

# Chapter 1

## Introduction to Bakery & confectionery

### Definition

- **Baking** is cooking of food by the action of dry heat in an oven. The degree of dryness of heat may be modified by the amount of steam produced from the items baked. Bread rolls, cakes, pastries, puddings etc. are baked.
- A **bakery** (or **baker's shop**) is an establishment that produces and sells flour-based food baked in an oven such as bread, cakes, pastries, and pies.
- **Confectionery** is the art of making **confections**, which are food items that are rich in sugar and carbohydrates.
- In general, though, confectionery is divided into three categories:
  1. **Flour confectionery** includes principally sweet pastries, cakes, and similar baked goods.
  2. **Sugar confectionery** includes sweets, candied nuts, chocolates, chewing gum, sweetmeats, pastillage, and other confections that are made primarily of sugar
  3. **Chocolate confections** (confections made of chocolate) are treated as a separate category, as are sugar-free versions of sugar confections.
- The words *candy* (US and Canada), *sweets* (UK and Ireland), and *lollies* (Australia and New Zealand) are common words for the most common varieties of sugar confectionery.

## Principles of baking

1. Use the exact ingredients called for.
2. Measure accurately
3. Follow the mixing directions in the recipe
4. Use the correct type and size of pan
5. Use the correct oven temperature
6. Pans must be properly prepared for baking, so the baked product isn't difficult to remove.
7. When greasing pans, it is best to use unsalted shortening or a cooking spray
8. **Preheat** the oven so that the oven will be at the correct temperature when the product goes in.
9. Before placing pans in the oven, wipe off the pan **sides** and **bottom**. Food particles on the pan will **burn**
10. Be sure pans don't **touch** each other or the sides, top, bottom, or door of the oven. That would create a **hot spot**.
11. The recipe should tell you when to **remove** the baked product from the pan. Some are taken out right away; others need to **cool** in the pan for a few minutes. Usually, they are then placed on a **wire cooling rack** to cool completely.
12. Try and bake evenly sized portions, arranged symmetrically on a tray to assist even cooking.
13. Fragile items such as custards may need to be placed a food item in a water bath to moderate the heat.

## Bakery Equipment (small & large)

Large	Small	Tools & Miscellaneous
Revolving oven / Rack or Rotary oven	Sheet Pans	French Knife
Deck oven	Baking Tins	Utility Knife
Convection oven	Baking Moulds (Pie, Tart, Brioche, Muffins, Cup Cake)	Paring Knife
Cook stoves	Mixing Bowls	Serrated / Bread Knife
Vertical mixers	Sauce Pans	Palette Knife
Dough dividers	Measuring Jugs	Cookie / Biscuit Cutters
Dough sheeter		Pastry Bag & Nozzles
Prover		Icing Comb
Refrigerator		Sugar Dredger
Retarder		Rolling Pins
Tray Rack		Pastry Brush
Flour & Ingredient Bins		Scraper / Dough Cutter
Work tables		Weighing Scale
Sinks		Thermometer
		Sieve
		Bowls
		Whisks
		Spatulas
		Wooden Spoon
		Measuring Spoon

## Formulas & measurements

- Bakers generally talk about formulas rather than recipe.
- The bake shop is very much like a chemistry laboratory both in the scientific accuracy of the procedures and in the complex reactions that takes place during mixing & baking.
- Ingredients are almost always weighed in a bake shop rather than measured by volume because measurement by weight is more accurate.
- Accuracy of measurement is very essential in a bake shop.
- The Baker's term for weighing out ingredients is scaling.
- Ingredients like water, egg, milk may sometimes be measured by volume at the ratio of 1 lit. / Kg.

## UNIT OF MEASUREMENT

- The United States is the only major country that uses the complex system of measurement
- Other countries use a much simpler system called the metric system

Abbreviations of U.S. Units of Measure	○ Units of Measure—U.S. System
<ul style="list-style-type: none"><li>• pound -lb</li><li>• ounce -oz</li><li>• gallon -gal</li><li>• quart -qt</li><li>• pint -pt</li><li>• fluid ounce- fl oz</li><li>• tablespoon -tbsp</li></ul>	<p><b>Weight</b></p> <ul style="list-style-type: none"><li>○ 1 lb=16 oz</li></ul> <p><b>Volume</b></p> <ul style="list-style-type: none"><li>○ 1 gal=4 qt</li><li>○ 1 qt=2 pt or 4 cups or 32 (fl) oz</li><li>○ 1 pt=2 cups or 16 (fl) oz</li><li>○ 1 cup=8 (fl) oz</li></ul>

<ul style="list-style-type: none"> <li>• teaspoon -tsp</li> <li>• inch -in.</li> <li>• Foot- ft</li> </ul>	<ul style="list-style-type: none"> <li>○ 1 (fl) oz=2 tbsp</li> <li>○ 1 tbsp=3 tsp</li> </ul> <p style="text-align: center;"><b>Length</b></p> <ul style="list-style-type: none"> <li>○ 1 ft=12 in.</li> </ul>
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### **METRIC UNITS**

In the metric system, there is one basic unit for each type of measurement

- The gram (g) is the basic unit of weight.
- The liter (L) is the basic unit of volume.
- The meter (m) is the basic unit of length.
- The degree Celsius (°C) is the basic unit of temperature

### **Baker's Percentage:**

- Bakers percentage express the amount of each ingredient used as a percentage of the amount of flour used
- The percentage of each ingredient is its total weight divided by the weight of flour multiplied by 100 % or

Total weight of ingredient

\_\_\_\_\_ X 100 = % of ingredients

Total weight of flour

- Thus flour is always 100%. If two kinds of flours are used the total weight is 100 %. Any ingredient that weighs the same as the flour is also given as 100%.

## **Physical & chemical changes during baking:**

- The changes undergone by a dough or batter as it bakes are basically the same in all baked products, from breads to cookies and cakes.

### ***1. Formation and expansion of gases***

- The gases primarily responsible for leavening baked goods are *carbon dioxide*, which is released by the action of yeast, baking powder and baking soda; *air*, which is incorporated into dough's and batters during mixing; and *steam*, which is formed during baking.
- Some gases — such as carbon dioxide in proved bread dough and air in sponge cake batters — are already present in the dough. As they are heated, the gases expand and leaven the product.
- Some gases are not formed until heat is applied. Yeast and baking powder form gases rapidly when first placed in the oven. Steam is also formed as the moisture of the dough is heated.

### ***2. Trapping of the gases in air cells***

- As the gases are formed and expand, they are trapped in a stretchable network formed by the proteins in the dough. These proteins are primarily gluten and sometimes egg protein.
- Without gluten or egg protein, most of the gases would escape, and the product would be poorly leavened. Breads without enough gluten are heavy.

### ***3. Gelatinization of starches***

- The starches absorb moisture, expand, and become firmer. This contributes to structure. Gelatinization of starches begins at about 150 ° F (65°C)

### ***4. Coagulation of proteins***

- Like all proteins, gluten and egg proteins coagulate or solidify when they reach high enough temperatures. This process gives most of the structure to baked goods. Coagulation begins when the temperature of the dough reaches about 165 ° F (74°C).

- Correct baking temperature is very important. If it is too high, coagulation will start too soon, before the expansion of gases has reached its peak. The resulting product will have poor volume or a split crust. If the temperature is too low, the proteins will not coagulate soon enough, and the product may collapse.

#### ***5. Evaporation of some of the water***

- This takes place throughout the baking process. If a baked product of a specific weight is required, allowance must be made for moisture loss when scaling the dough. For example, to get a 1-pound loaf of baked bread, it is necessary to scale about 18 ounces of dough.

#### ***6. Melting of Shortenings***

- Different shortenings melt and, release trapped gases at different temperatures, so the proper shortening should be selected for each product.

#### ***7. Crust formation and browning***

- A crust is formed as water evaporates from the surface and leaves it dry. Browning occurs when sugars caramelize and starches and sugars undergo certain chemical changes caused by heat. This contributes to flavor. Milk, sugar, and egg increase browning.