MICROBIAL FOOD POISONING

1 *How much do you know about food poisoning?*

Do you know the temperature inside your refrigerator? It should be 4°C or colder. The surest way to find out is to buy a thermometer and keep it in the fridge. Now answer these questions.

1. Which of the following is the most important in the war against food poisoning?
a) Strong disinfectants
b) A refrigerator
c) A microwave oven
d) A conventional oven

2. If there is a power cut for 3 hours, what would you do about the contents of your freezer?
a) Throw everything away
b) Distribute the food among your neighbours and tell them to eat it straight away
c) Just leave the whole thing alone and let it refreeze
d) Feel the food to see if it is completely or partially thawed and then decide what to do.

3. You have a chilled recipe dish containing chicken. It is 2 days past the 'best before' date. You think it has been kept in the fridge, so what do you do?
a) Throw it away
b) Cook it in the usual way and eat it
c) Cook it for a few minutes longer than stated and eat it

4. Which of these is the most important? Washing your hands…
a) before handling raw meat/poultry
b) after handling raw meat/poultry
c) after handling cooked meat poultry
d) a. b. and c. are equally important

5. Some foods such as meats, fish and bacon are now packed in gas-flushed packs to extend their storage life. How should you keep them?
a) In the fridge for up to 3 days
b) In the larder for up to 3 days
c) In the fridge for up to 5 days
d) In the fridge for the time stated on the pack

How did you score?
1. a = 1 b = 5 c = 3 d = 3
Cooking should kill bacteria. It probably won't destroy toxins. Disinfectants are used on surfaces, not food.
2. a = 1 b = 2 c = 3 d = 5
A three hour power cut won't have any significant effect on a well-stocked freezer.
3. a = 3 b = 0 c = 1
It is recommended that food is used by the 'best before' date.
4. a = 3 b = 4 c = 1 d = 1
5. a = 2 b = 0 c = 1 d = 4
Gas flushed packs are not sterile. They must be kept cool and used within the time stated. Never pierce them.
21 Everyone can be confident about eating your food.
11-20 Room for some improvement.
5-10 You may have been lucky so far. Don't leave it to chance from now on!

Food poisoning and food infections are fairly common occurrences that most of us will experience at some time. Food poisoning usually manifests itself as an attack of gastroenteritis the symptoms of which are nausea, vomiting, pyrexia, diarrhoea and abdominal pain.

Foods cause food poisoning when:

- they are contaminated with poisonous chemicals
- they are poisonous themselves
- they contain food poisoning microorganisms and/or their toxins.

Salmonellosis is a form of food infection that may result when foods containing *Salmonella* bacteria are consumed. The bacteria are spread through contact with the intestinal contents or excrement of animals, including humans. *Salmonella* bacteria thrive at temperatures between 4.4°C and 60°C. They do not grow at refrigerator or freezer temperatures but survive refrigeration and freezing and will begin to grow again once warmed to room temperatures.

Campylobacteriosis is caused by ingesting food or water contaminated with the bacteria *Campylobacter jejuni*. The organism grows best in a reduced oxygen environment, is easily killed by heat (48°C), it is inhibited by acid, salt and drying and will not multiply at temperatures below 30°C. Preventive measures include pasteurizing milk, cooking raw meat, poultry and fish, and preventing cross-contamination between raw and cooked or ready-to-eat foods.

As a result of its wide distribution in the environment, its ability to survive for long periods of time under adverse conditions, and its ability to grow at refrigeration temperatures, *Listeria monocytogenes* is recognized as an important foodborne pathogen. The organism grows in the pH range of 5.0-9.5. It is salt tolerant and relatively resistant to drying, but easily destroyed by heat. Preventive measures include maintaining good sanitation, pasteurizing milk and cooking foods thoroughly *Staphylococci* bacteria are found on the skin and in the nose and throat of most people, they are also widespread in untreated water, raw milk and sewage. When staphylococci get into warm food and multiply, they produce a toxin - not detectable by taste or smell - that causes illness.

The bacteria can be killed by temperatures of 48°C but its toxin is heat resistant. To prevent contamination, food must be kept clean, either hot (above 60°C) or cold (below 4.4°).

Botulism is the deadliest kind of food poisoning. The greatest danger of botulism is in *underprocessed* home-canned foods. *Clostridium botulinum*, spore-forming bacteria, grow without oxygen in places such as canned foods, producing a poison that can cause death. It attacks the nervous system, progressively causing double vision, impaired speech, muscle paralysis and difficulty in breathing. Home-canned vegetables and meats should be boiled 10 minutes plus 1 minute per 1,000 feet elevation before tasting as a preventive measure to destroy any toxin that may have developed if the spores were not adequately destroyed during processing.

The disease produced by *Clostridium Perfringens* is not as severe as botulism. Spores of some strains are so heat resistant that they survive boiling for hours. A warm, moist, protein rich environment with little or no oxygen is necessary for multiplication and growth of the vegetative cells. Holding foods at warm (43°C) rather than hot (60°C) temperatures and cooling foods too slowly are the primary causes of *perfringens* contamination.

Many strains of *E. coli* live peacefully in the gut, however, one strain, E. coli 0157:H7, causes a severe form of gastroenteritis. The source of the problem appears to be raw and undercooked foods of animal origin.

Bacillus cereus causes food poisoning through the production of toxins in the food in which it grows. The vegetative cells can grow aerobically in most food products of pH 6-7, in the temperature range 10- 48°C), and during growth they produce toxins which are excreted into the food. Cooking usually destroys the vegetative cells.

2 *Say whether these statements are true or false and correct them when necessary.*

a. Food poisoning may be caused by poisonous foods, by chemicals, by microorganisms and their toxins. .....

b. *Salmonella* bacteria are killed by refrigeration and freezing. .....

c. Heat, acid, salt and drying prevent the growth of *C. jejuni*. .....

d. Listeria can grow at fridge, room and body temperatures. .....

e. Staphylococci are more resistant to heat than their toxins. .....

f. Botulism is one of the most serious forms of food poisoning. .....

g. *Clostridium botulinum* is an aerobic bacterium. .....

h. Botulism symptoms resemble those of all the other forms of food poisoning. .....

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i. Botulism may cause death by respiratory paralysis. .....

j. *Clostridium perfringens* is easily destroyed by cooking. .....

k. Both *C. botulinum* and *C. perfringens* cause very severe forms of food poisoning. .....

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l. *E. coli* live in the intestine of healthy people. .....

m. *B. cereus* commonly grows in canned foods. .....