Seven Wonders of the Microbe World
Food Preservation

COMM
Microbes are responsible for creating some of our most enjoyable food products such as cheese, bread, yogurt and of course beer.

But other microbes, such as Salmonella, Listeria, E.coli O157 can do us a great deal of harm.

In the UK alone, there are more than ten million cases of gastroenteritis each year – a concoction of symptoms such as nausea, vomiting, diarrhea and stomach pain, caused by eating and drinking food contaminated by microbes. Since ancient times we have done our utmost to keep them out.

CHARLES
If you leave fresh food lying around one of the first things that happens is that microbes land on it and this starts to deteriorate the food over time. And one of the worst things they can do is start to produce toxins that can be poisonous to anyone eating that food. And the ancients discovered a very, very long time ago that one way to stop this is to try and preserve food.

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They used a variety of methods – such as salting, drying, icing, pickling, smoking and fermentation for beer, cheese and bread – all of which we still use today.

CHARLES
You can deny microbes water by turning the food very sugary, for example making jam – or we can put salt on our food, and that's why people used to salt meat in the days before refrigerators, to stop microbes from growing.

One of the characteristics of microbes is that they're very sensitive to temperature. Many of them don't like cold temperatures – many of them don't like hot temperatures and so we can preserve food by changing its temperature. One way in which we do this is to put food in a refrigerator.
We also boil food – that's a very common way to preserve it and the way in which that's working is to kill microbes that can't really grow at high temperatures.

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Boiling doesn't kill all the microbes, just most of them. Some bacteria are actually resistant to the temperature of boiling water, which is 100 degrees celsius. To get rid of them all you need to raise the temperature to about 121 degrees – but you can only do this heating water under pressure.

A common method of food preservation using this technique, is canning, which was developed by the French confectioner, Nicholas Appert, In the 1790s, Appert began experimenting with ways to preserve foodstuffs, succeeding with soups, vegetables, juices, dairy products, jellies, jams, and syrups. He placed the food in glass jars, sealed them with cork and sealing wax and placed them in boiling water.

And then there's alcohol and acid …

Tom
Many microbes can't survive in alcohol; yeast can which makes it an effective form of preservation. Acid conditions, such as vinegar, or pickling, are also inhospitable environments for microbes.

COMM
Pickling to block microbes is responsible for some of our most famous brands. In 1922, in Burton, Staffs, Cross and Blackwell produced the very first jar of Branston pickle. 28 million jars of it are now sold every year – still keeping out the microbes as it did 90 years ago.

CHARLES
One thing you have to remember is that if you refrigerate food and the microbes on it – you only slow down the growth of the microbes – you don't actually kill them.

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So when you get back from holiday, all might not quite be as you left it….