

Frozen Confections

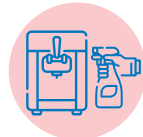
Prepared at Points of Sale for
Immediate Consumption

Food Safety Guidelines for Food Businesses



In a nutshell

- Frozen confections are high risk food as there is no extra heat treatment to kill pathogens before consumption. Milk also provides a favourable environment for the growth of microorganisms.
- Frozen confections can be cross-contaminated due to unsanitary handling, unclean machines and utensils, and in-house remixing of pre-prepared mixtures, such as adding fruits.
- Raw materials and frozen confections should be kept at proper temperatures to inhibit bacterial growth.
- When preparing frozen confections at points of sale, use heat-treated pre-prepared mixtures or heat treat self-prepared mixtures.
- The dispensing machine and utensils should be properly and regularly cleaned and disinfected.
- Food handlers should maintain good personal and environmental hygiene at all times.



Introduction and scope

Some frozen confections can be readily available in the freezers of supermarkets and tuck stores. Others are served by hand at restaurants, ice-cream parlours, ice-cream vans, and convenience stores. For example, soft serve ice-cream and frozen yogurt are prepared with dispensing machines, and hard ice-cream and gelato are scooped out of tubs.

Frozen confections are high-risk food that requires no further cooking and heating process to eliminate disease-causing microorganisms before consumption. Milk, which is used in preparing certain frozen confections, provides a favourable environment for the growth of microorganisms. During the production process, unhygienic handling of frozen confections with hands, the addition of contaminated ingredients without heat treatment, and the use of improperly maintained machinery and utensils may all contribute to potential microbiological risks in the product. The sale of frozen confections with microbial count that exceeds the legal limit not only indicates failure in practicing food hygiene, but can also result in potential prosecution.

Under the Frozen Confections Regulation (Cap. 132 AC),

No person shall sell, or offer or expose for sale, any frozen confection which contains more than 50 000 bacteria per gram or more than 100 coliform bacteria per gram.

Based on the results of previous food surveillance, the unsatisfactory rates of soft serve frozen confections tend to be higher in terms of total bacterial count and coliform bacteria than that of the 'hard' ones.

This set of guidelines is intended for food business operators (FBO) who manually prepare frozen confections **at the points of sale, via dispensing machines and ice-cream tubs for example**, for customers' immediate consumption. It aims to assist the food business in implementing food safety measures throughout their operations, ensuring **the preparation and delivery of safe frozen confections to customers**.

This guidance reviews some essential parameters related to Good Hygiene Practices (GHP) and recommends best practices that any FBO should consider in providing safe foods to the consumers.

Frozen confections manufacture at wholesale level



The Centre for Food Safety considers food safety hazards differ between wholesale and point-of-sale frozen confection manufacture, with the former focusing on insufficient heat treatment of raw materials and improper storage temperature. Wholesale manufacturers of frozen confections should refer to the *Food Safety Guidelines for Food Businesses on Frozen Confections Manufactured at Wholesale Level*.



Common food safety problems related to frozen confections prepared at points of sale

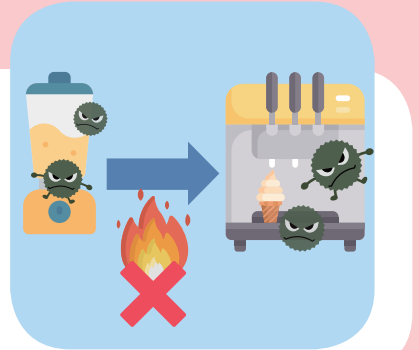
Contamination of frozen confections

- Contamination by dirty utensils, such as ice-cream scoops.
- Contamination by food handlers with poor personal hygiene, such as dispensing ice-cream after handling cash without washing hands.



Ice-cream mixtures without proper heat treatment

- Pre-prepared ice-cream mixtures not heat treated before being fed into the machine.
- Adding other ingredients, such as fresh fruits, to heat-treated ice-cream mixtures with no further heat treatment and serving immediately.



Inadequate cleaning and disinfection of machines

- The machine's nozzle not routinely cleaned and disinfected before use.
- The machine not regularly cleaned and disinfected according to the manufacturer's instructions.



Food safety measures

1

Purchasing and receiving

- Source ice-cream mixtures, scoop serve frozen confections, and other ingredients from approved and reliable suppliers.
- Upon receiving, check:
 - the expiry dates of raw materials;
 - the general conditions of raw materials, e.g. intact packaging with no signs of contamination; and
 - whether chilled ingredients are kept at 4°C or below and the frozen ones entirely frozen.
- Reject any unfit raw material and inform the supplier.
- If the final product will not be heat treated in-house, only use ice-cream mixtures that have been heat treated, either by ultra-high temperature (UHT) treatment or by pasteurisation.



Food safety measures

Storage

2

- Store different raw materials of frozen confections at the following conditions, or according to manufacturer's instructions if available:

Pre-prepared frozen confection mixtures

Sterilised liquid mix ('UHT mix')

- Store in a clean, dry place and keep out of direct sunlight when unopened.
- Once opened, keep refrigerated at 4°C or below.

Pasteurised liquid mix ('fresh mix')

- Keep refrigerated at 4°C or below.
- Do not freeze before use.

Powdered mix

- Store in a clean, dry place and keep out of direct sunlight when unopened.
- Once mixed with drinking water, keep the pre-prepared mixtures refrigerated at 4°C or below.



Scoop serve frozen confections

- Keep frozen at -18°C or below.
- Maintain the storage temperature of deep freezers / counters used to serve frozen confections at -12°C or below – this storage is not suggested for more than one week.



Other “dry” Ingredients

Wafer cones and dry toppings (e.g. nuts, chocolate chips)

- Store in a clean, dry place.
- Store in a way that prevents contaminations, e.g. in sealed containers or storage tubes.



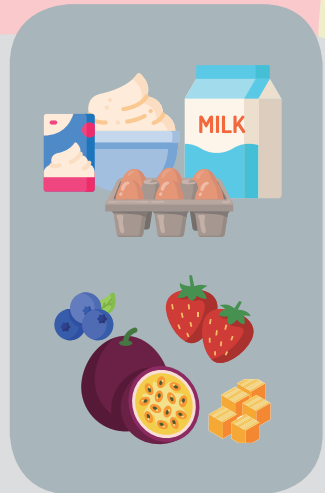
Other “wet” ingredients

Milk, cream, eggs (for self-prepared mixture)

- Keep eggs and pasteurised egg and dairy products refrigerated at 4°C or below.
- Keep UHT milk at room temperature and refrigerate it at 4°C or below once open.

Fruits

- Keep perishable fresh fruits, e.g. strawberries, as well as pre-cut or peeled fresh fruits at 4°C or below.
- Keep frozen processed fruits, e.g. mango cubes at -18°C or below.



- Check the temperature of the refrigerator and freezer with a thermometer. Keep records of the temperature at least twice a day.
- Store the ready-to-eat ingredients separately from raw foods to prevent cross-contamination.
- Apply the first-in-first-out principle to store and use of raw materials. Perishable ingredients, e.g. powder mixed with water and pre-cut fruits, should be used as soon as possible.



Food safety measures

Preparation

3

The food handler should observe good hygiene practices while preparing the frozen confections:

- Wash hands thoroughly before putting on gloves and handling foodstuff.
- Change gloves regularly (e.g. once an hour) or whenever they get soiled, torn or taken off.
- Do not reuse disposed gloves.



Soft serve frozen confections (from a dispensing machine)

- When using pre-prepared ice-cream mixtures (e.g. UHT mix, fresh mix and powdered mix):
 - discard any mixtures that have passed its 'use-by' date;
 - wipe the package of the mixture down with a clean cloth before opening; and
 - use clean tools to open the package as needed.
- When preparing ice-cream mixtures from scratch:
 - use clean utensils and drinking water and follow manufacturer's instructions to prepare the mixture;
 - use pasteurised ingredients (e.g. eggs) if possible;
 - do not prepare the mixture too far in advance;
 - all self-prepared mixtures should be maintained at 4°C or below before being fed into the machine with heat treatment function; and
 - conduct effective pasteurisation of the self-prepared mixture in the machine before the freezing process begins.



- Dispensed confections should not be returned to the hopper of the machine.
- Wash hands before filling or topping up the hopper.
- Clean and disinfect all serving nozzles of the dispensing machine before use and regularly during business
- Check the temperature displayed on the machine and ensure that it is in good working condition.
- Discard any products with abnormal texture.

Scoop serve frozen confections

- Check for large ice crystals or other signs of defrosting and refreezing in the confections. Discard if there is any evident sign.
- Clean and disinfect all utensils, such as scoops, before use and regularly during operation.
- Wash, disinfect and dry the lids of the frozen confection containers before placing back in the container.
- Do not refreeze frozen confections after melting has occurred.



Other ingredients

- Serve the wafer cone in a cone sleeve or a paper napkin.
- Wash fresh fruits thoroughly before use. Keep pre-cut or peeled fruits refrigerated and use as soon as possible – discard them if left in room temperature for more than 4 hours.
- Use clean utensils to avoid handling toppings with bare hands.



Food safety measures

In-house remixing of pre-prepared mixtures

Some FBOs may remix pre-prepared, heat-treated mixtures by themselves to achieve the desired flavour. However, manual handling and addition of ingredients without heat treatment, such as fresh fruits, into mixtures may risk cross-contamination. If such remixing is required, food handlers should:



- Maintain good personal hygiene, which includes frequent hand washing, the correct use of gloves, and the proper use of touch-free utensils.
- Make sure that utensils and equipment for remixing are thoroughly cleaned and disinfected.
- Remixing should be done in a clean container instead of the original packaging of the pre-prepared mixtures.
- Do not remix too far in advance and keep the remixing process as brief as possible.
- Wash thoroughly and peel, if applicable, the fresh ingredients before use.
- All remixed mixtures should be maintained at 4°C or below before being fed into the machine with heat treatment function.
- Conduct heat treatment of the remixed mixture in the machine in accordance with Frozen Confections Regulation (Cap. 132AC) before the freezing process begins.



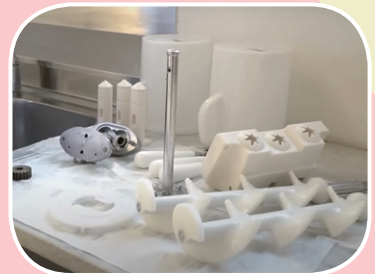
4

Cleaning and disinfection

Cleaning is very important as it removes the dirt and food residues which allow bacteria to grow. Cleaning should be carried out using a designated bucket or sink.

Dispensing machines

- **Clean** the dispensing machine according to the supplier's instructions, which are likely to involve the following:
 1. Drain and discard any unused mix from the machine (do this at the end of each business day for machines that have no self-pasteurisation function).
 2. Wash through the tank of the machine with warm water using the machine's cleaning cycle.
 3. Dismantle the machine and thoroughly wash all parts with disinfectant, followed by rinsing with drinking water.
 4. Clean the hopper and the nozzles of the dispenser unit as well as the exterior of the machine.
- Inspect the seals and O-rings, and replace those cracked, split or showing signs of damage.
- After cleaning, reassemble the machine.



Food safety measures

- **Disinfect** the machine according to the manufacturer's instructions, which are likely to include:
 1. Fill the machine with a food-grade disinfectant solution.
 2. Follow the chemical manufacturer's instructions, such as recommended concentration, contact time, and shelf-life after dilution, when preparing the solution.
 3. Put the machine onto the cleaning cycle to disinfect all parts of the machine.
 4. Drain the disinfectant solution from the machine and flush through with drinking water if needed.
- Prime the machine with a small amount of mixture and discard the first run.
- Document the cleaning schedule of the machine.
- Employees should be trained on how to clean and disinfect the machine properly.



Utensils used for scoop serve frozen confections

- The utensils should be rinsed with warm water and food-grade disinfectant. Follow the manufacturer's instructions when preparing the disinfectant solution.
- Utensils should be cleaned and disinfectant frequently during business hours:
 - This can be done by placing two containers containing sanitising solution within easy reach of the confection freezer.
 - One container should be used for washing off the frozen confection, while the other should be used to sanitise the utensils.
 - Both containers should be emptied and replenished with new solution at least once an hour.
- Shake off the excess solution before scooping.



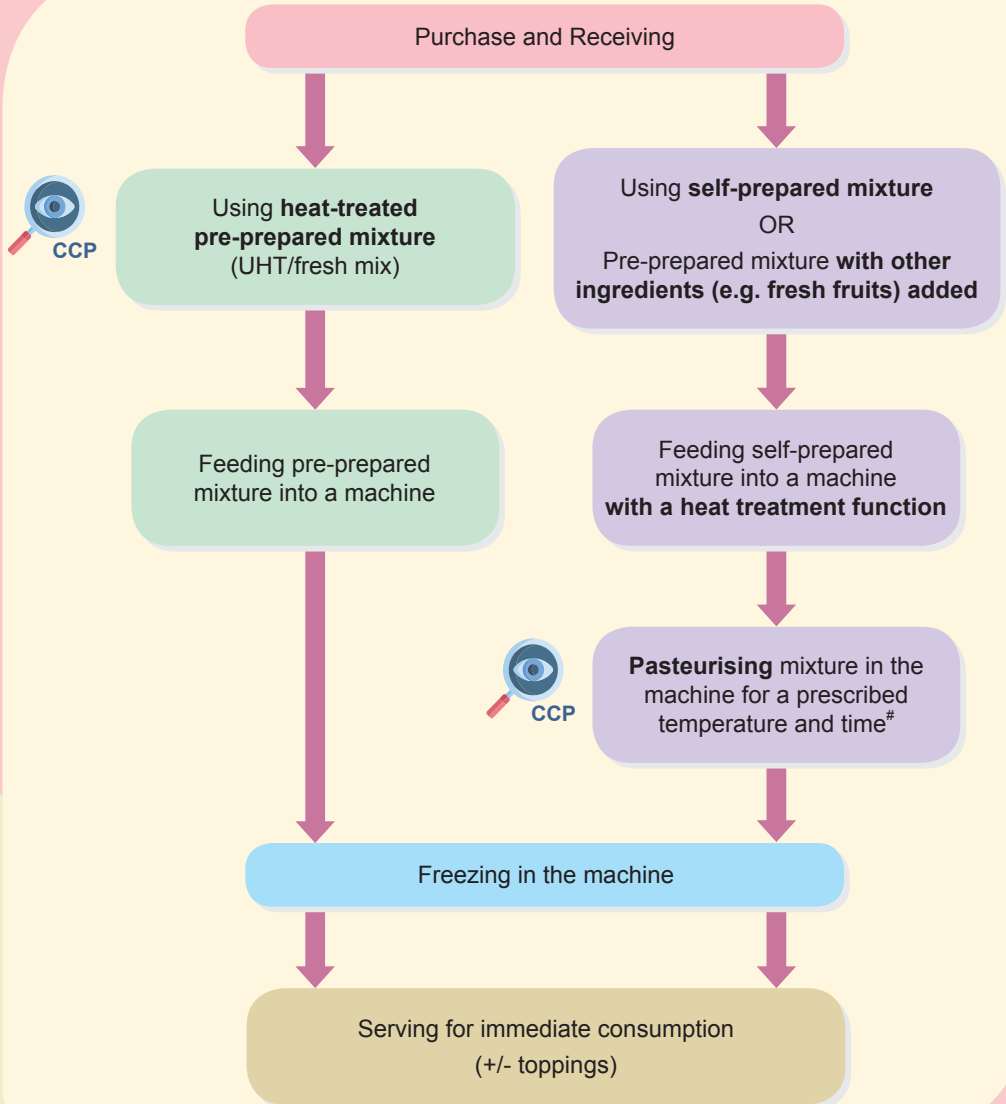
Personal and environmental hygiene

- Always follow good personal hygiene practices. Wash hands thoroughly with warm soapy water for 20 seconds before operating the dispensing machine.
- Open wounds should be covered by waterproof bandages or gloves.
- Food handlers should stop working if they have or suspect to be suffering from an infectious disease with symptoms such as diarrhoea, vomiting, fever, sore throat, or abdominal pain.
- Adequate washing facilities be made available at the points of sale. Separate washing facilities should be provided for hand-washing and preparing food/ washing to reduce the risk of cross-contamination.*

* In catering units such as ice-cream vans where only a sole type of food preparation and a few utensils are involved, a purpose-made double unit manufactured for itinerant food businesses comprising a small hand basin and sink would suffice.



Production flow diagram of soft serve frozen confections



The conditions of heat treatment as stipulated in Frozen Confections Regulation (Cap.132AC) are that the mixture should be raised to and kept at:

- 66°C or above for not less than 30 minutes; or
- 71°C or above for not less than 10 minutes; or
- 79°C or above for not less than 15 seconds.



A **Critical Control Point (CCP)** refers to a step at which control can be applied and is essential to prevent or eliminate a food safety hazard or reduce it to an acceptable level.

Always maintain good personal, environmental and food hygiene throughout the process. Follow the Five Keys to Food Safety:

- 1 **Choose** (Choose safe raw materials);
- 2 **Clean** (Keep hands and utensils clean);
- 3 **Separate** (Separate raw and cooked food);
- 4 **Cook** (Cook thoroughly); and
- 5 **Safe temperature** (Keep food at safe temperature).



FBO should manufacture and sell frozen confections according to the licensing terms of the type of licence obtained.

