

Pre-cut Fruits and Fresh Fruit and Vegetable Juices

Food Safety Guidelines for Food Businesses



Introduction and scope

Processing fresh produce into fresh-cut products or juices increases the risk of bacterial growth and contamination by breaking the natural exterior barrier of the produce. Pre-cut fruits and fresh juices, often served cold, are considered high-risk foods as the ingredients do not undergo any heat treatment process before consumption. Disease-causing bacteria like *Listeria monocytogenes*, *Salmonella spp.* and Shiga toxin-producing *Escherichia coli* may be present in some common ingredients such as apples and oranges. Additionally, there is a risk of mycotoxin contamination, specifically patulin, in mouldy or damaged fruit, which can pose health hazards. The processing of fresh produce without proper personal and environmental hygiene can also increase the risk of contamination by microorganisms with antimicrobial resistance (i.e., “superbugs”). To ensure the safety of pre-cut fruits and fresh juices, food handlers should be alert to possible food safety risks and take appropriate measures in the production process.

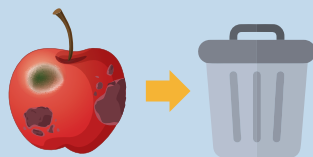


This set of guidelines is intended for food business operators (FBOs) who prepare and sell pre-cut fruits and fresh juices at food premises. It aims to help FBOs to implement food safety measures in their operations in order to produce and supply safe and wholesome pre-cut fruits and fresh juices. While this is not a legal document and its use is voluntary, it reviews some essential parameters related to Good Hygiene Practices (GHPs) and recommends best practices that any FBO should consider in providing safe foods to consumers.

In this guideline, “pre-cut fruits” refers to fruits that have been cut open, cut into pieces but remain in a fresh state, and are stored/displayed for sale or for serving in food service and retail stores. “Fresh fruit and vegetable juices” (“fresh juices”) refers to juices that are extracted from fresh fruits and vegetables (such as oranges, apples, carrots and celery), prepared and sold in the same business premises without undergoing any pasteurisation process.

What is patulin?

- Patulin is a heat stable toxin produced by a number of different moulds such as *Penicillium* and *Aspergillus*.
- It can be found in damaged or mouldy fruits, particularly apples.
- Removal of mouldy tissues of an apple will not necessarily remove all the patulin present in the fruit as some patulin may have diffused into “healthy” looking tissues.
- Any externally and/or internally damaged or mouldy apples should be refrained from use.
- If contaminated apples are used to make juices, high levels of patulin are likely to be carried through to the final product.





Common food safety problems related to pre-cut fruits and fresh juices



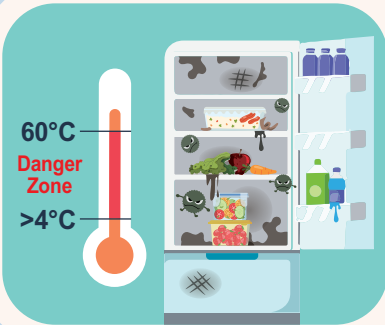
Presence of disease-causing bacteria, mould, hazardous chemicals and/or foreign materials in the raw ingredients

- Poor hygiene status of incoming raw ingredients
- Lack of good hygiene practices, e.g., fresh produce not properly washed before use



Contamination of ingredients during preparation

- Fruits and vegetables contaminated by dirty equipment or utensils, such as chopping boards and knives
- Fruits and vegetables contaminated by food handlers with poor personal hygiene



Improper storage conditions or temperatures

- Prepared pre-cut fruits and fresh juices not properly stored at a temperature at or below 4°C to prevent bacterial growth
- Prepared pre-cut fruits and fresh juices not properly covered to prevent cross contamination during storage

Food safety measures for the preparation of pre-cut fruits and fresh juices

1

Purchase and receiving

When making purchases, choose

- food ingredients from reliable sources; and
- fruits and vegetables that are not bruised or damaged.

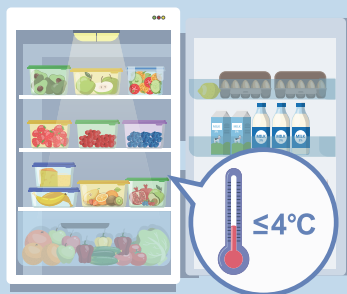
Upon receipt, check fresh produce to make sure that:

- the fresh produce is not damaged, mouldy, decomposed or contains extraneous matter; and
- chilled/frozen ingredients arrive at appropriate temperatures (e.g., frozen items at -18°C or below and chilled items at 4°C or below) and are free from signs of temperature abuse, such as the presence of ice crystals or water or fluid stains on the packaging.

2

Storage of fresh fruits/vegetables

- Handle all fruits and vegetables as gently as possible to minimise physical damage, apples in particular, as any bruising will encourage patulin formation.
- Store fresh produce away from raw foods, such as raw meat, poultry and seafood, to avoid cross-contamination.
- Place fresh produce in a cool and dry place. Highly perishable fruits, such as strawberries and grapes should be immediately stored in refrigerators.
- Avoid overloading the refrigerator and follow the first-in-first-out stock rotation practice.
- Store and handle disposable plates, cups and straws in a clean and sanitary manner.



Food safety measures for the preparation of pre-cut fruits and fresh juices

Preparation

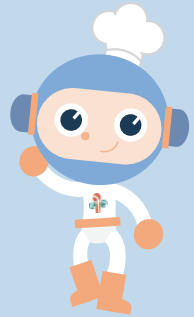
3

- Remove any externally and/or internally damaged or mouldy fresh produce.
- Wash all fresh produce thoroughly under running water and, ideally in a sink exclusive for this use.
- Rub firm-skin fruits/vegetables under running tap water or scrub with a clean produce brush while rinsing.
- When using disinfectants for fresh produce, choose food grade products and follow the manufacturer's instructions regarding concentrations and contact time to ensure food safety and effectiveness.
- Use separate equipment and utensils for handling fresh ready-to-eat produce to minimise the risk of cross-contamination.
- Clean and sanitise all food preparation utensils and surfaces, including juicers and blenders before starting work.



- Cut away any bruised areas on fresh fruits/vegetables before preparation. Discard any rotten fresh fruit/vegetables.
- Check the presence of internal mould when cutting the fruits and vegetables and discard the mouldy ones.
- Maintain good personal hygiene (e.g., keep hands washed and sanitised, wear clean protective clothing, etc.) at all times.
- Wrap fresh-cut or peeled fruits tightly in plastic wrap and refrigerate them immediately (i.e., at a temperature of 4°C or below).
- Use distilled water or boiled water if water is one of the ingredients for making juices.
- Prepare just enough pre-cut fruits/vegetables for the day needed. It is a good practice to discard any leftovers and prepare fresh-cut fruits/fresh juices on the next day.

Please refer to the **“Guidelines on Hygienic Production and Handling of Ice in Food Premises”** if ice is intended to be used for making juices.

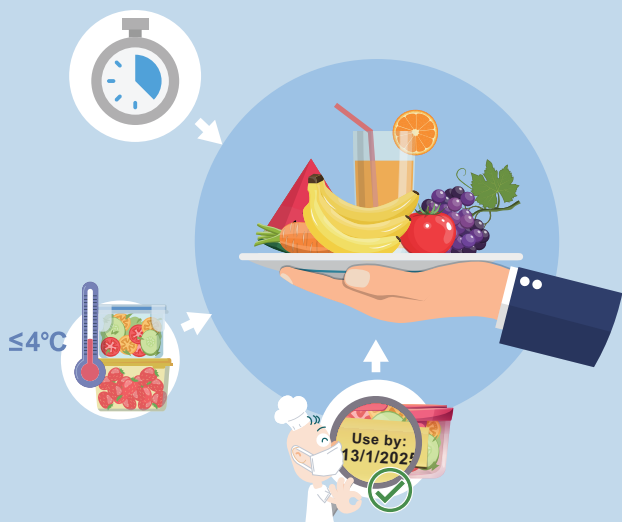


Food safety measures for the preparation of pre-cut fruits and fresh juices

Dish Serving/Packing

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- Serve pre-cut fruits/fresh juices immediately.
- Keep pre-cut fruits/fresh juices, which are not for immediate use, in clean containers with close-fitting covers at 4°C or below.
- Avoid keeping pre-cut fruits or fresh juices at temperatures above 4°C for more than two hours.
- Label packed pre-cut fruits/fresh juices with a “use-by” date and storage condition instructions.



Display

5

- Clean all display areas on a daily basis. Promptly remove and sanitise any spillages that occur throughout the day.
- Inspect prepackaged pre-cut fruits/fresh juices on a regular basis throughout the day for damage, breakdown and spillages.
- Remove any poor-quality prepackaged pre-cut fruits/fresh juices from sale and dispose of them.

Advice on Personal and Environmental Hygiene for Food Handlers

Personal hygiene

- Wear clean overalls.
- Wear a face mask when handling food. Discard masks that have been damaged, soiled or used for a prolonged period.
- Discard disposable gloves that have been damaged, soiled or taken off during breaks. Wash hands between glove changes and after removal of gloves.
- Wash hands thoroughly before handling food, after using the toilet or after touching unclean items (e.g., after handling garbage or cash). Rub hands with liquid soap for at least 20 seconds.



For details, please refer to the *Hand Washing Guideline for Food Handlers* of the Centre for Food Safety.



- Properly cover open wounds and wear gloves.
- Temporarily cease handling food when suffering or suspected to be suffering from an infectious disease or having symptoms of illnesses such as flu, diarrhoea, vomiting, jaundice, fever, sore throat and abdominal pain.



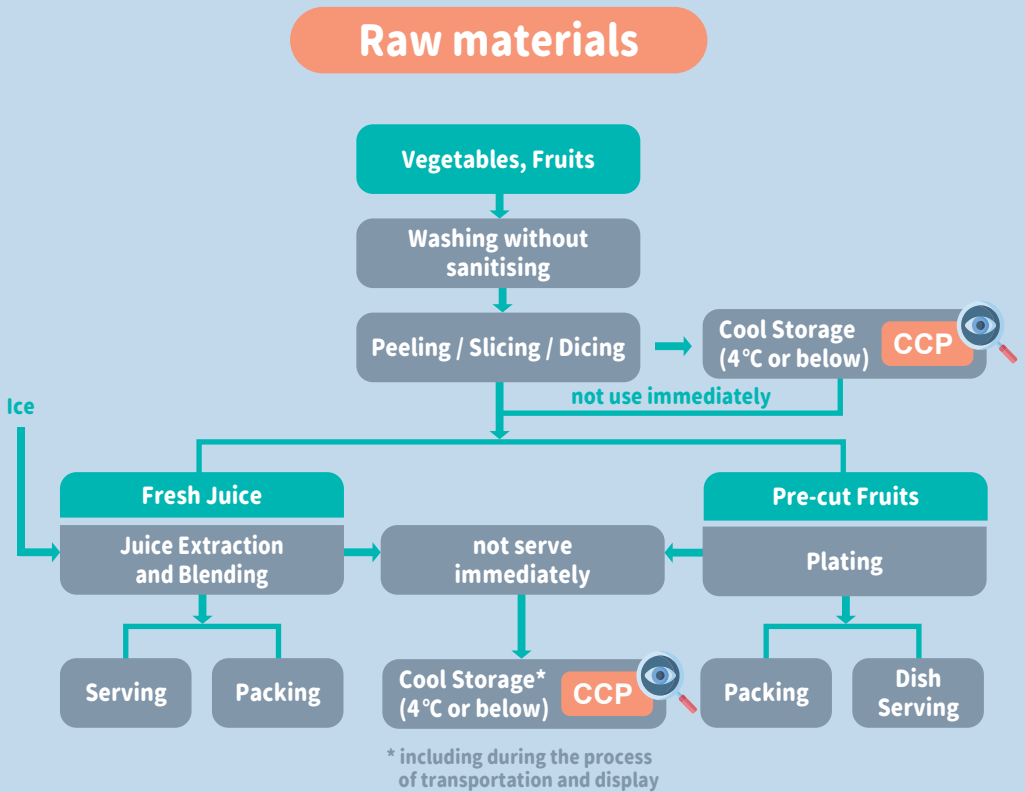
Advice on Personal and Environmental Hygiene for Food Handlers

Environmental hygiene

- Hand washing and drying facilities should be suitably located in food preparation or production areas and supplied with liquid hand soap. Where possible, hand washing facilities should be equipped with non-hand-operated taps and single-use towels.
- Clean and sanitise utensils, equipment including electric juicers, blenders and cutlery, work station surfaces and wiping cloths with boiling water or approved bactericidal agents regularly (e.g., at four hours interval). Follow the manufacturer's instructions, e.g., the required contact time, correct concentration, and shelf life after dilution, etc., for the use of bactericidal agents.
- Keep refrigeration facilities in good condition. Make sure temperature controls are operating properly.



Flow diagram of pre-cut fruits and fresh fruit and vegetable juices production



Remark: A critical control point (CCP) is 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.



Food safety management system

Implement a preventive food safety management system (such as the HACCP-based Food Safety Plan) to identify and control food safety problems at every stage of the food manufacturing process. Please refer to the *“How to Implement a Food Safety Plan”* for details.



Pre-cut fruits and fresh juices are examples of ready-to-eat foods. They can become contaminated by foodborne pathogens and "superbugs" if not handled properly because there is no heat treatment to kill any bacteria that may be present. This can pose a serious threat to human health. As a result, it is critical to maintain a high level of personal, environmental and food hygiene when preparing the food.



In addition to this set of guidelines, food handlers should go through the *“Ready-to-eat Food: General Hygiene Advice for Food Businesses”* of the CFS. Please scan the QR code for more information.

