

HMPE 212
BREAD AND PASTRY 1
First Semester; A.Y. 2020-2021

Preparing Cakes Products

Lesson 1: Formulas and Measurements

Objectives

At the end of the session, you should be able to:

- ✓ Calculate for the baker's percentage and convert the recipe to another yield;
- ✓ Identify the different measuring abbreviation;
- ✓ Determine the standard table of weight and measure, temperature conversion table and cake pan size conversion table;
- ✓ Familiarize the ingredients that can be used to substitute; and
- ✓ Determine the correct technique in measuring dry and liquid ingredients.

Introduction

To start understanding the principles of baking, a pastry chef must gain mastery first on the formulas and measurement. The exact measurement indicated in the recipe is important in making a successful, flavourful baked cake. Aside from the measurement, conversion of temperature and cake pan size is also a challenge for a pastier.

Do not be afraid in the computation included in this lesson. Each lesson is discussed briefly and thoroughly to help you become the best pastry chef!

Baker's Percentage

As discussed earlier, the main ingredient in producing cake is the flour. Baker's percentage will rely solely on the percentage of the flour in a given recipe.

To compute for the baker's percentage in a recipe, the total weight of each ingredient is divided by the total weight of the flour. The result is then multiplied by 100 percent to get the percentage of the ingredient, or

$(\text{Total weight of ingredient} / \text{Weight of the flour}) \times 100\% = \% \text{ of the ingredient}$

Remember that the flour is always 100%. If there are 2 kinds of flour, their combined or total weight is still 100%.

Calculating the Percentage of Each Ingredient

Getting the baker's percent means getting the percentage of each ingredient. Baker's Percentage is not the percentage of the total yield but is used to show ingredient proportion. The advantage of knowing the baker's percentage is that you can adopt it for any given yield.

In getting the percentage, you will first need the list of ingredients needed in making cake. In this cake, use the ingredient and its yield in making butter cake.

Ingredient	Weight
All-purpose Flour	195 g
Cake Flour	180 g
Butter	227 g
Baking Powder	14 g
Salt	3.35 g
Sugar	350 g
Large Eggs	226.8 g
Vanilla Extract	8 g
Fresh Milk	302.5 g

1. Convert the weight of all ingredients into grams.
2. Get the weight of all types of flour used in making cake. In the example, add the weight of the all-purpose flour and the cake flour to get the total weight of the flour.

195 g + 180 g = 375 g total weight of the flour

This will be used as the given number in the denominator.

3. To compute for the baker's percentage of the all-purpose flour, divide its weight to the total weight of the flour multiply by 100%

195 g / 375 g = 0.52 x 100% = 52%

4. Another example is the percentage for butter. Divide its weight to the weight of the flour multiply by 100%.

The weight of the butter is 227 g, the total weight of all-purpose flour and cake flour is 375 g.

$$227 \text{ g} / 375 \text{ g} \times 100\% = 60.5\%$$

The portion of butter in the mixture is 60.5%.

Ingredient	Weight	Percentage
All-purpose Flour	195 g	52%
Cake Flour	180 g	48%
Butter	227 g	60.53%
Baking Powder	14 g	3.73%
Salt	3.35g	0.89%
Sugar	350 g	93.33%
Large Eggs	226.8g	60.48%
Vanilla Extract	8 g	2.13%
Fresh Milk	302.5g	80.67%
TOTAL	1506.95 g	401.76%

- 5.
6. Get the total weight of the ingredients. That will be the total weight of the dough. In this recipe, the batter weighs 1,506.95 g or 1.5 kg. Make use of the cake pan conversion to determine if the size of the pan is enough for the batter.

The total percentage of 402% parts, meaning the part of flour is 100, other ingredients is 302%.

Converting Formula to a New Yield

Supposedly, you need more or less weight of the batter. The dilemma faced by most pastier is the conversion of the recipe to a smaller or larger yield. Small changes in the measurement of the ingredients can greatly affect the outcome of the baked goods. Use this technique to convert the recipe or formula to a new yield.

For example, you have this butter cake recipe, but the batter of the recipe is enough for two 9-inch round pans. You only have one 9-inch round pan that would fit a 750 g batter. Having the formula that is 402% parts, this will determine the calculation of weight for each part.

1. To achieve the desired weight, divide it with the baker's percentage or the weight of each part. Round off the answer.

Desired weight of batter / baker's percentage = amount needed to make the desired weight

e.g. $750 \text{ g} / 402\% = 1.87 = 1.9$

2. To get the weight for each ingredient, multiply the total 1.9 to the percentage of each ingredient.

Ingredient	Weight	Percentage	Weight of the New Yield (in grams)
All-purpose Flour	195 g	$52\% \times 1.9$	98.8 g
Cake Flour	180 g	$48\% \times 1.9$	91. 2g
Butter	227 g	$60.53\% \times 1.9$	115 g
Baking Powder	14 g	$3.73\% \times 1.9$	7.09 g
Salt	3.35g	$0.89\% \times 1.9$	1.7 g
Sugar	350 g	$93.33\% \times 1.9$	177.3 g
Large Eggs	226.8g	$60.48\% \times 1.9$	114.9 g
Vanilla Extract	8 g	$2.13\% \times 1.9$	4 g
Fresh Milk	302.5g	$80.67\% \times 1.9$	153.3 g
TOTAL	1506.95 g	401.76%	763.34 g

NOTE: Formula balance is often referred to as the balance of ingredients. Good quality cake must have proper proportion. Remember that the tenderizing agents are sugar, shortening and egg yolk. The binding or toughening agents are flour, egg white and milk solids. In general, it is recommended to use same quantity of flour to sugar, except for High Ratio formulas. The density of the cake is determined by the egg content. The more egg content as compared to the flour and sugar, the lighter the sponge will be.

Common Measurement Abbreviation

Is the abbreviation Tbsp different from TB or T?’

This small detail causes confusion even among professional food workers. These measurement abbreviations can mostly be seen in recipes. They are not hard to master because they just simplify the units of measurement, like tablespoon, grams, etc.

Study and familiarize yourself with the different abbreviations.

Abbreviation/s	Description
C, c	Cup
G	Gram
Kg	Kilogram
L, l	Liter
Lb	Pound
mL, ml	Milliliter
Oz	Ounce
Pt	Pint
t, tsp	Teaspoon
T, TB, Tbl, Tbsp	tablespoon

Standard Table of Weight and Measure

Aside from the Baker's Percentage, another factor that contributes to make a perfect cake is the precise measurement of ingredients. But are you aware that there are differences in cup conversion and spoon sizes? Did you know that the U.S., U.K. and Australian Standard Weights have a different measurement of cups, teaspoons and quarts?

Best example is the measurement of cups.

In U.S., one cup is 237 milliliters.

In U.K., one cup is 227 milliliters.

In Australia, one cup is 250 milliliters.

One could also notice that the U.S. standard weight is usually pound (lb) or ounce (oz). You should also be aware that Australian recipes require the use of Australian standard measuring cups and spoon.

It is best to weigh by using a kitchen scale than to measure using a measuring cup. Although this is the case, measuring cups and spoons are frequently used in recipes because it is one of the most common and available household utensils.

STANDARD TABLE OF WEIGHT AND MEASURES

1 tablespoon (T or tbsp)	=	3 teaspoon (t or tsp.)
2 tablespoon	=	1/8 cup
4 tablespoon	=	¼ cup
5 1/3 tablespoon	=	1/3 cup
¾ cup plus 2 tablespoons	=	7/8 cup
16 tablespoon	=	1 cup(c.)
2 cups	=	1 pint
4 cups	=	1 quart
16 ounces	=	1 pound

COMMON UNITS OF WEIGHT

1 pound (lb.)	=	463.59 grams
1 ounce	=	28.35 grams
1 kilogram (kg.)	=	2.21 pounds
1 gram	=	.035 ounces
1 medium orange	=	¼ to ½ cup (slice)
1 medium apple	=	1 cup slice
14 oz. can condensed milk	=	1 ¼ cups
14 oz, can evaporated milk	=	1 2/3 cups
1 lb. brown sugar	=	2 ¼ cups (packed)
1 lb. confectioner sugar	=	3 ½ cups
1 lb. confectioner sugar	=	2 ½ cups
1 lb. nuts	=	4 ½ cups
1 lb. dried nuts	=	2 cups
5 whole eggs	=	1 cup
12 egg yolks	=	1 cup
8 egg whites	=	1 cup

COMMON UNITS OF VOLUME

1 bushel (bu)	=	4 pecks
1 peck (pk)	=	8 quarts
1 gallon (gal.)	=	4 quart
1 quart	=	2 pints
	=	964.4 milliliters
1 teaspoon (tsp. or t.)	=	4.9 milliliters
1 tablespoon (T. or tbsp.)	=	½ fluid ounce
	=	14.8 milliliters

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½ fluid ounce	14.8 milliliters
15 ounces raisins	3 cups
1 pound dates	2 ½ - 3 cups
½ pint whipping cream	2 cups whipped creams

Converting Units of Measure

Before converting the units of measure, you must understand first the conversion factors.

- A. When the number is multiplied by 1, the number stays the same. If the number has the same numerator and denominator, the fraction is equals to 1.

For example: $36 \times \frac{6}{6} = 36$

Take a look at the equation, 4 tablespoon = ¼ cup

It is the same as and can be interchanged.

- B. You can also cancel the units of measurement, if both can be seen in the numerator and denominator.

Converting Units

Suppose you want to convert 8 tablespoons into cup measurement. Use the formula 4 tablespoon = ¼ cup. Make sure the unit of measure tablespoon can be cancelled.

	The units of measure 'tablespoon' cannot be cancelled. Therefore, it must not be used.
	This should be used since the unit of measure 'tablespoon' can be cancelled, making the answer equal to cup.

C.

Now, multiply the values in the numerator, then divide it by the value of the denominator. In this case, change $\frac{1}{4}$ first into decimal by dividing the numerator, 1, to the denominator, 4, of the value $\frac{1}{4}$ to get 0.25 as its decimal value.

$$= 8 \times \left(\frac{1}{4}\right) = 8 \times 0.25 = 2 \text{ cups}$$

Or multiple 8 by 1, then divided by 4

$$= 8 \times \left(\frac{1}{4}\right) = 8 \times 1 = 8 / 4 = 2 \text{ cups}$$

Temperature Conversion Table

To bake a baker, you must know not only your oven, but also how to convert temperature from Celsius to Fahrenheit, and vice versa. You must also know if the oven to be used is electric, electric fan forced or powered by gas range.

Use this temperature conversion table to convert temperature depending on what is listed in the recipe and on the type of oven to use.

Is Fahrenheit different from Celsius?
Yes. In degrees Fahrenheit, water freezes at 32 degrees and boils at 212 degrees (at sea level). In degrees Celsius, water freezes at 0 degrees and boils at 100 degrees.

Fan forced, often known as fan baked or convection oven, works by letting the warm air circulate around the oven. That is why fan forced oven are usually 20°C lower than the regular or electric oven. However, this oven is not recommended to bake cakes because it makes the cake set too quickly than the desired time or gets dried out.

Celsius (°C) Electric	Celsius (°C) Fan Forced	Fahrenheit (°F)	Gas	Description
110	90	225	$\frac{1}{4}$	Very cool

120	100	250	½	Very cool
140	120	275	1	Cool
150	130	300	2	Cool
160	140	325	3	Moderately cool/Warm
180	160	350	4	Moderately Warm
190	170	375	5	Moderately hot
200	180	400	6	Fairly hot
220	200	425	7	Hot
230	210	450	8	Hot/Very hot
250	230	475	9	Very hot
260	240	500	10	Extremely hot

Cake Pan Size Conversion Table

In baking, we cannot ignore some instances that the pan required is not available. Use this chart to convert the required pan size to any of the listed alternative pan.

If the available pan size is not listed and has its unusual pan size, measure the amount of water it takes to fill the pan. Compare the volume in the chart and determine how much batter you need. You can also change the yield using baker's percentage, if needed.

If the alternative pan is used, fill the pan to half-way mark to ensure that it will rise evenly. Baking time may also change so change for doneness using your own method. Extra batter should not be disposed and can be used to make a few cupcakes.

Required Pan Size		Volume	Alternative Pan
	1 (8-inch) round cake pan	4 cups	1 (8 x 4)-inch loaf pan; 1 (9-inch) round cake pan; 1 (9-inch) pie plate

	2 (8-inch) round cake pans	8 cups	2 (8 x 4-inch) loaf pans; 1 (9-inch) tube pan; 2 (9-inch) round cake pans; 1 (10-inch) Bundt pan; 1 (11 x 7-inch) baking dish; 1 (10-inch) springform pan
	1 (9-inch) round cake pan	6 cups	1 (8-inch) round cake pan; 1 (8 x 4-inch) loaf pan; 1 (11 x 7-inch) baking dish
	2 (9-inch) round cake pans	12 cups	2 (8 x 4-inch) loaf pans; 1 (9-inch) tube pan; 2 (8-inch) round cake pans; 1 (10-inch) Bundt pan; 2 (11 x 7-inch) baking dishes; 1 (10-inch) springform pan
	1 (10-inch) round cake pan	11 cups	2 (8-inch) round cake pans; 1 (9-inch) tube pan; 1 (10-inch) springform pan

	2 (10-inch) round cake pans	22 cups	5 (8-inch) round cake pans; 3 or 4 (9-inch) round cake pans; 2 (10-inch) springform pans
	9-inch tube pan	12 cups	2 (9-inch) round cake pans; 2 (8-inch) round cake pans; 1 (10-inch) Bundt pan
	10-inch tube pan	16 cups	3 (9-inch) round cake pans; 2 (10-inch) pie plates; 2 (9-inch) deep dish pie plates; 4 (8-inch) pie plates; 2 (9×5-inch) loaf pans; 2 (8-inch) square baking dishes;

			2 (9-inch) square baking dishes
	10-inch Bundt pan	12 cups	1 (9×13-inch) baking dish; 2 (9-inch) round cake pans; 2 (8-inch) round cake pans; 1 (9-inch) tube pan; 2 (11×7-inch) baking dishes; 1 (10-inch) springform pan
	11 x 7 x 2-inch baking dish	6 cups	1 (8-inch) square baking dish; 1 (9-inch) square baking dish; 1 (9-inch) round cake pan
	9 x 13 x 2-inch baking dish	15 cups	1 (10-inch) Bundt cake pan; 2 (9-inch) round cake pans; 3 (8-inch) round cake pans; 1 (10 x 15-inch) jellyroll pan
	10 x 15 x 1-inch jellyroll pan	15 cups	1 (10-inch) Bundt pan; 2 (9-inch) round cake pans; 2 (8-inch) round cake pans; 1 (9 x 13-inch) baking dish

	9 x 5-inch loaf pan	8 cups	1 (9 x 2-inch) deep dish pie plate; 1 (10-inch) pie plate; 1 (8-inch) square baking dish; 1 (9-inch) square baking dish
	8 x 4-inch loaf pan	6 cups	1 (8-inch) round cake pan; 1 (11 x 7-inch) baking dish
	9-inch springform pan	10 cups	1 (10-inch) round cake pan; 1 (10-inch) springform pan; 2 (8-inch) round cake pans; 2 (9-inch) round cake pans
	10-inch springform pan	12 cups	2 (8 x 4-inch) loaf pans; 1 (9-inch) tube pan; 2 (9-inch) round cake pans; 1 (10-inch) Bundt pan; 2 (11 x 7-inch) baking dishes; 2 (8-inch) round cake pans

	8-inch square baking dish	8 cups	1 (9 x 2-inch) deep dish pie plate; 1 (9 x 5-inch) loaf pan; 2 (8-inch) pie plates
	9-inch square baking dish	8 cups	1 (11 x 7-inch) baking dish; 1 (9 x 2-inch) deep dish pie plate; 1 (9 x 5-inch) loaf pan; 2 (8-inch) pie plates

Substitution of Weights and Measure

In baking, substitution of one ingredient is sometimes necessary. But remember that using different ingredients can affect the taste and texture of the baked good, so it is also important to understand the role or part of the ingredient in the recipe.

Ingredient	Amount/ Weight of Ingredient	Substitution
All-Purpose Flour	1 tablespoon	$\frac{1}{2}$ tablespoon cornstarch or potato starch or rice starch or arrowroot starch
Cornstarch	1 tablespoon	2 tablespoon all-purpose flour
Cake Flour	1 cup sifted	$\frac{7}{8}$ cup all purpose flour sifted, 1 cup all purpose flour minus 2 tablespoon
Granulated Sugar	1 cup	1 $\frac{1}{3}$ cup brown sugar, lightly packed, 1 $\frac{1}{2}$ cup corn syrup minus $\frac{1}{2}$ to $\frac{1}{3}$ cup liquid
Honey	1 cup	1 $\frac{1}{4}$ cup sugar plus $\frac{1}{2}$ cup liquid
Chocolate	1 ounce	3 tablespoon cocoa plus 1 tablespoon fat

Baking Powder	1 tablespoon	$\frac{1}{4}$ teaspoon baking soda plus $\frac{1}{2}$ cup fully soured milk or lemon juice mixed with sweet milk to make $\frac{1}{3}$ cup, $\frac{1}{4}$ teaspoon baking soda plus $\frac{1}{4}$ to $\frac{1}{2}$ cup molasses, $\frac{1}{4}$ cream of tartar
Active Dry Yeast	1 teaspoon	1 package (7 gram) dry yeast compressed yeast cake
Whole Egg	1 piece	2 egg yolks or 3 tablespoon thawed from frozen eggs, 2 $\frac{1}{2}$ tablespoon sifted dry whole eggs powder plus 2 $\frac{1}{2}$ tablespoon lukewarm water
Egg Yolk	1 piece	1 $\frac{1}{3}$ tablespoon frozen egg yolk
Egg White	1 piece	2 tablespoon frozen egg white, 2 teaspoon dry egg yolk powder plus 2 teaspoon water
Unsweetened Chocolate	1 square	3 tablespoon cocoa plus 1 tablespoon fat
Butter	1 cup	1 cup margarine, $\frac{7}{8}$ to 1 cup hydrogenated fat plus $\frac{1}{2}$ teaspoon of fat, $\frac{7}{8}$ cup of lard plus $\frac{1}{2}$ teaspoon salt
Coffee Cream (20 percent)	1 cup	3 tablespoons butter plus about $\frac{7}{8}$ cup milk
Heavy Cream (40 percent)	1 cup	$\frac{1}{4}$ cup butter plus $\frac{3}{4}$ cup of milk
Whole Milk	1 cup	1 cup reconstituted non-fat dry milk plus 2 $\frac{1}{2}$ teaspoons of butter or margarine
Milk	1 cup	3 tablespoon of sifted non-fat dry milk plus 1 cup water, 6 tablespoons of sifted crystals plus 1 cup water
Butter Milk or Sour Milk	1 cup	1 tablespoon of vinegar or lemon juice plus enough sweet milk to make up 1 cup (let stand for 5 minutes), 1 $\frac{3}{4}$ teaspoon of cream of tartar plus 1 cup of sweet milk

Measuring Dry and Liquid Ingredients

Measuring both dry and liquid ingredients is an important task to do, especially if you are measuring using cups or spoons. There are specific instructions or procedures that should be followed to correctly get the desired weight or volume of each ingredient.

Oven temperatures

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times 5/9$$

$$^{\circ}\text{F} = (^{\circ}\text{C} \times 9/5) + 32$$

TEMPERATURE CONVERSION TABLE			
°CENTIGRADE (°C) TO °FARENHEIT (°F)			
50 - 122	110 - 230	170 - 338	230 - 446
60 - 140	120 - 248	180 - 356	240 - 464
70 - 158	130 - 266	190 - 374	250 - 482
80 - 176	140 - 284	200 - 392	260 - 500
90 - 194	150 - 302	210 - 410	270 - 518
100 - 212	160 - 320	220 - 428	280 - 536

Guidelines in Measuring Dry and Liquid Ingredients

- Sift the ingredients in a dry measuring cup, then level off using a spatula or a knife. If it is scooped directly from the bag, the flour will be compacted and will get more than what the recipe needs.
- Sift the dry ingredients. Fill the measuring cup until overflowing. Do not shake the cup. Level off with a spatula. Sifting is necessary if the ingredient is lumpy.
- For solid fats, fill the measuring cup while pressing until it is full. Level it with a spatula.
- Pour the liquid ingredient in a glass measuring cup. Check if it is filled up to the measuring mark. Do not lift the cup while measuring.
- It is best to weigh by using a kitchen scale than to measure using a measuring cup. Using a cup can make the amount intended less or more depending on how tight or packed the ingredient is to the cup. However, cups and spoon measures are frequently used because it is readily available as one of the common household utensils.

Note that “1 cup flour, sifted” is different from “1 cup sifted flour”. “1 cup flour, sifted” means you need to measure first, then sift the flour.

While “1 cup sifted flour” means you need to measure the already sifted flour.

Lesson 2: The Baking Process

Objectives

At the end of the session, you should be able to:

- ✓ Identify the function of gluten in the batter mixture;
- ✓ Explain the gluten development;
- ✓ Determine the ways to control the gluten development;
- ✓ Enumerate the sequence in the baking process; and
- ✓ Explain the techniques to slow down staling of baked cakes.

Introduction

Aside from formulas and measurement, another important lesson to understand is the role of ingredients in the baking process, especially the flour. After this lesson, you will completely understand how each ingredient helps and how it works from the mixing up to the baking process.

It will cover discussion on the gluten, a protein present in flour that gives shape to cakes, and is the reason behind why flour is considered as the major ingredient in cake making. The discussion on the sequence of the baking process and on the techniques to slow down staling are also discussed as the last topic of the lesson.

Mixing and Gluten Development

Understanding Gluten

Others may wonder what gluten is. Gluten refers to the protein substance present in wheat flour that gives shape and structure to the baked goods.

In order for the bread to develop structure, the gluten must first be developed. Gluten in wheat flour must first absorb water. As it is mixed or kneaded, the gluten forms strands that are long and elastic. As the batter is leavened, or is light and expanded before it is baked, the strands confine the gases in its tiny pocket and the product rises. When it is baked, the gluten rises and solidifies giving structure to the baked goods.

Controlling the Gluten

The concern of every Pastry Chef is the development of the gluten in the flour, not on the starch. Too much gluten makes the cake tough. Without - or less than the required - gluten can result to a cake that doesn't have good structure, or doesn't hold together.

If a recipe requires much gluten or large amount of flour, the end product of a cake would be firm and chewy.

If there is little gluten development, then the cake would be tender.

The ways that could control the gluten development would be the following:

- **Flour selection**

The flours are classified as either strong or weak based on their protein content. Strong flour refers to hard wheat that has high protein content. Weak flour refers to soft wheat that has low protein content.

That is why strong flours are used for breads, and weak flours are used for cakes.

Note that only the wheat flour develops gluten. If making bread from other grains such as rye, other than wheat flour, make sure the formula is balanced with some high-gluten wheat flour, or else the bread will be heavy.

- **Shortening**

As discussed in the previous lesson, any fat used in baking are called shortening. It is called 'shortening' because it shortens the gluten strands. It works by lubricating the strands so that they will not stick together. That is why fats are also called tenderizers.

Remember that making a cake with high fat content will make it crumbly, but too much of it will result to a weakened structure.

- **Liquid**

Liquid ingredients, such as water and milk, in a recipe can affect the development of gluten. As discussed in the introductory part of this lesson, gluten develops before baking, when the gluten proteins absorb the liquid. This greatly affects the toughness or tenderness of the cake being prepared. Recipe that calls for less liquid result to tender or soft cakes.

- **Mixing method**

Mixing of the batter also affects in the development of the gluten. The more the batter is mixed, the more it is developed. Cakes, together with the pie crust, muffins and other product that must be tender should be mixed for a short time. Meanwhile, bread dough are mixed and kneaded for a long period of time to develop gluten.

It is also possible to overmix the batter. This will result to the overstretching of the gluten strand causing it to break or to crack even after baking.

If the eggs are over whipped there is dull appearance and there is curdling. If there is no air, there will be a dull texture. It should be silky smooth with no sign of breakage.

The baking process is the same process from baking cakes to breads and cookies. This change happens in order, or at the same time, or not one after the other. Knowing each stage would help you how to control them.

1. Melting of fats
2. Formation and expansion of gases
3. Killing of yeast and other microorganism
4. Coagulation of proteins
5. Gelatinization of starches
6. Escape of water and other gases
7. Crust formation and browning

There is chemistry in baking! Recall the ingredients to be used and how it would help to bake high-quality, flavourful cakes. The ingredient that has an intimate chemistry includes the flour, leaveners, fats, sugar and eggs.

Stage 1. Melting of Fats

There is a reason why melted fats and even room temperature butter is done in the mixing process or while preparing the batter. As the fat melts, they release trapped gases and surround the air cell at different temperature. These gas bubbles from the melted fats make the baked goods more tender/soft, having melt-in-the-mouth texture, dividing the batter into delicate sheets.

Stage 2. Formation and Expansion of Gases

Some gases are present, some expand as they are heated. Gases formed from yeast and baking powder as it expands if they are heated. This expansion causes the cake to rise and transform, making the cell wall thinner as they are stretched. This expansion causes the product to become soft and tender. Aside from gases, steam is also formed as the moisture of the batter is heated.

Stage 3. Killing of Yeast and Other Microorganism

The batter may also contain other microorganism, such as bacteria and mold, in addition to the yeast. These microorganisms die when the temperature of the batter in the oven reaches about 140 degrees Fahrenheit or 60 degrees Celsius. Fermentation stops and no more gas are released when the yeast dies.

Stage 4. Coagulation of Proteins

When the temperature is high enough, protein such as gluten and egg proteins solidify or coagulate. This gives structure to the baked goods.

That is why baking temperature is crucial in cake making. If the coagulation starts soon caused by too high temperature, the solidification will start too soon before the expansion of gases complete. This will result to baked goods that has poor volume or split gas.

If the temperature is too low, the product may not solidify or not set enough, making the product collapse.

Stage 5. Gelatinization of Starches

The starches will then absorb the moisture, enabling it to expand and become firm.

Stage 6. Escape of Water and Other Gases

As you bake the cake, water and gases are released due to its rise in temperature, but this happens fastest in the last stages of baking. Note that water evaporation decreases the weight of the baked good, as it enables crust formation.

Stage 7. Crust Formation and Browning

As water evaporates or escapes as explained in stage 6, it enables the formation of crust and browning. Browning is due to the caramelization or browning of sugar, while the starches and proteins undergo Maillard browning that contributes to its flavour. Another factor that increases the browning is the inclusion of milk, sugar and egg in the recipe.

Staling

What is Staling?

The main concern of the baker is to make the cake fresh and flavourful, while keeping its structure intact. Staling refers to the change of texture and aroma of the baked goods. This is due to the loss of moisture made by the starch granules and the structure changes of the baked cake. Having the cakes stale makes it firmer, drier and more crumblier.

Techniques to Slow Down Staling

Losing the freshness and palatability of the cake decreases the consumer acceptance of the baked products. The 3 techniques that can be used to slow down staling of freshly baked cakes, are:

- 1. Protecting the product from air.**

To protect the product, wrap the cake bases with or without icing in a cling wrap or plastic.

- 2. Adding moisture retainers to the formula.**

Ingredients that can retain moisture are fats and sugars. Products that are high in these have less chance of being stale. For longer keeping, small amount of fat or sugar can be added to the formula. The moisture retained will also increase the holding capacity of the baked cake.

- 3. Freezing.**

Cakes that are frozen before they become stale can maintain its quality for a longer period of time. These cake bases should be served after thawing or losing its stiffness by being warmed.

Refrigerating, on the other hand, can increase speed of staling. Refrigerating can only be done in storing cream fillings.

Lesson 3: The Production Process

Objectives

At the end of the session, you should be able to:

- ✓ Enumerate and identify the different cake and sponge production methods;
- ✓ Demonstrate the correct baking techniques;
- ✓ Determine the ways to control the gluten development;
- ✓ Determine the correct oven condition; and
- ✓ Identify the enterprise requirements and standards in cake making.

Introduction

The gluten development, baking process and techniques to slow down staling are clearly discussed in the previous lesson.

In this lesson, the focus will be on the production process. The scope is on the different cake and sponge production method, correct baking techniques, correct oven condition and enterprise requirements in cake making.

Cake Production Methods

There are five (5) main cake production methods to be discussed in this lesson, namely: sugar batter method, flour batter method, blending method, all-in method and boiling method.

Sugar Batter Method It is a method where fat, such as egg, and sugar are creamed together until the batter is light and fluffy.

Adding the egg per piece ensures that each fat mixture is fully incorporated, well creamed and not separated before adding another. Another important factor in this method is the temperature of the eggs. The curdling or the thickening, solidifying and separating of mixture into lumps is due to too cold egg used in the batter. Curdling forms as the fat separates out from the liquid.

If the egg is too cold, the fat hardens, air escapes, and the mix curdles or forms into lumps. If the egg is too warm, the fat becomes oil, air escapes and the mix curdles. If the egg is added too fast, it will make the mix saturated, that will make the air escape, making the mix curdle.

Note that after adding all the eggs, the batter should have a soft, smooth and thick texture. Over mixed batter will make the cake tough.

Flour Batter Method

It is a method where fat is mixed with one-third (1/3) of the sifted flour for around 8 minutes until it is fully creamed. This is done to ensure that the batter is fully incorporated and aerated (introduce air into the batter).

Note that the egg and sugar are whisked in a different or separate bowl. Both ingredients must be on the same temperature before they are combined.

To adjust consistency, some of the egg mixture can be mixed into the fat. Then the remainder of the eggs, together with the sifted flour, baking powder and liquid (must be in order) can be carefully folded into the fat mixture. Each ingredient must be added fully and must be in sequence to avoid any lumps.

Blending Method

This method does not require creaming or aeration of fat with sugar or flour as the first step like sugar or flour batter method, but is done as the last step in the mixing cycle.

The reason behind the creaming done in the end is because the formula or recipe container has high level of liquid, in the form of milk that replaces some of the egg.

Using this method relies solely on the fat, egg white and small amount of gluten to hold the air, but are not very strong to form a structure. Remember that the trapped air tenderizes and softens the protein found in fat, egg, and flour.

Less amount of the egg will lower its aerating capacity that is why adding baking powder to the formula will compensate and will give off extra gas (CO₂) to increase lift during baking. Adding glycerine to the batter will also increase the moisture retention or holding capacity of the cake and will act as emulsifier that will help hold and combine extra liquids with fat.

The two variations in this method include the two stage method and three stage method. These methods are used to produce 'high ratio cakes'. These cakes are sweeter and moister because of its capability to take more liquid and sugar.

Two Stage Method

Done by mixing all the ingredients except for the eggs and any liquid. The remaining ingredients, such as eggs and liquid, are added in intervals into the flour mix, creaming it for 3 to 5 minutes until the batter is light.

Three Stage Method

This method is done by adding half of the flour into the mix after initial creaming, for 3 minutes using a beater set on low speed, then adding the remainder of the flour and creaming it on low speed.

All in Method

This is used in making cheaper types of cake. It is when eggs are replaced with baking powder and liquid. This method is commonly used with high speed mixers, for 6 to 7 minutes.

Boiled Method

This method is used in making Genoese sponges and Madeira cakes. It is also considered to be the safest because of its small list of troubleshooting, but is rarely used in the manufacturing.

To do this method, heat the fat to 50 degree Celsius and stir well until completely cleared. Eggs and sugar are whisked until stiff peak and are added into the flour mixture in 4 to 5 additions (or parts divided equally).

Sponge Production Methods

Sponge Production Methods

Note that the weighing and mixing equipment to be used in a recipe that follows sponge production method must be free from grease for this may greatly affect the batter.

Traditional Method (Orthodox Sponge) This egg sponge has the ration of 2 parts egg : 1 part sugar : 1 part flour.

Its light texture is due to whisking together of eggs and sugar on high speed, followed by folding of flour. Nowadays, formula may also contain some baking powder and butter.

For better result, mixture is whisked on medium speed for short time and the batter must fill into the baking sheets and baked immediately. Sifted flour is also folded carefully into the butter so as not to lose the trapped air.

Enriched Method (Genoese Sponge) This method is the same as the traditional sponge but it contains fat that is up to 80% of the sugar weight. Sifted flour must be incorporated in the mixture, followed by the folding of melted butter in cool temperature. If the butter is too hot, the egg will curdle (or form lumps).

Emulsified or Stabilized Sponges This method is most widely produced using the all-in method with a stabiliser or emulsifier. This emulsifier often contains lecithin and lacto albumen that binds incompatible substances like water and fat to form an emulsion. This can be stored longer because of the established emulsion that retains

the condition of the cake. This usually contains water and proportion of baking powder.

Delayed Soda Method After the sponge is aerated, the baking powder will be added. This is not added at the same time to gain better aeration.

To do this method, liquids are placed in a mixing bowl. In another bowl, dry ingredients including the cream of tartar are sifted. Dry ingredients will then be added into the liquids. Followed by the mixture of the batter until it is aerated.

Cream of tartar is used to increase stability of proteins in eggs. Bicarbonate of soda is mixed with cold water, and then must be added slowly to the batter. Mixing it first with cold water will retain its ability to aerate the sponge. The batter should be baked immediately in a pre-heated oven.

Separated Sponges This method as the name implied has a separated mixture. This is when the egg yolks and whites are whisked separately with some sugar. It will then be combined and the sifted flour will be folded in.

Whisking egg yolk needs some water for better aeration. Egg whites must not be overbeaten to prevent lumps in the batter.

The Correct Baking Techniques

The start of a good result is in the mixing bowl. These baking techniques are skills that must be learned because it greatly affects the texture of the prepared batter.

Listed are the correct techniques that can be used in cake making:

- **Sifting.**

This is done by passing the dry ingredients through a strainer to aerate it (e.g. sifting of flour).

- **Beating.**

It is a technique where ingredients are moved strenuously in a back and forth, and up and down motion until the correct consistency is achieved (e.g. beating of eggs).

- **Whisking or Whipping.**

It is done by mixing the ingredients vigorously until it adheres together (e.g. whisking or whipping the heavy cream and egg whites). Airy and foamy like texture of angel food, sponge and chiffon cake are formed when whole eggs or white eggs are whipped until voluminous, then folded into the batter. The air incorporated by whipping the eggs gives the cake volume, making it springy and elastic.

- **Folding.**

It is a technique of gently adding one ingredient into another using a large spoon or spatula (e.g. folding whipped cream and melted chocolate to make mousse).

- **Creaming.**

This is done by blending several ingredients together until the consistency is smooth, lighter and fluffier (e.g. creaming the sugar and butter). The soft, fine texture and moistness of butter cakes like pound cake and moist cakes are from the crumble, or first creaming together the fat and sugar, adding eggs, and slowly incorporating dry ingredients while alternating it with a liquid such as milk or buttermilk.

- **Piping.** This technique is used to decorate cakes. To do this, squeeze the piping bag from the top using your dominant hand, and let the tip of the bag rest on your other hand.

The Correct Oven Settings

Oven Settings for Cakes

Oven should be in 'solid heat', with temperature set to 150 to 180 degrees Celsius. Solid heat means that the oven should have stabilized within this temperature for 15 to 20 minutes before placing the cake.

To prevent premature coloring of cake surface, a baking pan can be covered with sheets of clean paper for approximately 50% of baking time.

To test the internal temperature and test whether the cake is baked, use an oven thermometer. The baking process is considered complete when the center of the cake reached gelatinization, having 87 to 90 degrees Celsius in temperature.

Skewer can also be used to test if the cake is already baked. It should be inserted into the cake and must come out clean.

Oven Settings for Sponges

Sponge cake and Genoise cake will cook quicker in an oven temperature of 180 to 200 degrees Celsius, because of its lighter density.

Gelatinization and coagulation happens quickly, having less drying out of product. Sponge sheets can be baked at 220 to 230 degrees Celsius for about 7 minutes.

Tips in Using the Oven

- It is important to know the oven that you will use, as you bake any type of cake. Get oven thermometers to make sure that the oven is calibrated correctly. Placing the oven thermometer inside the oven will assure that the cake will not be underdone or overdone.
- Place the cake in the middle of the oven because placing it too close to the top or bottom can cause overbrowning. Gently close the oven afterwards.
- Rotate the pans during baking. Do this until the two -thirds of the way through baking time to prevent collapse. If using more than one rack, it is time to swipe the pans.
- Do not remove the cake from the tin pan until it is cold to avoid damage. Cold cake bases must be wrapped immediately to prevent staling.

Enterprise Requirements and Standards in Cake Making

The characteristic of a desired cake product are the following:

1. Color of the Product

The color of the product, when removed from the oven, is important to stimulate the senses of the customer. Color can also be a factor that could encourage customer to purchase the product.

2. Appearance

This refers to the shape and form of the cake base. It is important to have consistency in appearance.

3. Mouth Feel and Eating Properties

Another important element considered is the eating properties of the cake. This is achieved if the maintenance in cake production is achieved.

4. Moisture Content

As discussed on the precious lesson, the more moisture content the cake has, the less chances for it to be stale. Staling refers to the loss of aroma and freshness of any baked goods. Moisture also adds to the shelf life and mouth feel of the cake.

5. Consistency

The texture and consistency refers to how it feels in the mouth when the consumer is tasting the product. This also means that the batter is fully incorporated to achieve consistency.

Lesson 1: Baking Sponges and Cakes

Objectives

At the end of the session, you should be able to:

- Differentiate varieties of sponge and cake base; and
- Demonstrate how Butter, Sponge, Genoese, Pound, Madeira and Chiffon cake bases are prepared.

Top of Form

Bottom of Form

Introduction

In this courseware, we will learn how cake bases, fillings, coatings, icing and decorations are prepared. To start off, the first lesson will focus on how to prepare different varieties of cake. These include in making cake bases such as Butter Cake, Sponge Cake, Genoese Cake, Pound Cake, Madeira Cake and Chiffon Cake.

Baking Sponges and Cakes

Butter Cake

The main ingredient of this cake is the butter. This consists of the basic ingredients such as the butter, sugar, egg, flour, and a leavening agent – the baking powder. The mixing and production method that can be used in making this cake are the creaming method, blending method or combining method. Among these, the creaming method is commonly used since it produces the lightest cake with greater volume. The goal of this method is to incorporate maximum air into the batter to achieve the desired volume, to restrict the development of gluten, to provide structure and tenderness to the product, and to have uniform batter.

Example:

Yellow Butter Cake

Inspired by The Martha Stewart Show Yield: Makes two 9-inch cake layer Tools and Equipment: Two 9-by- 2 inch round cake pan, parchment paper, pastry brush, sifter, rubber spatula, cake board, electric mixer, wire rack, oven, cake tester, mixing bowls

Ingredients

2 sticks (1 cup/227 g) unsalted butter, room temperature, plus more for pans
1 1/2 cups (195 g) all-purpose flour, plus more for pans
1 1/2 cups (180 g) cake flour
1 Tbsp. (14 g) baking powder

1/2 tsp salt
1 3/4 cups sugar
4 pcs. large eggs (200 g without shell)
2 tsp pure vanilla extract
1 1/4 cups fresh milk

Procedure:

1. Preheat the oven to 300 degrees Fahrenheit. Line the bottom of two 9-by-2-inch round springform pans with parchment paper. Butter parchment paper and dust with flour, tapping out excess. Set aside. In a medium bowl, sift together the all-purpose flour, cake flour, baking powder and salt. Set aside.
2. Using a mixer set in medium speed, beat the butter and sugar until light and fluffy for 3 to 4 minutes, scraping down the sides of the bowl as needed. Beat in eggs, one at a time, then beat in vanilla. With the mixer on low speed, add the flour mixture in three parts, alternating with the milk. (Your sequence must begin and end with the flour.) Beat until combined after each addition.
3. Divide batter between the prepared pans, and smooth with an offset spatula. Bake at 300°F for 30 to 35 minutes, rotating the pan halfway through, until cake is golden brown and a cake tester inserted into the center comes out clean. Transfer the pan to a wire rack to cool for 20 minutes. Invert the cake onto the rack. Peel off the parchment. Invert the cake and let it cool completely, top side up.

Sponge cake is a soft, light cake that contains eggs beaten into foamy consistency. It is used as the base in making Swiss roll.

Example:

Swiss Roll

Yield: 7 to 8 sliced rolls Tools and Equipment: 12.5-by-8.5 inch baking sheet, mixing bowls, whisk, spatula, parchment paper, oven, wire rack, pastry brush, cake tester

Ingredients

3/4 cup (90 g) sifted cake flour
½ tsp (2.5 g) sifted baking powder
¼ tsp salt
4 pcs. (72 g) egg yolks

½ cup sugar, divided into half
4 pcs. (120 g) egg whites
1 tsp vanilla
3 Tbsp. water
1 tsp lemon extract
1/8 tsp cream of tartar

Procedure:

1. Preheat the oven to 300 degrees Fahrenheit for 10 to 15 minutes. Butter the 12.5-by-8.5 inch baking sheet and line its bottom with parchment paper. Butter the parchment paper.
2. Using a spatula, mix the flour, baking powder, ¼ cup sugar and salt. Set aside.
3. Beat egg yolks with a wire whisk. Gradually add the dry ingredients alternately with water until all dry ingredients were added. Add vanilla and lemon extract. Set aside.
4. In a separate bowl, beat egg whites using a mixer set on low speed. Do this until you've reached the soft peaks stage. Gradually add the 1/8 teaspoon cream of tartar and the remaining ¼ cup sugar. Beat until the sugar dissolves, having a stiff texture.
5. Cut and fold the flour mixture with the egg white mixture. Pour the mixture in the rectangular pan line with parchment paper and smooth with a spatula.
6. Bake at 300°F for 10-15 minutes. Insert the cake tester making sure it comes out clean. Transfer pan to a wire rack to cool for 15 minutes.
7. Lay the parchment paper on the table and dust it with confectioners' sugar. Invert the cake on the prepared parchment paper. Cut off any hard crusty edges. The cake base in making Swiss Roll is now ready.

It is a French Sponge Cake - it is like a regular sponge cake, but with added butter. Having added butter, makes it more tender and flavourful. This type of cake is made to rise by beating air into the eggs, without using baking soda or baking powder.

Example:

Genoese

Inspired by The Martha Stewart Show, December Holiday 2007

Yield: Makes one 10-inch round cake

Tools and Equipment: 10-inch round springform pan, parchment paper, mixing bowl, sifter, whisk, heatproof bowl, gas range, electric mixer, spatula, knife, wire rack, oven

Ingredients

8 large eggs, room temperature
1 1/3 cups granulated sugar
1 ½ tsp vanilla extract
1 ¾ cups all-purpose flour, plus more for dusting
1/8 tsp salt
1 stick (8 Tbsp.) unsalted butter, melted and cooled
1/8 stick unsalted butter, room temperature, for the pan

Procedure:

1. Preheat oven to 350 degrees Fahrenheit. Butter a 10-inch round springform pan. Line bottom with parchment paper cut to fit, and coat it with butter. Dust with flour, and tap out excess.
2. Sift the flour and salt in a bowl. Set aside.
3. Whisk together eggs and sugar in a large heatproof bowl. Set bowl over a pan of simmering water, and whisk until mixture is warm and sugar has dissolved, for about 3 minutes.
4. With a mixer set on high speed, beat egg mixture until it is pale and very thick for about 12 minutes. Beat in vanilla. Add the sifted flour mixture over the egg mixture in 3 parts, folding gently with a spatula. When the batter is almost incorporated, place about 1/2 cup of this mixture into the bowl containing the melted butter. Pour this back to the main batter and gently fold until completely incorporated.

5. Gently pour the batter into a prepared pan. Bake at 350°F for 30 to 35 minutes or until a toothpick inserted into center of cake comes out clean, and the top springs back when lightly touched. Let the cake in the pan cool completely on a wire rack.
6. Run the knife around the sides of the pan. Invert cake onto rack and remove parchment.

Pound Cake(see video)

From the word itself 'pound', this type of cake is traditionally made with a pound of flour, butter, eggs and sugar. Additional flavourings or dried fruits can also be added.

Example:

Classical Pound Cake

Inspired by Martha Bakes, February 2011

Yield: Makes 2 loaves

Tools and Equipment: 9-by-5-by-3 inch loaf pans, pastry brush, sifter, electric mixer, straight edge spatula, wire rack, oven, offset spatula, cake tester

Ingredients

- ✓ 3 sticks (1 ½ cup/340 g) unsalted butter, room temperature, plus more for pans
- ✓ 4 cups (400 g) sifted cake flour, plus more for pans
- ✓ 1 tsp salt
- ✓ 4 tsp (18 g) baking powder
- ✓ 2 ¾ cups sugar
- ✓ 8 pcs. eggs, room temperature (400 g without shell)
- ✓ 1 cup milk, room temperature
- ✓ 2 teaspoons pure vanilla extract

Procedure:

1. Preheat the oven to 325 degrees Fahrenheit. Butter the two 9-by-5-by-3-inch loaf pans and dust it with flour. Set aside.
2. Sift the flour with the salt and baking powder two times and set aside.

3. With an electric mixer set on medium speed, cream the butter until fluffy. Add the sugar gradually, beating until light and fluffy.

4. Add the eggs, one at a time, beating well after each addition. Add the flour mixture to the butter mixture, alternating with the milk and vanilla. Stir only until thoroughly blended.

5. Pour batter into the prepared pans, making sure to divide the batter evenly between the two pans. Level tops with an offset spatula. Bake at 325°F for about 1 1/2 hours, until the cake tester comes out clean. Let the cake cool in the pan for about 10 minutes, then invert to a wire rack to cool thoroughly.

Serving suggestion: Plate the cake with a teaspoon of cream cheese and blueberry on the side. Dust it with confectioners' sugar.

Madeira Cake(see video <https://www.e-tesda.gov.ph/mod/lesson/view.php?id=1547&pageid=1829>)

Madeira Cake, also known as English Pound Cake, is derived from the pound formula. This traditional English cake is from an 18th to 19th century recipe similar to pound formula but is flavoured with lemon zest and almond.

Example:

Madeira Loaf Cake

Inspired by bbcgoodfood.com, January 2012

Serving: 8 slices

Tools and Equipment: 9-by-5-by-3 inch loaf pan, pastry brush, greaseproof paper, electric whisk, wooden spoon, skewer, wire rack, oven, mixing bowls, cake tester

Ingredients

175 g butter, softened, plus extra for greasing

175 g caster sugar

3 pcs. large eggs (150 g without shell)

1 lemon zest

¼ tsp vanilla extract

220 g all-purpose flour

1 ½ tsp baking powder

½ tsp salt

50 g ground almonds

Procedure:

1. Heat oven to 325 degrees Fahrenheit. Butter and line the base of 9-by-5-by-3 inch loaf pan with parchment paper.
2. In a bowl, mix the all-purpose flour, baking powder and salt. Set aside.
3. In another bowl, beat together the butter and sugar with a mixer on medium speed. Do these until the mixture is light and creamy, then beat in the eggs one at a time. Add the lemon zest and vanilla. Now beat in the flour mixture and almonds until you have a thick batter. The batter should be loose enough that it falls off a wooden spoon. If it's too thick, mix in 2 Tbsp. of milk.
4. Tip the batter into the tin and smooth over the top with a spatula. Bake at 325 °F for 35 to 40 minutes until the cake tester inserted in the middle comes out clean. Remove from the oven then leave to cool for 15 minutes. Remove from the pan, peel away the paper and leave on a wire rack to cool completely before slicing. The loaf can be kept in an airtight container for three days.

Chiffon Cake(see video)

Chiffon Cake is a very light cake with spongy texture that is made with vegetable oil, eggs, sugar, flour, baking powder and flavouring such as vanilla extract. Since it contains egg yolks and oil, it is expected that this cake is much richer compared to other cakes.

Example:**Chiffon Cake**

Inspired by Martha Stewart Living, June 2012

Yield: 12 servings

Tools and Equipment: 9 ½ inches in diameter by 4 ½ inches deep tube pan, electric mixture, spatula, paring knife, cake plate or platter, mixing bowls, wire whisk, cake tester

Ingredients

- 2 1/4 cups (270 g) cake flour
- 1 1/2 cups white granulated sugar, divided
- 2 1/4 tsp (11.25 g) baking powder
- 3/4 tsp salt
- 1/2 cup vegetable oil or corn oil

7 pcs. (126 g) large egg yolks plus 9 pcs. (270g) large egg whites
3/4 cup whole milk
1/2 tsp cream of tartar
2 tsp pure vanilla extract

Procedure:

1. Preheat oven to 325 degrees Fahrenheit. Cover the 9 ½ - by – 4 ½ deep tube pan with butter. Set aside.
2. In a bowl, whisk together cake flour, 3/4 cup white granulated sugar, baking powder and salt. Set aside. Whisk together in another bowl the egg yolk, milk and oil. Gradually incorporate the flour mixture into the egg yolk mixture and mix it using a wire whisk. Set aside.
3. Beat egg whites with a mixer on high speed, until frothy. Add cream of tartar and vanilla extract, and beat until soft peaks form. Gradually add remaining 3/4 cup white granulated sugar, beating until stiff, glossy peaks form for about 5 minutes. Whisk one-third of the egg-white mixture into batter. Gently but thoroughly fold in remaining egg-white mixture with a spatula.
4. Transfer the batter to the tube pan. Bake at 325°F for 52 to 55 minutes or until top of cake springs back when touched. Let cool upside down for 1 hour.
5. Slide a knife around edges of tube and side of pan, and then release the cake.

Serving Suggestion: Cut the cake horizontally into 2 layers with a serrated knife. Transfer bottom later to a cake plate. Spread the whipped cream and blueberries. Top with the remaining cake layer and sprinkle with confectioners' sugar.

Unit 4: Preparing Fillings, Coatings, Icing and Decoration

Lesson 1: Preparing Fillings and Coatings

Objectives

At the end of the session, you should be able to:

- Determine the techniques to decorate cake;
- Differentiate different fillings and coatings used in cake making; and
- Demonstrate how Buttercream, Creme Patisserie and Ganache are prepared.

Introduction

In the last module, we learned about making 6 different cake bases, namely, Butter Cake, Sponge Cake, Genoese Cake, Pound Cake, Madeira Cake and Chiffon Cake.

In this module, the topic will be first about fillings and coatings, followed by icing and decoration.

Fillings are the icing mixture inserted between the cake to enhance the taste and the layering of the cake.

Whereas **coatings** are the mixture used to cover the cake. Procedure in making fillings and coating such as Buttercream, Cream Patisserie and Ganache will be the focus of this lesson.

Remember that fillings, coating and icing need to compliment the cake. It must also add eye appeal and flavor to the cake base.

Decorating the Cake

Before studying the procedure on how to prepare different fillings, coatings, icing or decoration, let us study first the basic decoration skills needed to be practiced and will be used as go along with the lesson.

Decoration of cakes involves personal style of the pastry chef. It includes:

Spreading of the cream

Spread the cream with the use of the spatula. Even thickness should be shown across the layer of the cake.

Piping of cream or icing

Piping can be either single layer or double layer. The piping size should all be the same and should be in balance with the size of the cake.

Curling chocolate

Tempered chocolate can be used to decorate the cake. It can be shaved and curled.

Enrobing

Enrobing is the action of applying the glaze, such as icing or ganache, to the exterior of the cake.

Consistency of design

In decorating cake, the following consideration should be taken account: symmetry, consistency in the size of the decoration, and balance across the products.

Buttercream

Buttercream, also known as butter cream, butter icing or mock cream, is the traditional choice used to fill and coat the cake. It is due to its flavor and versatility. It also softer and more spreadable compared to other icings.

Example:

Vanilla Buttercream Frosting

Yield: 3 cups

Tools and Equipment:

- *hand mixer or electric mixer*
- *lazy susan*
- *straight edge spatula*
- *mixing bowl*

Ingredients

2 sticks (1 cup/227 g) unsalted butter, softened
3 ½ cups confectioners' sugar
1 tsp fresh milk
1 tsp vanilla extract
1/8 tsp salt

Procedure:

1. Cream room temperature butter with a hand mixer set on medium speed until the texture is smooth and fluffy. Gradually beat in confectioners' sugar until fully incorporated. Beat in the salt until blended.
2. Add the vanilla and milk, and beat for an additional 3 to 5 minutes or until smooth and creamy.

Serving Suggestion: Use vanilla buttercream to coat a 9-inch cake. Top it with blueberry.

Crème Pâtisserie(see video)

Crème Pâtisserie, known as pastry cream or vanilla custard, is an important ingredient used in many French recipes. This is a classic creamy custard commonly used as fillings not only for cake but also for tarts and pastries. This can also be used as fillings to make Swiss Roll.

Example:

Crème Pâtisserie/Vanilla Custard

***Yield:** Makes 1 ¼ cups*

Tools and Equipment:

- *small saucepan*
- *stove*
- *whisk*
- *lazy susan*
- *straight edge spatula*
- *mixing bowl*

Ingredients

1 cup evaporated milk
3 pcs. (54 g) large egg yolks
3 Tbsp. sugar
3 Tbsp. all-purpose flour
1 tsp pure vanilla extract

Procedure:

1. In a small saucepan, bring the milk to a boil over medium heat. Meanwhile, whisk egg yolks and sugar together in a bowl. Add flour, and mix until smooth and free of lumps.
2. Thin egg-yolk mixture with approximately 1/4 cup of warm milk. When remaining milk begins to boil, add it to egg-yolk mixture, and stir well. Return to saucepan, and place over high heat. Cook, whisking constantly, until pastry cream thickens and boils for about 1 minute.
3. Reduce heat to medium, and cook, whisking constantly, until cream becomes shiny and easier to stir for about 2 minutes more.

Serving Suggestion: Use the filling to make Swiss Roll. Dust the parchment paper with confectioners' sugar. Lay the cake on the paper and evenly spread the filling using a spatula. Roll the sponge gently and tightly. Leave it for a few minutes before serving.

Ganache

Ganache (pronounced as guh-nahsh) is a chocolate whipped frosting, filling or paste made from chopped chocolate and heavy cream. This is prepared by heating the cream and stirring it into the chocolate.

Example:

Ganache

Yield: 3 cups

Tools and Equipment:

- *serrated knife*
- *chopping board*
- *medium saucepan*
- *stove*
- *whisk*
- *wooden spatula*
- *mixer*
- *lazy susan*
- *straight edge spatula*

Ingredients

16 oz (454 g) semisweet or bittersweet chocolate (61 percent cacao)

2 cups heavy cream

¼ tsp coarse salt

Procedure:

1. Coarsely chop the chocolate bar using a serrated knife.
2. Bring the heavy cream just to a boil over in a medium to high heat. Pour over the chocolate, and add salt. Let it stand for 5 to 10 minutes or until the chocolate is melted. Do not stir because this will cool the ganache

too quickly, making it grainy.

3. After 5 to 10 minutes of melting the chocolate, stir the mixture with a whisk until smooth and shiny. This is done to break up any pieces and to emulsify the cream and chocolate.
4. Scrape the chocolate on the bottom or sides of the bowl using a wooden spatula to incorporate all of it.
5. Let the ganache cool to room temperature, stirring often for 45 minutes to 1 hour. Beat it with a mixer on medium-high speed for 2 to 4 minutes or until paler and fluffy.

Serving Suggestion: Spread the ganache evenly on a 9-inch cake using an offset spatula. Sprinkle the top with chocolate chips and confectioners' sugar

Unit 4: Preparing Fillings, Coatings, Icing and Decoration

Lesson 2: Preparing Icing and Decoration

Objectives

At the end of the session, you should be able to:

- Differentiate different icings and decorations used in cake making
- Demonstrate how Boiled Icing, Royal Icing and Fondant Icing are prepared

Introduction

On the previous lesson, the procedure in making fillings and coatings was clearly discussed. This includes procedure in making Buttercream, Cream Patisserie and Ganache.

To completely prepare and decorate the cake, we will now study on how to prepare icing and decoration, such as boiled icing, royal icing and fondant icing. Procedure on how to prepare piping bag, how to pipe royal icing leaf and flower are also include

Boiled Icing(video)

Boiled Icing is a light, fluffy icing decoration that can be used in any type of cake or cupcakes.

Example:

Boiled Icing

Tools and Equipment:

- *pipng bags*
- *pipng nozzles*
- *saucepan*
- *bowls*
- *whisk*
- *offset spatula*

Ingredients

4 pcs. (120 g) egg whites
½ tsp. cream of tartar
2 cups sugar
½ cup water
2 Tbsp. corn syrup

Procedure:

1. Boil the sugar, water and syrup together over low heat for 3 to 5 minutes until it form threadlike texture. Do not stir the mixture.
2. Beat the egg white and cream of tartar until soft peaks. Set aside.
3. Gradually add the boiled mixture to the beaten egg whites.
4. Coat the cake with boiled icing using an offset spatula.

Serving Suggestion: Color the icing with blue liquid food coloring. Pipe the boiled icing onto the side of the cake and topped it with flower royal icing.

Royal Icing

Royal Icing is a hard, white icing made from softly beaten white eggs, confectioners' sugar and kalamansi or lemon extract. This is the recommend icing to make icing leaves and flowers.

Royal Icing

Tools and Equipment:

- *piping bags*
- *piping nozzles*
- *bowls*
- *mixer*
- *pastry bag*
- *Ateco tip number 69*
- *Atelco closed star tip number 852*
- *Atelco tip number 264*
- *toothpick and foam pad*
- *coupler*

Ingredients

2 ½ cups confectioners' sugar
2 pcs. (60 g) egg whites
1 pc. Kalamansi extract
Food color/s

Preparing Icing Procedure:

1. With a mixer set on low speed, whisk the egg whites until soft peaks.
2. Gradually add the confectioners' sugar. Continue whisking until all sugar is added and completely incorporated. If the mixture is too thick, add more egg whites; if it is too thin, add more sugar.
3. Add the kalamansi extract and food color/s. Beat for 1 minute more.

Preparing the Piping Bag Procedure:

1. To assemble the piping bag, prepare first the pastry bag, coupler and decorating tip.
2. Place the tip of the bag down on the bottom and cut the edge of the pastry bag. Place the coupler inside the decorating bag to hold the decorating tip in place.
3. Add the tip outside the bag and screw it in the coupler.
4. Let the bag stand upright in a tall container to fill it easier. Fold the edges of the bag over the container.
5. Use a spoon or spatula to fill 2/3 of the bag with icing.

6. Twist the top of the bag and squeeze it until the icing comes out.
7. Hold the top of the bag with your dominant hand and guide the bag with the other hand.

Piping Royal Icing Leaf Procedure:

1. Lay the parchment paper on the table. Prepare the piping bag, Ateco tip number 69 and green royal icing.
2. Prepare the piping bag and screw the Ateco tip number 69 in the coupler.
3. Fill the piping bag with green royal icing.
4. Hold the piping bag at 45 degree angle with its tip parallel on the parchment paper.
5. Squeeze the piping bag firmly to build the base of the icing to make leaf.
6. Gently shake the tip forward and backward, drawing the tip away from the base while decreasing the pressure to build up ruffles.
7. Once the desired length of the leaf is achieved, stop piping and carefully lift up the piping bag to create the tip of the leaf.
8. Let the leaves dry for about 30 minutes. Set aside until ready to use.

Piping Royal Icing Flower in Toothpick Procedure:

1. Prepare the white and yellow royal icing, Atelco closed star tip number 852, Atelco tip number 264, toothpick and foam pad.
2. To make the flower bud that will serve as an anchor to the flower, use a piping bag with white royal icing and tip number 852. Insert half-inch of the toothpick inside the tip. Squeeze the piping bag while slowly pulling out the toothpick. Stop squeezing once it is completely pulled out. Place it in a foam pad and let it dry for an hour.
3. To make the petal, use a piping bag with yellow royal icing and tip number 264. Make sure that the small end of the piping tip is pointing up. Squeeze the piping bag and slowly rotate the bud, moving the tip to cover the peak of the flower bud. Do 2 to 3 layers of petal or until the desired layers are achieved. For the outer layer of the petals, position the tip at 45-degree angle, letting the wide opening of the tip touching slightly the bud. Move the toothpick upwards and downwards until all sides of petal has been covered.

Fondant Icing

Fondant Icing is a type of icing used to decorate cakes. This requires higher level of skills to decorate or sculpt cakes. This type of icing is also used to make edible art cake decoration.

Example:

Tools and Equipment:

- *bowl*
- *sifter*
- *small saucepan*
- *gas range/stove*
- *spatula*
- *plastic wrap*
- *airtight container*

Ingredients

2 pounds (8 cups) confectioners' sugar, sifted
1/4 cup cold water
1 tablespoon unflavored gelatin
1/2 cup white corn syrup
1 1/2 tablespoons glycerine
1 teaspoon vanilla extract

Procedure:

1. In a large bowl (any kind except metal), sift the sugar and make a well in the center. Set aside.
2. In a small saucepan, add the water and sprinkle the gelatin on top to soften for about 5 minutes. Begin to heat the gelatin and stir until the gelatin is dissolved and clear. Do not boil. Turn off the heat and add the corn syrup and glycerine, stirring until well blended. Add the vanilla extract.
3. Pour the gelatin mixture into the well of sugar, and mix until all of the sugar is blended. Use hands to knead icing until it becomes stiff.
4. Add small amounts of confectioners' sugar if the mixture is sticky.
5. Form the mixture into a ball and wrap tightly in plastic wrap. Place in an airtight container. This icing works best if allowed to rest at room temperature for about eight hours before using, particularly if the weather is humid. Do not refrigerate.

Serving Suggestion:

To cover a cake with fondant, dust a smooth, clean surface, with cornstarch and roll the fondant with a rolling pin until it is approximately 1/4 inch thick. Make sure that the fondant is large enough to fit over the top and sides of the cake. Slide both hands under the fondant and carefully center it on top of a cake that has been freshly iced with buttercream to make the fondant adhere to the cake.

Dust your hands with cornstarch and smooth the fondant, starting at the top and working down the sides until the entire surface is even and flat. Cut off the excess icing around the bottom of the cake with a pizza cutter or sharp knife. Decorate the cake with buttercream or royal icing. This fondant keeps a cake fresh for two days at room temperature. Do not refrigerate a cake with fondant icing.

Unit 4: Preparing Fillings, Coatings, Icing and Decoration

Lesson 3: Presenting and Storing Cakes, gateaux and tortes

Objectives

At the end of the session, you should be able to:

- Identify two ways to present cakes, gateaux and tortes
- Determine ways to store cakes, gateaux and tortes

Introduction

Presentation and storing of cakes, gateaux and tortes is as important as on how we prepare those.

The presentation of cakes will aid to increase sale of the baked cakes. Storage will ensure that the cake will still be served fresh.

In this lesson, the topic will be on ways to present the prepared cake and on how to store them to maintain maximum eating quality, appearance and freshness.

Presenting Cakes, Gateaux and Tortes

In the previous lesson, the topic on how to decorate the cake was discussed. It is clearly states that the style of the decoration can be at the discretion of the head pastry chef. The main criterion in decorating cake is the consistency, which is why product must look the same every time it is produced.

One of the great ways to increase sales is to well display the cake. Doing so increase eye appeal and this may pursued customers to order a slice or buy the whole cake.

The two common ways to display the cake are:

- In a display fridge

- Displayed on dessert buffet

It is also important to keep the cake seasonal. It is also important to keep everything clean, neat and tidy.

Do not leave in the display 1/3 of the cake left with its bread crumb lying along the plate.

The cake must also be on a cake board slightly larger than the actual cake for it to be carried away easily by the cake servers.

A lace doily can also be placed under the cake for it adds visual pleasure.

Storing Cakes, Gateaux and Tortes

Cakes can easily be stored but not gateaux and tortes. Listed are the guidelines to follow in storing cakes, gateaux and tortes in order to maintain maximum eating quality, appearance and freshness:

- **Away from strong odour**

The cakes must be protected from strong odours such as onion and garlic. In some kitchen, there is dedicated controlled storage, or chilled, enclosed spaces, for these cakes.

- **Cool room temperature**

Most cakes need to be chilled because of the nature of ingredients. Food cool room must operate below 4 degrees Celsius. Note that some tortes need not to be chilled because it will spoil the flavor of the product.

- **Appropriate containers**

The best way to store sold cakes is to place them into boxes to ensure the product is kept intact. Take care of the edges and top decoration that it will not be damaged when packaged.

- **Labelling**

Correct labelling of cakes is also important. It can be placed inside the display fridge as well as outside the package to inform the customer and protect the manufacturer against complaints.

- **Length of time in the cool storage**

Cakes have varied expiration dates and may depend on the freshness of the ingredients. Inconsumable food not fit for human consumption must not be sold and should be considered as waste on the part of the manufacturer.

- **Freezer temperature**

Long term storage in the freezer must be 18 degrees Celsius or less.

References:

Rojo, Cruz and Duran Home Economics III P. 83,84,85, 86, 87

General Heat La Germania Instruction Manual P. 9