How to prevent the growth of bacteria in food

Being ‘food safe’ can prevent foodborne illness (i.e. food poisoning). Those at greatest risk of food poisoning are those who do not have strong immune systems, such as young children, pregnant women, elderly people and people with chronic illness. We can prevent food poisoning by: preventing food from becoming contaminated with bacteria in the first place; and preventing the growth of bacteria in food.

What are the main factors that increase the growth of bacteria?

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Time</th>
<th>Moisture</th>
<th>Protein content</th>
<th>Oxygen</th>
<th>Acidity</th>
<th>Salt/sugar content</th>
</tr>
</thead>
</table>

**Temperature**

The most favourable temperature for bacterial growth is between 5 - 60 °C. This is referred to as “the DANGER ZONE”.

In order to curb bacterial growth:

**Storage**

- Store cold foods in the fridge at under 5°C
- Store frozen foods in the freezer at under -18°C
- Hold hot cooked foods at over 60°C until served
- Thaw frozen food in the fridge, not on the kitchen bench
- Avoid re-freezing cooked food

**Cooking**

- Heat foods (particularly meat) to at least 75°C. Poultry and fish should be cooked through with no pink/clear flesh
- If you aren’t going to eat the food you prepared, chill/freeze as soon as it stops steaming

“Keep hot foods hot, and cold foods cold”

**Time**

Given time, bacteria grow and multiply when food is left sitting at a temperature in the “danger zone” (see above). In order to control for time, the best rule of thumb is the “2 hour / 4 hour rule”:

**The food safety 2 hour / 4 hour rule**

<table>
<thead>
<tr>
<th>If food has been in the danger zone (5 – 60 °C) for...</th>
<th>What is safest to do with this food?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 2 hours</td>
<td>Consume or refrigerate/freeze immediately</td>
</tr>
<tr>
<td>More than 2 hours, but less than 4 hours</td>
<td>Consume immediately or throw out</td>
</tr>
<tr>
<td>More than 4 hours</td>
<td>Throw out</td>
</tr>
</tbody>
</table>

**Moisture**

Moist foods are at greater risk of bacterial growth than dry foods, e.g. cooked rice is at greater risk of bacterial growth than dry rice.
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Protein content
Bacteria grow especially well in protein-rich foods such as:
- Meat, poultry and fish/seafood
- Eggs
- Dairy products
- Cooked rice and pasta

Acidity
The more acidic a food is, the less chance of bacterial growth, e.g. vinegar (a mild acid) is used to ‘pickle’ foods, allowing for a longer shelf life.

Oxygen
Many bacteria require oxygen for growth. Long-life products such as UHT milk have been heated to high temperatures and sealed without oxygen inside the packaging, allowing for a long shelf life without spoilage. However, once long-life products are opened and exposed to oxygen in the air, their risk of spoilage increases.

Salt/Sugar content
Foods that are very high in sugar or salt are at less risk of bacterial growth. Meats are often cured with salt to prevent spoilage, e.g. prosciutto, ham and beef jerky. Sugary items such as honey and boiled lollies have a very low risk of causing bacterial food poisoning.

Rule of Thumb
If you are ever unsure about the safety of a food item, the best motto is:

“If in doubt, throw it out!”

For more information:

Check out our other fact sheets:
- Food safety at home
- Helping your children learn about food safety
- How to be ‘food safe’ when buying foods