



TECHNICAL ASSISTANCE TO BUILD FOOD SAFETY CAPACITY FOR THE FISHERIES SECTOR



MODULE 1

Microbiological hazards

Training for TIBU Impex, Guyana



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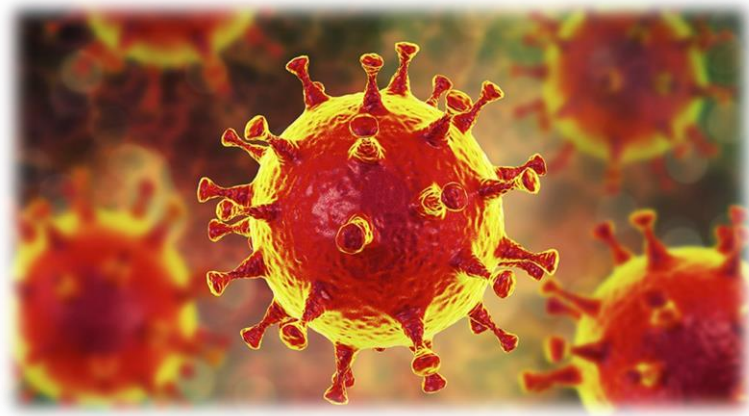
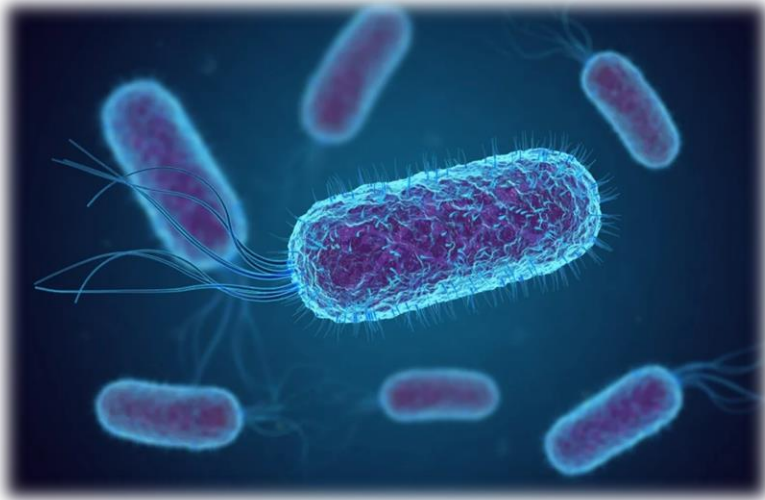
Learning Outcomes

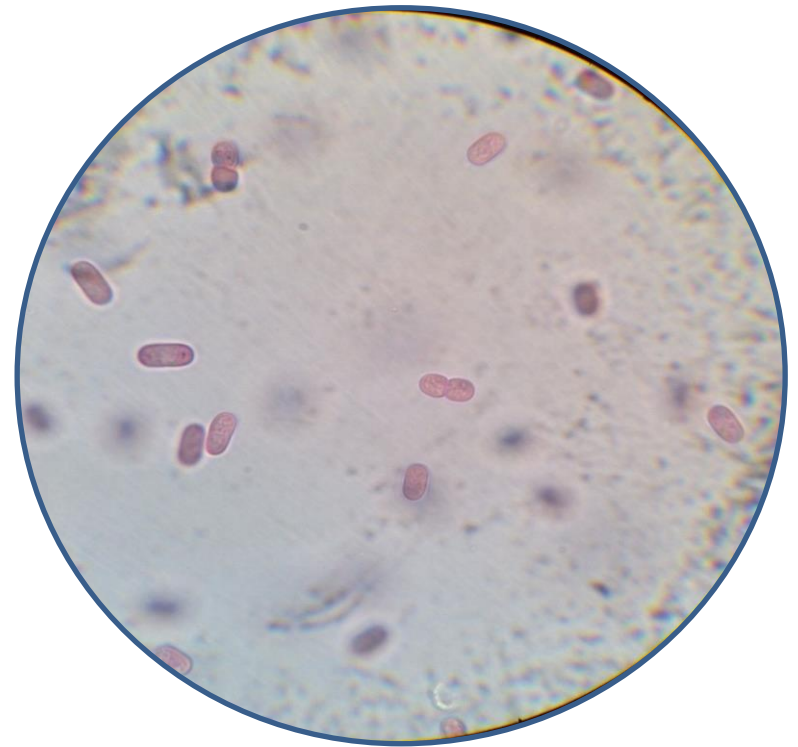
At the end of this session, you should be able to:

- Describe microbiological hazards.
- Understand how food poisoning can occur.
- Explain the symptoms of food poisoning.
- Discuss ways to control bacterial growth.



Microbiological hazards





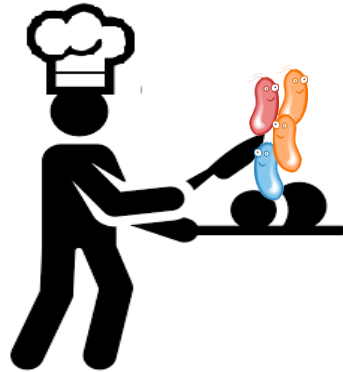
In many food businesses, microbiological hazards are the **MOST IMPORTANT** because they can make people very ill or can spoil food!

An example of how food poisoning can occur - Microbiological Hazard

**BACTERIA
PRESENT IN
FAECES**



**ORGANISM
TRANSFERRED
TO FOOD BY
FOOD
HANDLER**



**CONTAMINATED
FOOD
CONSUMED**



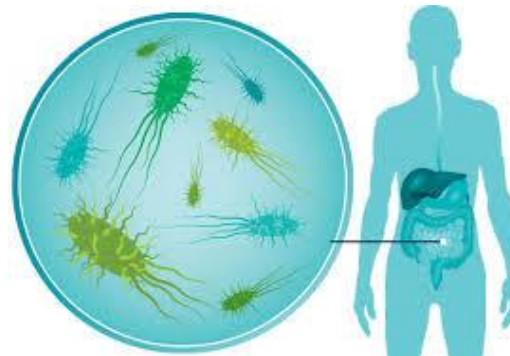
**CONSUMER
DEVELOPS
FOOD
POISONING**



**FOOD HANDLER DOES NOT
WASH HANDS PROPERLY
AFTER USING BATHROOM**

Types of Bacteria

- Pathogens – make people sick
- Spoilage – cause food to spoil
- Essential –
 - ❖ Human body
 - ❖ Food industry



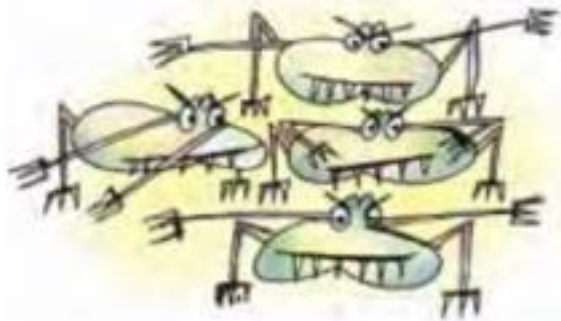
Bacteria can...



MAKE YOU SICK

MAKE FISH SPOIL

What do they like?



WATER



WARMTH



FOOD



What do they hate?



DRY CONDITIONS



VERY HOT TEMPERATURES



COLD

Bacteria and Temperature

- Between 4°C and 60°C bacteria grow quickly. **This is called the temperature danger zone.**
- At 4°C and colder, bacteria grow slowly. **This is called the refrigeration temperature.**
- At -18°C and colder, bacteria do not grow but are still alive. **This is called the freezer temperature.**

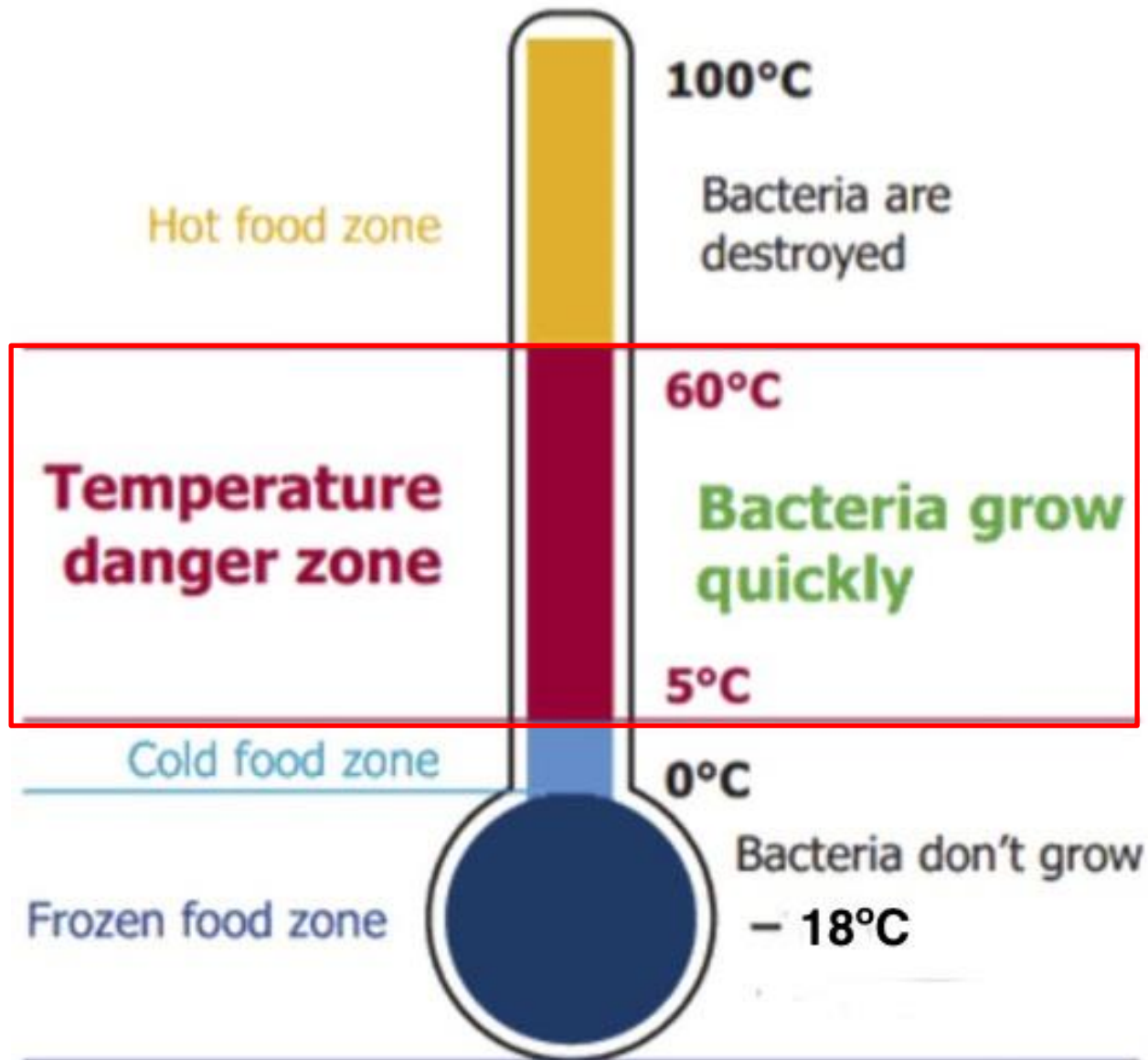








Temperature Danger Zone



Where can we find them?

DIRTY TOILETS



DIRTY CLOTHES AND FEET



ANIMALS



IN THE AIR

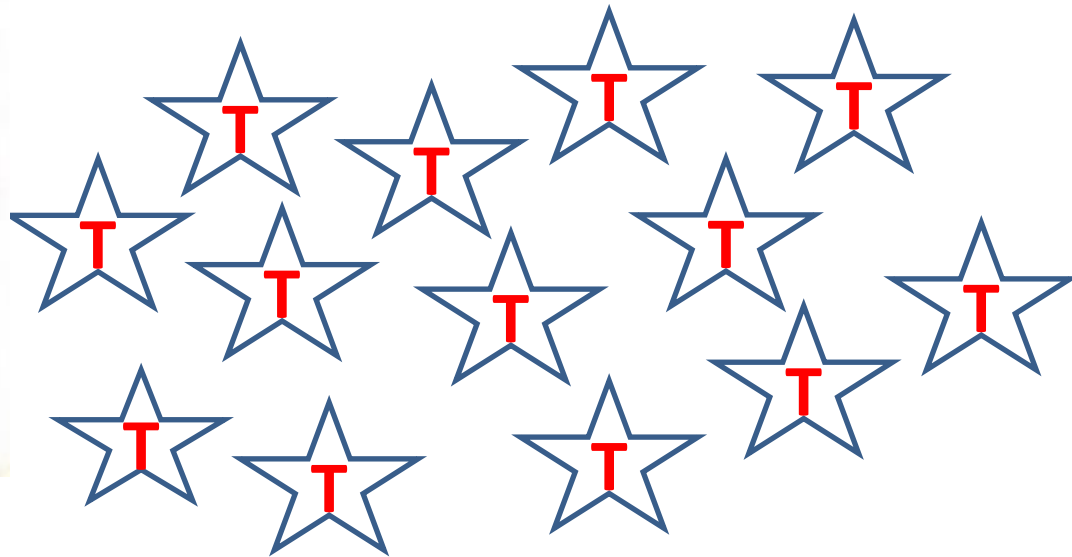
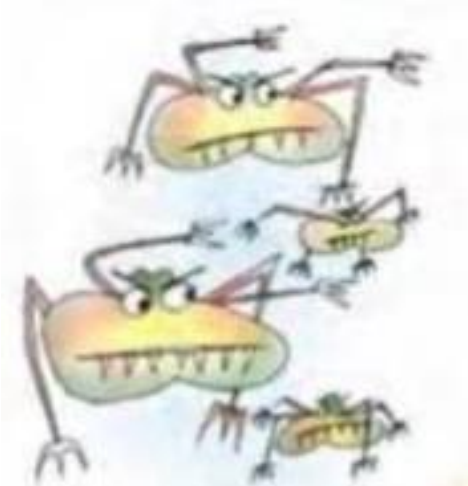


HANDS



INSECTS

Bacterial toxins



- Poisons produced by some bacteria
- Produced when toxin-producing bacteria grow in food
- May not be destroyed by cooking process

Bacterial spores



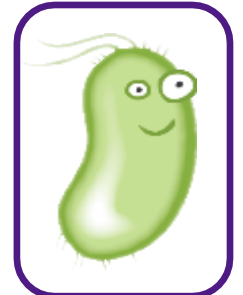
- Inactive stage of some bacteria that allow them to survive unfavourable conditions:
 - High temperature
 - Low nutrients
 - Lack of water
 - Some disinfectants

Bacterial spores – unsuitable conditions

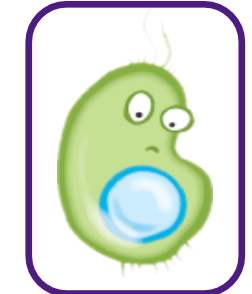
99.3°C



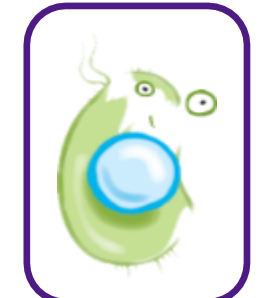
Bacterial cell



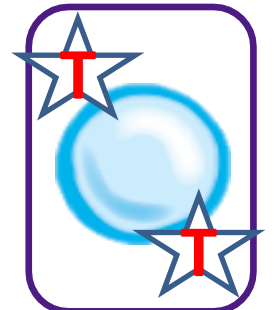
Spore forms inside cell



Bacterial cell breaks apart



Releases spore and may release toxin



Bacterial spores – suitable conditions



Spore germinates



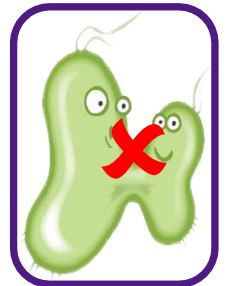
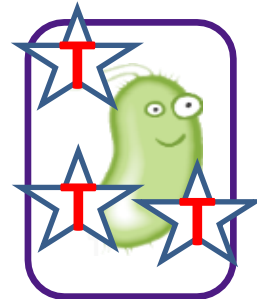
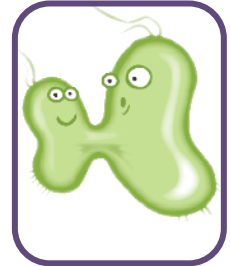
Cell produced and multiplies



Toxin may be released in intestine or in food



Cool food rapidly to stop germination and multiplication.



**How can we stop bacteria from
multiplying?**

**Proper handling, hygiene and storage practices
can stop bacteria from multiplying**



Bacteria can be killed/inactivated by adequate cooking



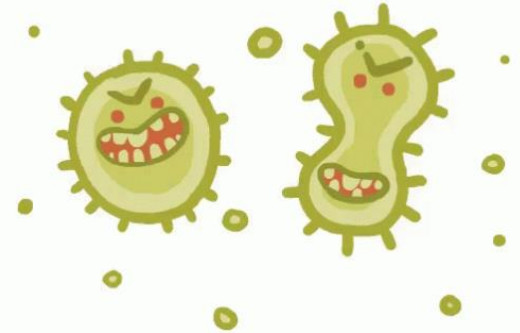
Effective cleaning, disinfection and hygienic practices can prevent bacteria from multiplying



Symptoms of Food Poisoning



Food poisoning myths



TRUE OR FALSE

1. Food with enough bacteria to make you sick will look, smell or taste bad.
2. Really fresh food cannot make people sick.
3. Food poisoning is always caused by the last thing you ate.
4. Properly cooked food can never cause food poisoning.

Food with enough bacteria to make you sick may look, smell or taste good.

Really fresh food can cause food poisoning if it is not properly handled.

Food poisoning can be caused by what you ate several hours to even a week ago.

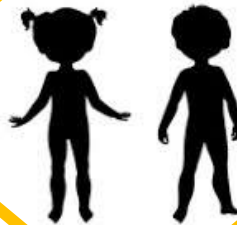
Food poisoning can occur even when foods are properly cooked, if contaminated after cooking.

Food poisoning onset and duration

- ❑ Food poisoning usually occurs within 1 to 3 days of eating contaminated food
- ❑ Symptoms typically last for 1 to 7 days



High risk groups



Foodborne illness can affect anyone, but some groups are more at risk than others because of the severity of their illness (can lead to death in some cases)

Food poisoning cases related to fish and fish products...



Food poisoning outbreak from contaminated fish-balls

W Tangkanakul ¹, P Tharmaphornpilas, D Datapon, S Sutantayawalee

Affiliations + expand

PMID: 11215857



Abstract

On February 9th, 1998, a food poisoning outbreak occurred at a boarding school for underprivileged students. An unmatched case-control study was done. An environmental survey, laboratory study of rectal swab culture, fish-balls, water and the cooking utensils were also performed. There were 132 suspect cases, of which the attack rate in teachers was 9.8 per cent (4/41), 16.7 per cent (1/6) in the food handlers and 15.7 per cent (127/810) in the students. The median incubation period was 18 hours. Analysis of food consumption revealed those who ate lunch noodles had the highest risk (OR 3.8, 95% CI 0.6-5.9). In details of food components, those who ate fish-balls in curry had the only significant risk (OR 3.5, 95% CI 1.2-0.8) of becoming ill when compared to those who did not. Fish-balls in noodles and curry had a dose response relationship. Bacterial culture from 25 grams of fish-balls was positive for *Vibrio parahaemolyticus*. The fish-balls in noodles and curry were identified as the implicated food. The modes of contamination were uncooked food, cooking utensils and the food handlers. The manufacturer, which had no license to operate and had poor standards of sanitation, was closed by the Food and Drug Administration.

RECALL: Uneviscerated Fish Recalled Amid Poisoning Concerns

[Home](#) » [RECALL: Uneviscerated Fish Recalled Amid Poisoning Concerns](#)

By [GWC Injury Lawyers](#) Posted [June 30, 2009](#) In [General Interest Blog](#)



In our last post we discussed product recalls linked to salmonella and listeria contamination. Although these are the most common types of food recall causes, other forms of bacteria can also result in tainted consumer products and product liability litigation.

One company is recalling salted fish which was found to be uneviscerated. In the U.S., most fish are eviscerated before being sold. This means that the entrails of the fish are removed and the fish are washed before sale. This is done because the viscera, or guts, of the fish are more likely to contain *Clostridium botulinum*, a bacteria that can cause botulism, a potentially fatal form of food poisoning.

Call our pe



QUIZ – true ✓ or false ✗ ?

Bacteria are too small to see with the naked eye.



A toothache is a symptom of food poisoning.



Bacteria like dry conditions.



Young children, elderly persons and pregnant women are at higher risk to suffering from food poisoning.



Cooking food properly can kill any bacteria present.



Bacteria can quickly multiply under the right conditions.



Any questions?

