

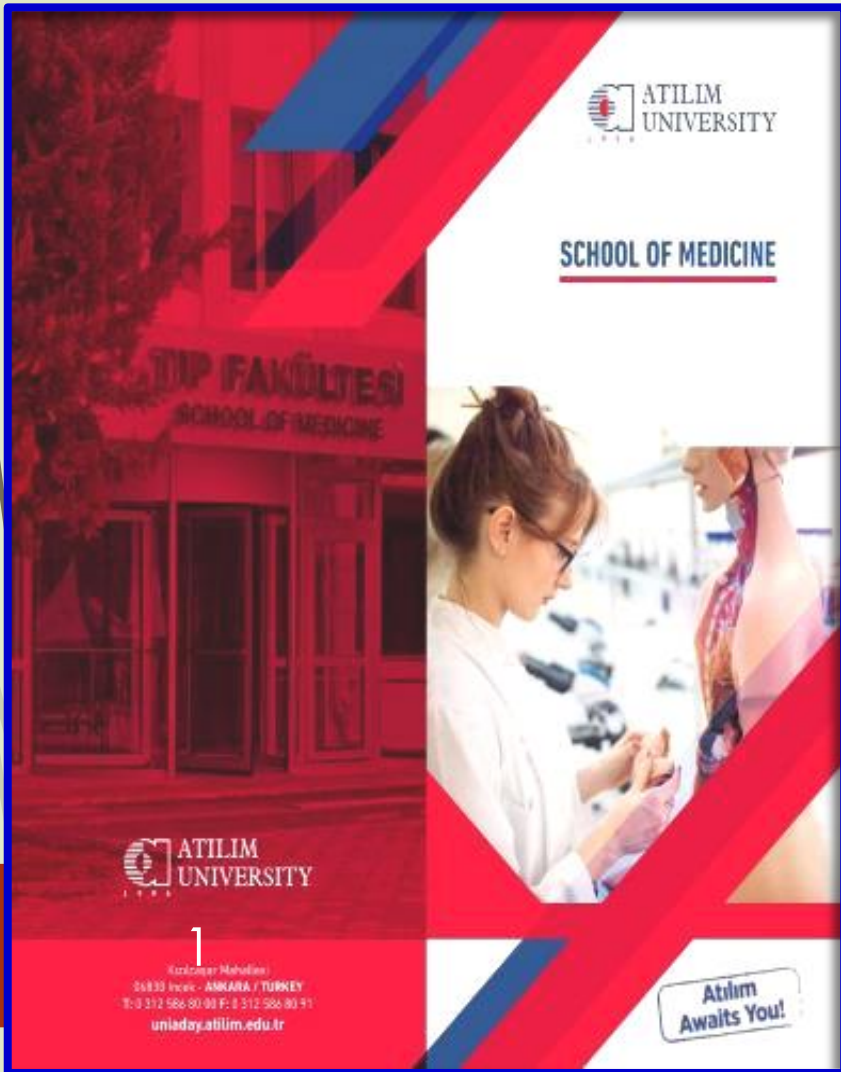
FOOD & WATER SAFETY

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**Phase 1 lecture, 2023 - 2024
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"...public health promotes and protects the health of people and the communities where they live, learn, work, and play."

29/04/2024



WATER SAFETY

Learning Objectives

At the end of this lecture you will be able to :

- Realise the vital role of safe water for Public Health
- Realise the vital role of safe food for Public Health
- Recognize serious stress on water & food sources
- Discuss major methods for personnel water & food safety
- Define unsafe water & food originating health problems and Public Health services
- Understand the importance of disease burden due to unsafe food / water during health services





Ismahane Elouafi
FAO Chief Scientist



Soumya Swaminathan
WHO Chief Scientist

World Food Safety Day

SAFE FOOD NOW FOR A HEALTHY TOMORROW

Monday, 7 June 2021

13:00 - 13:45 CEST

SAVE THE DATE



Food and Agriculture
Organization of the
United Nations



World Health
Organization



SUSTAINABLE
DEVELOPMENT
GOALS

World Food Safety Day

Safer food, better health

7 JUNE 2022
14:00-15:00 CEST



Food and Agriculture
Organization of the
United Nations



World Health
Organization



 Food and Agriculture Organization of the United Nations |
  World Health Organization |
  SUSTAINABLE DEVELOPMENT GOALS

7 June

World Food Safety Day



#WorldFoodSafetyDay | www.fao.org/world-food-safety-day
www.who.int/world-food-safety-day

INDIA TV

WORLD FOOD SAFETY DAY 2023




2023 WORLD FOOD SAFETY DAY

JUNE 07

SAFE FOOD NOW FOR A HEALTHY TOMORROW

Food safety is everyone's business



JUNE 07 World Food Safety Day
 

 Food and Agriculture Organization of the United Nations |
  World Health Organization |
  SUSTAINABLE DEVELOPMENT GOALS

7 June 2023 | World Food Safety Day



Food standards save lives

#WorldFoodSafetyDay | www.fao.org/world-food-safety-day
www.who.int/world-food-safety-day

Overview

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- ❑ Safe and readily available water is important for public health, whether it is used for drinking, domestic use, food production or recreational purposes.
- ❑ Improved ***water supply and sanitation***, and better management of water resources, can boost countries' economic growth and can contribute greatly to ***poverty reduction***.
- ❑ *In 2010, the UN General Assembly explicitly recognized the **human right to water and sanitation**.*
- ❑ Everyone has the right to sufficient, continuous, safe, acceptable, physically accessible and affordable water for personal and domestic use.

Key Facts-1

- ❑ Over 2 billion people live in water-stressed countries, which is expected to be exacerbated in some regions as result of **climate change/ disaster** and population growth.
- ❑ *Globally, at least 2 billion people use a drinking water source **contaminated with faeces**. Microbial contamination of drinking-water as a result of contamination with faeces poses the greatest risk to drinking-water safety.*
- ❑ While the most important chemical risks in drinking water arise from **arsenic, fluoride or nitrate**, emerging contaminants such as pharmaceuticals, pesticides, per- and polyfluoroalkyl substances (PFASs) and **microplastics** generate public concern.

Key Facts-2

- ❑ Safe and sufficient water facilitates the practice of hygiene, which is a key measure to prevent not only **diarrhoeal diseases**, but acute respiratory infections and numerous neglected tropical diseases.
- ❑ Microbiologically **contaminated drinking water can transmit diseases** such as **diarrhoea, cholera, dysentery, typhoid and polio** and is estimated to cause **485 000 diarrhoeal deaths each year**.
- ❑ In 2020, 74% of the global population (5.8 billion people) used a safely managed drinking-water service – that is, one located on premises, available when needed, and free from contamination.

Drinking-water services-1

11 **Sustainable Development Goal** target 6.1 calls for universal and equitable access to safe and affordable drinking water. The target is tracked with the indicator of “safely managed drinking water services” – drinking water from an improved water source that is located on premises, available when needed, and **free from faecal** and priority chemical contamination.

In 2020, 5.8 billion people used safely managed drinking-water services – that is, they used improved water sources located on premises, available when needed, and free from contamination. The remaining 2 billion people without safely managed services in 2020 included:



TRANSFORMING OUR
WORLD:
THE 2030 AGENDA FOR
SUSTAINABLE
DEVELOPMENT

1 NO
POVERTY

2 ZERO
HUNGER

3 GOOD HEALTH
AND WELL-BEING

4 QUALITY
EDUCATION

5 GENDER
EQUALITY

6 CLEAN WATER
AND SANITATION

7 AFFORDABLE AND
CLEAN ENERGY

8 DECENT WORK AND
ECONOMIC GROWTH

9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE

10 REDUCED
INEQUALITIES

11 SUSTAINABLE CITIES
AND COMMUNITIES

12 RESPONSIBLE
CONSUMPTION
AND PRODUCTION

13 CLIMATE
ACTION

14 LIFE
BELOW WATER

15 LIFE
ON LAND

16 PEACE, JUSTICE
AND STRONG
INSTITUTIONS

17 PARTNERSHIPS
FOR THE GOALS

Drinking-water services-2

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- ❑ 1.2 billion people with basic services, meaning an improved water source located within a round trip of 30 minutes;
- ❑ *282 million people with limited services, or an improved water source requiring more than 30 minutes to collect water;*
- ❑ 368 million people taking water from unprotected wells and springs; and 122 million people collecting untreated surface water from lakes, ponds, rivers and streams.
- ❑ *Sharp geographic, sociocultural and economic **inequalities** persist, not only between rural and urban areas but also in towns and cities where people living in low-income, informal or illegal settlements usually have less access to improved sources of drinking-water than other residents.*

Water and Health-1

- 14
- ❑ Contaminated water and poor sanitation are linked to transmission of diseases such as **cholera, diarrhoea, dysentery, hepatitis A, typhoid and polio**.
 - ❑ *Absent, inadequate, or inappropriately managed water and sanitation services expose individuals to preventable **health risks**.*
 - ❑ This is particularly the case in health care facilities where both patients and staff are placed at additional risk of infection and disease when **water, sanitation and hygiene** services are lacking.
 - ❑ *Globally, 15% of patients develop an infection during a hospital stay, with the proportion much greater in low-income countries.*

Water and Health-2

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- ❑ Inadequate management of urban, industrial and agricultural **wastewater** means the drinking-water of hundreds of millions of people is dangerously contaminated or chemically polluted.
- ❑ Natural presence of chemicals, particularly in groundwater, can also be of health significance, including **arsenic and fluoride**, while other chemicals, such as **lead**, may be elevated in drinking-water as a result of leaching from water supply components in contact with drinking-water.



Water and Health-3

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- ❑ Some 829 000 people are estimated to die each year from **diarrhoea** as a result of **unsafe drinking-water**, sanitation and hand hygiene.
- ❑ *Yet **diarrhoea** is largely preventable, and the deaths of 297 000 children aged under 5 years could be avoided each year if these risk factors were addressed.*
- ❑ Where water is not readily available, people may decide **handwashing** is not a priority, thereby adding to the likelihood of diarrhoea and other diseases.



Water and Health-4

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- ❑ **Diarrhoea** is the most widely known disease linked to contaminated food and water but there are other hazards. In 2017, over 220 million people required preventative treatment for **schistosomiasis** – an acute and chronic disease caused by parasitic worms contracted through exposure to infested water.
 - ❑ *In many parts of the world, insects that live or breed in water carry and transmit diseases such as **dengue fever**. Some of these insects, known as **vectors**, breed in clean, rather than **dirty water**, and household drinking water containers can serve as breeding grounds.*
 - ❑ The simple intervention of covering water storage containers can reduce vector breeding and may also reduce **faecal contamination** of water at the household level.

Economic and social effects

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- When water comes from improved and more accessible sources, people spend less time and effort physically collecting it, meaning they can be productive in other ways. This can also result in greater personal safety and reducing musculoskeletal disorders by reducing the need to make long or *risky journeys* to collect and carry water.
- *Better water sources also mean less expenditure on health, as people are less likely to fall ill and incur medical costs and are better able to remain economically productive.*
- With children particularly at risk from water-related diseases, access to improved sources of water can result in better health, and therefore better school attendance, with positive longer-term consequences for their lives.

<https://www.who.int/news-room/fact-sheets/detail/drinking-water#:~:text=In%202010%2C%20the%20UN%20General,for%20personal%20and%20domestic%20use> 13.5.23

Challenges-1

- Historical rates of progress would need to double for the world to achieve universal coverage with basic **drinking water** services by 2030.
- To achieve universal safely managed services, rates would need to quadruple.
- ***Climate change***, increasing water scarcity, population growth, demographic changes and urbanization already pose challenges for water supply systems.
- *Over 2 billion people live in water-stressed countries, which is expected to be exacerbated in some regions as result of climate change and population growth.*
- **Re-use of wastewater** to recover water, nutrients or energy is becoming an important strategy.
- *Increasingly countries are using wastewater for irrigation; in developing countries this represents 7% of irrigated land.*

<https://www.who.int/news-room/fact-sheets/detail/drinking-water#:~:text=In%202010%2C%20the%20UN%20General,for%20personal%20and%20domestic%20use> 13.5.23

Challenges-2

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- While this practice if done *inappropriately* poses health risks, safe management of **wastewater** can yield multiple benefits, including increased **food production**.
- *Options for water sources used for drinking-water and irrigation will continue to evolve, with an increasing reliance on groundwater and alternative sources, including wastewater.*
- **Climate disaster** will lead to greater fluctuations in harvested rainwater. Management of all water resources will need to be improved to ensure provision and quality.



Challenges-3

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- As the international authority on public health and water quality, **WHO leads global efforts** to prevent water-related disease, advising governments on the development of health-based targets and regulations.
- *WHO produces a series of water quality guidelines, including on **drinking-water**, **safe use of wastewater**, and **recreational water quality**.*
- The water quality guidelines are based on managing risks, and since 2004 the Guidelines for drinking-water quality promote the Framework for safe drinking-water.
- *The Framework recommends establishment of **health-based targets**, the development and implementation of **water safety plans** by water suppliers to most effectively identify and manage risks from catchment to consumer, and independent surveillance to ensure that water safety plans are effective and **health-based targets** are being met.*

Challenges-4

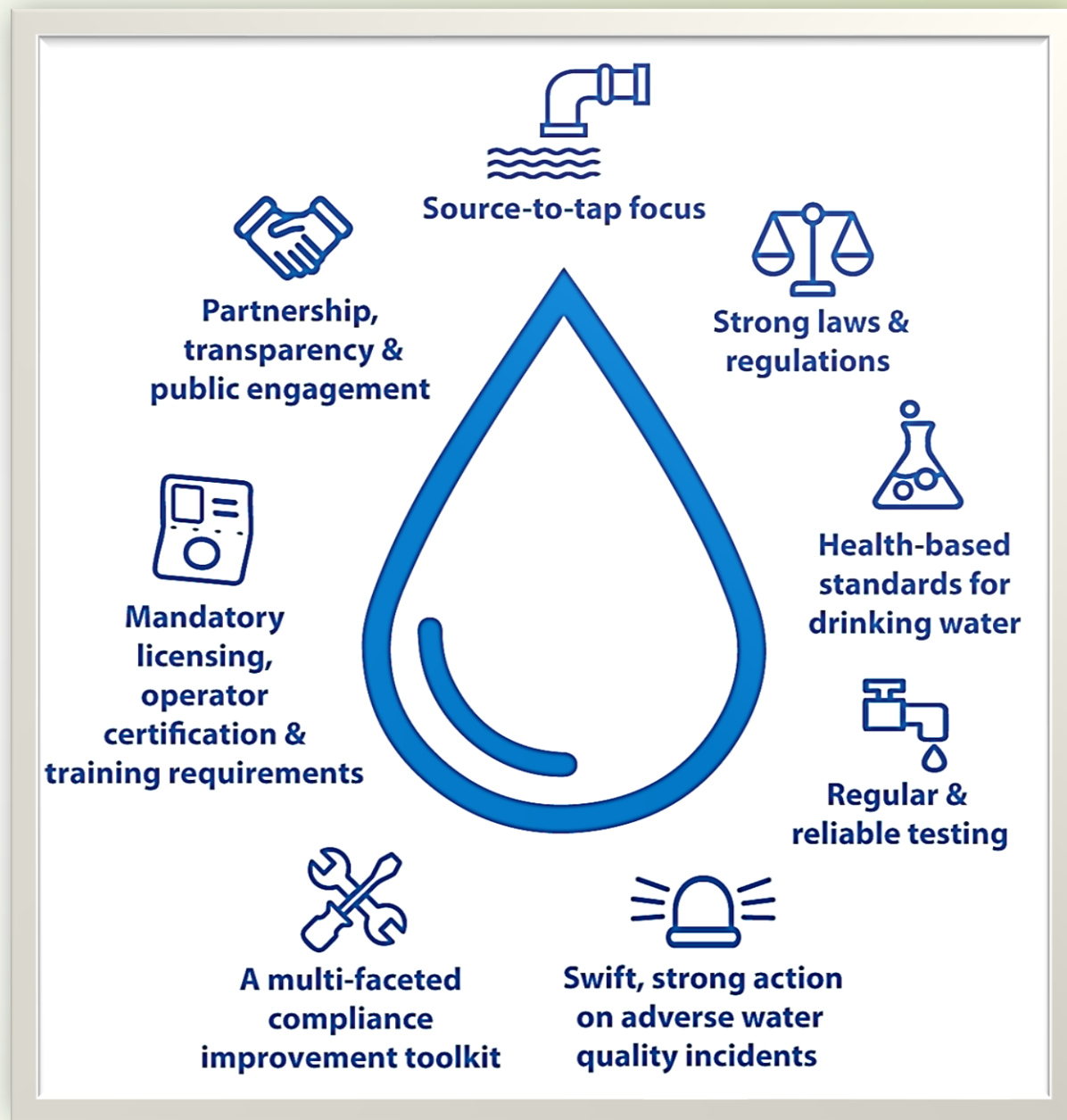
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- The drinking-water guidelines are supported by background publications that provide the technical basis for the Guidelines recommendations.
- *WHO also supports countries to implement the **drinking-water quality guidelines** through the development of practical guidance materials and provision of direct country support.*
- This includes the development of locally relevant drinking-water quality regulations aligned to the principles in the Guidelines, the development, implementation and auditing of **water safety plans** and strengthening of surveillance practices.

Challenges-5

- **Guidelines for drinking-water quality**
- **Water Safety Plan resources**
- **Developing drinking-water quality regulations and standards**
- **Supporting publications to the Guidelines for drinking-water quality**

<https://www.who.int/news-room/fact-sheets/detail/drinking-water#:~:text=In%202010%2C%20the%20UN%20General,for%20personal%20and%20domestic%20use> 13.5.23



Challenges - 6

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- Since 2014, WHO has been testing household water treatment products against WHO health-based performance criteria through the **WHO International Scheme to Evaluate Household Water Treatment Technologies**.
- *The aim of the scheme is to ensure that products protect users from the pathogens that cause **diarrhoeal disease** and to strengthen policy, regulatory and monitoring mechanisms at the national level to support appropriate targeting and consistent and **correct use** of such products.*

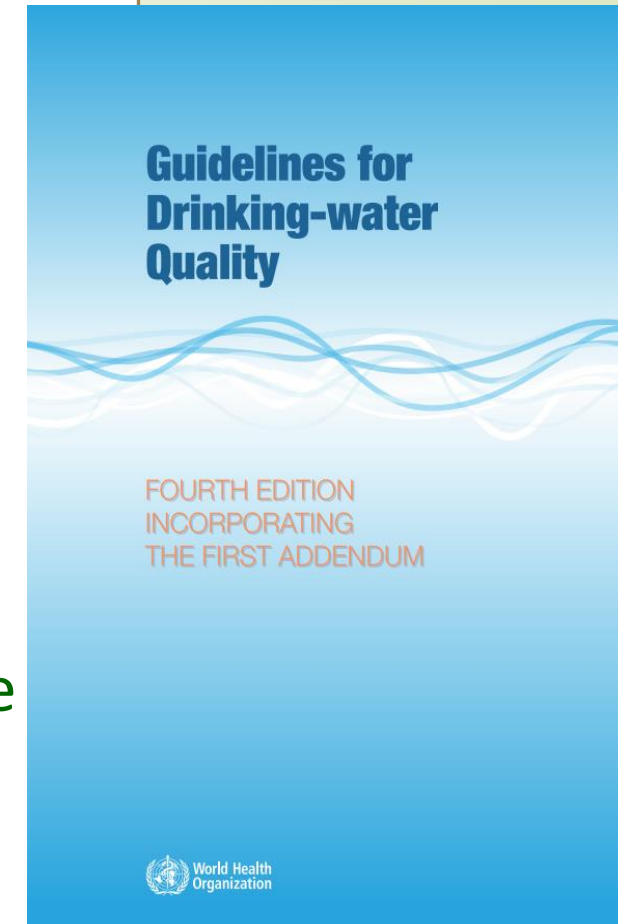


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Challenges-7

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- WHO works closely with **UNICEF** in a number of areas concerning water and health, including on water, sanitation, and hygiene in health care facilities.
- In 2015 the two agencies jointly developed **WASH FIT** (*Water & Sanitation for Health Facility Improvement Tool*), an adaptation of the water safety plan approach.
- **WASH FIT** aims to guide small, primary health care facilities in low and middle-income settings through a continuous cycle of improvement through assessments, prioritization of risk, and definition of specific, targeted actions.
- A 2019 report describes practical steps that countries can take to improve water, sanitation and hygiene in health care facilities.



FOOD SAFETY..

4 STEPS TO FOOD SAFETY




CLEAN




SEPARATE




COOK




CHILL



Main types of food safety testing

1. Microbiological testing
2. Chemical testing
3. Physical testing

***10
minutes***



Food Safety-1

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- ❖ Access to sufficient amounts of safe and nutritious food is key to sustaining life and promoting good health.
- ❖ **Unsafe food** containing harmful bacteria, viruses, parasites or chemical substances can cause more than 200 different diseases – ranging from **diarrhoea** to **cancers**.
- ❖ Around the world, an estimated 600 million – almost 1 in 10 people – fall ill after eating contaminated food each year, resulting in 420 000 deaths and the loss of 33 million healthy life years (**DALYs**). <https://www.who.int/health-topics/food-safety>, 13.5.22

Food Safety-2

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- ❖ **Food safety**, nutrition and **food security** are closely linked.
- ❖ Unsafe food creates a **vicious cycle** of disease and malnutrition, particularly affecting infants, young children, elderly and the sick.
- ❖ *In addition to contributing to food and nutrition security, a safe food supply also supports national economies, trade and tourism, stimulating sustainable development.*
- ❖ The **globalization** of food trade, a growing world population, **climate change** and rapidly changing food systems have an impact on the safety of food.
- ❖ **WHO** aims to enhance at a global and country-level the capacity to prevent, detect and respond to public health threats associated with unsafe food.

<https://www.who.int/health-topics/food-safety>, 13.5.22

EFSA–European Food Safety Agency

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- **The European Food Safety Authority (EFSA)** plays a crucial role in ensuring **food security** within the European Union. Its contributions include:
 - ❑ **Providing Scientific Advice:** *EFSA offers independent scientific advice on food-related risks. This encompasses both existing and emerging risks within the food chain.*
 - ❑ **Informing Policymaking:** The advice given by EFSA informs European laws, rules, and policymaking, which in turn helps protect consumers from potential risks associated with the food chain.
 - ❑ **Data Gathering and Expertise:** *EFSA is involved in collecting scientific data and expertise, which is essential for understanding and managing food safety issues.*

EFSA–European Food Safety Agency

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- **The European Food Safety Authority (EFSA)** plays a crucial role in ensuring **food security** within the European Union. Its contributions include:
 - ❖ **Communication**: *It communicates its scientific findings to the public, ensuring transparency and helping to build trust in the **EU's food safety system**.*
 - ❖ **Cooperation**: EFSA cooperates with EU countries, international bodies, and other stakeholders to maintain a coherent and trusted **food safety system** across the EU.
 - ❖ **Overall**, EFSA's work is pivotal in ensuring that European consumers are among the best protected in the world regarding **food chain risks**, contributing significantly to the sustainability of **safe food systems**.

Key facts-1

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- ❖ Access to sufficient amounts of safe and nutritious food is key to sustaining life and promoting good health.
- ❖ **Unsafe food** containing harmful bacteria, viruses, parasites or chemical substances, causes more than 200 diseases – ranging from **diarrhoea** to **cancers**.
- ❖ An estimated 600 m almost 1 in 10 people in the world – fall ill after eating **contaminated food** and 420 000 **die** every year, resulting in the loss of 33 million healthy life years **DALYs**).

<https://www.who.int/health-topics/food-safety>, 13.5.22



Key facts-2

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- ❖ US\$110 billion is lost each year in productivity and medical expenses resulting from **unsafe food** in low- and middle-income countries.
- ❖ Children under 5 years of age carry 40% of the **foodborne disease burden**, with 125 000 deaths every year.
- ❖ **Diarrhoeal diseases** are the most common illnesses resulting from the consumption of contaminated food, causing 550 million people to fall ill and 230 000 **deaths** every year. <https://www.who.int/health-topics/food-safety>, 13.5.22

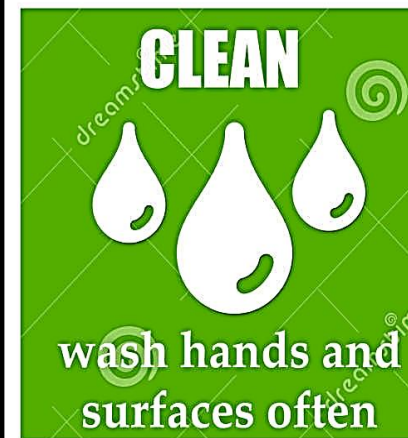
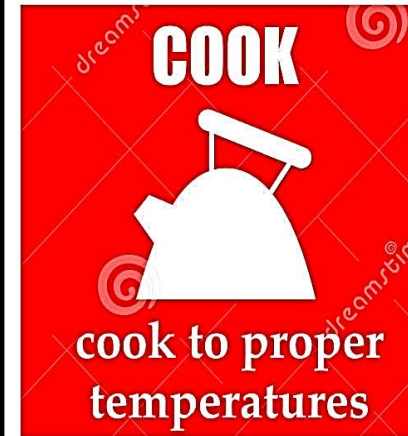


Key facts-3

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- ❖ **Food safety**, nutrition and food security are inextricably linked.
- ❖ **Unsafe food creates a vicious cycle of disease and malnutrition, particularly affecting infants, young children, elderly and the sick.**
- ❖ Foodborne diseases impede socioeconomic development by straining health care systems, and harming national economies, tourism and trade.
- ❖ **Food supply chains now cross multiple national borders.**
- ❖ Good collaboration between governments, producers and consumers helps ensure food safety. <https://www.who.int/health-topics/food-safety>, 13.5.22

FOOD SAFETY



give bacteria no chance

Major foodborne illnesses and causes

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- ❖ Foodborne illnesses are usually infectious or toxic in nature and caused by ***bacteria, viruses, parasites or chemical substances*** entering the body through contaminated food or water.
- ❖ *Foodborne pathogens can cause **severe diarrhoea** or debilitating infections including **meningitis**.*
- ❖ Chemical contamination can lead to acute poisoning or long-term diseases, such as **cancer**. Foodborne diseases may lead to long-lasting **disability** and **death**. Examples of unsafe food include uncooked foods of animal origin, fruits and vegetables contaminated with faeces, and raw shellfish containing **marine biotoxins**. <https://www.who.int/health-topics/food-safety>, 13.5.22

Bacteria

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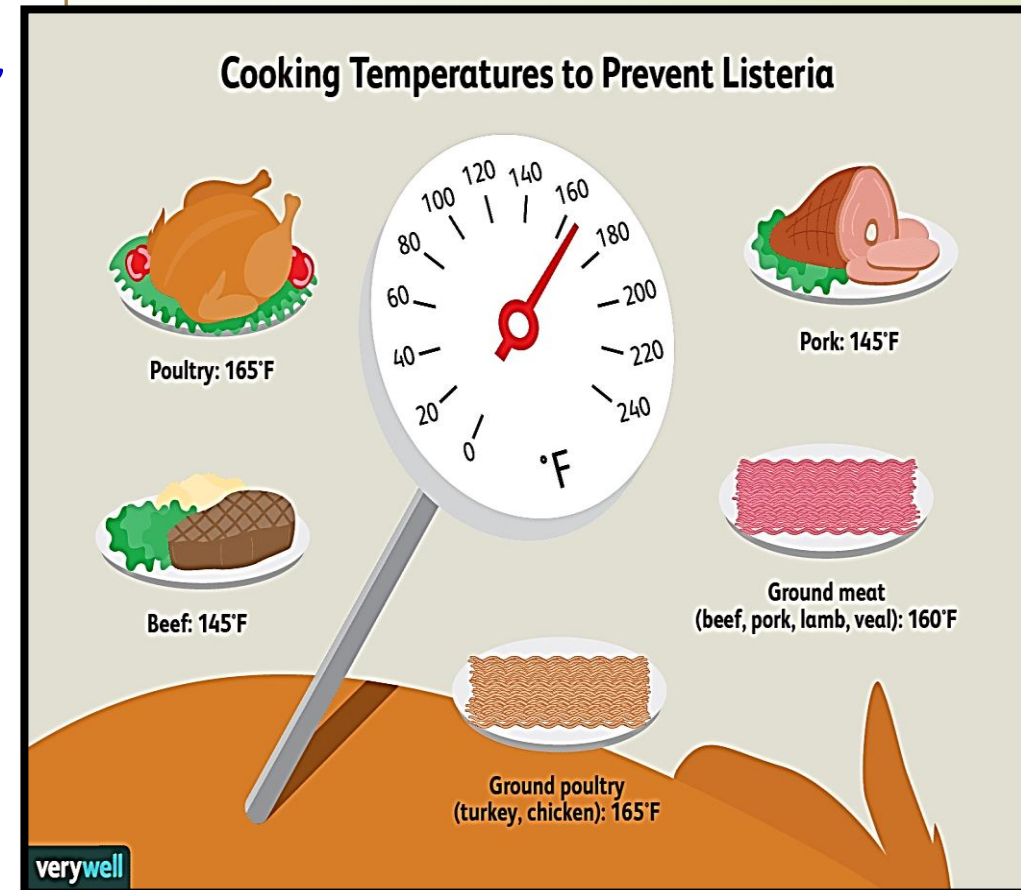
- ❖ *Salmonella, Campylobacter, and Enterohaemorrhagic Escherichia coli* are among the most common foodborne pathogens that affect millions of people annually – sometimes with severe and fatal outcomes.
- ❖ Symptoms are *fever, headache, nausea, vomiting, abdominal pain and diarrhoea*. Examples of foods involved in outbreaks of *salmonellosis* are eggs, poultry and other products of animal origin.
- ❖ Foodborne cases with Campylobacter are mainly caused by **raw milk**, raw or undercooked poultry and drinking water. Enterohaemorrhagic Escherichia coli (**EHEC**) is associated with unpasteurized milk, undercooked meat and fresh fruits and vegetables. <https://www.who.int/health-topics/food-safety>, 13.5.22

Listeria

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- ❖ Listeria infection leads to miscarriage in pregnant women or death of newborn babies.
- ❖ *Although disease occurrence is relatively low, listeria's severe and sometimes **fatal** health consequences, particularly among infants, children and the elderly, count them among the most serious foodborne infections.*
- ❖ Listeria is found in **unpasteurised dairy** products and various ready-to-eat foods and can grow at refrigeration temperatures.

<https://www.who.int/health-topics/food-safety>, 13.5.22

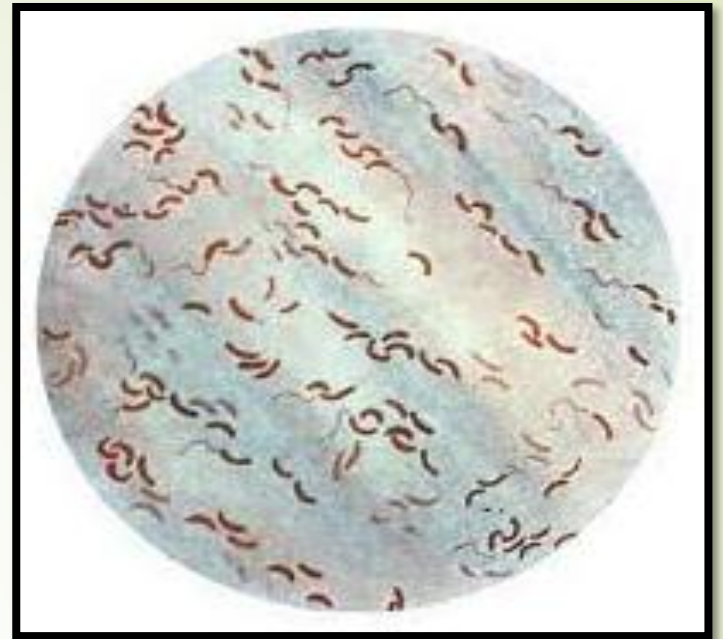


Vibrio cholerae

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- ❖ Vibrio cholerae infects people through ***contaminated water or food.***
- ❖ Symptoms include abdominal pain, vomiting and ***profuse watery diarrhoea,*** which may lead to ***severe dehydration*** ***and possibly death.***
- ❖ Rice, vegetables, millet gruel and various types of seafood have been implicated in **cholera** outbreaks.

<https://www.who.int/health-topics/food-safety>, 13.5.22



Anti-microbials

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- ❖ Antimicrobials, such as antibiotics, are essential to treat **infections** caused by bacteria.
- ❖ *However, their overuse and misuse in veterinary and human medicine has been linked to the emergence and spread of **resistant** bacteria, rendering the treatment of infectious diseases ineffective in animals and humans.*
- ❖ Resistant bacteria enter the food chain through the animals (e.g. Salmonella through chickens).
- ❖ *Antimicrobial resistance* *is one of the main threats to modern medicine.*

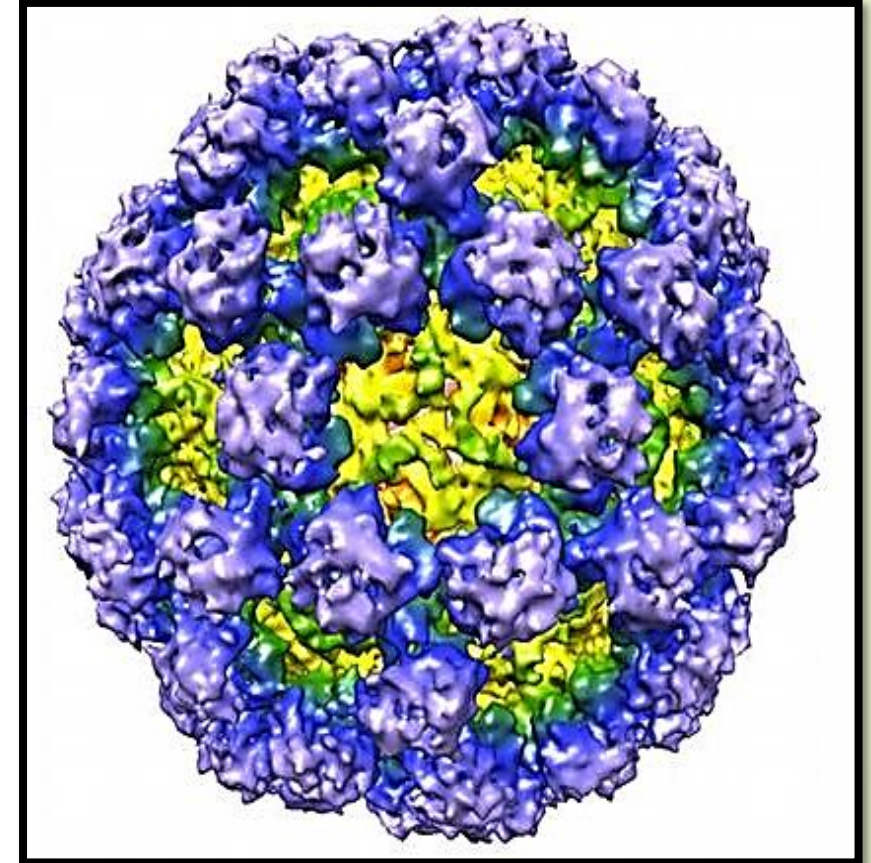
<https://www.who.int/health-topics/food-safety>, 13.5.22

Viruses

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- ❖ **Norovirus** infections are characterized by nausea, explosive vomiting, watery diarrhoea and abdominal pain.
- ❖ *Hepatitis A virus can cause long-lasting liver disease and spreads typically through raw or undercooked seafood or contaminated raw produce.*
- ❖ Infected food handlers are often the source of **food contamination**.

<https://www.who.int/health-topics/food-safety>, 13.5.22

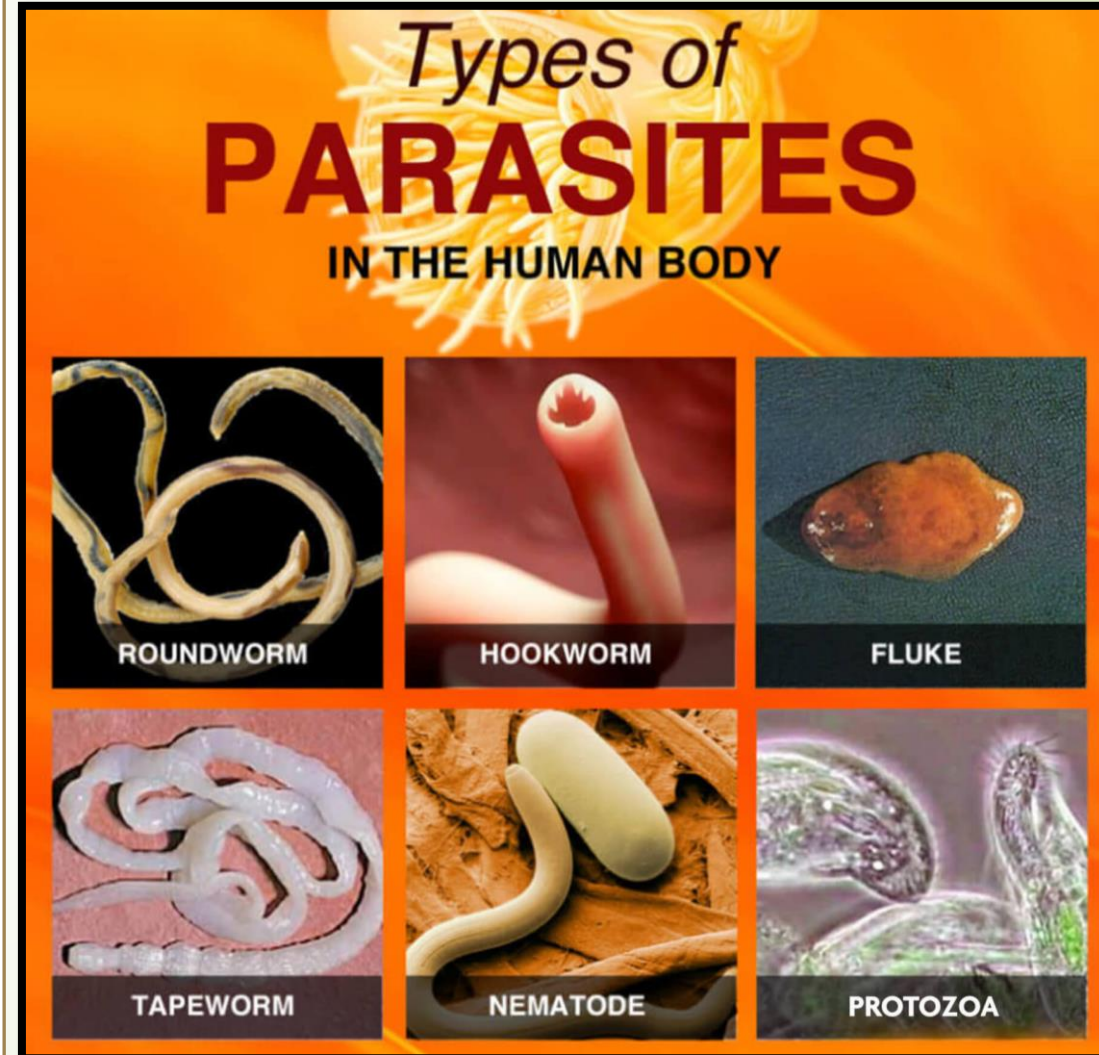


Parasites

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- ❖ Some parasites, such as fish-borne trematodes, are only transmitted through food.
- ❖ *Others, for example tapeworms like Echinococcus spp, or Taenia solium, may infect people through food or direct contact with animals.*
- ❖ Other parasites, such as Ascaris, Cryptosporidium, Entamoeba histolytica or Giardia, enter the **food chain** via water or soil and can contaminate fresh produce.

<https://www.who.int/health-topics/food-safety>, 13.5.22

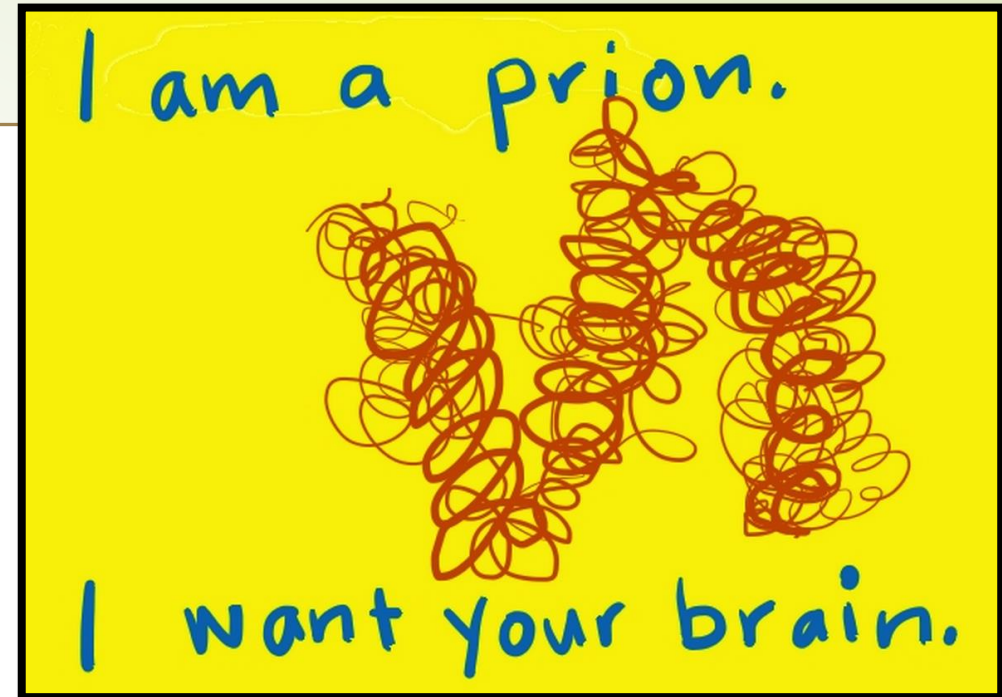


Prions

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- ❖ Prions, infectious agents composed of protein, are unique in that they are associated with specific forms of neurodegenerative disease.
- ❖ *Bovine spongiform encephalopathy (BSE, or "mad cow disease") is a prion disease in cattle, associated with the variant Creutzfeldt-Jakob Disease (vCJD) in humans.*
- ❖ Consuming bovine products containing specified risk material, e.g. brain tissue, is the most likely route of transmission of the **prion** agent to humans.

<https://www.who.int/health-topics/food-safety>, 13.5.22



Chemicals

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- ❖ Of most concern for health are naturally occurring toxins and environmental pollutants.
- ❖ *Naturally occurring toxins include mycotoxins, marine biotoxins, cyanogenic glycosides and toxins occurring in poisonous mushrooms. **Staple foods** like corn or cereals can contain high levels of mycotoxins, such as aflatoxin and ochratoxin, produced by mould on grain. A long-term exposure can affect the immune system and normal development, or cause **cancer**.*

<https://www.who.int/health-topics/food-safety>, 13.5.22

Persistent organic pollutants (POPs)

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- ❖ Persistent organic pollutants (POPs) are compounds that accumulate in the environment and human body.
- ❖ *Known examples are **dioxins** and polychlorinated biphenyls (PCBs), which are unwanted by-products of industrial processes and waste incineration.*
- ❖ They are found worldwide in the environment and accumulate in animal **food chains**.
- ❖ ***Dioxins** are highly toxic and can cause reproductive and developmental problems, damage the immune system, interfere with hormones and cause **cancer**.*
- ❖ Heavy metals such as **lead**, **cadmium** and **mercury** cause neurological and **kidney damage**.
- ❖ Contamination by **heavy metal** in food occurs mainly through **pollution of air, water and soil**. <https://www.who.int/health-topics/food-safety>, 13.5.22

Food safety: A public health priority

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- ❖ Unsafe food poses global health threats, endangering everyone.
- ❖ Infants, young children, pregnant women, the elderly and those with an underlying illness are particularly **vulnerable**.
- ❖ *Every year 220 million children contract **diarrhoeal diseases** and 96 000 die.*
- ❖ **Unsafe food** creates a vicious cycle of diarrhoea and **malnutrition**, threatening the nutritional status of the most vulnerable.

<https://www.who.int/health-topics/food-safety>, 13.5.22

Food safety: A public health priority

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- ❖ *The International Conference on Food Safety held in Addis Ababa in February 2019, and the International Forum on Food Safety & Trade held in Geneva in 2019, reiterated the importance of **food safety** in achieving the **Sustainable Development Goals (SDGs)**.*
- ❖ Governments should make food safety a **public health priority**, as they play a pivotal role in developing policies and regulatory frameworks, and establishing and implementing effective **food safety systems**. <https://www.who.int/health-topics/food-safety>, 13.5.22

Food safety: A public health priority

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- ❖ Food can become contaminated at any point of production and distribution, and the primary responsibility lies with food producers.
- ❖ *Yet a large proportion of **foodborne disease** incidents are caused by foods improperly prepared or mishandled at home, in food service establishments or at markets.*
- ❖ Not all food handlers and consumers understand the roles they must play, such as adopting **basic hygienic practices** when buying, selling and preparing food to protect their health and that of the wider community.

<https://www.who.int/health-topics/food-safety>, 13.5.22

❖ Food safety: *WHO response*

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- ❖ **WHO** aims to facilitate **global prevention**, detection and response to **public health threats** associated with **unsafe food**. WHO works to ensure consumer trust in their authorities, and confidence in the safe food supply.

<https://www.who.int/news-room/fact-sheets/detail/food-safety#cms>

- ❖ *To do this, WHO helps Member States build capacity to prevent, detect and manage **foodborne risks** by:*

- ❖ providing independent scientific assessments on microbiological and chemical hazards that form the basis for *international food standards*, guidelines and recommendations, known as the **Codex Alimentarius**, to ensure food is safe wherever it originates.

<https://www.who.int/health-topics/food-safety>, 13.5.22

❖ Food safety: *WHO* response

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- ❖ **WHO** works closely with **FAO**, the **World Organization for Animal Health (OIE)** and other international organizations to ensure **food safety** along the entire **food chain** from production to consumption. <https://www.who.int/health-topics/food-safety> 13.5.22

The infographic features a header with logos for the Food and Agriculture Organization of the United Nations (FAO), the World Health Organization (WHO), and the Sustainable Development Goals. Below the header, a dark teal banner contains the text 'Unsafe food affects us all, particularly vulnerable populations'. The main content area is light teal and contains two columns of information. The left column includes an illustration of a magnifying glass over a red pepper with a small yellow and red icon of a person falling, and text stating that 600 million people fall ill and 420,000 die annually from contaminated food. The right column includes an illustration of a child with a thermometer in their mouth and text stating that 40% of the foodborne disease burden is on children under 5 years of age.

Food and Agriculture Organization of the United Nations


World Health Organization

SUSTAINABLE DEVELOPMENT GOALS

Unsafe food affects us all, particularly vulnerable populations



Did you know an estimated **600 million** people around the world – almost **1 in 10** – fall ill after eating contaminated food and **420 000** die every year?



40% of the foodborne disease burden is on children under **5 years** of age

WHO global response to salt reduction strategies



Dr Godfrey C Xuereb
Team Leader
Population-based Prevention Team
SPP Unit
Prevention of Noncommunicable Diseases Department

FDA's Foodborne Outbreak Response Improvement Plan

New Era of Smarter Food Safety

Date: April 13, 2022

Time: - 2:00 - 3:00 p.m. ET



The Economist

Inside the Putin show
What next for SoftBank?
Graphene and decarbonisation
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MAY 21ST-27TH 2022

The coming food catastrophe



May 21st, 2022



While increasing crop prices put millions at risk, **droughts** and rising fertilizer prices have begun to threaten grain supplies in the coming period.

“This is not cyclical. This is a seismic crisis. This is a once-in-a-generation event that could dramatically affect the geopolitical era!”

(CEO for Gro Intelligence, Sara Menker, UNSC speech, 19.05.2022, Bloomberg HT)

ABSTRACT-1

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- ❑ Food is vulnerable to contamination by chemicals, **heavy metals**, bacteria, parasites, and fungi, posing threats to human and animal health.
- ❑ *Analytical methods encompassing microbiological, chemical, physical, immunological, and sensory analyses control this contamination.*
- ❑ Before analysis, **representative sampling is crucial** to assess the overall safety of food batches.
- ❑ *Timely sampling is essential to minimize the interval between collection and analysis.*

<https://www.sciencedirect.com/science/article/abs/pii/S174801322300364X>, 29.4.24

ABSTRACT-2

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- ❑ **Microneedles**, micron-sized needles integrated into patches, offer a distinct advantage over conventional methods.
- ❑ *They enable non-destructive and minimally invasive **sampling** with precision and expedited **field sampling**, allowing for the rapid collection of multiple samples.*
- ❑ This capability enhances the efficiency of analyzing numerous food contaminants quickly.
- ❑ *Microneedle-assisted tools for detecting chemical and biological contaminants in food, significantly improving the speed and efficiency of current analytical methods.*

<https://www.sciencedirect.com/science/article/abs/pii/S174801322300364X>, 29.4.24

CONCLUSION-1

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1.Importance of Hygiene: Emphasize the critical role of personal and environmental hygiene in preventing foodborne and waterborne diseases.

2.Pathogen Awareness: *Understand the common pathogens responsible for food and water contamination and the conditions that promote their growth.*

3.Safe Food Handling: Teach proper food handling and storage techniques to prevent contamination and spoilage.

CONCLUSION-2

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4. Cooking and Heating: Highlight the importance of cooking food to appropriate temperatures to kill harmful organisms.

5. *Water Quality Monitoring:* *Stress the need for regular monitoring and treatment of water sources to ensure safety for consumption and use in food preparation.*

6. Risk Communication: Develop skills in communicating risks and safety practices to the public effectively.

7. *Regulatory Standards:* *Familiarize with international and national food safety standards and regulations.*

CONCLUSION-3

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8. Emergency Response: Be prepared to respond to food and water safety emergencies, including outbreaks of foodborne illnesses.

9. Nutrition and Safety: *Understand the interplay between nutrition and food safety, and how unsafe food can lead to nutritional deficiencies.*

10. Continuous Education: Advocate for continuous education on the latest research and developments in food and water safety.

*These items are listed to provide a comprehensive overview of the critical aspects of **food and water safety**, which are essential for medical students to understand and apply in your future careers.*



Thank You

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