

Introduction to Public Health

Module # 16

Food safety and security

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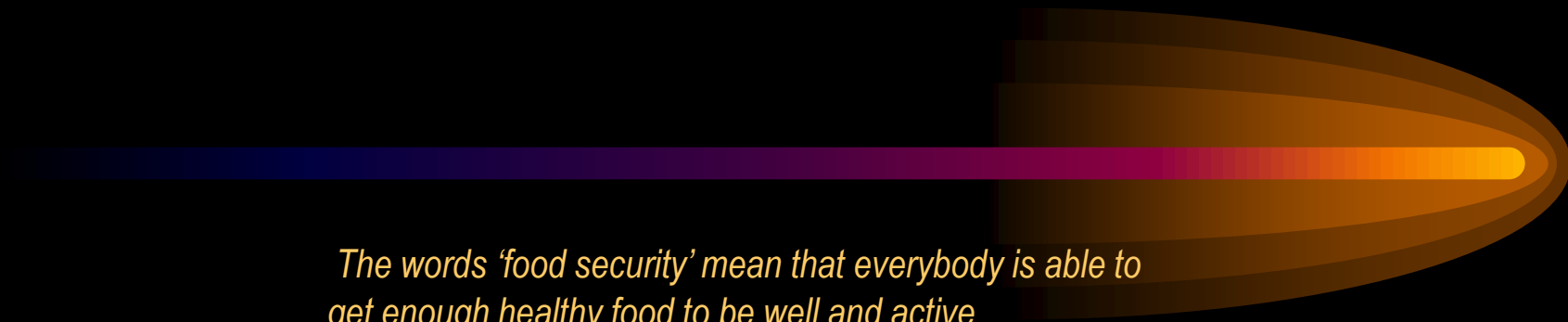
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OBJECTIVES OF THE LECTURE

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

- *Conceptualize Food Safety and Food Security*
 - *Food adulteration and food contamination*
 - *Health impacts of food adulteration*
 - *How foods are adulterated and contaminated*
- *Identify the levels of prevention of food adulteration and food contamination.*

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- ❖ “Food security exists when all people,
at all
 - ❖ times, have physical and economic
access to
 - ❖ sufficient, safe and nutritious food to
meet their
 - ❖ dietary needs and food preferences for
an active
 - ❖ and healthy life”
 - ❖ World Food Summit – 1996



The words 'food security' mean that everybody is able to get enough healthy food to be well and active. For everybody to get enough healthy food, we need a food system that works well.

FOOD SYSTEM

Five parts of the food system:

Production


Distribution

Access

Consumption

Disposal (as waste).

When all the parts of the food system are working well together, we have food security.

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- (a) availability of food means food production within the country, food imports and the previous years stock stored in government granaries.*
 - (b) accessibility means food is within reach of every person.*
 - (c) affordability implies that an individual has enough money to buy sufficient, safe and nutritious food to meet one's dietary needs.*

For the poor sections of the society



Earthquake



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Flood, tsunami



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A food system that is working well does a few very important things:


It protects the land, water, and air so we can keep producing food.

*2. It supports people and businesses to make enough money
to keep working in the food system.*

It makes sure that everyone is able to get enough healthy food.



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- Food safety
 - Handling, preparation, and storage of food
 - To prevent food borne diseases
 - Food contamination
 - Even when hands look clean, they still carry bacteria
 - Meat and poultry drippings carry bacteria
 - Uncovered coughs and sneezes spread bacteria
 - Mishandling of food during preparation, cooking, and storage

Food Contamination

- Food contamination refers to the presence in food of harmful chemicals and microorganisms which can cause consumer illness.
- Food contamination can occur in many different ways.
- Four main causes of food contamination are:
 1. Not washing hands
 2. Cross-contamination
 3. Improper storage and cooking temperatures
 4. Contamination by animal waste.

Food Contamination

- Contaminants include:
- Agrochemicals : insecticides, herbicides, rodenticides, etc
- Environmental contaminants:
- Air: radionuclides ($^{137}\text{Caesium}$, $^{90}\text{Strontium}$), polycyclic aromatic hydrocarbons (PAH)
- Water: arsenic, mercury
- Soil: cadmium, nitrates, perchlorates, Polychlorinated biphenyls (PCB)
- Packaging materials:
- Processing/cooking equipment: copper,
- Naturally occurring toxins,
- Pesticides and carcinogens: formaldehyde
- Hair in food,
- Processing contaminants: polycyclic aromatic hydrocarbon etc.


Food contamination and diseases



- Many foodborne **microbes** are present in healthy animals (usually in their **intestines**)
- Fresh fruits and vegetables can be contaminated if they are **washed** or **irrigated** with water that is contaminated with animal manure or human sewage
- Some types of **salmonella** can infect a hen's ovary so that the internal contents of a normal looking egg can be contaminated

Food processing & diseases

- **Shigella** bacteria, **Hepatitis A** virus can be introduced by the **unwashed** hands of food handlers who are themselves infected
- **In the kitchen**, microbes can be transferred from one food to another food by **using the same knife, cutting board, or other utensil** to prepare both, without washing the surface or utensil in between
- Fully cooked food can become recontaminated if it touches other raw foods or drippings from raw foods that contain pathogens.

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- Given **warm moist conditions** and an ample supply of nutrients, one bacterium that reproduces by dividing itself **every 30 min** can produce **17 million progeny in 12 hours**. As a result, lightly contaminated food left out overnight can be highly infectious by the next day.
 - Microbes are killed by heat.

Preventing food contamination

- Cook
 - To the right temperature
- Clean
 - Wash hands & surfaces often
- Chill
 - Refrigerate promptly
- Separate
 - Raw meat, poultry, seafood, and eggs can spread illness-causing bacteria to ready-to-eat foods—unless they are separated

FIVE KEYS TO SAFER FOOD



KEEP CLEAN



**SEPARATE RAW
AND COOKED**



**COOK
THOROUGHLY**



**KEEP FOOD AT
SAFE TEMPERATURE**



**USE SAFE WATER
AND RAW MATERIALS**

Source: World Health Organization

Symptoms & treatment

- Bloody diarrhea
- Weight loss
- Diarrhea leading to dehydration
- Fever
- Sudden onset of nausea, vomiting, diarrhea
- Severe abdominal pain
- Drinking fluids to prevent dehydration
- Consult with your doctors
- Stool culture
- Get medicine, even antibiotics

Food hygiene



- WHO- 5 key principles of food hygiene
 - Prevent contaminating food with pathogens spreading from people, pets, and pests
 - Separate raw and cooked foods to prevent contaminating the cooked foods
 - Cook foods for the appropriate length of time and at the appropriate temperature to kill pathogens
 - Store food at the proper temperature
 - Do use safe water and safe raw materials

Food adulteration



- Extraction of valuable components from food or addition of some thing of lower price which is absent in the food normally with an evil motive which lowers the food value and has injurious effect to health is called food adulteration.

Food adulteration



- Forms of food adulteration:
- 1) Mixing
- 2) Substitution
- 3) Abstraction
- 4) Concealing the quality
- 5) putting up decomposed foods for sale
- 6) Misbranding
- 7) false labeling
- 8) Addition of poison/ insecticides /chemicals etc.

Food adulteration



- Adulterated food is impure, unsafe, or harmful food
- Causes:
 - Poor harvesting or storage of grain
 - Use of banned veterinary products
 - Industrial discharges
 - Deliberate adulteration and fraud













Food adulteration

- Prevention of food Adulteration in Bangladesh:
- A. Food traders :
- B. Food Inspectors:
- C. Food Consumers:
- D. Health education among the community to create awareness etc.:



- THANK YOU