

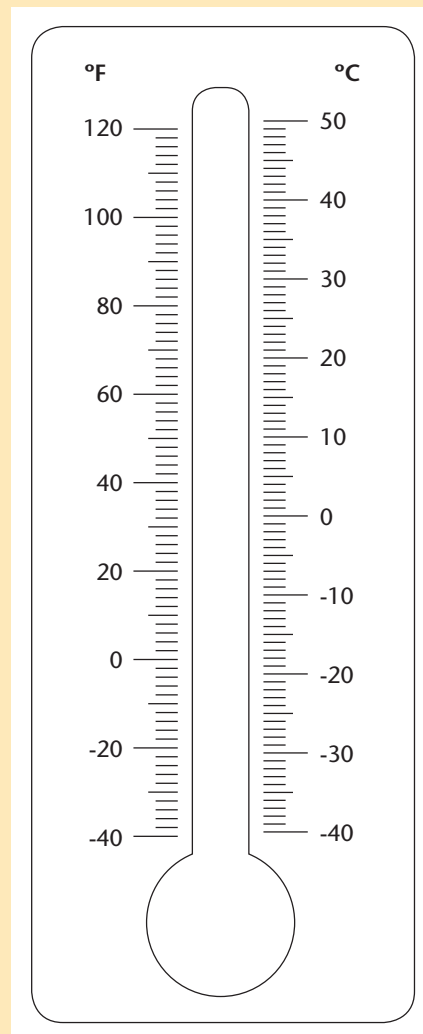
Food spoilage and contamination

Below are two practice questions; the first question shows students responses and examiner feedback; the second question is for you to try yourself.

Chapter 5: Practice question 1 (with student responses and examiner feedback)

Scenario: A group of students gather to enjoy a barbeque at the end of the summer term. They enjoy a range of dips, burgers, chicken drumsticks and coleslaw, and then they end the meal with strawberries and cream.

The following morning, a number of them feel unwell, suffering from vomiting, diarrhoea and headaches – all the general signs of food poisoning.



- Name one bacteria that could cause food poisoning. (1 mark)
- What conditions do micro-organisms need to grow? (3 marks)
- Label the following on the thermometer:
 - the temperature inside a freezer
 - the temperature of a fridge
 - the danger zone
 - the temperature at which harmful bacteria are killed. (4 marks)
- Describe what the students could have done to prevent food poisoning when buying, storing and cooking food for the barbeque. (9 marks)

Responses

The following responses were provided by students. The level and detail within the response increases. More examples, with reasons, have been provided that allow students to achieve higher marks. The use of subject-specific language shows more informed understanding of the subject content.

Responses part a)

One mark for naming one of the following: Campylobacter, E. coli, Salmonella, Listeria.

Food spoilage and contamination**Responses part b)****Basic level response**

Bacteria need warm conditions to grow. (1 mark)

Examiner feedback (1 mark)

A correct answer is given but the student has only listed one condition needed for micro-organisms to grow.

Medium level response

Microbes need warm conditions to grow. They grow rapidly in the danger zone of 5 to 63°C. They also need food to grow. Any food that is nutritious for us is eg meat and fish is also nutritious for micro-organisms. (2 marks)

Examiner feedback (2 marks)

This answer is correct, with more than one condition listed. It is good that the student has been able to name the specific temperatures at which micro-organisms grow most quickly.

High level response

Micro-organisms (bacteria, moulds and yeasts) need four conditions to grow – food, warmth, moisture and time.

Micro-organisms need nutrients and energy from food to help them to grow rapidly.

Micro-organisms grow best at a temperature of approximately 37°C. If the temperature is low, -18°C when stored in a freezer, then they are dormant. When food is stored in a fridge at a temperature of 0 to below 5°C the micro-organisms grow very slowly. At high temperatures, for example, when cooking food at 63°C and above, harmful bacteria start to be destroyed.

A supply of water is needed for micro-organisms to grow. If the water is removed (for example, when drying foods such as milk), then they cannot grow.

It takes time for micro-organisms to grow and multiply. It is important to store, cook and cool foods thoroughly in order to reduce the amount of time micro-organisms have to multiply.

A neutral pH is needed for micro-organisms to grow. If conditions are too acid or alkaline then they will not multiply. For example, in food preserved in vinegar, such as pickles, the conditions are too acidic for micro-organisms to grow. (3 marks)

Examiner feedback (3 marks)

The student has given a very detailed answer here. Specific temperatures are given and the student has listed all of the main conditions needed for micro-organisms to grow.

Responses part c)

One mark for each correctly marked temperature or range.

i.e. freezer -18 to -24C; refrigerator 0 to below 5C; danger zone 5 - 63C; harmful bacteria are killed 70–100C

Food spoilage and contamination**Responses part d)****Basic level response**

The students should buy food that is in good condition, eg strawberries that do not have any mould, and foods that are within their use-by or best-before date.

The food should be stored in the way it says on the food label, eg cream, dips, chicken and burgers in the fridge at 0 to below 5°C.

Food should be cooked thoroughly, eg burgers and chicken to 75°C to destroy micro-organisms. (3 marks)

Examiner feedback (3 marks)

This student has given one example for each part of the question – buying, storing and cooking food, which is good. In order to gain more marks, this student should have given a wider range of examples for each part of the question.

Medium level response

The students should buy foods that are in good condition, for example, the strawberries should be free from mould. The food should also be in date and the packaging should not be damaged. The shop where the food is bought should be clean.

The food should be stored in the correct place and at the correct temperature. For example, high-risk foods should be stored at low temperatures such as in a fridge to slow down the growth of micro-organisms. The fridge temperature should be from 0 to below 5°C.

Food should be stored at the correct place in the fridge, eg raw meat on the bottom shelf to avoid cross-contamination.

It is important to keep checking the use by and best before dates to make sure that the foods are safe to eat.

If the food needs to be kept for longer, it could be frozen. The temperature of the freezer should be -18°C, where the micro-organisms will be dormant.

When cooking food they should consider making sure that food is cooked thoroughly to avoid the spread of food poisoning. A food probe could be used to make sure the food is cooked to 75°C, in order to kill the harmful bacteria.

It is important that food is thoroughly defrosted before cooking to make sure the centre of the food is cooked thoroughly. (6 marks)

Examiner feedback (6 marks)

Several examples are given for each part of the answer, relating to buying, storing and cooking, which shows good understanding of the subject.

High level response

When buying foods the students should look for the following. Food should be bought from a reputable supplier and the shop should be clean. The foods should be stored correctly in the shop, for example, perishable foods at the correct temperature in fridges (0 to below 5°C) or freezers (-18°C). The food should be in good condition, for example, there should be no bruising on fruit or vegetables. The foods should be within the use-by date for high-risk foods (such as chicken, dips, burgers and cream) and best-before date for ambient foods, such as breads. The packaging needs to be checked to ensure that it is intact and there is no contamination from rodents.

When storing food, they should follow the instructions on the packaging. High-risk foods need to be stored in a fridge at a temperature from 0 to below 5°C, to slow down the growth of micro-organisms. Frozen foods should be stored in a freezer at a temperature of -18°C, so that micro-organisms are dormant.

It is important to rotate the stock within a fridge and freezer so that foods are eaten within their use-by dates. This also helps to avoid throwing food away which is out of date, which is wasteful. Raw meats should be stored on the bottom shelf of the fridge to avoid any drip from the raw meat touching the cooked foods and causing cross-contamination.

All foods should be stored in the correct containers or sealed packages to avoid cross-contamination or damage to the food during storage.

When cooking food they should ensure that the person cooking the food is following personal hygiene rules such as wearing a clean apron, cleaning their hands before handling food, making sure long hair is tied back. The area where the food is being prepared should also be clean, for example, wiping surfaces with antibacterial spray, ensuring all equipment is clean.

Any frozen foods should be thoroughly defrosted before cooking to ensure that the centre of the food is cooked thoroughly.

High-risk foods should be cooked to 75°C to ensure that harmful micro-organisms, such as Salmonella, are destroyed and to help prevent food poisoning. A food probe could be used to ensure that this temperature is reached in the centre of food such as chicken. (9 marks)

Examiner feedback (9 marks)

This is a very good answer for a number of reasons. The student has addressed all the areas of the question – buying, storing and cooking food. There are specific temperatures listed with a very good range of examples to show the full extent of their understanding. There is good use of technical terminology throughout.

Food spoilage and contamination

Mark scheme

For 7–10 marks: A wide range of examples are given for each aspect of keeping food safe when buying, storing and cooking, showing a thorough understanding of the principles involved. The response demonstrates application of the main concepts of food safety. There is **excellent** use of specialist terminology.

For 4–6 marks: The responses show several examples of how to keep food safe when buying, storing and cooking food, showing a good understanding of the principles involved in food safety. One or more aspect may be covered in greater detail. There is evidence of **good** use of specialist terminology.

For 0–3 marks: The response shows **some** knowledge and understanding of the principles involved in keeping food safe when buying, storing and/or cooking. The response should include one example for each of buying, storing and cooking, covering the most obvious answers but may include an extended answer for one or two of aspects of buying, storing or cooking food.

Points to include in the answer:

Buying:

- Buy from a reputable supplier
- Buy from a shop that is clean
- Food should be stored correctly in the shop e.g. high risk foods in chillers at 0 to below 5°C, frozen foods at -18°C
- Packages should not be damaged in any way to avoid rodents, insects etc. getting into the food
- The food should be within its use by date (for high risk foods e.g. meat, fish) or best before date for foods stored at ambient temperatures e.g. bread, vegetables)
- Do a visual check to see that the food looks as it should e.g. no mould or bruising

Storing:

- Store foods according to the supplier's instructions e.g. chilled in a refrigerator or in a freezer
- Store foods at the correct temperature 0 to below 5° for a refrigerator -18°C for a freezer
- Do not over fill the refrigerator or freezer
- Rotate the stock in a refrigerator and freezer to make sure foods are eaten within date
- Raw meat should be stored on the bottom shelf of the refrigerator to avoid any drip spilling onto the cooked meat and re-contaminating it or to avoid cross contamination
- All foods should be stored in the correct containers and these should be sealed

Cooking:

- The person cooking the food should follow personal hygiene rules e.g. have hair tied up, wear a clean apron, have clean hands
- Clean equipment should be used
- The area where the food is clean e.g. work surfaces wiped with anti-bacterial spray
- The correct coloured chopping boards/knives should be used e.g. red for raw meat, blue for raw fish
- Ensure that any frozen food is thoroughly defrosted before cooking
- Cook high risk foods to 75°C to ensure that harmful bacteria are destroyed to prevent the spread of food poisoning e.g. salmonella
- Check the core temperature using a food probe

Food spoilage and contamination

Chapter 5: Practice question 2

- a) Name two signs of food spoilage. (2 marks)
- b) Give two conditions bacteria need to grow. (2 marks)
- c) High-risk foods can cause food poisoning if not stored or cooked properly. Name **two** high-risk foods. (2 marks)
- d) Cheese is an example of a food in which micro-organisms are used in food production.
Name one other food where micro-organisms are used to good effect in food production. (1 mark)
- e) Explain how you could reduce the risk of food poisoning when storing, preparing and cooking food. (8 marks)

Food spoilage and contamination

Chapter 5: Mark scheme for practice question 2

- Name two signs of food spoilage. (2 marks)
- Give two conditions bacteria need to grow. (2 marks)
- High-risk foods can cause food poisoning if not stored or cooked properly. Name **two** high-risk foods. (2 marks)
- Cheese is an example of a food in which micro-organisms are used in food production.
Name one other food where micro-organisms are used to good effect in food production. (1 mark)
- Explain how you could reduce the risk of food poisoning when storing, preparing and cooking food. (8 marks)

Mark scheme

For 7–9 marks: The **detailed** answer **addresses all aspects** of the question – storing, preparation and cooking. Answers are relevant and specific examples are given, such as temperatures or examples relating to specific foods.

For 4–6 marks: The response includes a **good range of points** and shows good understanding of how to reduce the risk of food poisoning.

For 0–3 marks: This is a **basic response** in which the answers **lack reference** to specific temperatures or examples of specific foods. May not attempt all aspects of the question.

Points to include in the answer

- Correct answers include: mould growing on the food, bruising of fruit, change in the colour of the food, loss of water/shrinkage, sprouting in potatoes, change in texture such as slime, hardening, graininess, development of an unpleasant taste, food curdling, milk that has separated.
- Correct answers include: food, warmth, moisture, time.
- Correct answers include: meat, fish, eggs, milk, cream, soup, sauce, gravy, cooked rice, yogurt, custard.
- Correct answers include: bread, yogurt.
- The answers given should include storing, preparing and cooking food. Maximum marks cannot be awarded if all three aspects are not included.

Correct answers related to storage of foods include:

- Food should be stored in the appropriate place and according to the storage instructions, in order to reduce the growth of micro-organisms.
- Food should be stored out of the danger zone (5 to 63°C) to inhibit the growth of the micro-organisms.
- High-risk foods such as meat, fish, milk should be stored in a refrigerator at a temperature of from 0 to below 5°C.
- Raw meat and fish should not be stored on the top or middle shelf of a refrigerator to avoid any drip going onto cooked food causing cross-contamination.
- Packaging should not be damaged in any way.
- Store food in a suitable container.

Food spoilage and contamination

- Foods should be covered to avoid cross-contamination.
- Check that foods are within their use-by or best-before dates and rotate stock so that foods are used before they have gone out of date.

Correct answers related to preparing of foods include:

- Use the correct coloured chopping boards for preparing foods, for example, red for raw meat, blue for raw fish.
- Make sure equipment is clean.
- Make sure working area is clean.
- Make sure frozen foods are thoroughly defrosted before use.
- Make sure the person preparing the food has followed hygiene procedures, for example, hair tied back, clean hands, clean apron.
- Clean hands thoroughly before handling food and particularly after going to the toilet.
- Do not cough or sneeze over food as this can spread bacteria.
- Do not allow pests or animals near the food when it is being prepared.

Correct answers related to cooking food include:

- Check that the core temperature of the food is 75°C as this is the temperature at which harmful bacteria are destroyed.
- Use a food probe to check the core temperature.
- Check that meat and fish are cooked all the way through.
- Cook the food for the correct amount of time.