

Principles of Cooking

Chapter 10

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After studying this unit

- You will be able to:
 - Understand how heat is transferred to foods through conduction, convection and radiation
 - Understand how heat affects foods
 - Understand the basic principles of various cooking methods

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To cook successfully you must first understand the ways in which heat is transferred: conduction, convection and radiation.

You should also understand what the application of heat does to the proteins, sugars, starches, water and fats in food.

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Heat Transfer

- Conduction
- Convection
 - Natural convection
 - Mechanical convection
- Radiation
 - Infrared cooking
 - Microwave cooking

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The Effects of Heat

- Proteins coagulate
- Starches gelatinize
- Sugars caramelize
- Water evaporates
- Fat melts

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Cooking Methods

- Dry-heat cooking methods
 - Air
 - Fat
- Moist-heat cooking methods
 - Water
 - Steam
- Combination cooking methods
 - Employ both dry- and moist-heat methods

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Dry-Heat Cooking Methods

- Broiling
- Grilling
- Roasting and baking
- Sautéing
 - Stir-frying
- Pan-frying
- Deep-frying

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Moist-Heat Cooking Methods

- Poaching
 - Submersion poaching
 - Shallow Poaching
- Boiling
- Steaming

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Moist-Heat Cooking Methods

Table 10.4 MOIST-HEAT COOKING METHODS

| METHOD | LIQUID'S TEMPERATURE | LIQUID'S CONDITION | USES |
|-----------|------------------------------------|--|-----------------------------|
| Poaching | 160–180°F 71–82°C | Liquid moves slightly but no bubbles | Eggs, fish, fruit |
| Simmering | 185–205°F 85–96°C | Small bubbles break through the liquid's surface | Meats, steaks, chicken |
| Boiling | 212°F 100°C | Large bubbles and rapid movement | Vegetables, pasta |
| Steaming | 212°F or higher 100°C or higher | Food is in contact only with the steam generated by a boiling liquid | Vegetables, fish, shellfish |

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Combination Cooking Methods

- First step: brown the main ingredient using dry heat
- Second step: complete cooking by simmering the food in liquid
 - Braising
 - Small amount of liquid
 - Stewing
 - Enough liquid to cover the food

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