



# TECHNICAL ASSISTANCE TO BUILD FOOD SAFETY CAPACITY FOR THE FISHERIES SECTOR



# Introduction to Food Safety

*Training for Ocean Delight, Suriname*



Prepared by: Megapesca Lda Portugal

# Learning Outcomes

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

- Understand the basic principles of food hygiene
- Know the meaning of:
  - Food safety
  - Food safety hazards
  - Contamination and cross-contamination
  - Food poisoning/foodborne illness
- Highlight how good food handling practices can prevent foodborne illness



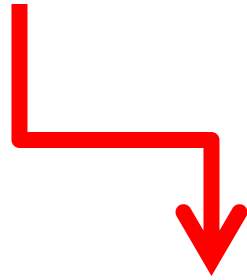
# What is food safety?



**The things we do to make sure our food is safe to eat**



# FOOD SAFETY



# BEHAVIOUR






# TRAINING TIPS

- ✓ You should encourage a positive food safety culture within your organization!
- ✓ Important for workers to understand that everyone has a role to play.
- ✓ Workers should be aware that what they are doing can have an impact on quality and safety of fish.
- ✓ Food safety is linked to their general attitude and behaviour.



Food safety is everyone's business...

## **Fish Processing Factory In Kepong Shut Down!**

On 26 January 2021, the DBKL Health & [Environment](#)  Department inspected a fish processing factory at Jalan 4/33 B MWE in the Kepong Commercial Park.





019-9154402











## Fish Processing Factory In Kepong **Shut Down!**

On 26 January 2021, the DBKL Health & [Environment](#) Department inspected a fish processing factory at Jalan 4/33 B MWE in the Kepong Commercial Park.

They discovered that this fish processing factory was unhygienic, shutting it down under Section 11 of the [Food](#) Act 1983, based on these reasons :

- the premises were unsanitary
- the walls and floors were untiled and covered in moss
- the walls and floors in the food processing area were covered in dirt and dried blood
- the fish were processed on the floor
- there was no oil trap
- fish blood and waste water were poured into the public drain
- equipment used were filthy and improperly maintained



# TRAINING TIPS



- These slides illustrate what can happen when a company does not understand the importance of food safety.
- These provide a visual reminder of why hygiene and sanitation are important in producing/supplying safe, good quality fish.

# Food safety hazards

“Agents that can **contaminate**  
food and cause  
**illness or injury**”

# Types of food safety hazards



MICROBIOLOGICAL – results in food poisoning  
(*eg bacteria, viruses, fungi/moulds, parasites*)

CHEMICAL – results in chemical poisoning/allergic reaction  
(*eg cleaning agents, pesticides, allergens*)



PHYSICAL – results in injury  
(*eg broken glass, hair, insects*)

## Food safety hazards

“Agents that can **contaminate** food and cause **illness or injury**”

## Types of food safety hazards



MICROBIOLOGICAL – results in food poisoning  
(eg bacteria, viruses, fungi/moulds, parasites)

CHEMICAL – results in chemical poisoning/allergic reaction  
(eg cleaning agents, pesticides, allergens)



PHYSICAL – results in injury  
(eg broken glass, hair, insects)

# TRAINING TIPS

- Workers will learn about microbiological, chemical and physical hazards.
- For microbiological hazards, bacteria will be the main focus - their impact on fish spoilage and potential to cause foodborne illness.
- Symptoms of food poisoning discussed.



**WHAT TYPE OF FOOD SAFETY HAZARD IS THIS FLY?**



**What is a microbiological hazard?**



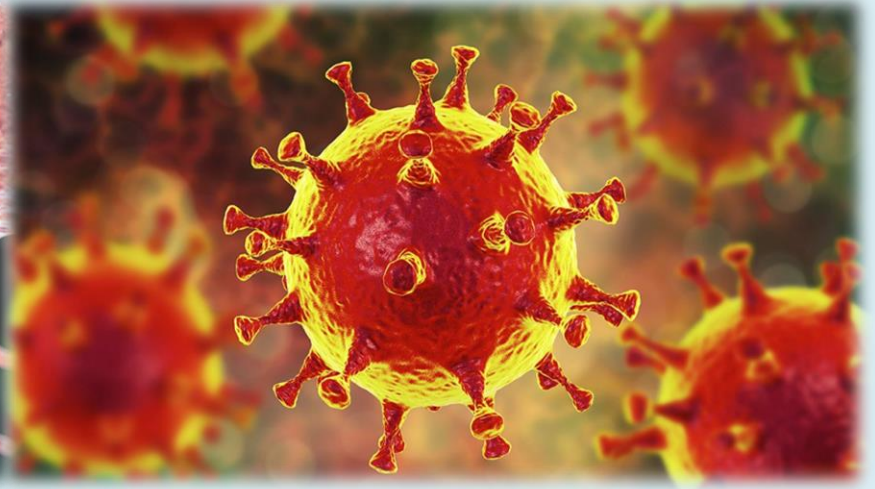
**BACTERIA**



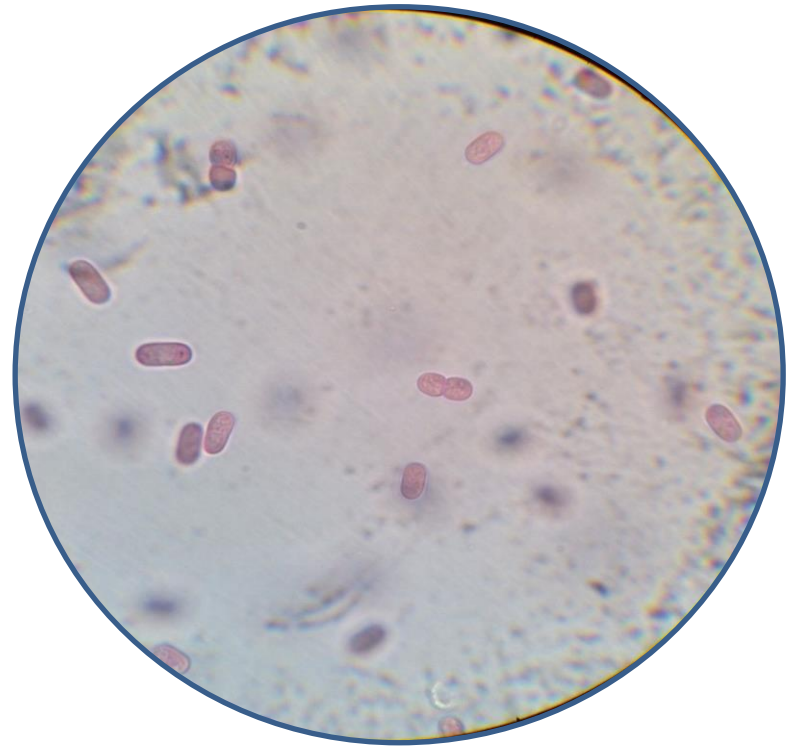
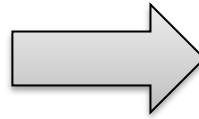
**PARASITES**



**MOLDS/FUNGI**



**VIRUSES**

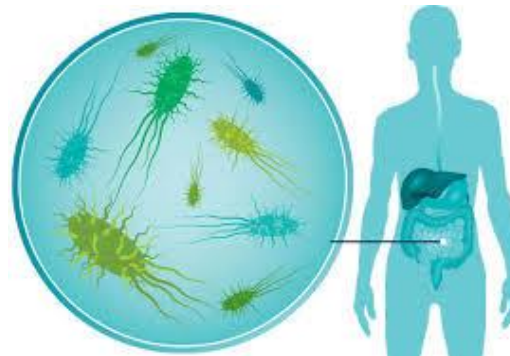


In many food businesses, microbiological hazards are the **MOST IMPORTANT** because they can make people very ill or can spoil food!

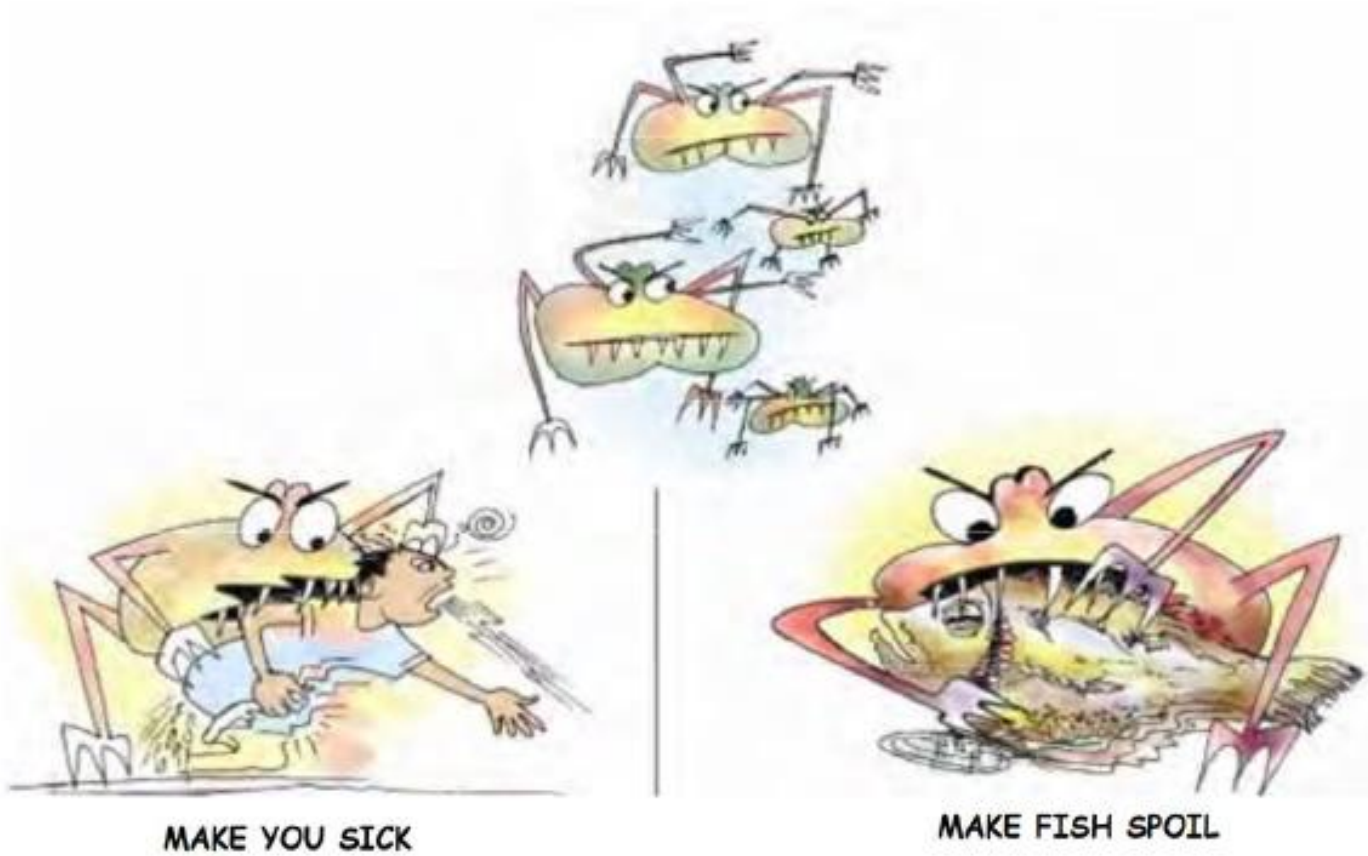


# Types of Bacteria

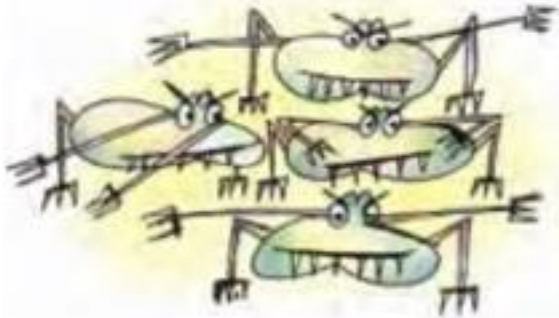
- Pathogens – make people sick
- Spoilage – cause food to spoil
- Essential –
  - ❖ Human body
  - ❖ Food industry



# Bacteria can...



# What do they like?



WATER



WARMTH



FOOD





# What do they hate?



DRY CONDITIONS



VERY HOT TEMPERATURES



COLD

# Where can we find them?

**DIRTY TOILETS**



**DIRTY CLOTHES AND FEET**



**ANIMALS**



**IN THE AIR**



**HANDS**



**INSECTS**

# Possible sources of microorganisms in food establishments

- People
- Raw materials **(Can be found on and in RAW FISH)**
- Equipment/Utensils
- Insects
- Rodents
- Animals
- Soil/dirt
- Waste

**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



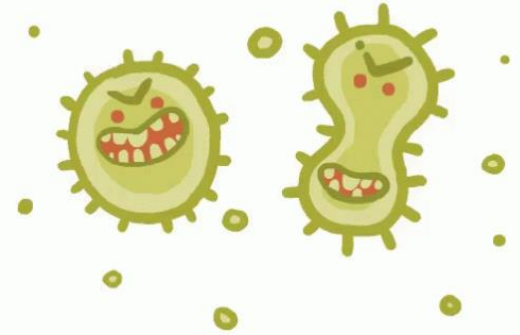
**Bacteria that can make you very sick are called **PATHOGENS**. They come from the intestines of humans and animals.**

**They can cause **FOOD POISONING** or **FOODBORNE ILLNESS**.**

# 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.



# TRAINING TIPS

## Food poisoning myths

### TRUE OR FALSE



- |  |  |
|--|--|
| 1. Food with enough bacteria to make you sick will look, smell or taste bad. | Food with enough bacteria to make you sick may look, smell or taste good.                    |
| 2. Really fresh food cannot make people sick.                                | Really fresh food can cause food poisoning if it is not properly handled.                    |
| 3. Food poisoning is always caused by the last thing you ate.                | Food poisoning can be caused by what you ate several hours to even a week ago.               |
| 4. Properly cooked food can never cause food poisoning.                      | Food poisoning can occur even when foods are properly cooked, if contaminated after cooking. |

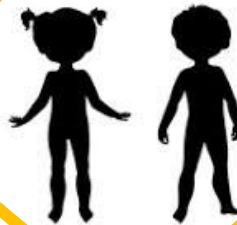
- Interactive slide that can be used to show that misconceptions may exist with people's understanding of food poisoning.

# 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

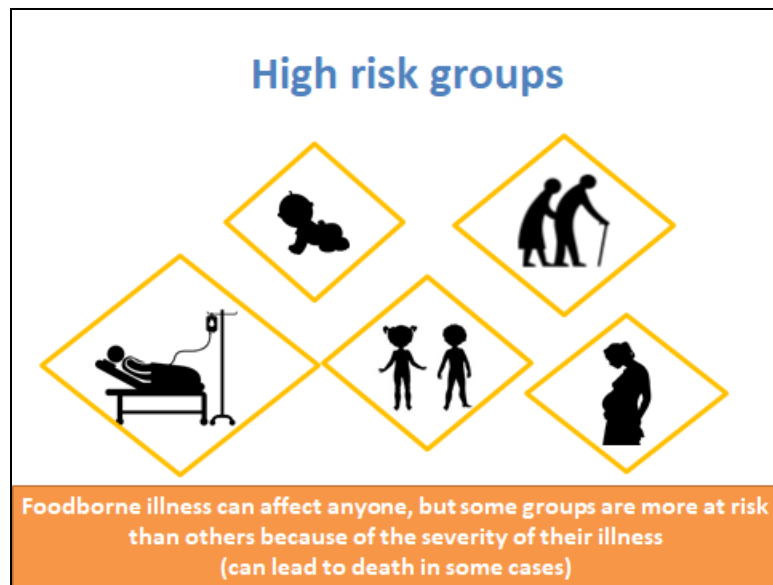


# High risk groups



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)

# TRAINING TIPS



- High risk groups – babies, young children, elderly persons and immunocompromised individuals
- Babies and young children have under-developed immune systems, making it difficult for their bodies to easily fight off pathogens.
- As people age (elderly), it becomes harder for their immune system to fight off bacteria/microbes.
- Chronic illnesses, such as diabetes, HIV and cancer, can also affect the immune system and therefore make it difficult for such person's bodies to fight off harmful bacteria.

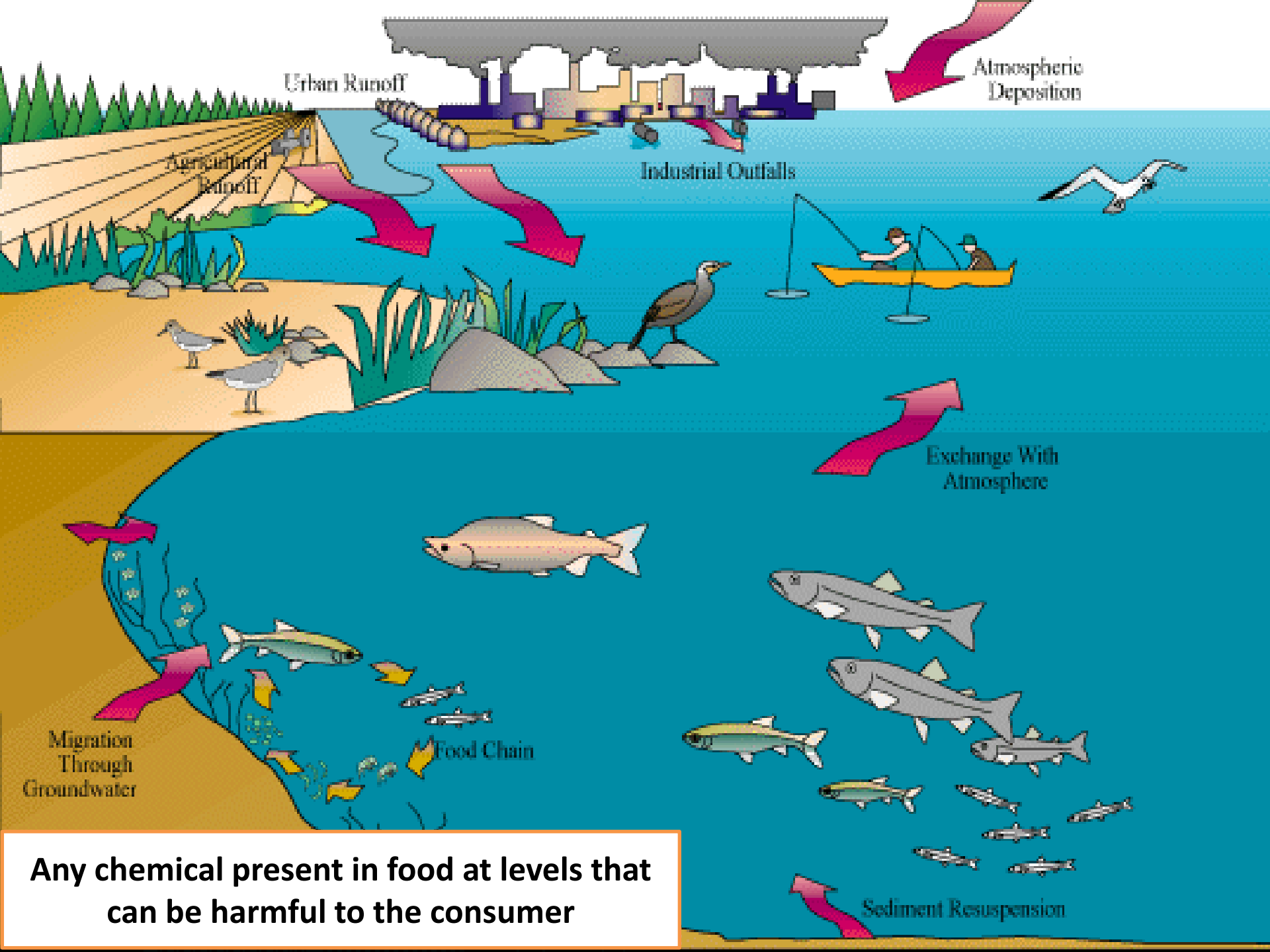


# Chemical hazards



Chemical hazards may lead to acute foodborne illness or chemical poisoning when excessively high doses of chemicals are consumed.

**What is a chemical  
hazard?**



**Any chemical present in food at levels that can be harmful to the consumer**

# Chemical hazards

Naturally occurring

Intentionally added

Unintentionally added





# Types of chemical hazards

## Naturally occurring

- Food allergens
- Mycotoxins (eg aflatoxin)
- Scombrototoxin (histamine)
- Ciguatera
- Shellfish toxins (eg Paralytic shellfish poisoning)

## Environmental & other contaminants

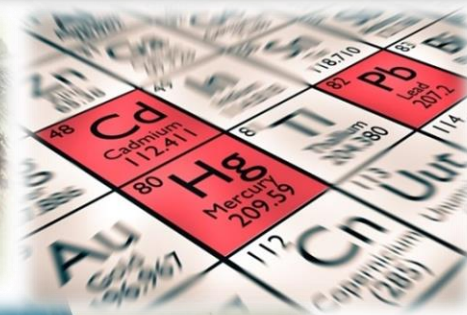
- Polychlorinated biphenyls (PCBs)
- Pesticides
- Antibiotics
- Heavy metals
- Lubricants
- Cleaners
- Sanitizers
- Paints

## Food additives

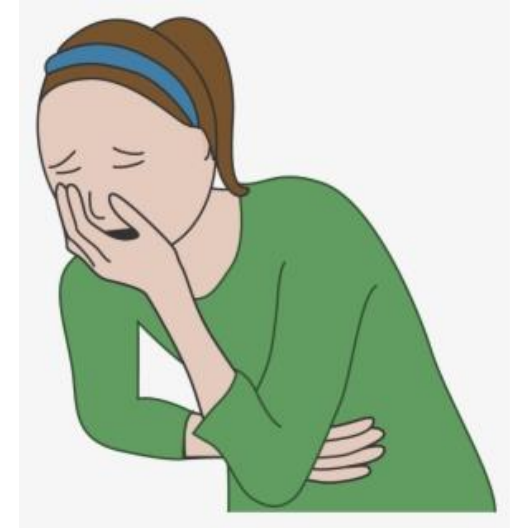
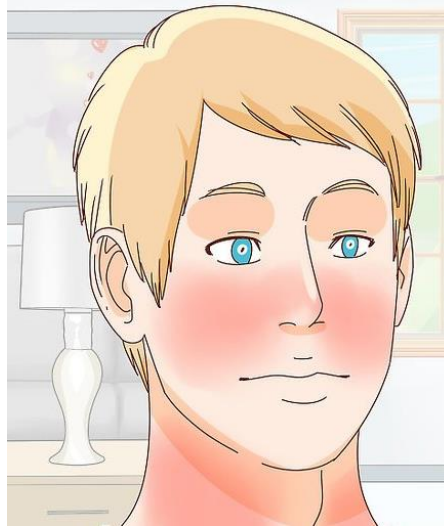
- Polycyclic aromatic hydrocarbons
- Carbon dioxide
- Sulphur

## From packaging material

- Plasticizers
- Vinyl chloride
- Printing/coding inks
- Adhesives



# Symptoms of Chemical Food Poisoning /Allergic Reaction



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





## Sweden reports histamine outbreak from imported fish

By [News Desk](#) on April 15, 2021

Almost 20 people have fallen ill in Sweden this month from histamine poisoning in fish from Vietnam.



Photo illustration of grouper fish

## Ciguatera cases linked to imported fish in New Zealand

By Joe Whitworth on June 9, 2020

Five people from two households in New Zealand became ill with ciguatera poisoning after eating fish imported from Fiji earlier this year.

The outbreak in Christchurch affected three males of 19 to 58 years old and two females – one aged in her 40s and the other in her 50s. One person was hospitalized and diagnosed with ciguatera poisoning but has since recovered.

# TRAINING TIPS



## Sweden reports histamine outbreak from imported fish

By News Desk on April 15, 2021

Almost 20 people have fallen ill in Sweden this month from histamine poisoning in fish from Vietnam.



Photo illustration of grouper fish

## Ciguatera cases linked to imported fish in New Zealand

By Joe Whitworth on June 9, 2020

Five people from two households in New Zealand became ill with ciguatera poisoning after eating fish imported from Fiji earlier this year.

The outbreak in Christchurch affected three males of 19 to 58 years old and two females – one aged in her 40s and the other in her 50s. One person was hospitalized and diagnosed with ciguatera poisoning but has since recovered.

- These stories are being told to educate the workers about real-life instances where persons became ill after eating imported fish.
- Also illustrating examples of chemical hazards.

# Sweden reports histamine outbreak from imported fish

By News Desk on April 15, 2021

Almost 20 people have fallen ill in Sweden this month from histamine poisoning in fish from Vietnam.

The foodborne outbreak at the beginning of April affected 19 people in Stockholm.

Guests eating tuna at three different restaurants in Stockholm reported symptoms of histamine poisoning.

All three restaurants purchased frozen tuna loins with the same expiry date from the same supplier, indicating that high levels of histamine occurred before the tuna was brought into Sweden from Vietnam via the Netherlands.

## Recurring issue

In March, Italian authorities reported an outbreak caused by histamine in frozen yellowfin tuna loins from Vietnam, via the Netherlands but did not say how many people were affected.

In 2020, Sweden recorded [three outbreaks of histamine poisoning](#) in tuna from Vietnam in three months.

These outbreaks affected about 60 people but were not directly related as the tuna originated from different batches. Patients were from different areas in southern and central Sweden.



# Ciguatera cases linked to imported fish in New Zealand

By Joe Whitworth on June 9, 2020

Five people from two households in New Zealand became ill with ciguatera poisoning after eating fish imported from Fiji earlier this year.

The outbreak in Christchurch affected three males of 19 to 58 years old and two females – one aged in her 40s and the other in her 50s. One person was hospitalized and diagnosed with ciguatera poisoning but has since recovered.

In late May, Krazy Price Mart Ltd recalled a batch of frozen camouflage grouper (kawakawa) due to ciguatoxin. The item was sold as an individual whole gutted fish wrapped in clear plastic but was not labelled so had no date marking. It was available between March 10 and May 21, 2020 only at Krazy Price Mart Ltd in Christchurch.

## Sample analysis and label issue

The first household purchased, cooked and consumed affected fish on April 18 and the second household bought the fish on May 3 but did not cook and eat it until one week later. In both houses, the cases had onset of symptoms within eight hours of having the product.

The link between the product and illness was identified by the local public health unit investigator who interviewed the notified cases. Both affected families had purchased the same product from the same retailer but on different days. A sample of the fish remaining in the freezer of one of the households has been sent for analysis but results are not yet available.



**How can chemical hazards be  
controlled at your facility?**

**Use approved suppliers for  
chemicals and packaging**



# Use approved food-grade chemicals





Store chemicals in designated areas away from food, packaging and food contact surfaces



**Don't store chemicals in unmarked containers**



**Follow correct dilution procedures  
for cleaning chemicals**



# Physical hazards

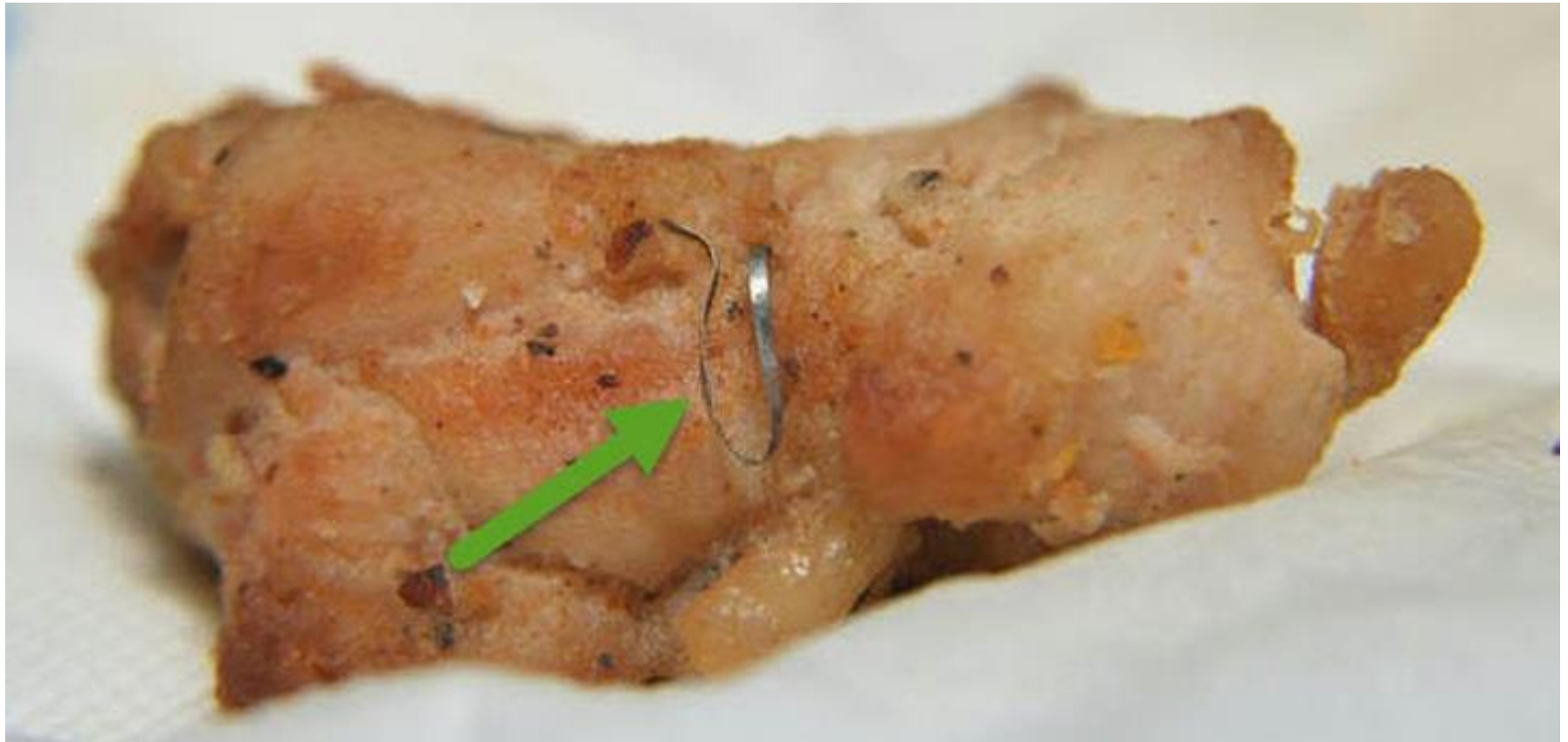
Some physical hazards can injure consumers.



**What is a physical  
hazard?**



**Any foreign object that is found in a food product, which is either naturally occurring or not normally present within that specific food, that can cause injury to consumer.**



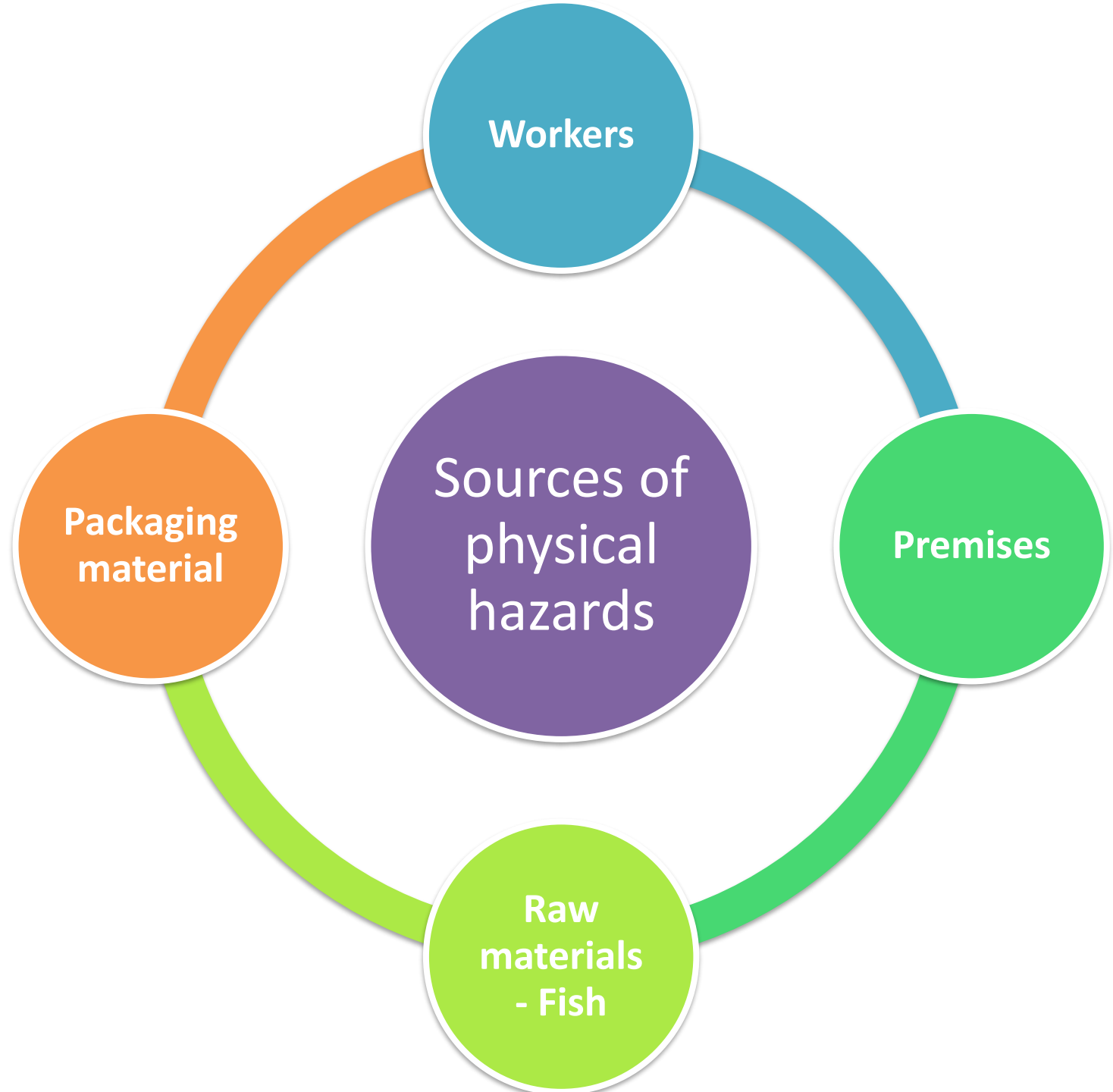
```
graph TD; A[Physical hazards] --> B[Naturally occurring]; A --> C[Unnaturally occurring]
```

Physical  
hazards

Naturally  
occurring

Unnaturally  
occurring









## Control of physical hazards

Physical hazards can be eliminated in food by:

- Workers following the strict food safety guidelines of your organization (e.g. no glass items in the processing area)
- Conducting thorough inspections of the food (e.g. using metal detector for any metal inclusions)



# What is contamination?

*The unintended presence of substances or microorganisms in food that can cause illness or injury.*





**How can fish in  
your factory  
become  
contaminated?**



**Unclean  
equipment,  
utensils or  
surfaces**





**Poor  
standards of  
sanitation  
and waste  
disposal**






**Spread  
from  
pests**







**Spread from workers**  
– clothes, skin, hair,  
sneezing/coughing



**Workers can  
contaminate the  
fish that they are  
handling,  
if not handled  
properly.**

# Food Handlers and Contamination

Workers can contaminate food by:

- Working while sick
- Touching pimples or sores on their face or skin
- Touching something dirty and not washing hands
- Not covering sores or wounds
- Not washing hands (properly) after using toilet



**Not washing your hands after  
the toilet is as good as ...**



# Ways to reduce contamination



# What is cross-contamination?

This happens when harmful bacteria or other microorganisms are unintentionally transferred from one place, object or person to another







# Ways to avoid cross-contamination...





**Proper employee hygiene, clothing and handling practices**



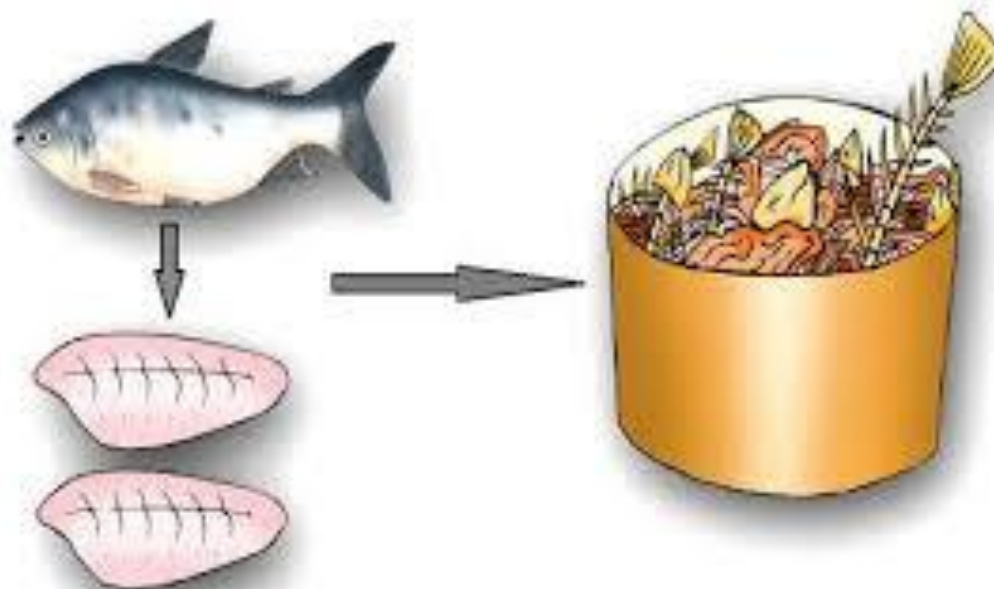
**Restricted and controlled traffic/movement  
about the plant  
(employees, product, equipment).**





**Adequate separation of raw and processed fish.**





**Proper waste disposal.**



**Adequate cleaning and disinfection of utensils, equipment and food handling/processing areas.**



**Use of safe, clean water for making ice and cleaning processing plant.**

# Everyone has a role to play at Ocean Delight!



# Remember these good food handling practices...

- ☐ Avoid excessive handling of the fish
- ☐ Avoid contamination during processing and packaging
- ☐ Report any symptoms of foodborne illness immediately
- ☐ Use good handwashing and personal hygiene techniques
- ☐ Store chemicals away from food processing area
- ☐ Keep food processing area clean and tidy
- ☐ Effectively clean and sanitize equipment and utensils



# QUIZ – true ✓ or false ✗ ?

Food safety means protecting our food from hazards so it is safe to eat.



It is okay to store raw fish with fish that has already been processed.



Always store cleaning chemicals away from processing area.



Bacteria and viruses are chemical hazards.



Workers can contaminate fish with dirty hands.



Fish processing areas should be adequately cleaned and disinfected.



# TRAINING TIPS

## QUIZ – true ✓ or false ✗ ?

- Food safety means protecting our food from hazards so it is safe to eat. ✓
- It is okay to store raw fish with fish that has already been processed. ✗
- Always store cleaning chemicals away from processing area. ✓
- Bacteria and viruses are chemical hazards. ✗
- Workers can contaminate fish with dirty hands. ✓
- Fish processing areas should be adequately cleaned and disinfected. ✓

- Quiz can be used at the end of session to gauge understanding of concepts.
- If persons are finding any of these questions difficult, then it may be necessary to go over the specific areas.

# Any questions?

