EU-India Capacity Building Initiative for Trade Development (CITD)

Train the Trainers in Food Safety and Nutrition

FOOD FUNDA

Hygienic Handling of Food and Hygiene of our surrounding

MODULE 3
Level 3: 12 to 17 years

fssai

FOOD QUALITY & SAFETY

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Food Quality

"Food quality" means the degree of excellence. The characteristics of food are such that are acceptable to all consumers on the basis of the appearance, odor, flavor, texture of the food.

It also includes nutritional value of the food and purity of food.

Food Quality ensures:

No adulteration

No fraud

No spoilage

No contamination

You may wonder what is Food Safety?

- It means food must first be safe to eat
- It should be free of hazards that may make food injurious to the health of consumers

How to achieve Food Safety?

Food must be handled hygienically from farm to plate

To retain its quality and nutritive value and would be safe to eat

Recap of Microorganisms

Living things that cannot be seen with the naked eye

- 3 different types of microorganisms:
- Good microorganisms
  - Useful in making food and drinks (e.g. cheese, yoghurt etc.)
  - Making medicine (e.g. Penicillin)
  - Help digest food in the gut
- Bad microorganisms
  - Do not usually make people sick
  - Cause food to smell bad, taste horrible and look disgusting
- Dangerous microorganisms
  - Make people sick, even kill!
  - Called “pathogens”

MORE ABOUT MICROORANISMS

- Microorganisms are so small that it takes 1 million to cover the head of a pin.
- Bacteria, viruses, yeasts, moulds and parasites are all microorganisms.
- The smell, taste and appearance of food are not very reliable indicators of whether the food will make you sick.

- **Common dangerous food-borne microbes are:**
  - **Bacteria** (Salmonella, Shigella, Campylobacter and E. coli)
  - **Parasites** (Giardia, Trichinella)
  - Viruses (Hepatitis A, Norovirus)

Do a short survey at home to see how food safety is ensured at home.

- Have you noticed how your Mother selects good quality wholesome food from reliable sources
- She will reject contaminated or poisonous food
- Mummy will check for date of expiry of the food product
- She will also remove unsafe or unfit food from the fridge

How does Mummy ensure Safe Food?

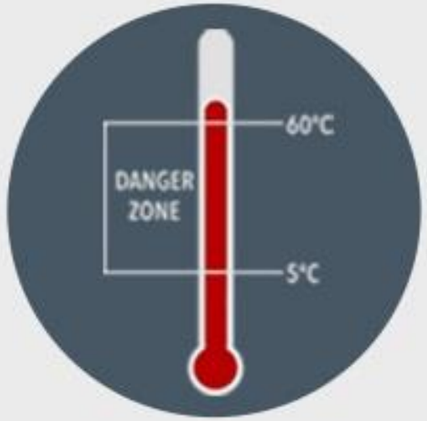
1) She keeps the dishes covered
2) She keeps cooked food into the refrigerator to avoid bacteria from multiplying in the food

These are
5 Keys to Safer Food!

KEEP CLEAN

SEPARATE RAW AND COOKED

COOK THOROUGHLY



KEEP FOOD AT SAFE TEMPERATURE

USE SAFE WATER AND RAW MATERIALS

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- **NON-PERISHABLE FOODS**
  - Stay good up to a year
  - Sugar, legumes, whole grains, oil, preserves like pickles
  - In a cool, dry place
- **SEMI-PERISHABLE FOODS**
  - Stay good up to a few weeks – few months
  - Semolina, gram flour, vegetables like onions & potatoes, apples and frozen foods
  - In well ventilated cool rooms or fridge.
- **PERISHABLE FOODS**
  - Spoil within a day
  - Items we consume everyday: milk, eggs, meat, fish, poultry and most fruits and vegetables specially green leafy vegetables.

What is Food Spoilage?

It is defined as decomposition & damage caused to food by various agents, making it unsuitable for consumption.

The term CONTAMINATED foods is not fit to be eaten for sanitary reasons.

Although food may look, smell and taste good, it may contain harmful chemicals, non-food matter and microbes.

Contaminated food is also considered as spoilt.

Both spoilt and contaminated food should be discarded.

Spoilt food has an unattractive colour, smell, taste and looks unfit to eat.

How does food spoil?

- Foods with high amounts of proteins, moisture and other nutrients become an ideal medium for bacterial growth.
- They have short shelf-life of a few hours to a few days after which they will spoil rapidly and are responsible for the outbreak of some food borne diseases

How does food spoil?

Look around you!

Natural Enzymatic changes

Microbial action

Chemicals

Stones, grit, irradiation

Insects & Bugs

Physical damage

Air
Water
Soil
Dust

What is a contaminant?

Anything naturally introduced into the product or intentionally added during stages of the food chain from the farm to the table, which may cause harm to the consumer.

Types of Contaminants

Biological

(rats droppings, beetles, weevils, insects body parts flies, worms bacteria, virus etc.)

Physical

(glass, metal, bone, hair, feathers, shell, stone, grit, etc.)

Chemical

(food additives, inks, heavy metals, pesticides residues etc.)

Cross Contamination…

- **Transfer of pathogens from contaminated food (usually raw) to ready-to-eat food by direct, drip or indirect contact.**
- **It can occur at any stage during processing, transportation, storage, distribution or even consumption.**

Vehicles for Cross Contamination are …

- Hands
- Clothes, utensils and equipment
- Food contact surfaces
- Hand contact surfaces

How does Cross Contamination take place?

Food to food transfer

Surface to surface transfer

Food to surface transfer

Not washing hands after handling each item

Prevent Cross Contamination

- Keep raw & cooked food apart
- Store cooked food above raw food in fridge
- Color code chopping boards & knives
- Practice hand hygiene

Food Poisoning, Food Infection & Food Allergies

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Food borne illness/disease

It is a general term applied to all types of illnesses caused by microbes, substances or any kind of material present in the food we have eaten.

Food borne illness/disease

- Food Poisoning
- Food Infections and
- Food Allergies

Food Poisoning

It is an illness caused by toxins present in contaminated food!

On consumption, the toxin irritates the lining of the GI tract causing symptoms such as vomiting, abdominal pain and diarrhoea.

The toxin maybe…

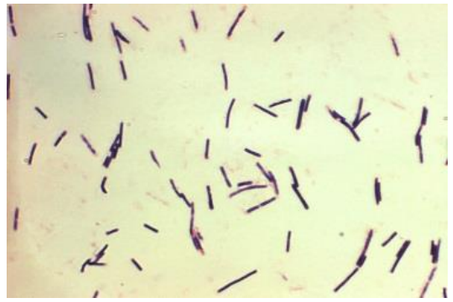
1) Poisonous chemical
2) Naturally occurring poison eg-Solanine in green potatoes
3) Toxic metabolite excreted by bacteria

Food Poisoning

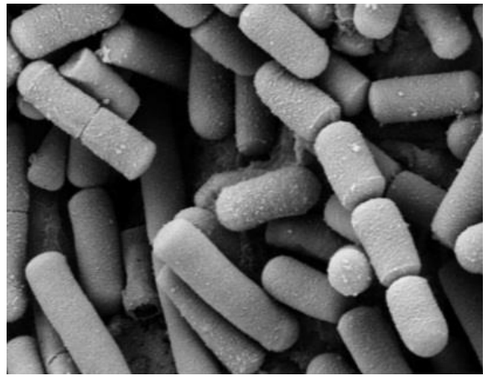
Toxin is Produced during growth of Bacteria in contaminated food.

Symptoms appear in one to six hours after consuming food.
Food may not contain any living bacteria, which may have been destroyed during reheating.

Types of Bacterial Food Poisoning

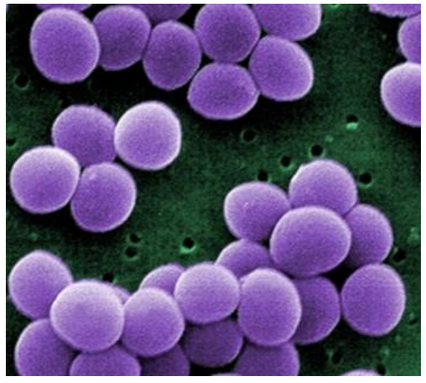


Clostridium perfringens



Bacillus cereus

Clostridium botulinum



Staphylococcus aureus

Food Infection

A food infection is an illness caused by microbes.
It happens when we consume food which contains living bacteria.

The bacteria multiply in our body and cause infection.
Symptoms occur when body reacts to presence of large number of bacteria or their metabolites.

Symptoms of Food Infection

Incubation period is longer, approximately 12-24 hours

DID YOU KNOW?

For bacterial food poisoning or food infection to occur, approximately one million or more bacteria must be present in food.

DID YOU KNOW?

Gastric juice present in our stomach is acidic and destroys some bacteria. We are more likely to contract a food borne illness when we overeat.

Bacterial Growth

TIME	TIME LAPSED	NO. OF BACTERIAL CELLS
7:00 AM	---	1
7:20 AM	20 minutes	2
7:40 AM	40 minutes	4
8:00AM	1 hour	8
9:00AM	2 hours	64
10:00AM	3 hours	512
11:00AM	4 hours	4096
01:00PM	6 hours	2.62.144
03:00PM	8 hours	1.67.77.216

Explosive rate of multiplication

Activity 1

- **Bacteria multiply fast under favorable conditions in food**
  - **Bacteria are omnipresent & in large numbers**

Assume 100 food poisoning bacteria are present in a perishable food

- **How much time would it take for the bacteria to multiply and render the food harmful to health under favorable conditions.**

(Hint – You may refer to the chart on Bacterial growth)

Activity 1 – Answer!

Time required is approx. 5 hours

At least, 1 million bacteria are required to be present in food to cause food poisoning

Golden Rules of Handling Food

- Prevent Contamination
- Prevent Multiplication
- Prevent Survival

What is Food Allergy?

An allergy is a special reaction some people show to some foods.

These reactions could be serious. These foods are otherwise harmless to most people.

Substances causing allergies are called <u>Allergens</u>

ALLERGEN ALERT

This item contains the following Allergens:

- ☐ Eggs
- ☐ Fish
- ☐ Lupin
- ☐ Milk
- ☐ Mustard
- ☐ Peanuts
- ☐ Sesame
- ☐ Soya
- ☐ Tree Nuts
- ☐ Cereals containing Gluten
- ☐ Celery and Celeriac
- ☐ Sulphur Dioxide (preservative found in some dried fruit)
- ☐ Crustaceans (i.e.: prawns, crabs, lobster & crayfish)
- ☐ Molluscs (i.e.: clams, snails, mussels, whelks, oysters & squid)
- ☐ Other _____

Common Food Allergies

Symptoms of Allergies

- General flushing of the skin
- Swelling of throat and mouth
- Severe breathlessness
- Sudden feeling of weakness
- Fall in blood pressure

Symptoms of Allergies

- Urticaria or rashes on the body
- Difficulty in swallowing and speaking
- Abdominal pain, nausea and vomiting,
- Sudden feeling of weakness
- Loss of consciousness in some cases

Allergies must be taken seriously because...

Allergens cause the body's immune system to react often within minutes, but sometimes within hours.

In serious cases the person may go into life threatening anaphylactic shock.

Food handlers should know ingredients in food

How to control Allergies?

Read the ingredients
on the food label carefully

The label must mention whether same processing plant
is used for processing foods containing likely allergens

If you have an allergy read the menu description before ordering food in restaurants

For severe symptoms seek immediate medical attention

Loss of consciousness in some cases

How to control Allergies?

If you have an allergy, make sure that you communicate it effectively to your school.

All food handlers in school should know basic ingredients in each recipe &

Be briefed regarding allergens and its control.

Control of Food Borne Diseases

- Prevent cross contamination
- Ill persons or carriers should not handle food
- Thorough cooking of potentially hazardous foods like mincemeat and cutlets
- Washing of salad vegetables, fruit thoroughly
- High standards of personal hygiene, hand washing

Control of Food Borne Diseases

- Strict segregation of raw/ high risk foods
- Proper temperature control
- Avoid untreated milk and milk products
- Improve hygiene of harvesters, slaughter house, retailers
- Training of food handlers including farm workers
- Increase consumer awareness

Prevent Food Contamination – 7 C's!

FOOD FUNDA

Check	**Clean**	**Cover**	**Cross Contamination**

Cook	**Cool / Chill**	**Consume**

7 C's of Control Food Contamination

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Check

Select wholesome food at right stage of maturity.

If packaged, check ‘Best before date’

Clean

Clean and wash before cooking

Dry all items before storing them in the correct place

Cover

Keep all food covered

food kept in refrigerator should be covered to prevent contamination, drying out and absorbing odors.

If lids are unavailable, use cling film or aluminium foil.

Cross Contamination

Wash hands well before handling food.

Use separate chopping boards and knives for raw and cooked food.

Wash hand often to prevent cross contamination

Cook

Cooking destroys pathogenic organisms

Increases taste, flavor and aroma and digestibility and increases shelf life!

Cook thoroughly. Reheat leftovers thoroughly. Check internal temperature of food is at least 70^0

Chill

Cool food within 1 ½ to 2 hours if food is perishable and is to be served later.

Cool food in shallow containers or in a water/ice bath.

Refrigerate/freeze food within 1 ½ to 2 hours

Consume

Serve food in clean environment. Use clean crockery and cutlery.

As far as possible, eat freshly prepared food. Do not waste food! Serve only what you can eat!

Rinse/wash dishes/tiffin boxes well after the meal is over.

Hygienic Storage of Food

- The dry food store or storeroom – room temperature
- The refrigerator – 1^0C to 4^0C – chilled storage
- The deep freezer – Temperature - 18^0C – Frozen storage

Dry Food Storage

- Used to store stable or non-perishable food
- Storage area should be airy, well-lit, clean, protected from pests
- Food should be kept cool, clean and covered
- Rotate food supplies First-In, First-Out (FIFO)
- Commodities should be inspected once a week for signs of spoilage

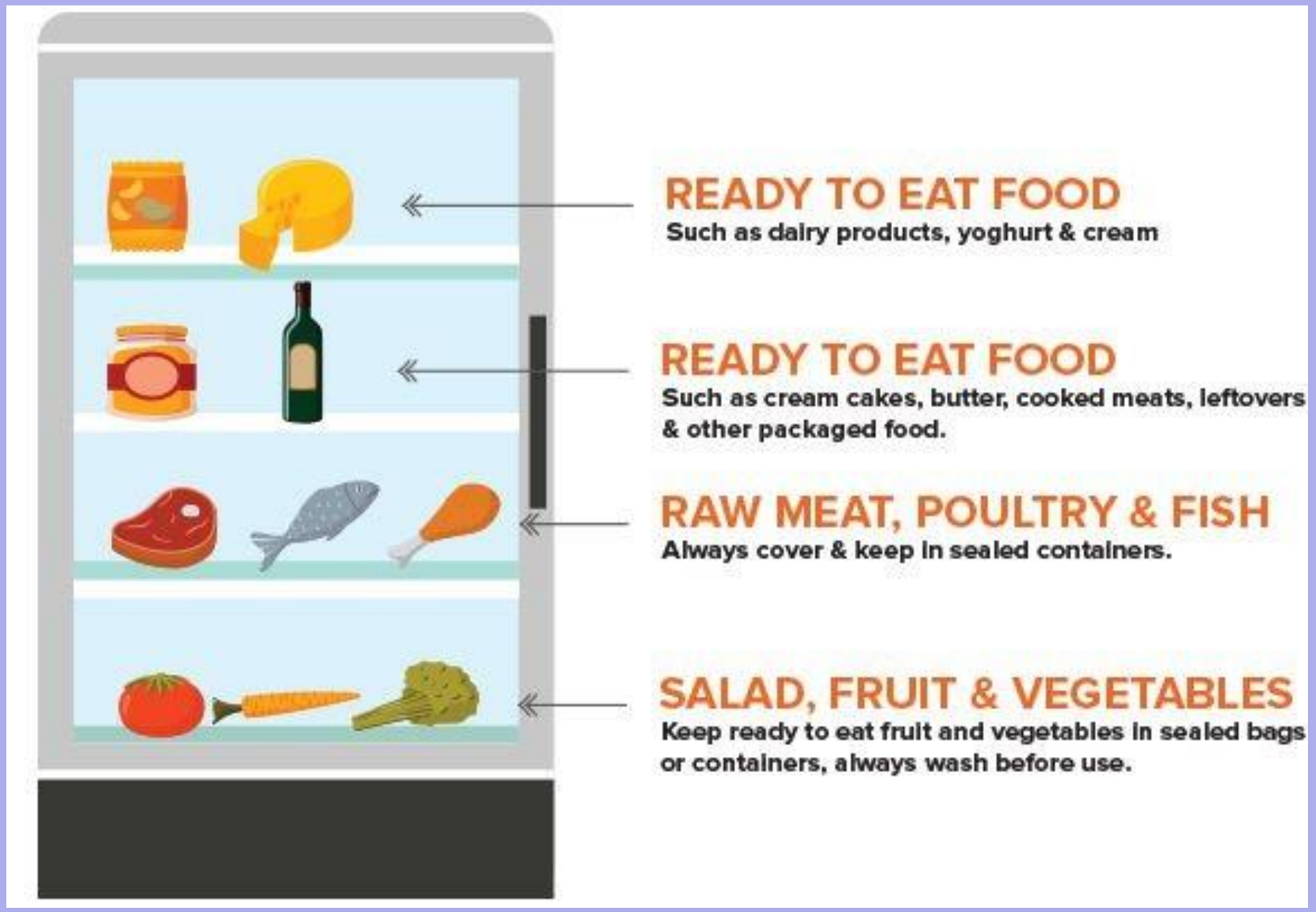
Refrigerator Storage

Used to store short-term perishable food

All food should be kept covered. Fruits like banana should not be refrigerated!

Rotate food supplies First-In, First-Out (FIFO)

What to store in Refrigerator?



Storage in Deep Freezer

Used for long term storage of perishable food and frozen food Items. (Ideal temperature is -180C).

Preservation happens by circulation of cold air. Hence, door should not be opened often.

Frozen foods should be thawed before use.
Once thawed, use immediately, do not refreeze.

Foods should be well wrapped to prevent freezer burn, cross contamination and absorption of odor and flavor.

DID YOU KNOW?

Food can remain frozen in a deep freezer for

up to 24 hours

if freezer is not opened!

DID YOU KNOW?

Freezer Temperatures must be maintained to prevent food spoilage!

FROZEN FOODS

DID YOU KNOW?

Some shop keepers <u>switch off the deep freezer to save on power.</u>

Foods often <u>thaw and refreeze</u>.

<u>Reject food</u> with large number of ice crystals in the packet

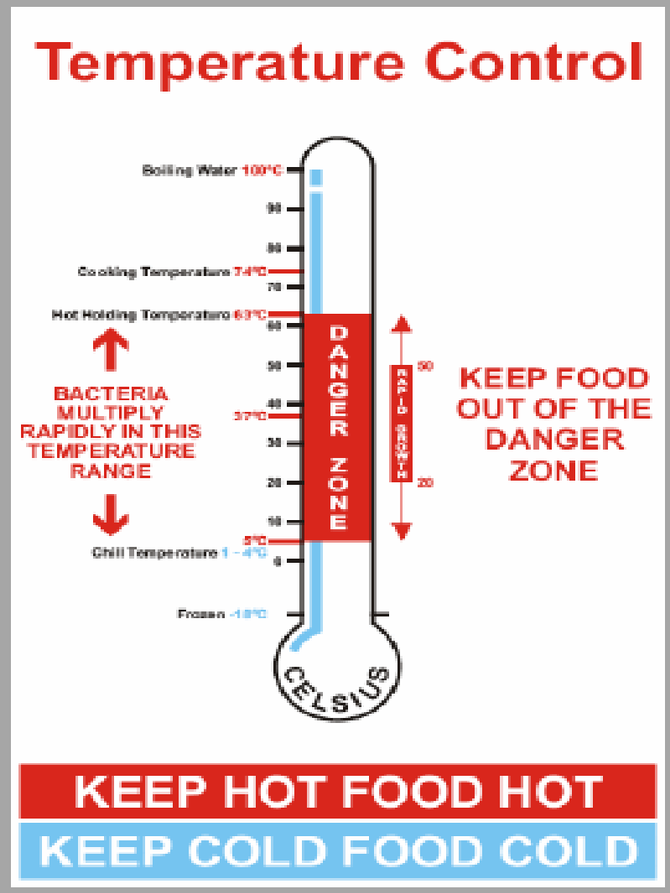
Thawing is the stage when a frozen food reaches an unfrozen state i.e., when the ice crystals that were formed during the freezing process, melt and the food can be cooked.

Thaw or defrost frozen food as follows:

- In the refrigerator below 4°C
- Under cold potable running water while it is still in the packet
- In the microwave oven if you are cooking it immediately

Use a probe thermometer to check internal temperature of cooked food!

You can't tell by *looking.*
Use a *food thermometer* to be sure!



Potable Water is drinking water free from harmful pathogens & toxic chemicals!

It is the main ingredient used in food preparation, for drinking and for cleaning food contact surfaces and equipment.

Potable water is essential for our survival!

Prevent Water Contamination in Kitchen…

- Store drinking water in a clean, covered container
- Clean the water container every day.
- If no use tap, use long handled glass for taking out water
- Do not dip hands or any container in the water
- Clean overhead tank and sump once in 6 months
- Keep tanks covered with well fitted lids
- Make ice from potable water only or purchase from reliable sources
- Use clean tongs/spoon to pick up ice

Diseases transmitted through contaminated water

- Cholera
- Hepatitis A (Jaundice)
- Gastroenteritis
- Polio
- Dysentery

Methods to Purify Water

- Chlorination
- Membrane / Micro Filtration
- Reverse Osmosis(RO)
- UV Filtration
- Boiling

Activity 2
Importance of Food Labels

Imagine that your class has manufactured Nutritious Baby food.
You have to *market it.*

What do you need to put on the label of the baby food jar?

Activity 2 Continued…
Importance of Food Labels

Design a label:

1) Choose name of product
2) Design the label
3) Do its pricing

Why label Food?

Labels tells what they are purchasing in terms of nutritive value. It helps make conscious selection.

It helps compare food products by value for money

Cross Contamination

It is the transfer of harmful microbes from contaminated raw food to ready- to- eat cooked foods by unhygienic handling practices.

We can prevent food borne diseases if we practice food hygiene.

It can happen at any time when food is being cooked and served

DID YOU KNOW?

All prepackaged foods must be labeled before they are sold

DID YOU KNOW?

The label should:

- **Be clearly visible**
- **Be legible**
- **Properly adhere to the container**

DID YOU KNOW?

Labels should mention additives & allergens which may have accidently entered food!

Information displayed on label!

1. Name of the food product
2. List of ingredients in descending order of weight
3. Symbol for vegetarian/non-vegetarian food
4. Nutritional facts
5. Food additives and their class/numerical identification number of colours
6. Name and address of manufacturer and manufacturing unit
7. Net weight of contents and drained weight
8. Lot/Code/Batch identification no.

Information displayed on label!

1. Date of manufacture dd/mm/year
2. Best before date
3. If irradiated mention particulars
4. Country of origin for imported food
5. Instructions for use & disposal of packaging
6. Licensing authority and license number
7. The label may have pictures and graphics on it

Nutrition Information on label!

Nutrition Facts

Serving Size 1 cup (228g)
Servings per Container 2

Amount Per Serving

Calories 280	**Calories from Fat** 120
	% Daily Value*
Total Fat 13g	20%
Saturated Fat 5g	25%
Trans Fat 2g	
Cholesterol 2mg	10%
Sodium 660mg	28%
Total Carbohydrate 31g	10%
Dietary Fiber 3g	0%
Sugars 5g	
Protein 5g	

Vitamin A 4%	•	Vitamin C 2%
Calcium 15%	•	Iron 4%

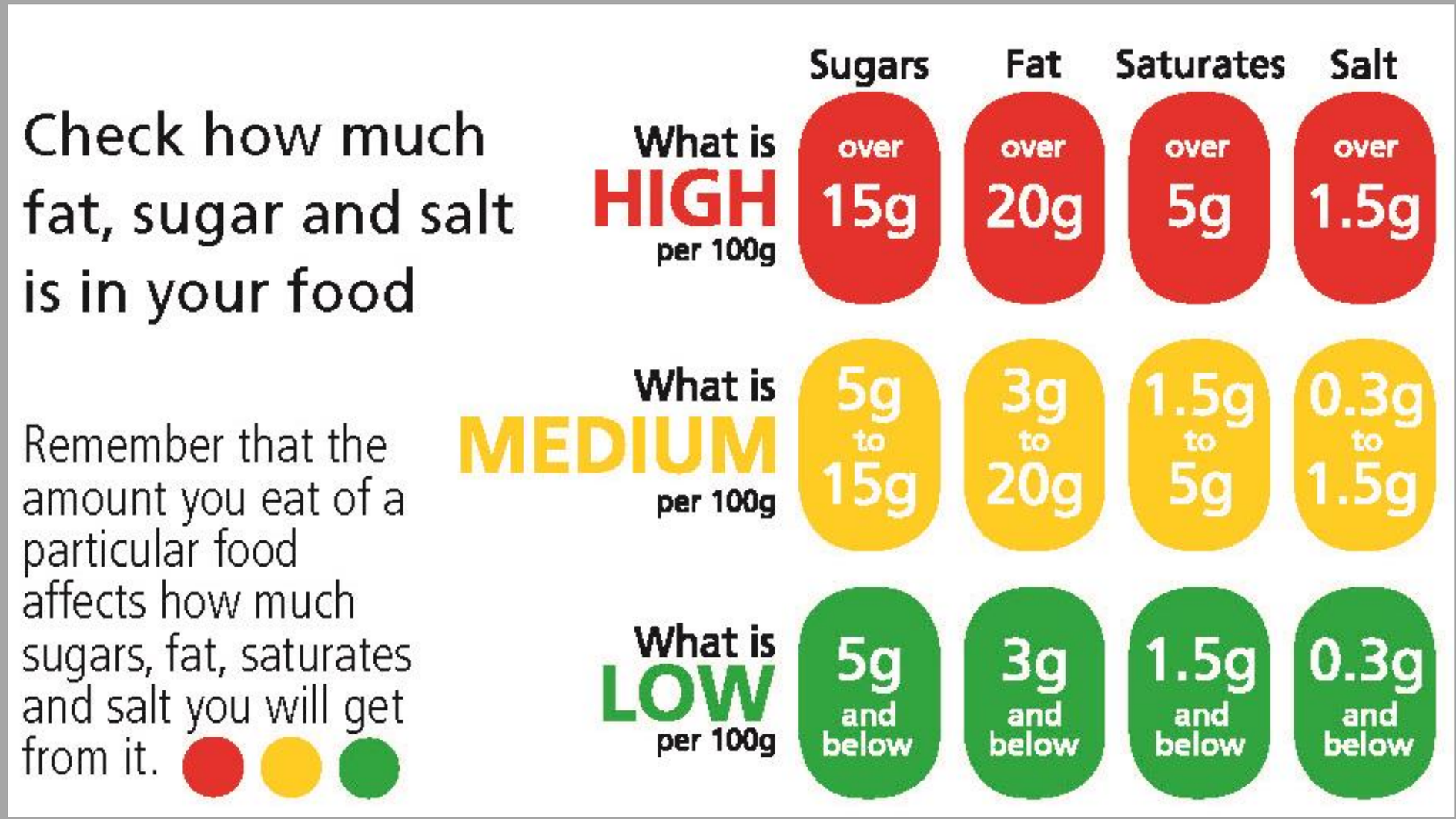
*Percent Daily Values are based on a 2,000-calorie diet. Your daily values may be higher or lower depending on your calorie needs.

	Calories:	**2,000**	**2,500**
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Fiber		25g	30g

Calories per gram:

Fat 9 • Carbohydrate 4 • Protein 4

Labels warn about sugar, salt & fats levels also!



Activity 3: Can you classify contaminations as Biological, Chemical, Physical

Moldy peanuts

Staphylococci

Washing soda

Stapler pin

Rat droppings

Glass

Hair

Pesticide

Activity 3: Answers!

Biological, Chemical, Physical

Biological	Moldy peanuts	Staphylococci	Rat Droppings
Physical	Stapler pin	Hair	Glass
Chemical	Washing Soda	Pesticide	

Activity 4: Match the following!

- Semi-perishable
- Ready-to-eat
- Perishable
- Non-perishable

Activity 5: Memory Game (Food Basket)

- You will be shown a tray with 8 food wrappers or food pictures for 30 seconds

- On the score card given to you , classify these foods under the following type of storage space written on the score card

- STORAGE SPACE

Fruit basket | Freezer | Refrigerator | Store cupboard

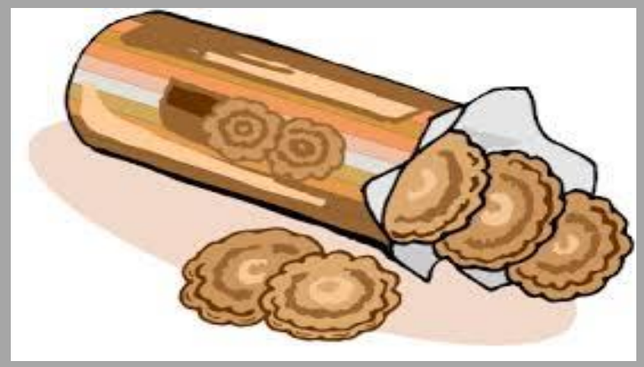
Activity 5: Memory Game (Food Basket)

Freezer

Refrigerator

Fruit basket

Refrigerator



Store cupboard

Freezer

Activity 6: Match the Following!

Column 1 to Column 2 (items in Column 2 may be used more than once)

	Column 1		Column 2
A	Food Poisoning	1	Curdled milk
B	Food infection	2	Botulism
C	Allergy	3	Tree nuts
D	Worm infestation	4	Hepatitis A
E	Food spoilage	5	Trichinella
		6	Pasteurized milk
		7	Banana
		8	Olive oil

Activity 6: Match the Following!

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		7	Banana
		8	Olive oil

Activity 7: Put tick mark in right places!

- Cutting raw and cooked food on the same chopping board
- Cooling hot food in the refrigerator
- Making maximum use of refrigerator space by over-stacking it
- Cooking frozen chicken after it has been thawed
- Opening the refrigerator door often for proper ventilation
- Holding hot foods above 63 °C and cold foods below 5 °C

Activity 7: Put tick mark in right places!

- Cutting raw and cooked food on the same chopping board
- Cooling hot food in the refrigerator
- Making maximum use of refrigerator space by over-stacking it

✓Cooking frozen chicken after it has been thawed

- Opening the refrigerator door often for proper ventilation

✓Holding hot foods above 63 °C and cold foods below 5 °C

Activity 8: Mrs. Kapoor has purchased a new fridge!

- **Guide her and tell her where she has gone wrong while placing food in the refrigerator!**

1. Do not store ready to eat foods and raw food side by side
2. Store raw food below cooked food
3. Keep all food items covered
4. Do not store bananas and apples in refrigerator
5. Keep vegetables in the crisper

Activity 9: Visit nearest supermarket & check labels of at least 6 of your favorite foods!

- Are number of servings mentioned on the label?
- How many grams of sugar is present in one serving?
- How many grams of fat does the food contain/serving?
- How much saturated fat is present in one serving?
- How many grams of salt does the food contain per serving?
- Does the food make any special nutritional claims?
- Based on the traffic light system of labeling food, how would you rate the food?

Thank You