Food Microbiology Overview for SFA. Food handlers

Introduction with students

- Name, Company Name and roll in the company

Trainer Team:

Miss Deepa Trainer Food Safety
Sindh Food Authority

IMPORTANCE OF THIS TRAINING SESSION

- MANDATORY OF SINDH FOOD AUTHORITY
- OBLIGATORY FOR ALL FOOD HANDLERS IN SINDH PROVINCE
- A MILE STONE FOR CAREER GROWTH
- CUSTOMER OR CONSUMER IS OUR PAYER
- IT IS A PRIME DUTY (WITH ALL ASPECTS) OF A FOOD HANDLER TO DO SERVE ALL FOODS SHOULD BE FREE FROM MICROORGANISM, DISEASE AND VIRUS.

A Brief History

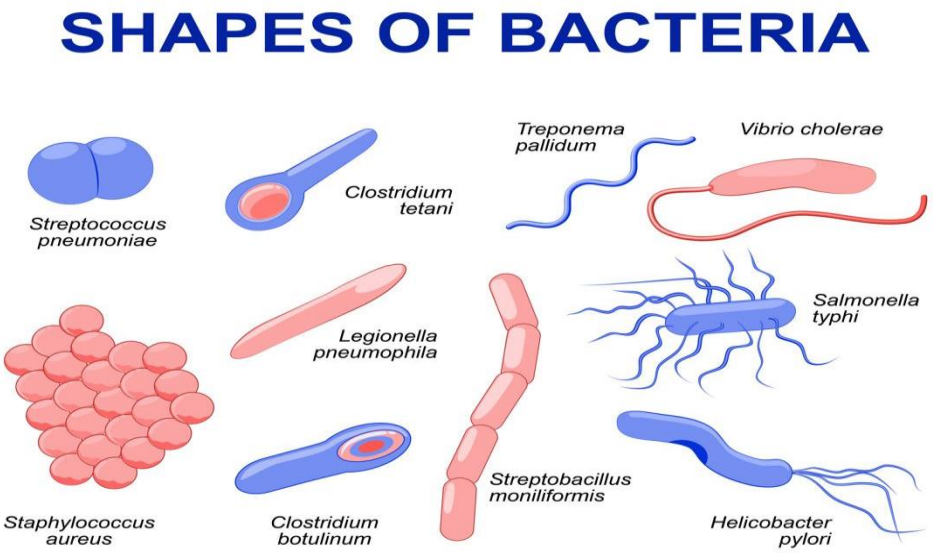
- Early Food Preservation
- 900 AD – "Food Poisoning" Recognized
- 1795-Appert Developed Canning (During canning, food is preserved through heat processing and storage in sealed airtight containers. This process was developed by Nicolas Appert of France)
- 1854-1864-FOOD MICROBIOLOGY BECOMES A SCIENCE

Food Microbiology &Why Study Food Microbiology?

- Provide Clean, Safe, Healthful Food to Consumer
    - Food Licenses Growth
    - Control of Microbial Growth
- Prevent Food Spoilage
- Prevent Food-borne Illnesses
- Food Preservation and Production

Microorganism

MICROORGANISM A SIXT CREATION OF ALLAH SUBHAN HU TAALA, WHERE 5 ARE VISIABLE I.E. HUMAN, ANIMAL, BIRD, INSECTS AND SEA BREATHES, MICROORGANISM/ BACTERIA CAN'T SEE WITH BARE EYES AND COULD BE OBSERVED ONLY WITH MICO SCOPES



- Food microbiology is the study of microorganisms associated with food, food spoilage, food poisoning and the role in the welfare of human beings both in harmful and useful ways.

- **Food microbiology** is a rapidly growing and highly dynamic field of study because of **continued incidence of foodborne outbreaks, threat of intentional contamination of food supply, and the renewed interest of health beneficial effects of lactic acid bacteria.**
- **Foods, microorganisms, and humans** have had a long and interesting association that developed long before the beginning of recorded history.
  - Foods are not only of **nutritional value to those who consume** but often are **ideal culture media for microbial growth**.
  - Some of them play desirable roles in food, such as in the **production of naturally fermented foods**, whereas others **cause food spoilage and foodborne diseases**.
  - To study the role of microorganisms in food and to control them when necessary, **it is important to isolate them in pure culture and study their morphological, physiological, biochemical, and genetic characteristics.**
  - Food microbiology is specifically concerned with the **desirable and undesirable effects microbes** can have on the quality and safety of food products.
  - The foods we eat, whether they are fresh, prepared, or even preserved, **are seldom sterile** and may be contaminated with spoilage microorganisms or occasionally with pathogens. Humans are constantly exposed to **bacteria, fungi, and viruses in food as well as in air and water.**

  - They carry microbial associations whose composition **depends upon which organisms gain access and how they grow, survive and interact in the food over time.**

- **The microorganisms present will originate from the natural micro flora of the raw material and those organisms introduced in the course of harvesting/slaughter, Processing, storage and distribution.**
- If one considers the types of microorganisms associated with **plant and animal foods in their natural states**, one can then **predict the general types of microorganisms to be expected on this particular food product at some later stage in its history**.
- Results from many laboratories show that untreated foods may be expected to contain **varying numbers of bacteria, molds, or yeasts, and the question often arises as to the safety of a given food product based on total microbial numbers.**
- The numerical balance between the various types will be determined by the properties of the **food, its storage environment, properties of the organisms themselves and the effects of processing**.

Primary sources of microorganisms found in foods

Different environmental sources of organisms to foods are listed below.

- ☑ **Dirt and Water**
- ☑ **Plants and Plant Products**
- ☑ **Food Utensils**
- ☑ **Stomach Area**
- ☑ **Food Handlers**
- ☑ **Animal Feeds**
- ☑ **Animal Skins**
- ☑ **Air and Dust**

Microorganisms Growth in Foods

- The ability of microorganisms (except viruses) to grow or multiply in a food is determined by the food environment **as well as the environment in which the food is stored, designated as the intrinsic and extrinsic environments of food, respectively**

PRESENCE OF MICROORGANISM IS EVERYWHERE AND WE HAVE NOTHING TO DO

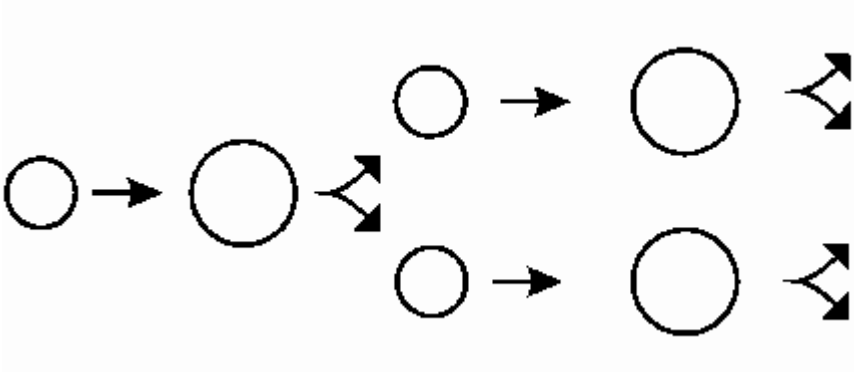
FOR ITS ACCESSIBILITY OF ALL OVER THE PLACES.

But we necessity to stop its growth

Factor for Bacterial Growth

F FOOD
A ACIDITY
T TEMPERATURE
T TIME
O OXYGEN
M MOISTURE

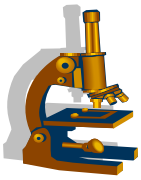
Bacterial Multiplication
(20+40 Minutes)



Hazard Examples

- **Biological**

- Bacteria
- Viruses
- Parasite



- **Chemical**
- Cleaners
- Pesticides
- Allergens

- **Physical**
- Glass
- Wood
- Metal

Safe Minimum Internal Temperature Chart

Safe steps in food handling, cooking, and storage are essential in preventing foodborne illness. You can't see, smell, or taste harmful bacteria that may cause illness. In every step of food preparation, follow the four guidelines to keep food safe:

- **Clean**—Wash hands and surfaces often.
- **Separate**—Separate raw meat from other foods.
- **Cook**—Cook to the right temperature.
- **Chill**—Refrigerate food promptly.

Cook all food to these minimum internal temperatures as measured with a food thermometer before removing food from the heat source. For reasons of personal preference, consumers may choose to cook food to higher temperatures.

Product	Minimum Internal Temperature & Rest Time
Beef, Pork, Veal & Lamb Steaks, chops, roasts	145 °F (62.8 °C) and allow to rest for at least 3 minutes
Ground Meats	160 °F (71.1 °C)
Ground Poultry	165 °F
Ham, fresh or smoked (uncooked)	145 °F (62.8 °C) and allow to rest for at least 3 minutes
Fully Cooked Ham (to reheat)	Reheat cooked hams packaged in USDA-inspected plants to 140 °F (60 °C) and all others to 165 °F (73.9 °C).
All Poultry (breasts, whole bird, legs, thighs, wings, ground poultry, giblets, and stuffing)	165 °F (73.9 °C)
Eggs	160 °F (71.1 °C)
Fish & Shellfish	145 °F (62.8 °C)
Leftovers	165 °F (73.9 °C)
Casseroles	165 °F (73.9 °C)

What is the recommended temperature for food?

Keeping food hot

hot food when held must be kept at 63°C or above. You can keep it below 63°C for up to two hours. If it has not been used within two hours, you should either: cool the food as quickly as possible to a temperature of 8°C or below.

What are the key food temperatures?

Keep high-risk food at 5 °C or below or above 60 °C to avoid the temperature danger zone and food poisoning. Store raw foods below cooked foods. Store food in suitable, covered containers. Avoid refreezing thawed foods.

What is the optimum temperature for food?

Time and temperature are both significant because proteins need to be heated up for a long enough time for them all to be broken down. Bacteria are happiest when it is warm. The optimum temperature for bacterial growth is 37°C – the same temperature as the human body.

Which temperature is danger zone?

40–140°F

The danger zone is the temperature range of 40–140°F (4–60°C), in which bacteria grow and thrive. Keeping perishable foods out of the danger zone is critical to keeping your food safe.

What are high risk foods?

High-risk foods are those generally intended to be consumed without any further cooking, which would destroy harmful food poisoning bacteria. High-risk foods include cooked meat and poultry, cooked meat products, egg products and dairy foods. These foods should always be kept separate from raw food.

What is the danger zone in Haccp?

The Food Standards Agency (FSA) sets the danger zone between 8 °C and 60 °C, and this is the range you want to keep your food out of. This means that food is safest when it is either frozen, chilled, or heated beyond 60 °C. However, as best practice, we recommend food is heated beyond 70 °C to further remove bacteria.

What is the 2 hour 4 hour rule?

Food held between 5oC and 60oC for less than 2 hours can be used, sold or put back in the refrigerator to use later. Food held between 5oC and 60oC for 2-4 hours can still be used or sold, but can't be put back in the fridge. Food held between 5oC and 60oC for 4 hours or more must be thrown away.

What temperature kills bacteria Celsius?

Bacteria stops growing at 8°c and below, and at 63°C or above. You should store food at these temperatures. Bacteria is killed at 100°C and above (boiling point). Bacteria definitely won't grow at -18°C (freezer temperature), but might still stay live. Also die in highly acidic environments like pickle juice.

What temperature kills bacteria in food?

165 degrees

It is a myth that bacteria are killed at temperatures below 40 degrees. In fact, bacteria growth is slowed, but not stopped. The only way to kill bacteria by temperature is by cooking food at temperatures of 165 degrees or more. Bacteria

What are low risk food?

Low risk foods are foods that do not provide ideal conditions for bacteria to grow. They are typically foods that are high in acid or sugar, as well as salted foods, dry foods or canned and vacuum-packed foods. Some examples of low risk foods include: Dry goods - Crackers, biscuits, flour, plain breads and rolls.

What is the 7 principles of HACCP?

Seven basic principles are employed in the development of HACCP plans that meet the stated goal. These principles include hazard analysis, CCP identification, establishing critical limits, monitoring procedures, corrective actions, verification procedures, and record-keeping and documentation.

Safe Storage of Cooked Food and Leftovers

Any temperature between 40 F (4.4 C) and 140 F (60 C) is considered the "danger zone" for food. If food stays in this danger zone for too long, harmful bacteria can grow to levels that could cause illness.[1]

Never leave food out of the refrigerator for over 2 hours. If the temperature is above 90 F (32.2 C), no more than 1 hour.

Keep hot cooked food at or above 140 F (60 C) if you aren't serving it right away or if you are serving buffet-style. Slow cookers, chafing dishes, and warming trays are good for keeping food warm for serving or use a warming drawer or the Keep Warm setting of the oven (usually between 150 F (65.5 C) and 200 F (93.3 C).

Put leftovers in shallow containers so they will cool quickly. They must be refrigerated at 40 F (4.4 C) or below within 2 hours—1 hour if the temperature is above 90 F (32.2 C).

There are some exceptions, but most foods can be frozen. Leftover food that won't be eaten within about three days should be frozen. Foods frozen for a very long time can lose quality, but if frozen at a constant temperature of 0 F (-18 C), the food will be safe. Always label freezer containers and bags with the name of the food or dish and the date. A vacuum sealer is an excellent way to store food, and the appliance is worth considering if you

freeze food often. There's no air in vacuum-sealed food, so no freezer burn. Foods frozen in freezer bags or containers should be used within 3 to 6 months for best quality, while vacuum-sealed food can be frozen for up to 2 years or longer with no loss of quality.

Reheating the Leftovers

Reheat foods to a minimum internal temperature of 165 F (73.9 C), or until they are steaming hot. Microwave ovens do not heat evenly, so when using a microwave to reheat leftovers, cover the container and rotate to ensure they are heated evenly. If possible, check the temperature with an instant-read thermometer.

Are Your Refrigerator and Freezer Cold Enough?

Refrigerated food must be kept at or below 40 F (4.4 C). Many new refrigerators have a temperature display, so you know whether or not it is operating at the correct temperature. It's also important to keep frozen food at a safe temperature. The temperature of the freezer should be 0 F (-18 C) or lower. If your refrigerator doesn't have a display, keep a refrigerator/freezer thermometer in it and check it from time to time.

How to Check Your Thermometer for Accuracy

The best way to check a thermometer's accuracy is with ice water. Boiling water is less accurate because while the boiling point at sea level is 212 F, it's around 202 F in Denver, Colorado. So, unless you are sure of your boiling point temperature, use the ice water method.

1. Fill a container all the way to the top with ice cubes and then fill the container with cold water to about 1/2-inch below the top of the ice.
2. Insert the thermometer stem or probe about 2 inches into the ice water, not touching the container.
3. Slowly swirl it for about 15 seconds. It should read 32 F (0 C).

Microbes and disease | Microbes and the human body

Microbes cause infectious diseases such as flu and measles. There is also strong evidence that microbes may contribute to many non–infectious chronic diseases such as some forms of cancer and coronary heart disease. Different diseases are caused by different types of micro-organisms.

How do microorganisms harm our body?

These pathogenic bacteria, virus, and other microorganisms cause infections or make toxins that harm our bodies. Many of the symptoms that make a person suffer during an infection—fever, malaise, headache, rash—result from the activities of the immune system trying to get rid of the infection in the body

Can microorganisms be seen with naked eyes?

No, microorganisms cannot be seen with the naked eye. They are microscopic in nature, hence they are called 'microorganisms'. A microscope or a magnifying lens is required to observe them.

What are the damage caused by microorganisms?

The harmful microorganisms are called pathogens. The diseases causing microorganisms include bacteria, viruses, protozoa, fungi and a few variations of worms. Once they invade the host cell, they disrupt or damage the normal cellular activities. This leads to diseases on a larger scale.

What are the 10 harmful effects of microorganisms?

- Human diseases like cholera, pneumonia, tuberculosis (TB), typhoid, and many more can be brought on by specific types of bacteria.
- For example - Typhoid is caused by the bacterium Salmonella typhi.
- People suffering from typhoid usually have a high fever.

What are the harmful microorganisms in water?

Of the many infectious microorganisms found in the environment, bacteria (such as Shigella, Escherichia coli, Vibrio, and Salmonella), viruses (such as Norwalk virus and rotaviruses), and protozoans (such as Entamoeba, Giardia, and Cryptosporidium) may be found in water.

What they are 10 uses of microorganisms in our daily life?

- Microorganisms are helpful in making food stuffs Example-yeast.
- They are used in industries as a source of useful enzymes like lipases and proteases.
- They are used in producing vaccines.
- They are used in cosmetics and ointments.
- Rhizobium, a bacteria is useful in nitrogen fixation.

What is the most harmful microorganisms?

The bacteria and viruses that cause the most illnesses, hospitalizations, or deaths in the United States are described below and include:

- Campylobacter.
- Clostridium perfringens.
- E. coli.
- Listeria.
- Norovirus.
- Salmonella.

How do microorganisms spread disease?

Modes of Transmission. There are five principal modes by which bacterial infections may be transmitted: Contact, airborne, droplet, vectors, and vehicular (contaminated inanimate objects such as food, water, and fomites) (see Figure 5). Modes of disease transmission.

What are useful and harmful bacteria?

Lactobacillus is found in curd, and can ferment milk into cheese and yoghurt. Harmful bacteria: there are number of bacteria that causes various diseases to living organisms, such bacteria are referred to as harmful bacteria. Diseases such as cholera, typhoid, pneumonia and tuberculosis etc.

What is the killing of all microorganisms?

Sterilization describes a process that destroys or eliminates all forms of microbial life and is carried out in health-care facilities by physical or chemical methods.

Where do microorganism live?

They live in water, soil, and in the air. The human body is home to millions of these microbes too, also called microorganisms. Some microbes make us sick, others are important for our health. The most common types are bacteria, viruses and fungi.

How do microorganisms enter the body?

Microorganisms capable of causing disease—pathogens—usually enter our bodies through the mouth, eyes, nose, or urogenital openings, or through wounds or bites that breach the skin barrier. Organisms can spread—or be transmitted—by several routes.

IMMUNE SYSTEM

An infection can be seen as a battle between the attacking pathogens and the host. Our bodies are equipped to fight off attacking microbes that may cause disease. These are called our natural defenses.

مدافعتی سسٹم ۔

انفیکشن کو حملہ آور پیتھوجینز اور میزبان کے درمیان جنگ کے طور پر دیکھا جا سکتا ہے۔ ہمارے جسم حملہ آور جرثوموں سے لڑنے کے لیے لیس ہیں جو بیماری کا سبب بن سکتے ہیں۔ یہ ہمارے قدرتی دفاع کہلاتے ہیں

First line of defense

The first line of defense is non-specific and aims to stop microbes from entering the body. The skin and slippery skins act as a physical barrier preventing penetration by microbes.

If the skin is cut then the blood produces a clot which seals the wound and prevents microbes from entering.

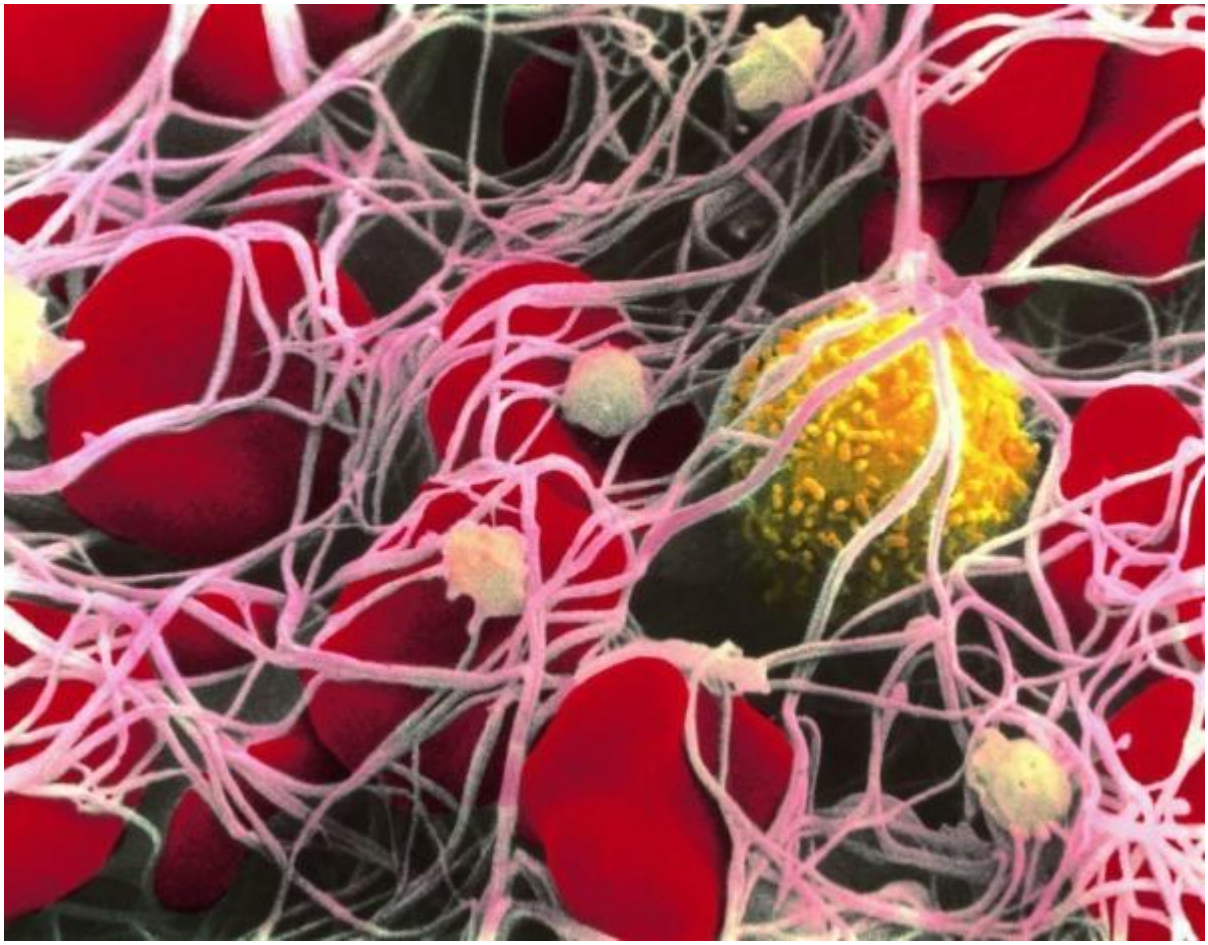
The surfaces of the body – the skin, digestive system, and the lining of the nose – are covered by a community of microbes called the normal body flora. They help protect the host from becoming infected with more harmful micro-organisms by acting as a physical barrier. The normal body flora colonizes these linings which reduces the area available for pathogens to attach to and become established. It also means that the harmful microbes have to compete with the normal body flora for nutrients. The average human gut contains around one kilo of these good bacteria which is equivalent to one bag of sugar.

The respiratory system – the nose and passageways leading to the lungs – is lined with cells that produce sticky fluid called mucus that traps invading microbes and dust. Tiny hairs called cilia move in a wave-like motion and waft the microbes and dust particles up to the throat, where they are either coughed or sneezed out or swallowed and then passed out of the body in faeces.

The body produces several antimicrobial substances that kill or stop microbes from growing. For example the enzymes in tears and saliva break down bacteria. The stomach produces acid which destroys many of the microbes that enter the body in food and drink. Urine as it flows through the urinary system flushes microbes out of the bladder and urethra.

دفاع کی پہلی لائن

دفاع کی پہلی لائن غیر مخصوص ہے اور اس کا مقصد جرثوموں کو جسم میں داخل ہونے سے روکنا ہے۔ جلد اور پھسلن والی کھالیں ایک جسمانی رکاوٹ کے طور پر کام کرتی ہیں جو جرثوموں کے دخول کو روکتی ہیں۔ اگر جلد کاٹ دی جائے تو خون جمنا پیدا کرتا ہے جو زخم کو بند کر دیتا ہے اور جرثوموں کو داخل ہونے سے روکتا ہے۔



A blood clot

جسم کی سطحیں - جلد، نظام انہضام، اور ناک کی پرت - جرثوموں کی ایک جماعت سے ڈھکی ہوئی ہیں جسے عام جسمانی نباتات کہتے ہیں۔ وہ جسمانی رکاوٹ کے طور پر کام کرکے میزبان کو زیادہ نقصان دہ مائکروجنزموں سے متاثر ہونے سے بچانے میں مدد کرتے ہیں۔ عام جسمانی نباتات ان پرتوں کو نوآبادیات بناتی ہے جو پیتھوجینز کے منسلک ہونے اور قائم ہونے کے لیے دستیاب جگہ کو کم کر دیتی ہے۔ اس کا مطلب یہ بھی ہے کہ نقصان دہ جرثوموں کو غذائی اجزاء کے لیے جسم کے عام پودوں سے مقابلہ کرنا پڑتا ہے۔ اوسط انسانی آنت میں تقریباً ایک کلو ان اچھے بیکٹیریا ہوتے ہیں جو ایک تھیلی چینی کے برابر ہوتے ہیں۔

نظام تنفس - ناک اور پھیپھڑوں کی طرف جانے والے راستے - ایسے خلیوں سے جڑے ہوئے ہیں جو بلغم نامی چپچپا سیال پیدا کرتے ہیں جو حملہ آور جرثوموں اور دھول کو پھنساتے ہیں۔ سیلیا کہلانے والے چھوٹے بال لہر کی طرح حرکت کرتے ہیں اور جرثوموں اور دھول کے ذرات کو گلے تک لے

جاتے ہیں، جہاں وہ کھانستے یا چھینکتے ہیں یا نگل جاتے ہیں اور پھر پاخانے میں جسم سے باہر نکل جاتے ہیں۔

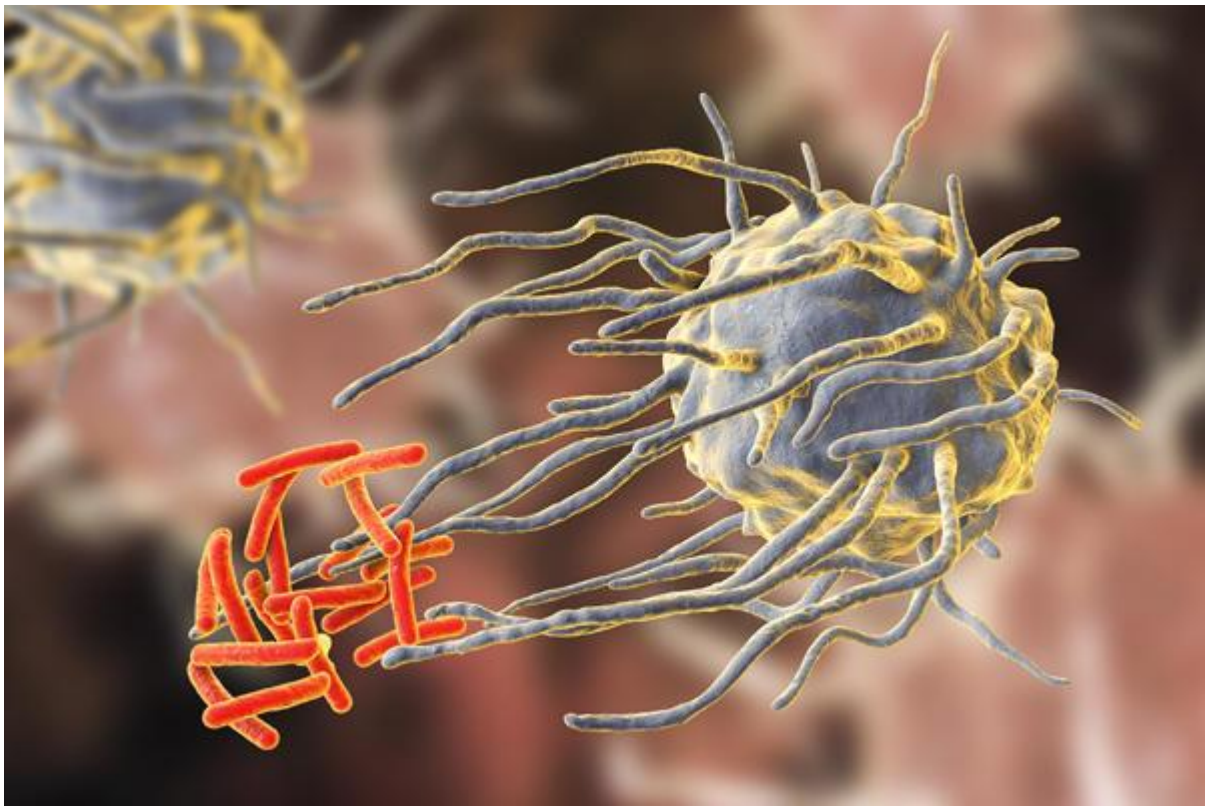
جسم کئی antimicrobial مادے پیدا کرتا ہے جو جرثوموں کو مارنے یا بڑھنے سے روکتے ہیں۔ مثال کے طور پر آنسوؤں اور تھوک میں موجود انزائمز بیکٹیریا کو توڑ دیتے ہیں۔ معدہ تیزاب پیدا کرتا ہے جو کھانے پینے میں جسم میں داخل ہونے والے بہت سے جرثوموں کو ختم کر دیتا ہے۔ پیشاب جب پیشاب کے نظام سے گزرتا ہے تو مثانے اور پیشاب کی نالی سے جرثوموں کو باہر نکال دیتا ہے۔

Second line of defense

If microbes do manage to get inside the body then the second line of defense is activated. This is also non-specific as it stops any type of microbe. Phagocytes are a type of white blood cell that move by amoeboid action. They send out pseudopodia which allows them to surround invading microbes and engulf them. Phagocytes release digestive enzymes which break down the trapped microbes before they can do any harm. This process is called phagocytosis.

دفاع کی دوسری لائن

اگر جرثومے جسم کے اندر داخل ہونے میں کامیاب ہوجاتے ہیں تو دفاع کی دوسری لائن فعال ہوجاتی ہے۔ یہ بھی غیر مخصوص ہے کیونکہ یہ کسی بھی قسم کے جرثومے کو روکتا ہے۔ فاگوسائٹس ایک قسم کے سفید خون کے خلیے ہیں جو امیبوڈ ایکشن سے حرکت کرتے ہیں۔ وہ سیڈوپوڈیا بھیجتے ہیں جس کی وجہ سے وہ حملہ آور جرثوموں کو گھیر لیتے ہیں اور انہیں گھیر لیتے ہیں۔ فاگوسائٹس ہاضمے کے انزائمز جاری کرتی ہیں جو پھنسے ہوئے جرثوموں کو کوئی نقصان پہنچانے سے پہلے ہی توڑ دیتے ہیں۔ اس عمل کو phagocytosis کہا جاتا ہے۔



Macrophage engulfing tuberculosis bacteria *Mycobacterium tuberculosis*. This process is called phagocytosis.

Third line of defense

The third and final line of defense is the immune response. The invading microbe or pathogen is called an antigen. It is regarded as a threat by the immune system and is capable of stimulating an immune response.

Antigens are proteins that are found on the surface of the pathogen. Antigens are unique to that pathogen. The whooping cough bacterium, for example, will have different antigens on its surface from the TB bacterium.

When an antigen enters the body, the immune system produces antibodies against it. Antibodies are always Y-shaped. It is like a battle with the army (antibody) fighting off the invader (antigen). A type of white blood cell called a

lymphocyte recognizes the antigen as being foreign and produces antibodies that are specific to that antigen. Each antibody has a unique binding site shape which locks onto the specific shape of the antigen. The antibodies destroy the antigen (pathogen) which is then engulfed and digested by macrophages.

White blood cells can also produce chemicals called antitoxins which destroy the toxins (poisons) some bacteria produce when they have invaded the body. Tetanus, diphtheria and scarlet fever are all diseases where the bacteria secrete toxins.

Once the invading microbes have been destroyed the immune response winds down.

Once a person has had a disease they don't normally catch it again because the body produces memory cells that are specific to that antigen. The memory cells remember the microbe which caused the disease and rapidly make the correct antibody if the body is exposed to infection again. The pathogen is quickly destroyed preventing symptoms of the disease occurring.

دفاع کی تیسری

اور آخری لائن مدافعتی ردعمل ہے۔ حملہ آور جرثومے یا پیتھوجین کو اینٹیجن کہا جاتا ہے۔ اسے مدافعتی نظام کے ذریعہ ایک خطرہ سمجھا جاتا ہے اور یہ مدافعتی ردعمل کو متحرک کرنے کے قابل ہے۔

اینٹیجنز وہ پروٹین ہیں جو روگزن کی سطح پر پائے جاتے ہیں۔ اینٹیجنز اس روگزنق کے لیے منفرد ہیں۔ کالی کھانسی کا جراثیم، مثال کے طور پر، اس کی سطح پر ٹی بی کے جراثیم سے مختلف اینٹیجنز ہوں گے۔

جب کوئی اینٹیجن جسم میں داخل ہوتا ہے، تو مدافعتی نظام اس کے خلاف کی شکل کی ہوتی ہیں۔ یہ فوج Yاینٹی باڈیز پیدا کرتا ہے۔ اینٹی باڈیز ہمیشہ (اینٹی باڈی) کے ساتھ جنگ کی طرح ہے جو حملہ آور (اینٹیجن) سے لڑ

رہی ہے۔ خون کے سفید خلیے کی ایک قسم جسے لیمفوسائٹ کہتے ہیں اینٹیجن کو غیر ملکی تسلیم کرتا ہے اور اینٹی باڈیز تیار کرتا ہے جو اس اینٹیجن کے لیے مخصوص ہوتے ہیں۔ ہر اینٹی باڈی کی ایک منفرد بائنڈنگ سائٹ کی شکل ہوتی ہے جو اینٹیجن کی مخصوص شکل پر بند ہوتی ہے۔ اینٹی باڈیز اینٹیجن (پیتھوجین) کو تباہ کر دیتے ہیں جو پھر میکروفیجز کے ذریعے ہضم اور ہضم ہو جاتا ہے۔

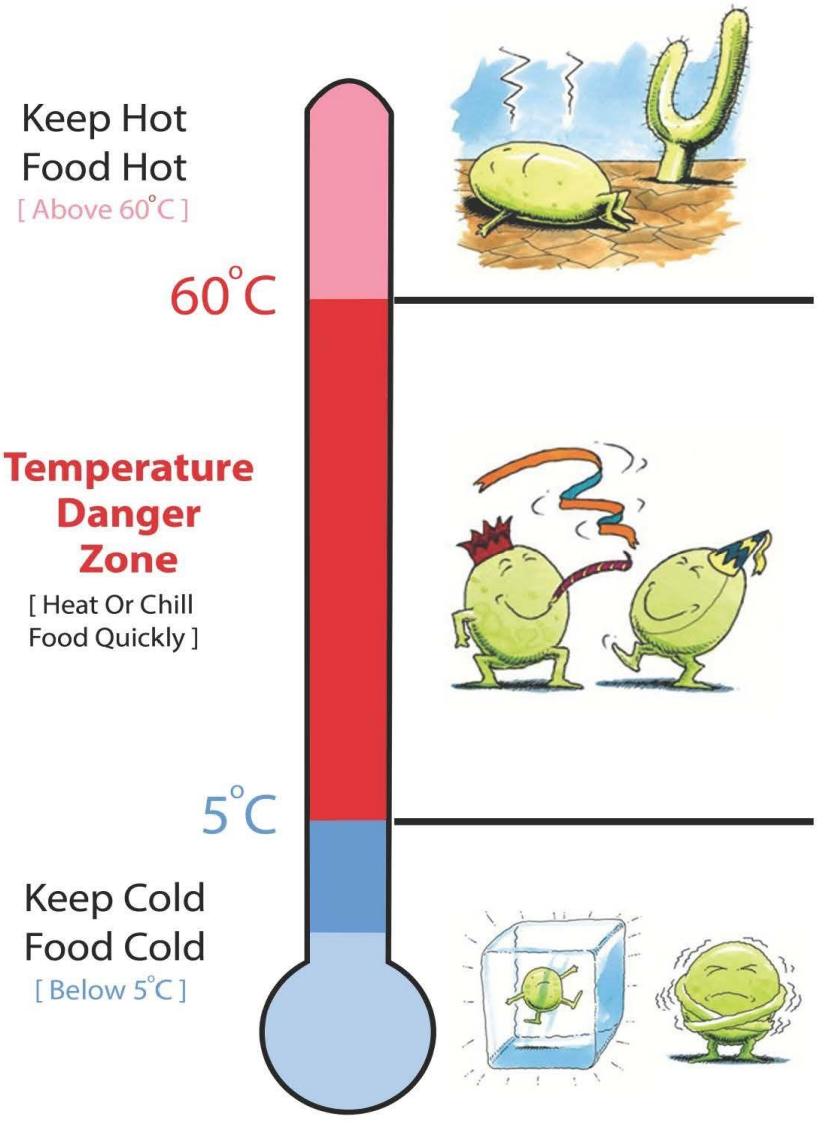
خون کے سفید خلیے اینٹی ٹاکسنز نامی کیمیکل بھی پیدا کر سکتے ہیں جو جسم پر حملہ کرنے پر کچھ بیکٹیریا پیدا ہونے والے زہریلے مادوں (زہر) کو تباہ کر دیتے ہیں۔ تشنج، خناق اور سرخ رنگ کا بخار وہ تمام بیماریاں ہیں جہاں بیکٹیریا زہریلے مادے خارج کرتے ہیں۔

ایک بار جب حملہ آور جرثومے تباہ ہو جاتے ہیں تو مدافعتی ردعمل ختم ہو جاتا ہے۔

ایک بار جب کسی شخص کو کوئی بیماری ہو جاتی ہے تو وہ عام طور پر اسے دوبارہ نہیں پکڑتا کیونکہ جسم میموری کے خلیات تیار کرتا ہے جو اس اینٹیجن سے مخصوص ہوتے ہیں۔ یادداشت کے خلیے اس جرثومے کو یاد رکھتے ہیں جس کی وجہ سے بیماری ہوئی اور اگر جسم دوبارہ انفیکشن کا شکار ہو جائے تو تیزی سے درست اینٹی باڈی بناتا ہے۔ روگزنق بیماری کی علامات کو روکنے کے لیے جلدی سے تباہ ہو جاتا ہے۔

Good Bye and See You Again

Temperature Danger Zone For Food



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FOOD SAFETY MONTH

Five keys to safer food

Keep clean

- Wash your hands before handling food and often during food preparation
- Wash your hands after going to the toilet
- Wash and sanitize all surfaces and equipment used for food preparation
- Protect kitchen areas and food from insects, pests and other animals

Why?

While most microorganisms do not cause disease, dangerous microorganisms are widely found in soil, water, animals and people. These microorganisms are carried on hands, wiping cloths and utensils, especially cutting boards and the slightest contact can transfer them to food and cause foodborne diseases.

Separate raw and cooked

- Separate raw meat, poultry and seafood from other foods
- Use separate equipment and utensils such as knives and cutting boards for handling raw foods
- Store food in containers to avoid contact between raw and prepared foods

Why?

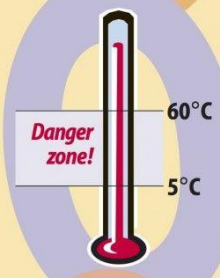
Raw food, especially meat, poultry and seafood, and their juices, can contain dangerous microorganisms which may be transferred onto other foods during food preparation and storage.

Cook thoroughly

- Cook food thoroughly, especially meat, poultry, eggs and seafood
- Bring foods like soups and stews to boiling to make sure that they have reached 70°C. For meat and poultry, make sure that juices are clear, not pink. Ideally, use a thermometer
- Reheat cooked food thoroughly

Why?

Proper cooking kills almost all dangerous microorganisms. Studies have shown that cooking food to a temperature of 70°C can help ensure it is safe for consumption. Foods that require special attention include minced meats, rolled roasts, large joints of meat and whole poultry.



Keep food at safe temperatures

- Do not leave cooked food at room temperature for more than 2 hours
- Refrigerate promptly all cooked and perishable food (preferably below 5°C)
- Keep cooked food piping hot (more than 60°C) prior to serving
- Do not store food too long even in the refrigerator
- Do not thaw frozen food at room temperature

Why?

Microorganisms can multiply very quickly if food is stored at room temperature. By holding at temperatures below 5°C or above 60°C, the growth of microorganisms is slowed down or stopped. Some dangerous microorganisms still grow below 5°C.

Use safe water and raw materials

- Use safe water or treat it to make it safe
- Select fresh and wholesome foods
- Choose foods processed for safety, such as pasteurized milk
- Wash fruits and vegetables, especially if eaten raw
- Do not use food beyond its expiry date

Why?

Raw materials, including water and ice, may be contaminated with dangerous microorganisms and chemicals. Toxic chemicals may be formed in damaged and mouldy foods. Care in selection of raw materials and simple measures such as washing and peeling may reduce the risk.

Design: Marilyn Longfield. Illustration: Janet Pettpierre

Food Safety
World Health Organization

Knowledge = Prevention

WHO/SDE/PHE/FOS/01.1
Distribution: General
Original: English

HOW IS A TEMPERATURE PROBE USED TO CHECK THAT COOKED FOOD IS SAFE TO EAT?

1.INSERT PROBE INTO CENTRE/CORE OF FOOD, THICKEST PART AT AN ANGLE.

2.LEAVE PROBE IN PLACE UNTIL TEMPERATURE STABILISES, TEMPERATURE MUST REACH 75C OR MORE.

3.ITS ONLY THE TEMPERATURE THAT GUARANTEES DESTRUCTION OF HARMFUL BACTERIA IN THE FOOD.

4.DO NOT PLACE FOOD PROBE INTO ANOTHER FOOD BEFORE CLEANING WITH AN ANTIBACTERIAL CLEANSER.

5.CLEAN AFTER USE WITH ANTI-BACTERIAL CLEANSERS, THIS WILL HELP AVOID CROSS CONTAMINATION.

6.STERILISE PROBE BEFORE USE AND CLEAN WITH ANTIBACTERIAL SPRAY OR WIPES.

PROPER FOOD STORAGE

Refrigerate Safely — Separate cooked and raw foods.

USE BY
Vencimiento

Prepared Foods

Fruits/Vegetables

Fish/Seafood

Beef/[redacted]

Ground Meat

Poultry

SAT

Label all food clearly and use the first in, first out system.

MON
LUNES

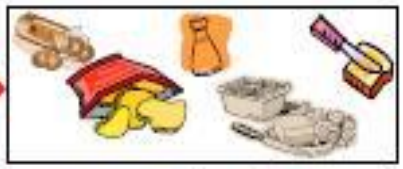
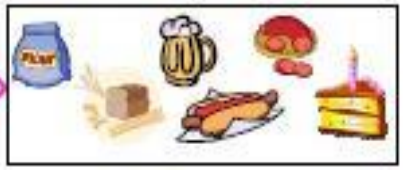
Call DayMark Food Safety Systems at 1-800-847-0101 for all your food-safety label needs or visit their Web site at www.dissolveaway.com

ALMACENE ALIMENTO APROPIADAMENTE


COLOUR CODED CUTTING BOARDS
eliminate the risk of bacterial cross contamination during food preparation
RED
RAW MEAT
BLUE
RAW FISH
YELLOW
COOKED MEAT
GREEN
SALAD & FRUIT
BROWN
VEGETABLES
WHITE
BAKERY & DAIRY
stika.co

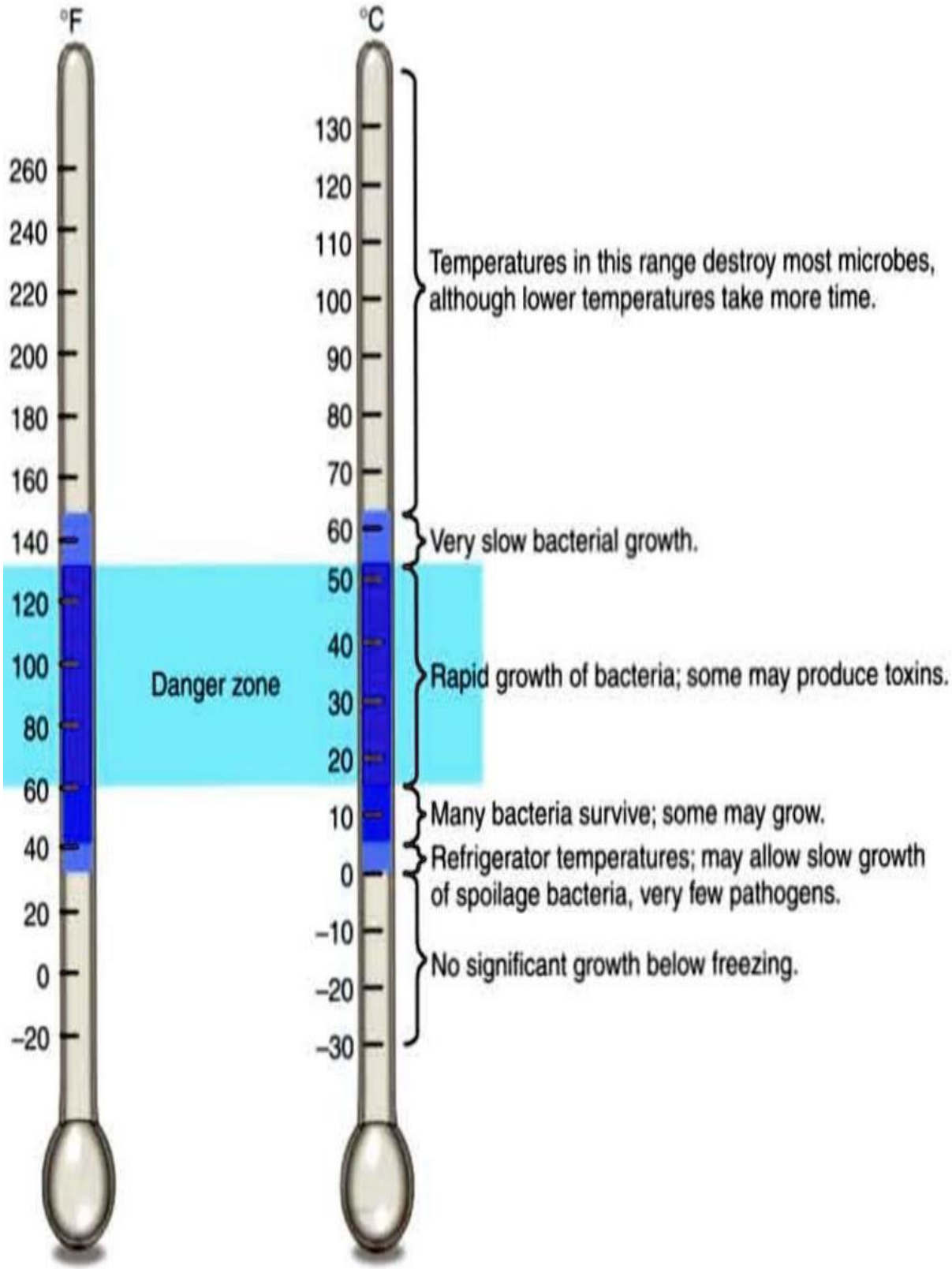
C·F·T QLD

These foods could cause an allergic reaction. Always check!

Milk	Milk, Yogurt, Cheese, Mayonnaise, Mousse, Ice-cream & anything made with milk.	
Egg	Egg, Cakes, Biscuits, Doughnuts, Salad Dressings, Custard, Ice-cream, Meringue, Meat Mixtures (hamburgers etc), Pasta, Egg Noodles, Battered-Fried Food etc.	
Peanut	Peanut, Peanut Oil, Peanut Butter, Peanut Flour - and look for traces of peanut in food labels, especially biscuits etc.	
Tree Nut	Tree Nuts, Almonds, Brazil Nuts, Cashews, Chestnuts, Hazelnuts, Macadamia Nuts, Pecans, Pine Nuts, Pistachios, Walnuts and look out for nougat, chocolate, cereals etc.	
Fish	Deli Meats, (bologna, ham), dips, Fried Rice, Spring Rolls, Gelatin (marshmallows), Pizza Toppings, Salad Dressings, Spreads, Sushi, Hot Dogs, Rice Crackers etc.	
Shellfish	Prawns, Lobster, Cray Fish, Oysters, Scallops, Moreton Bay Bugs, Crabs, Crab Meat, Fried Rice etc.	
Soy	Soy, Biscuits, Cake Mixes, Bean Sprouts, Potato Chips, Rice Crackers, Dressings, Sauces, Tofu, Spreads, Imitation Milk, Marinades, Processed Meats, Spices etc.	
Wheat	Flour, Bread, Beer, Broth (canned & cubed), Cakes, Biscuits, Ice-cream, Binders & Fillers (hot dogs, deli meats), Pie fillings, Puddings etc.	
Sesame Seeds	Sesame Seeds, Oil, Bread Crumbs, Crackers, Cereal, Flavourings (rice, noodles, stir fry), Margarine, Seasonings, Pretzels, Rice Cakes, Bagels, Sesame Bars etc.	

Specialists in Food Safety Training - online, in class or by correspondence

With compliments CFT QLD 1300 775 165 www.cftqld.com.au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Danger zone
Temperatures in this range destroy most microbes, although lower temperatures take more time.
Very slow bacterial growth.
Rapid growth of bacteria; some may produce toxins.
Many bacteria survive; some may grow.
Refrigerator temperatures; may allow slow growth of spoilage bacteria, very few pathogens.
No significant growth below freezing.

THE END