



UNIT II – TOPIC 3

Methods of Cooking: Dry Heat, Moist Heat, Combination Methods

1. Introduction to Microwave Cooking

Microwave cooking is a modern method of cooking food using electromagnetic radiation. It is widely used for reheating, defrosting, steaming, and even cooking certain dishes. This method is **fast, energy-efficient, and convenient**, making it popular in households and commercial kitchens.

2. Principles of Microwave Cooking

Microwave ovens use **microwave radiation (2.45 GHz frequency)** to heat and cook food.

□ How It Works:

- Microwaves generate **electromagnetic waves** that penetrate food.
- These waves cause **water, fat, and sugar molecules** in food to **vibrate rapidly**.
- The molecular friction generates **heat**, which cooks the food from the inside out.

□ Heat Distribution:

- Unlike conventional cooking methods (which heat food from the outside in), microwaves **directly heat the food molecules** internally.
- **Standing Time:** Food continues cooking even after the microwave is turned off because heat is retained within the food.

3. Components of a Microwave Oven

A microwave oven consists of the following key components:

Component	Function
Magnetron	Generates microwave radiation.
Waveguide	Directs microwaves into the cooking chamber.
Turntable	Rotates food for even cooking.
Control Panel	Allows the user to set time, power levels, and modes.
Door with Mesh	Prevents microwaves from escaping.
Cooling Fan	Prevents overheating of the oven's components.



4. Advantages of Microwave Cooking

- ✓ **Faster Cooking:** Microwave cooking is **quicker** than traditional methods like baking or boiling.
- ✓ **Energy Efficient:** Uses **less electricity** compared to gas stoves and ovens.
- ✓ **Retains Nutrients:** Shorter cooking time helps preserve **vitamins and minerals** in food.
- ✓ **Even Cooking:** Microwaves penetrate food **uniformly**, reducing the risk of burning.
- ✓ **No Need for Preheating:** Unlike ovens, **no preheating** is required.
- ✓ **Convenient for Reheating & Defrosting:** Ideal for warming up leftovers and **defrosting frozen food** quickly.
- ✓ **Less Use of Oil & Water:** Promotes **healthy cooking** by reducing oil usage.

5. Disadvantages of Microwave Cooking

- ✗ **Uneven Heating:** Thick or dense foods may **not heat evenly**, requiring stirring.
- ✗ **No Browning Effect:** Unlike frying or roasting, microwaves **do not create a crispy texture**.
- ✗ **Not Suitable for All Foods:** Some foods, like **bread and pastry**, may become **chewy or rubbery**.
- ✗ **Plastic Hazards:** Some plastics may **melt or release toxins** when microwaved.
- ✗ **Risk of Superheating:** Liquids can become **dangerously hot** and may suddenly boil over when disturbed.
- ✗ **Limited Cooking Techniques:** Cannot **grill, deep-fry, or bake** in the same way as conventional ovens.

6. Cooking Techniques in the Microwave

Microwave ovens are versatile and can perform multiple cooking functions:

A. Reheating

- **Best for:** Leftovers, beverages, soups, rice.
- Use a **low or medium power setting** to prevent overheating.
- Stir food midway for **even heating**.

B. Defrosting

- **Best for:** Frozen meat, fish, vegetables.
- Use the **defrost setting** or **low power mode (30%)**.
- Rotate and separate pieces for uniform thawing.



C. Steaming

- **Best for:** Vegetables, fish, eggs.
- Use a **microwave-safe bowl with a lid** to trap steam.
- Retains **more nutrients** than boiling.

D. Baking

- **Best for:** Mug cakes, brownies, bread, biscuits.
- Use **microwave-friendly recipes** (regular baking requires convection).

E. Boiling

- **Best for:** Pasta, rice, eggs, potatoes.
- Use a **large bowl** to prevent spillage.
- Stir occasionally for **even cooking**.

F. Roasting & Grilling (Convection Microwaves Only)

- **Best for:** Chicken, paneer, vegetables.
- Convection mode allows roasting, though not as effective as an oven.

7. Microwave-Safe & Unsafe Materials

✓ Safe for Microwave Use:

- ✓ Glass (Pyrex, Borosil)
- ✓ Ceramic (microwave-safe)
- ✓ Silicone cookware
- ✓ Microwave-safe plastics
- ✓ Paper towels & parchment paper

✗ Unsafe for Microwave Use:

- ✗ Metal (can cause sparks)
- ✗ Aluminum foil (can cause fire)
- ✗ Plastic containers (unless labeled microwave-safe)
- ✗ Styrofoam (can melt and release toxins)
- ✗ Dishes with metallic trim

□ **Pro Tip:** Always check for a "Microwave-Safe" label before using any container.



8. Best Practices for Microwave Cooking

- Use a **turntable** or rotate food manually for even heating.
- Cover food loosely** with a microwave-safe lid to prevent splattering.
- Avoid overheating liquids** to prevent superheating accidents.
- Use **lower power settings** for delicate foods like dairy and eggs.
- Let food rest (standing time)** for a few minutes after cooking for better heat distribution.

9. Common Microwave Cooking Problems & Solutions

Problem	Cause	Solution
Food is cold in some areas	Uneven heating	Stir food and rotate dish halfway.
Food is dry & rubbery	Overcooked at high power	Use lower power settings.
Soup/tea boils over	Superheating	Heat in short intervals and stir.
Eggs explode	Steam builds up inside	Poke a hole before cooking.
Plastics melt	Unsafe material	Use only microwave-safe containers.

10. Examples of Microwave-Friendly Recipes

- 1 **Microwave Mug Cake** – A quick dessert ready in 2 minutes.
- 2 **Microwave Scrambled Eggs** – Fluffy and ready in 1 minute.
- 3 **Microwave Steamed Vegetables** – Healthy and fast.
- 4 **Microwave Rice** – Cooks perfectly with the right water ratio.
- 5 **Microwave Popcorn** – A great snack in under 3 minutes.

11. Types of Microwave Ovens

Type	Features	Best For
Solo Microwave	Basic model, for reheating & simple cooking	Small households, students
Grill Microwave	Includes a grill heater for toasting & roasting	Cooking meat, sandwiches
Convection Microwave	Has a fan & heating element for baking & roasting	Cakes, pizza, chicken