frequency of cleaning and sanitizing; and
 - vi) inspection and monitoring records.
- c) Document that the sanitation program is monitored and its effectiveness verified.
- d) Reflect the level of risk of the food products as determined by the management plan required in Section 3.0 of this *Code*.

Rationale

The requirement for a written sanitation program is very similar to the requirement, in Section 3.1.3 of this Code, for management principles to control food hazards. The objective of the sanitation program is to provide reasonable assurance that the food establishment is being cleaned and sanitized effectively and consistently.

While the detailed program described above may do this, the costs of such a detailed program in necessary time and resources must be balanced by the benefits. As well, particularly in a smaller food establishment with simple operations, the cleaning and sanitation may be made up of only a few relatively simple steps. The complexity of the required written sanitation program should reflect the complexity of the cleaning and sanitizing of the operation.

4.2.2 Cleaning Frequency: Non-Food Contact Surfaces

Non-food contact surfaces of equipment should be cleaned at a frequency that will prevent the accumulation of dust, dirt, food residue and other debris.

4.2.3 Cleaning Frequency: Food Contact Surfaces

- a) Food contact surfaces of cooking equipment should be cleaned and sanitized at a frequency that prevents the accumulation of grease deposits and other residues.
 - i) Some types of equipment, which do not pose a public health risk (e.g., pizza pans, baking dishes), need not be cleaned at the frequency outlined in (a).
- b) Equipment that is used continuously at room temperature for the handling of potentially hazardous foods should be cleaned and sanitized at least every four hours (e.g., deli meat slicers).

4.2.4 Cleaning of Reusable Food Equipment

Cleaning processes for all reusable food equipment and utensils in the food establishment should effectively remove food residues and dirt from the item.

- a) Cleaning should involve:
 - i) removing gross debris from surfaces;
 - ii) washing by applying a detergent solution to loosen soil and bacterial film and hold them in solution and suspension;
 - iii) rinsing with water to remove loosened soil and residues of detergent;
 - iv) sanitizing (see Section 4.2.5 of this *Code*); or
 - v) alternative methods of cleaning that effectively remove residues and debris.

Rationale

Reusable food equipment should be effectively cleaned to remove gross debris, soil and bacterial film to prevent the contamination of food which may come into contact with the equipment.

4.2.5 Sanitizing of Equipment Food Contact Surfaces and Utensils

- a) Once cleaned in the manner described above, the food contact surfaces of equipment and utensils should then be sanitized by heat or chemical means.
 - i) Surfaces are effectively sanitized when, after application on a cleaned surface, a 5 log reduction of disease-causing microorganisms is achieved.
 - ii) The standard sanitizing methods contained in this *Code* (see Sections 4.2.6, 4.2.7, and 4.2.8) have been shown to attain this standard; alternative methods will be evaluated against achievement of this standard.
- b) The food contact surfaces should be handled in a sanitary manner after sanitizing, and air-dried.
- c) If applicable, they should be stored in a place and manner that prevents contamination.

- d) Wiping cloths used for wiping food spills on food contact surfaces:
 - i) should not be used for other purposes such as wiping raw animal foods;
 - ii) should be routinely cleaned and when not in use kept in separate sanitizing solution which is maintained at a concentration as specified in Section 4.2.6.

Rationale
Utensils should be allowed to air dry after sanitizing; towel-drying or storage on a dirty surface or where splashing may occur may lead to re-contamination of the cleaned and sanitized surface.

4.2.6 Mechanical Dishwashing: Chemical Sanitizing Methods

Mechanical dishwashing machines employing chemical agents to sanitize tableware, utensils and equipment should apply the sanitizing solution as specified below:

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

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

- b) An iodine solution used as a sanitizing agent should have:
 - i) a minimum temperature of 24°C (75°F);
 - ii) a pH of 5.0 or less, unless the manufacturer's specifications state otherwise; and
 - iii) a concentration between 12.5 mg/L and 25 mg/L.
- c) A quaternary ammonium compound solution used as a sanitizing agent should:
 - i) have a minimum temperature of 24° C (75°F);
 - ii) have a concentration of 200 mg/L or as indicated in the manufacturer's specifications; and
 - iii) be used only in water with a hardness concentration of less than 500 mg/L.
- d) Other chemical solutions may be used as sanitizers if the regulatory authority is satisfied that such chemicals can safely achieve the desired results and is used in accordance with the manufacturer's use directions included in the labeling.

- e) The operator should check the temperatures of the water and the sanitizer concentration frequently to ensure that effective results are occurring. Sanitizer test kits/strips should be obtained from the sanitizer/detergent supplier and stored for convenient use near the dishwasher.
- f) Operators should keep records of sanitizer concentrations and temperatures.

Rationale

The sanitizer concentrations, pH and temperatures referenced here are contained in the US FDA Food Code and have been evaluated for effective results against the standard swab test referenced in Section 4.2.5 of this Code.

4.2.7 Mechanical Dishwashing**Wash Solution Temperature:**

- a) The temperature of the wash solution in spray type ware washers that use hot water to sanitize may not be less than:
 - i) for a stationary rack, single temperature machine, 74⁰ C (165⁰F);
 - ii) for a stationary rack, dual temperature machine, 66⁰ C (151⁰F);
 - iii) for a single tank, conveyor, dual temperature machine, 71⁰ C (160⁰F); and
 - iv) for multitank, conveyor, multitemperature machine, 66⁰ C (151⁰F).

Hot Water Sanitizing Temperature:

- b) Mechanical dishwashing machines employing water temperature as a means of sanitizing tableware, utensils and equipment should ensure that dishware is exposed to clean rinse water for at least 10 seconds, at a temperature (measured at the manifold) of:
 - i) 74⁰C (165⁰F) for stationary rack, single temperature machines; or
 - iii) 82⁰C (180⁰F) for all other machines.

Rationale

The temperatures referenced here are contained in the US FDA Food Code and have been evaluated for effective results against the standard swab test referenced in Section 4.2.5 of this Code.

4.2.8 Manual Dishwashing

- a) Where manual dishwashing procedures are used for cleaning and sanitizing equipment or cooking utensils, the manual dishwashing equipment should include:
- i) at least a double sink of non-corrodible metal of sufficient size to permit complete immersion of the utensils to be sanitized;
 - ii) draining boards (if they are to be provided) of non-corrodible and non-absorbent material;
 - iii) a thermometer capable of measuring temperatures between 0°C and 100°C (32° F and 212° F); and
 - iv) testing equipment to determine the strength of any chemical used as the sanitizing agent.
- b) When relying on the manual method for washing and sanitizing dishware and serving/dining utensils, the operator should use a three compartment sink and the following procedure. Dishes should be:
- i) thoroughly scraped clean of visible foreign materials and food scraps;
 - ii) washed in the first compartment sink in detergent solution capable of removing grease and food particles and that is maintained at a temperature of not less than 45°C (113° F);
 - iii) rinsed in the second compartment sink in clean potable water maintained at a temperature of not less than 45°C (113° F); and
 - iv) sanitized in the third compartment sink by immersion, in one of the following methods:
 - for at least 2 minutes in water at a temperature of at least 77°C (171° F);
 - for at least 2 minutes in a chlorine solution of 100 - 200 mg/L available chlorine at a temperature of not less than 45°C (113° F);
 - for at least 2 minutes in a solution containing a quaternary ammonium compound having a strength of not higher than 200 mg/L consistent with efficacy at a temperature of not less than 45°C (113° F);
 - for at least 2 minutes in a solution containing not higher than 25 mg/L iodine at a temperature of not less than 45°C (113° F); or
 - in accordance with any other method that has been scientifically proven to produce results equivalent to those achieved by use of any of the methods in this subclause (iv).

NOTE: The solutions used for the methods outlined in (iv) should be completely changed often enough to prevent utensils from becoming soiled and to maintain the bactericidal effect of the solution.

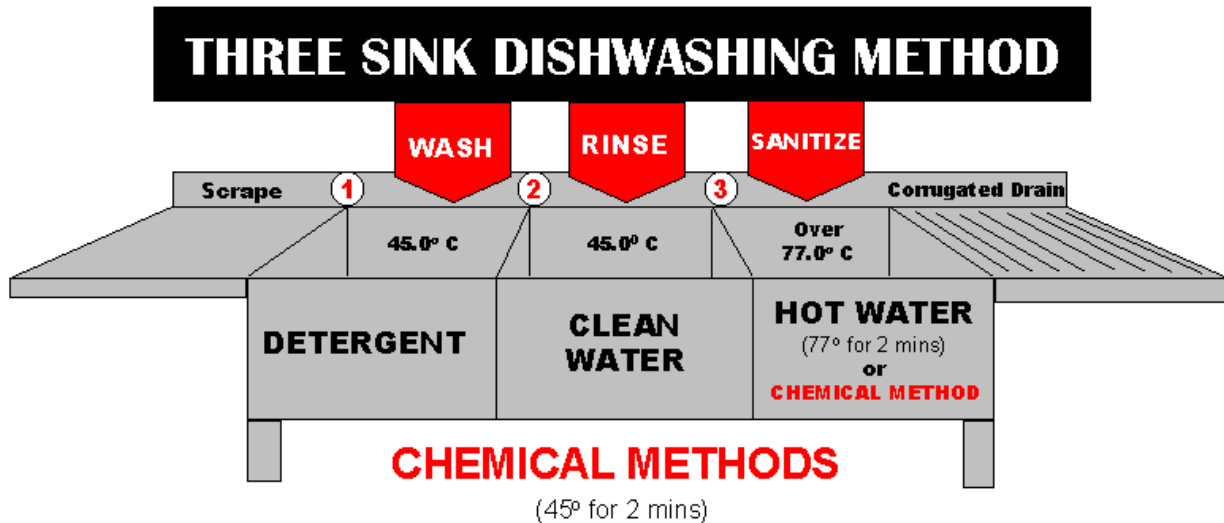
- v) air-dried, if possible.

c) The operator should test the temperatures of the water and the sanitizer concentration frequently to ensure that effective sanitizing is occurring.

Rationale

Once food equipment has been cleaned, food contact surfaces and utensils must be sanitized through mechanical or manual methods, to reduce the risk of food becoming contaminated with microorganisms when coming in contact with the utensil or surface. The approved sanitizing method or agent should be applied at the proper concentration and/or temperature and for the appropriate length of time to achieve the necessary reduction in bacterial levels. Regular monitoring of temperatures and/or sanitizer concentrations is necessary to ensure effective results, since sanitizer effectiveness decreases with time and temperature. Sanitizers should not be used at concentrations well above the recommended levels.

To assist food workers using chemical methods of sanitizing, a posted sign can be useful. A sample is printed below.



Chlorine Solution = 100ppm
 Dilution of 5% Bleach (Chlorine) approximately
 •one tbsp. per gallon of water
 •1/2 ounce per gallon of water
 •1/2 tsp. per litre of water
 •2ml per litre of water

Quaternary Ammonium Solution (Quats) = 200ppm
 Dilution of Quats
 Follow manufacture's instructions

4.3 Pest Management

4.3.1 Immediate Corrective Action

- a) The presence of birds, rodents or insects should be treated immediately by inspecting and discarding any adulterated food.
- b) Inspection should be followed by:
 - i) removing dirt, soil or filth if present;
 - ii) verifying cleaning procedures;
 - iii) cleaning and sanitizing surfaces contaminated by pests;
 - iv) destroying and sealing off nests and breeding places; and
 - v) protecting the food establishment against the entrance of pests.

Rationale

A pest infestation in a food establishment can result in food becoming contaminated by foreign matter (e.g., insect parts, rodent hair, etc.), pest urine/faeces, and/or pathogenic microbes carried by pests. Food establishment, which have become infested, must be thoroughly cleaned to eliminate pest harborage. Surfaces contaminated by pests must be cleaned and sanitized to destroy microbial pathogens which might be present and which might contaminate foods.

4.3.2 Eradication of Pests: Methods

- a) Pest control devices should be designed and located to effectively control the presence of pests in a food establishment.
- b) Insect control devices that are used to electrocute flying insects should be located at least 2 metres (6 feet) away from any food handling area. They should be equipped with an escape resistant trap, and they should be emptied and cleaned regularly.
- c) Insect control devices designed to trap insects by adhesive or devices that may expel the insects or insect fragments should be installed so that the dead insects or insect fragments cannot fall onto exposed food or equipment. To be effective, insect traps (sticky tapes or similar devices) should be changed regularly or when loaded with insects.
- d) Eradication of uncontrolled pests should be carried out by a certified pest control operator utilizing approved chemicals and methods. Integrated pest management approaches utilizing the minimal amount of chemical control possible are highly encouraged.

Rationale

The presence of pests increases the likelihood of contamination of food. Properly designed and installed pest control devices can be used as a means of eliminating pests.

Food establishment operators should rely on certified pest control services and emphasize integrated pest management practices that minimize the reliance on chemical controls, in order to minimize the risk of contamination of food products by pesticides.

4.3.3 Use of Rodenticides/Insecticides

- a) Rodenticides and insecticides used in a food establishment should be used in such a manner as to prevent the contamination of food. It is preferable that they not be applied while food production/preparation is taking place. Where, due to the nature of the food operation (e.g., 24-hour restaurants) this cannot be adhered to, reliance on traps and non-spray solutions should be emphasized, and open food should be protected from contamination.
- b) All material used should be identified on a list of approved rodenticides and insecticides which confirms that these may be used in a commercial food establishment.

4.3.4 Documentation

- a) Pest control measures shall be documented. Owners/operators should take note of information the pest control technician may need for follow-up.
- b) Documentation should include:
 - i) the name of the pest control operator responsible;
 - ii) the chemicals used for pest control (with the concentrations applied);
 - iii) the procedures and methods used;
 - iv) the frequency of application; and
 - v) records of inspection and monitoring.

Rationale

To ensure that pests are properly, effectively and safely eradicated, pest control measures requiring the application of chemicals in food establishment must be carried out only by individuals certified in pest control operations. Since chemicals used to eradicate pests may also be toxic to humans, food must be adequately protected while these substances are being applied in the food establishment. To verify that appropriate pest control measures have been undertaken, all aspects of pest control operations must be documented and monitored.

4.4 Use of Chemicals and Toxic Substances

- a) Chemicals, cleaning and disinfecting compounds and other toxic substances kept in a food establishment should be:
 - i) used in compliance with the manufacturer's labeling, directions or specifications; and
 - ii) used only in such a manner and under such conditions that the substances do not contaminate food, food equipment and food contact surfaces, or cause a health hazard.

- b) The chemicals, cleaning and disinfecting compounds and other toxic substances should be stored:
 - i) in a compartment separate from food, food contact surfaces and utensils; and
 - ii) in clearly labeled, non-food containers, which are (where appropriate) lockable.

Rationale

Special care should be taken when handling dangerous or toxic substances in food establishment. They should be used according to manufacturer's specifications, not only to ensure they function as intended but also to ensure worker safety.

To prevent the adulteration of food products, dangerous or toxic chemicals should be kept in containers which are clearly labeled to identify the contents, and stored in areas separate from food and food equipment. Locked containers or storage facilities can prevent malicious or accidental contamination of food.

4.5 Waste Management

4.5.1 Waste, Refuse and Recyclable Materials

Waste, refuse and recyclable materials should be removed from the food establishment at a frequency that will minimize the development of objectionable odours and other conditions that attract or harbour insects and rodents. Generally, these materials must be removed daily.

4.5.2 Sewage and Other Liquid Waste

Sewage waste systems and other non-sewage liquid conveyance and disposal systems should be flushed clean on a periodic basis.

4.6 General Maintenance Schedules

Surfaces, such as floors, walls and ceilings, should be cleaned at a frequency that will prevent the accumulation of dust, dirt, food residue and other debris.