Cooling potentially hazardous food

A common contributing factor to food poisoning in food businesses is incorrect temperature control. This is when food is held for too long at temperatures where harmful food poisoning bacteria can grow. The time food takes to cool (or reheat) is sometimes overlooked in food businesses and this is when problems occur.

It is important that food businesses make sure cooked potentially hazardous food (PHF) has been cooled in accordance with Standard 3.2.2, Clause 7(3) of the Food Standards Code (the Code).

Standard 3.2.2, Clause 7(3), Food Standards Code

A food business must, when cooling cooked potentially hazardous food, cool the food:

- within two hours – from 60°C to 21°C, and
- within a further four hours – from 21°C to 5°C,

unless the food business demonstrates that the cooling process used will not adversely affect the microbiological safety of the food.

The correct cooling process

The cooling of cooked PHF needs to be as quick as possible to prevent the growth of pathogenic bacteria to unsafe levels. The less time that cooked PHF remains at temperatures between 5°C and 60°C during the cooling process, the less opportunity there will be for foodborne pathogens to grow.

It is possible that foodborne pathogens may be present in cooked food from spores that have survived the cooking process. Cooking can activate the spores to become vegetative (live) cells, which then grow.

If cooked PHF is left to cool too slowly, for example at room temperature or in large volumes in a cool room, the vegetative cells can grow to dangerous levels. Re-heating the food may not reduce the number of bacteria and may not destroy any bacterial toxins that may be produced.

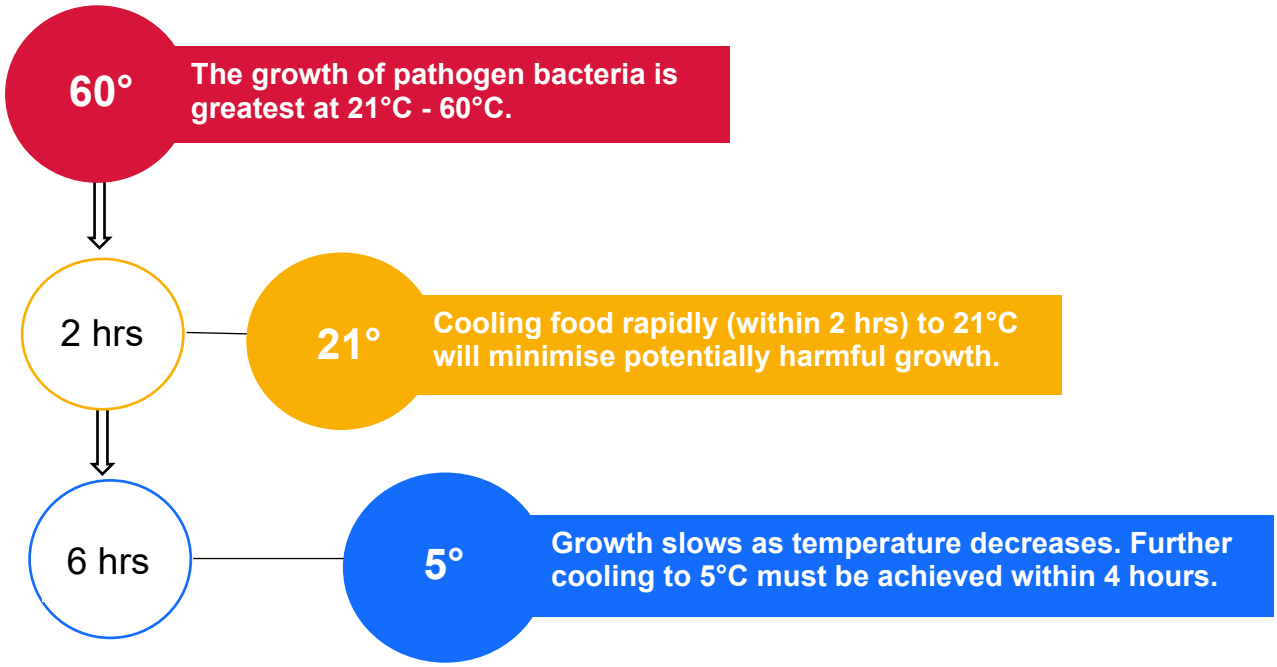
Factors affecting cooling

The procedure used to cool PHF will depend on:

- • The size or amount of the food to be cooled – large amounts will cool slower than small amounts, and cooling will be fastest on the food's surface and progressively slower towards its centre. Large volumes of food may not sufficiently cool all the way through within the times and temperatures specified, so it is important to portion food into smaller amounts.
- The density of the food (how solid/ liquid a food is) – the denser the food, the slower it will cool.

- The cooling capacity of the equipment – blast chillers will cool food much faster than refrigerators, and over-stocking a refrigerator or placing large amounts of hot food into a refrigerator will reduce its overall cooling capacity.

The cooling process



Note: The total cooling time of 6 hours only applies once the temperature of cooked potentially hazardous food has dropped to 60°C after cooking.

Cooling times can be reduced by:

- cooking and cooling smaller amounts or portions placing food into large shallow containers to cool (for example, 5 cm deep)
- using rapid-cooling equipment for example, a blast chiller)
- stirring liquid foods frequently (ensuring the stirring utensil has been cleaned and sanitised)
- using water or ice water baths
- allowing cool air to circulate around the container of food to be cooled – PHF should be cooled on racks and not on the floor of a cool room
- adding ice as an ingredient.

Monitoring the cooling process

It is important that the temperature of food is monitored during cooling to ensure the procedure used is effective. Food temperatures should be checked with a clean, sanitised thermometer in the part of the food that will take the longest to cool, usually the centre. It is good practice to record both the temperature and the time the temperature was taken to make sure the cooling process meets food safety requirements.

Alternative cooling processes

Extended cooling times may be necessary when large cooked meats or other products need to be cooled. Large volumes of food will not cool to below 5°C within the 6-hour requirement unless the mass and volume of the food can be decreased. If this option is not available, food businesses will need to demonstrate an alternative cooling process that will not adversely affect the microbiological safety of the food.

Examples of cooling food safely

Example 1 – Rice

A restaurant's usual practice is to cook 12 cups of rice (the capacity of a rice cooker) daily and cool the rice in a container in the cool room overnight for use the next day. However, when checking the temperature at the centre of the cooked rice as it is cooling, it is discovered the rice is not actually being cooled to 21°C in the first 2 hours and then to 5°C over the next 4 hours, as required.

The food business needs to work out a faster cooling method to ensure the rice is safe to eat. A decision is made to divide the cooked rice in half and spread it on two separate, shallow trays for cooling so that the rice can be correctly cooled all the way through within the 6-hour cooling requirement. The business documents this process in its operating procedure and consistently uses this new cooling method for rice.

Example 2 – Gravy

A food business prepares a large batch of gravy in the morning to use later that day. The pan of gravy is placed in an ice slurry and then stirred regularly. The temperature is checked several times over the next few hours to ensure cooling is within the required timeframe.

More information

- Visit the Food Authority's website at www.foodauthority.nsw.gov.au
    - Guideline: Potentially Hazardous Food
- Email the Helpline at food.contact@dpi.nsw.gov.au
- Phone the Helpline on 1300 552 406
- Refer to Safe Food Australia – A guide to the Food Safety Standards on the FSANZ website at www.foodstandards.gov.au

© State of New South Wales through Regional NSW 2023. The information contained in this publication is based on knowledge and understanding at the time of writing June, 2023. However, because of advances in knowledge, users are reminded of the need to ensure that the information upon which they rely is up to date and to check the currency of the information with the appropriate officer of the Regional NSW or the user's independent adviser.