Food Authority

NSW GOVERNMENT

GUIDANCE ON THE 2-HOUR/4-HOUR RULE

The NSW Food Authority is the regulator and source of truth for food safety in NSW, underpinned by science in an evidence-based approach from paddock to plate.

Note: This information is a general summary and cannot cover all situations. Food businesses are required to comply with all provisions of the Food Standards Code and the Food Act 2003 (NSW).

Contents

Introduction

This document explains how retail food businesses can use the 2-hour/4-hour rule as an alternative method of complying with *Australia New Zealand Food Standards Code* (Food Standards Code) requirements to keep potentially hazardous foods under temperature control while on display, during short-term storage and preparation.

Application

The document does not cover all requirements of the Food Standards Code, in particular requirements relating to premises and equipment. Businesses must read the Food Standards Code to ensure they comply with all aspects of the Food Standards Code as it relates to their business.

For businesses licensed with the NSW Food Authority under Food Regulation 2015, there may be specific temperature control requirements which businesses must comply with.

For sushi retailers, the Food Authority has prepared the *Food Safety Guidelines for the Preparation and Display of Sushi,* available at www.foodauthority.nsw.gov.au, for how the 2-hour/4-hour rule should be applied.

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Acknowledgements

The guideline has been developed with assistance from NSW local council environmental health officers.

Definitions

2-hour/4-hour rule	An alternative method of satisfying the temperature control requirements specified in the Food Standards Code. The principal concepts of the 2-hour/4-hour rule are that when potentially hazardous ready-to-eat food has been kept between 5°C and 60°C for: • up to 2 hours, it can be refrigerated below 5°C, or kept hot above 60°C, or used immediately • between 2 and 4 hours, it must be used immediately • up to a total of 4 hours or more, it must be thrown out. *Safe Food Australia – Appendix 2 (2016)*
Demonstrate	Means demonstrate to the satisfaction of the NSW Food Authority
Food Authority	Means the NSW Food Authority
Food Safety Program	A program set out in a written document retained at the food premises of the food business, including records of compliance and other related action, that: (a) systematically identifies the potential hazards that may be reasonably expected to occur in all food handling operations of the food business, (b) identifies where, in a food handling operation, each hazard identified under paragraph (a) can be controlled, and the means of control, (c) provides for a systematic monitoring of those controls, (d) provides for appropriate corrective action when that hazard, or each of those hazards, is found not to be under control, (e) provides for the regular review of the program by the food business to ensure its adequacy, and (f) provides for appropriate records to be made and kept by the food business demonstrating action taken in relation to, or in compliance with, the food safety program. *Food Standards Code 3.2.1, Division 2, Clause 5*
Pathogenic bacteria	Bacteria capable of causing food poisoning. Some examples: *Listeria monocytogenes, Salmonella, Bacillus cereus*, and *Staphylococcus aureus*.
Potentially hazardous food	Food that has to be kept at certain temperatures to minimise the growth of any pathogenic microorganisms that may be present in the food or to prevent the formation of toxins in the food. *Food Standards Code 3.2.2, Division 1, Clause 1*

Ready-to-eat food	Food that is ordinarily consumed in the same state as that in which it is sold and does not include nuts in the shell and whole raw fruits and vegetables that are intended for hulling, peeling or washing by the consumer. *Food Standards Code 3.2.2, Division 1, Clause 1*
Temperature control	Maintaining food at a temperature of: • 5°C or below if this is necessary to minimise the growth of pathogenic microorganisms in the food, so that the microbiological safety of the food will not be adversely affected for the time the food is at that temperature, or • 60°C or above, or • another temperature - if the food business demonstrates that maintenance of the food at this temperature for the period of time for which it will be so maintained, will not adversely affect the microbiological safety of the food. *Food Standards Code 3.2.2, Division 1, Clause 1*
Temperature danger zone	Between 5°C and 60°C

See the Food Standards Code at www.foodstandards.gov.au for more definitions.

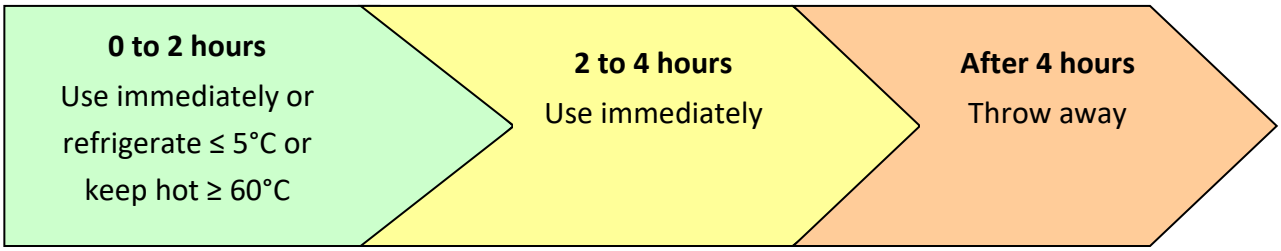
The use of time as a control for potentially hazardous food

Because food poisoning bacteria take time to grow to numbers that cause food poisoning, the Food Standards Code provides an alternative to holding food below 5°C or above 60°C. It allows food businesses to hold food between 5°C and 60°C for short, measured periods of time.

Introducing the 2-hour/4-hour rule

Studies have been done that show food can be safely held out of temperature control for short periods of time without significantly increasing the risk of food poisoning. The time for which food can be safely held between 5°C and 60°C is commonly referred to as the '2-hour/4-hour rule' and is applied as follows:

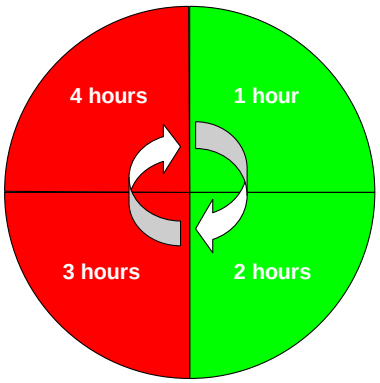
Total time food is between 5°C and 60°C



'Use immediately' means that the food must be sold within that 2-hour period, or cooked or processed to reduce or eliminate any pathogenic bacteria present in the food.

After the first 2 hours (red zone) the food must be either used up within 2 hours or thrown out.

It cannot be returned to refrigeration or reheated at 60°C or above (unless cooking for immediate consumption).



Within the first 2 hours (green zone) there are three options for the food:

- it can be used immediately,
- returned to refrigeration at or below 5°C, or
- reheated to 60°C or above.

BUT you must keep track of this time and subtract it from the total 4 hours.

The NSW Food Authority and local councils recognise the 2-hour/4-hour rule as a validated alternative means of compliance with temperature control requirements in the Food Standards Code. **However, it must be used correctly**.

This guideline has been prepared to help retail businesses apply the 2-hour/4-hour rule correctly to ensure compliance with Food Standards Code requirements.

How to use the 2-hour/4-hour rule

To ensure that the 2-hour/4-hour rule is being applied correctly to the retail display or temporary storage of potentially hazardous food, there are certain requirements that must be met. You must be able to show how you are complying with the rule if asked by an authorised officer from the Food Authority or a local council Environmental Health Officer.

To demonstrate that the 2-hour/4-hour rule is being applied correctly, you will need to:

- ensure the Food Standards Code requirements are followed for potentially hazardous food and ingredients during:
  - receival,
  - storage, and
  - preparation.
- ensure cold foods are not displayed in direct sunlight or at temperatures above 25°C, as this will allow bacteria to quickly increase in numbers.
- implement a documented system for:
  - monitoring the length of time food is displayed out of temperature control,
  - ensuring the food is appropriately identified, and
  - ensuring food is disposed of appropriately after 4 hours.

Food which has been in the temperature danger zone for less than 2 hours (during preparation + storage + display) can be returned to the refrigerator at or below 5°C or heated to above 60°C and brought out again at a later time. However, the total time in the temperature danger zone must not be longer than 4 hours. Whatever system you choose to use, you must be able to demonstrate what you have done.

The documented system can take the form of:

- a set of work instructions on how the 2-hour/4-hour rule is applied by your business (see Appendix 1 for an example), or
- keeping records demonstrating adherence to the time temperature requirements (see Appendix 2 for an example).

If you decide to use the 2-hour/4-hour rule for temperature control but are not able to satisfactorily demonstrate that you are applying the rule correctly, then you are in breach of Food Standards Code requirements. It could lead to enforcement action being taken against you.

It is the responsibility of the food business to ensure all food handlers are adequately trained in the use of the documented work instructions or the completion of records if the 2-hour/4-hour rule is to be applied.

Ensure potentially hazardous food and ingredients are handled correctly

To use the 2-hour/4-hour rule, you must ensure that potentially hazardous foods and ingredients have been handled correctly during receival, storage and preparation. If you cannot be sure of this, then you cannot satisfactorily demonstrate the use of the 2-hour/4-hour rule.

Receival of food

Only receive potentially hazardous foods that have been transported under temperature control.

- Once you receive potentially hazardous foods, you must place it under refrigerated storage at 5°C or less, or keep it hot above 60°C, or place it on display immediately with the time recorded or according to your work instructions.
- You should always check the temperature of food for each batch received. The temperature must be below 5°C or above 60°C (as appropriate).
- Any temperature outside this range should be recorded and the food either rejected or, if there is evidence that the food has only been out of temperature control for a short period of time, an assessment made as to its safety prior to its use and this time taken off the allowable 4 hours out of temperature control during display, preparation, or storage. Any assessment or corrective action should be recorded.

Storage

You must keep all potentially hazardous foods and ingredients under temperature control until you use or display them.

- Food must be covered during storage to protect against contamination.
- Cool room temperatures should be checked and recorded periodically to ensure they are running at 5°C or below.

Preparation of ready-to-eat foods

Because ready-to-eat food is eaten without any further cooking, it is important that you handle it correctly and safely. If your business only has a limited amount of storage and display space, you should only prepare an amount of food that you can adequately store or display under temperature control.

- When preparing foods such as sandwiches, limit the amount of time the potentially hazardous ingredients (e.g., cooked chicken, ham, fresh cut lettuce) are out of temperature control.
- Where sandwich ingredients are on display for ready-made sandwiches, the ingredients must be kept under temperature control or have the 2-hour/4-hour rule applied to them.
- It is important to maintain good personal hygiene when preparing ready-to-eat foods.

The total allowable time food can stay out of temperature control is 4 hours, so any time during transport, storage or preparation the food spends between 5°C and 60°C must be counted towards this time.

Display and use of cooked foods

If potentially hazardous food has not been cooled safely after cooking, the number of bacteria may be able to grow, and it may not be safe for this food to have the 2-hour/4-hour rule applied to it.

Cold display	You must ensure that cooked foods have been cooled in accordance with Food Standards Code requirements – that is, cooled to below 21°C within 2 hours and below 5°C within a total of 6 hours.
Hot display	You must display cooked foods at 60°C or above, or according to the 2-hour/4-hour rule with the time commencing immediately when the coolest part of the food drops below 60°C (i.e., into the temperature danger zone).

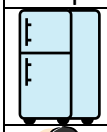
Bain marie and hot display cabinet temperatures should be checked and recorded periodically to ensure they are able to maintain food at or above 60°C. If they operate at a lower temperature, the 2-hour/4-hour rule is applied.

You must keep cooked foods separate from raw foods to avoid them becoming cross contaminated.

Examples showing how the rule should be implemented

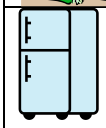
Example A – A shop making fresh sandwiches to order

A sandwich shop makes sandwiches on demand with all salad and meat ingredients sitting on display within a display case. This case typically keeps the ingredients at around 15°C. This is within the temperature danger zone.



7:00am: All potentially hazardous ingredients have been sitting in the refrigerator overnight and have been kept at or below 5°C.

8:00am: Sandwich ingredients are taken from the refrigerator and prepared by chopping/slicing at room temperature.



8:30am: Prepared ingredients are placed into tubs, marked with the preparation date and then stored back in the refrigerator (at or below 5°C). This 30 minute of preparation time must be counted towards the time the food is out of temperature control.

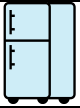
11:30pm: The tubs of ingredients are moved into the display case.
There are several options how to apply the 2-hour/4-hour rule.

1:00pm: The tubs can be returned to the refrigerator (this equals 2 hours out of temperature control, including preparation + display times). Mark with the time remaining.

3:00pm: The ingredients must be discarded (this equals to 4 hours out of temperature control, including preparation + display times).

These ingredients may then be displayed again in the display case the next day for another 2 hours. After this time they must be discarded (they cannot be returned to the refrigerator again).

Once the ingredients have spent a total of 4 hours in the temperature danger zone they must have been used up or discarded.



Tubs of spare ingredients are kept under refrigeration at or below 5°C until needed.

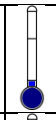
You must either make a written procedure which the staff will use each day or record the times when ingredients and sandwiches are out of refrigeration, and if/when they are returned to refrigeration or discarded.

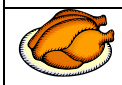
See Appendix 1 and 2 for examples of a work instruction and record sheet for this example.

Example B – Cooking and using ingredients

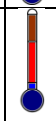
A sandwich shop receives raw chicken which is cooked and cooled for use in making sandwiches. The shop displays these sandwiches at room temperature over the busy lunch period.

7:00am: Raw chicken is delivered to the shop at 5°C or below.

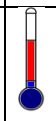




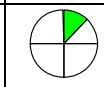
7:30am: Chicken is cooked to a minimum of 74°C (core temperature). This should be checked with a thermometer.



9:30am: Chicken is cooled from 60°C to 21°C within 2 hours. Cooling time does not count towards the time the food is out of temperature control – provided it meets Food Standards Code requirements (Standard 3.2.2).



9:30am: Chicken is cut up and used in making sandwiches.
This takes 30 minutes of preparation time, which must be counted towards the time the food is out of temperature control
There are several options how to apply the 2-hour/4-hour rule



10:00am:
Sandwiches are put back into refrigerator (at or below 5°C) for display later.

11:30am: Sandwiches have been at room temperature for 2 hours (including preparation + display times). They can be placed back in the refrigerator for use another time.

1:30pm: Sandwiches have been at room temperature for 4 hours (including preparation + display times).

Sandwiches may be displayed for another 1½ hours (with 2 hours still remaining) or 3½ hours (must be discarded)

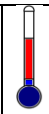
Sandwiches may be displayed again in the display case the next day for another 2 hours. After this time they must be discarded (they cannot be returned to the refrigerator again)

Once the sandwiches have spent a total of 4 hours in the temperature danger zone they must have been used up or discarded.

You must document the cooking and cooling process for the chicken to demonstrate the compliance with Standard 3.2.2 of the Food Standards Code. You must also either make a written procedure which the staff will use each day or record the times when chicken and sandwiches are out of refrigeration, and if/when they are returned to refrigeration or discarded.

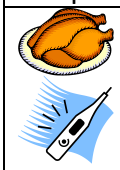
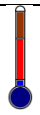
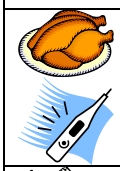
Example C – Receiving cooked ingredients from another business

A sandwich shop receives chicken that has been cooked that morning by another business.

	7:00am: Cooked chicken is delivered warm to the sandwich shop.	
	You must have a documented arrangement to show how the chicken is cooked and cooled by the other business. Unless you can demonstrate that the other business cools the chicken in accordance with Food Standards Code requirements, you cannot use the 2-hour/4-hour rule and you must either keep the chicken below 5°C or above 60°C immediately from the time you received it.	

Example D – Displaying hot food

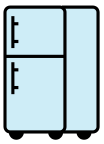
A bistro has ready-to-eat potentially hazardous food in display units for sale over the lunch and dinner periods. The display units keep the hot food at approximately 45°C (i.e. in the temperature danger zone).

	7:30am: Chicken is cooked to a minimum of 74°C (core temperature) and then cooled from 74°C to 60°C. This time does not count toward the 2-hour/4-hour rule.	
	9:30am: Because the food is to be displayed hot, the time for applying the 2-hour/4-hour rule starts when the food first cools below 60°C.	
	1:30pm: Any unused chicken must be discarded as it has been in the temperature danger zone for 4 hours.	
	You must either make a written procedure which the staff will use each day or record the times when the chicken and other foods are in the temperature danger zone (i.e. between 5°C and 60°C) and if/when they are returned to refrigeration or reheated or discarded.	

Food stored in a heated display unit where the food is maintained at or above 60°C does not need to have the 2-hour/4-hour rule applied. In this instance, it is complying with the Food Standards Code already.

Example E – Displaying or storing food for multiple times out of refrigerator

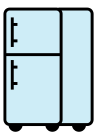
Monday 12:00pm: A leg of ham is removed from the refrigerator at 12 noon on Monday. There are several options how to apply the 2-hour/4-hour rule.



1:00pm: Ham is at room temperature for 1 hour then returned to the refrigerator. It has 3 hours left.

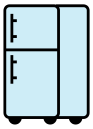
2:00pm: Ham is at room temperature for 2 hours then returned to the refrigerator It has 2 hours left.

4:00pm: Ham is at room temperature for 4 hours. It has 0 hours left so it must be discarded



Tuesday 12:00 – 1:00pm
Ham is at room temperature for 1 hour. It has 2 hours left.

Tuesday 12:00 – 2:00pm
Ham is at room temperature for a further 2 hours. It cannot be returned to the refrigerator. It has 0 hours left so it must be discarded.



Wednesday 12:00 – 2:00pm
Ham is at room temperature for a further 2 hours. It cannot be returned to the refrigerator. It has 0 hours left so must be discarded.

Once the ham has spent a total of 4 hours in the temperature danger zone it must have been used up or discarded.

You must either make a written procedure which the staff will use each day or record the times when foods are out of refrigeration and if/when they are returned to refrigeration or discarded.

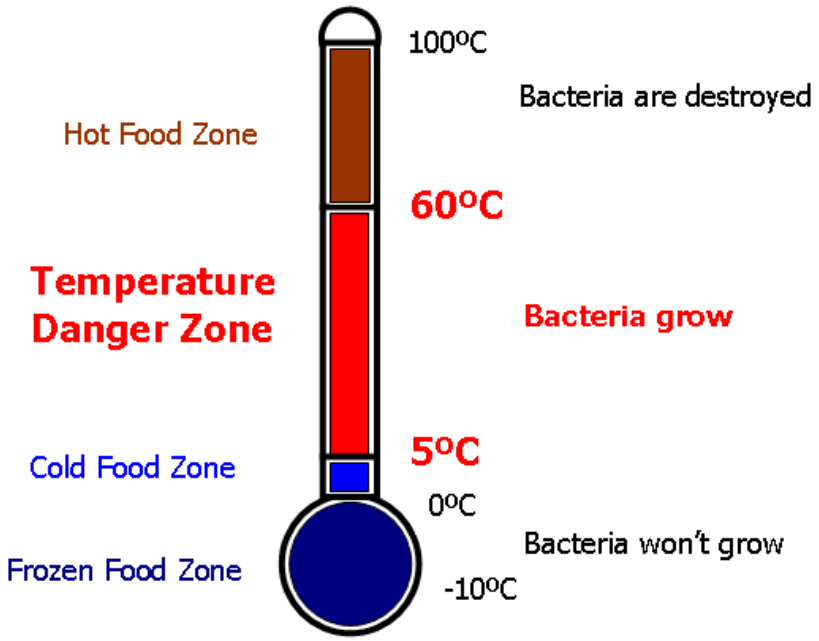
Any sandwiches made from this ham must take into account the time the ham has been in the temperature danger zone and also have the same 2-hour/4-hour rule time limitations applied to them.

Why do foods need to be kept under temperature control?

The temperature range between 5°C and 60°C is the 'temperature danger zone' where food poisoning bacteria can grow.

The legal requirement in Standard 3.2.2 of the Food Standards Code requires potentially hazardous food to be displayed under temperature control so that bacteria don't grow in the food. This means:

- you must minimise the time that food spends in the temperature danger zone to protect your customers from food poisoning
- you need to keep refrigerated food cold (5ºC or below)
- you need to keep hot foods at hot temperatures (60ºC or above)
- you can keep foods at another temperature, but only if it is safe to do so.



If you want to display potentially hazardous food at temperatures between 5°C and 60°C you must demonstrate this will not affect the safety of the food.

Potentially hazardous foods

In Standard 3.2.2 potentially hazardous food is defined as food that has to be kept at certain temperatures to minimise the growth of any pathogenic microorganisms that may be present in the food or to prevent the formation of toxins in the food. Examples of potentially hazardous foods include:

- raw and cooked meat/poultry or foods containing raw or cooked meat/poultry; for example, burgers, curries, kebabs, pate and meat pies
- foods containing eggs (cooked or raw), beans, nuts or other protein-rich food; for example, batter, mousse, quiche and tofu
- dairy products and foods containing dairy products; for example, dairy-based desserts, bakery products filled with fresh cream or with fresh custard
- seafood (excluding live seafood) and foods containing seafood; for example, sushi
- sprouted seeds, for example beans and alfalfa
- prepared fruits and vegetables; for example, cut melons, salads and unpasteurised juices
- cooked rice and both fresh and cooked pasta
- foods that contain any of the above foods, for example sandwiches, pizzas and rice rolls.

These foods need to be kept at temperatures that will stop bacteria from growing (i.e., out of the temperature danger zone). This is particularly important for ready-to-eat (RTE) foods as these foods will not be further cooked prior to being eaten.

The Food Authority has prepared a separate document on potentially hazardous foods to help distinguish whether foods fall within this category, see *Potentially hazardous foods – Foods that require temperature control for safety* at www.foodauthority.nsw.gov.au

Shelf stable foods

Shelf stable foods are not subject to the temperature control requirements. Shelf stable foods can be displayed at ambient (room) temperatures for the duration of the shelf life of the food. Examples include:

- whole fruits and vegetables
- canned food*
- dried foods
- pickled or preserved foods

* If the canned food contains a potentially hazardous food (e.g., canned salmon) it must be kept under temperature control once the can is opened, or the food is removed from the can.

Foods with storage instructions

When you receive foods that contain directions for use and recommended storage temperatures from the manufacturer, these instructions must be followed.

Alternatives to temperature control other than the 2-hour/4-hour rule

Enforcement agencies such as the NSW Food Authority and local councils will regard the 2-hour/4-hour rule, when used according to these guidelines, as a documented, sound scientific method of alternative compliance with the temperature control requirements of the Food Standards Code.

However, if you want to use a different method of complying with temperature control requirements, then the responsibility lies with your business to demonstrate that this will not affect the safety and suitability of the food.

Note that the word 'demonstrate' is defined in NSW food safety legislation as:

'…demonstrate to the satisfaction of the NSW Food Authority…'

To demonstrate to the satisfaction of the NSW Food Authority will require sound scientific evidence. For example, that an extension in time will not adversely affect the safety or suitability of the food.

The amount of time that the food can be safely displayed will vary depending on the type of food and the pathogens of concern. You may be required to apply to the Food Authority in writing outlining your alternative method of compliance.

References and further reading

CSIRO Food & Nutritional Sciences (2010). *Make it Safe. A Guide to Food Safety*. CSIRO PUBLISHING, Collingwood.

Food Standards Australia New Zealand (2016). *Safe Food Australia: A Guide to the Food Safety Standards*. Canberra. Available at: https://www.foodstandards.gov.au/publications/pages/safefoodaustralia3rd16.aspx

Food Standards Australia New Zealand (2002), *Food Safety: Temperature control of potentially hazardous foods – Guidance on the temperature control requirements of Standard 3.2.2 Food Safety Practices and General Requirements*. Food Standards Australia New Zealand, Canberra. Available at: http://www.foodstandards.gov.au/publications/documents/FSTemp_control_Edition_for_printing.pdf

NSW Food Authority (2020). *Food safety guidelines for the preparation and display of sushi.* Available at: https://www.foodauthority.nsw.gov.au/sites/default/files/2021-01/FI366%202011_%20Food%20Safety%20Guidelines%20for%20the%20Preparation%20and%20Display%20of%20Sushi.pdf

NSW Food Authority (2008). *Potentially hazardous foods: Foods that require temperature control for safety*. Available at: https://www.foodauthority.nsw.gov.au/sites/default/files/_Documents/scienceandtechnical/potentially-hazardous-foods.pdf

Appendix 1 – Example work procedure

Preparing sandwich ingredients

Receival and storage of ingredients

- Sandwich ingredients (potentially hazardous) received at or below 5°C.
- Sandwich ingredients (potentially hazardous) stored at or below 5°C.
- Cooked ingredients have been cooked and cooled in accordance with Food Standards Code requirements (you may need a procedure to show how you do this).

Preparing ingredients

- Sandwich ingredients are removed from the refrigerator at 8:00 am.
- All ingredients are prepared by 8:30 am and placed in tubs.
- All tubs of ingredients are returned to the cool room.
- Ingredients tubs for display are labelled with the appropriate coloured dot (or 'made-on date'), (e.g., Monday – blue; Tuesday – yellow; Wednesday – red; Thursday – green; Friday –).
- All prepared ingredients are stored in the cool room until they are removed and placed on display.

Displaying tubs of sandwich ingredients

- Ingredient tubs are placed in display case at 11:30 am.
- Using the 2-hour/4-hour rule the ingredients are displayed for a maximum of 3½ hours until 3:00pm (this equals a total of 4 hours to include preparation + display time)

Leftover ingredients

- Any ingredients returned to the fridge by 1:00pm (within the 2 total hours, during preparation + display) are marked with the time remaining (i.e., 2 hours remaining of the 4 hours which it can be displayed for).
- All unsold ingredients are removed from display at 3:00pm (after 4 total hours, for preparation + display) and discarded.

Prepare a number of work procedures for foods you prepare regularly.

To demonstrate compliance whenever you are visited by an authorised officer from the NSW Food Authority or a local council Environmental Health Officer, you will need to show them the procedure and follow it exactly every time sandwich ingredients are prepared and displayed using the 2-hour/4-hour rule.

If variations to the procedure are required, or any corrective action needs to be taken, these should be documented to ensure compliance.

Appendix 2 – Example records to be kept

Records that must be kept

An alternative to a work procedure is keeping records that demonstrate:

- the date and time the food was prepared and placed on display
- the time the food was on display
- whether the food was discarded or returned to the fridge
- the system used to identify food (e.g., corresponding sticker colour, plate patterns, labelled with 'made-on' date).

Example of records to be kept in demonstrating use of the 2-hour/4-hour rule

DATE	Food product	Time food removed from fridge for preparation	Time food placed in fridge after preparation	Time placed on display	Time product placed in fridge/discarded	Time used up/ remaining	Action
25/10/10	Sandwich ingredients Blue dot	8:00 AM/~~PM~~	8:30 AM/~~PM~~	11:30 AM/~~PM~~	3:00 ~~AM~~/PM	4 hours / 0 hours left	☐ Returned to fridge ☒ Discarded
26/10/10	Sandwich ingredients Yellow dot	8:00 AM/PM	8:30 AM/PM	11:30 AM/PM	1:00 AM/PM	2 hours / 2 hours left	☒ Returned to fridge ☐ Discarded
27/10/10	Sandwich ingredients Yellow dot	N/A	N/A	11:00 AM/PM	1:00 AM/PM	2 hours / 0 hours left	☐ Returned to fridge ☒ Discarded
				AM/PM	AM/PM		☐ Returned to fridge ☐ Discarded

Corrective action: _____

To demonstrate compliance whenever you are visited by an authorised officer from the NSW Food Authority or a local council Environmental Health Officer, you will need to show them these records for every time sandwich ingredients are prepared and displayed using the 2-hour/4-hour rule. If variations or corrective action is required, these should be documented to ensure compliance

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