PRESENTATION 2
BASIC BAKING INGREDIENTS AND FUNCTIONS

A corporate social responsibility project of:

Universal Robina
FLOUR & PASTA

Universal Robina Flourish Pilipinas

Multimedia Toolkit for Bread and Pastry Production

in partnership with

Kagawaran ng Edukasyon
Republika ng Pilipinas

Knowledge Community
Let's Work Together!

PRESENTATION OUTLINE
BASIC BAKING INGREDIENTS AND FUNCTIONS

I. FLOUR

A. USES OF FLOUR
B. TYPES OF FLOUR

II. SUGAR

A. FORMS OF SUGAR
B. USES OF SUGAR
C. TYPES OF SUGAR
D. SUGAR SUBSTITUTIONS IN BAKING

III. SYRUPS

A. TYPES OF SYRUPS

PRESENTATION OUTLINE
BASIC BAKING INGREDIENTS AND FUNCTIONS

IV. EGGS

A. USES OF EGGS IN BAKING

V. IODIZED SALT

VI. SHORTENING

A. TYPES OF SHORTENING IN BAKING
B. USES OF SHORTENING IN BAKING

VII.FATS

VIII.OILS

A. USES OF OILS
B. TYPES OF OILS

PRESENTATION OUTLINE
BASIC BAKING INGREDIENTS AND FUNCTIONS

IX. LEAVENING AGENTS

- A. YEAST
- B. BAKING SODA
- C. BAKING POWDER
- D. AMMONIUM BICARBONATE

X. FLAVORS

- A. VANILLA EXTRACT

XI. REFERENCES


FLOUR

FLOUR

The most important ingredient in baking is flour which is a finely ground meal obtained by grinding and milling cereal grains or other root crops. Flour is most commonly made from wheat but can also be made from many other grasses and non-grain plants such as rye, barley, maize (corn), rice, potatoes and other foods.

USES OF FLOUR

The main function of flour in baking is to build structure. When the proteins found in wheat flour are hydrated, they interact with each other forming what is known as gluten. As dough or batter containing wheat flour is worked, an elastic network is developed.

TYPES OF FLOUR

TYPES	PROTEIN CONTENT	VISUAL	TOUCH
Hard wheat flour	12.0 to 13.4%	Creamy white	• Slightly coarse • Will not pack when squeezed by hand • Dusts easily on the work bench
Cake flour	6.9 to 8.7%	Yellowish and creamy white	• Fine flour • Packs when squeezed but crumbles when you open your hand

Source: PROOF. The Philippine Baker's Guide. Philippine Society of Baking, Inc., 2017.

TYPES OF FLOUR

TYPES	PROTEIN CONTENT	VISUAL	TOUCH
Soft wheat flour	9.0 to 10.8%	Pure white	• Fine texture • Packs easily and lumps when squeezed • Lumps when dusted
All-purpose flour	10.7 to 11.8%	White	• Less lumpy than cake flour when squeezed

Source: PROOF. The Philippine Baker's Guide. Philippine Society of Baking, Inc., 2017.

SUGAR

Sugar is the generic name for sweet-tasting, soluble carbohydrates, many of which are used in food. The various types of sugar are derived from different sources such as sugar cane and sugar beet, consisting essentially of sucrose.

FORMS OF SUGAR

1. **Monosaccharides:** Glucose (blood sugar), fructose (fruit sugar) and galactose (milk sugar). These are simple sugars.

2. **Disaccharides:** Maltose (malt sugar; glucose + glucose), lactose (milk sugar; glucose + galactose) and sucrose (table sugar; glucose + fructose). These are complex sugars.

USES OF SUGAR

Sugar in baking adds sweetness and flavor. While granulated sugar is a fairly neutral sweetness, other varieties of sugar, such as brown sugar, add more depth of flavor in addition to the sweetness.

Sugar caramelizes when heated and therefore promotes browning of baked goods.

USES OF SUGAR

Since sugar holds onto water, it provides structure for gas expansion in the oven, promoting lift and rise in baked goods.

Sugar grabs and holds onto moisture thus delaying baked goods made with sugar to stale.

USES OF SUGAR

In recipes such as the meringue, the sugar serves as the cushion between the bubbles which stabilizes the egg foam.

Sugar can be used for garnishing or decorating such as when powdered sugar is dusted on top of baked goods or when caramelized sugar is shaped into intricate decorations.

TYPES OF SUGAR

1. Granulated sugar is a refined sugar that is white in color and is the most common type of sugar used in baking. Granulated sugar has a slight coarseness to it but is still a very fine grain.

2. Powdered sugar, which is also called confectioner's sugar, icing sugar, or 10x sugar, is a very finely ground white sugar. Because powdered sugar is so finely ground it is also combined with a bit of cornstarch, or other starch, to prevent it from clumping. Powdered sugar dissolves extremely quickly into baked goods, and because of its fine texture and the addition of cornstarch it can create very tender baked goods.

TYPES OF SUGAR

3. Brown sugar, according to Wikipedia, is a sucrose sugar product with a distinctive brown color due to the presence of molasses. It is either an unrefined or partially refined soft sugar consisting of sugar crystals with some residual molasses content (natural brown sugar), or it is produced by the addition of molasses to refined white sugar (commercial brown sugar).

4. Superfine sugar, also known as castor or caster sugar, is a more finely ground granulated sugar, though not as finely ground as powdered sugar. This type of sugar is popular for professional baking, and is very commonly used in the UK, because it more readily dissolves into batters and doughs. However, it is difficult to find in the US and is typically more pricey than granulated sugar.

TYPES OF SUGAR

5. Muscovado sugar is an unrefined cane sugar that is similar in texture to brown sugar due to the molasses naturally remaining in this type of sugar. Muscovado sugar has a very strong molasses flavor, more so than dark brown sugar, and is more moist than regular brown sugar. Muscovado sugar can be found in both light and dark varieties, similar to brown sugar.

6. Sanding sugar is a very coarse type of granulated sugar that is kept clear or sometimes colored a variety of colors. It is commonly used for topping and decorating desserts.

TYPES OF SUGAR

7. Turbinado sugar, also known as raw sugar is a type of sugar that has been minimally processed. The texture of the sugar is very coarse, like the texture of sanding sugar, and is light brown in color. Almost all of the molasses is removed from this type of sugar, so it is dry in texture but does have a hint of molasses flavor lingering. It can be used like sanding sugar, to top and decorate baking goods and to add crunchy texture.

8. Pearl sugar, also called nib sugar, is a type of specialty sugar that is made by compressing granulated sugar into large hunks of sugar. This type of sugar is only used for very specific baking purposes as it does not dissolve into baked goods.

SUGAR SUBSTITUTIONS IN BAKING

Swapping granulated sugar and brown sugars: In most cookies, brownies, and bars, it is typically safe to swap granulated sugar and brown sugar. Granulated sugar will make baked goods crispier while brown sugar will create chewiness and a more moist texture.

Using powdered sugar in place of granulated sugar: This substitution should only be done in baked goods that are fairly forgiving such as cookies, brownies, bars, muffins, and quick breads. Make sure you are measuring by weight as the amount of volume needed of granulated sugar is significantly less than powdered sugar.

Swapping brown sugar and muscovado sugar: These two sugars function very similarly and can typically be swapped without issues. Keep in mind that muscovado sugar will add a much more intense molasses flavor to your baked goods.

Universal Robina Flourish Pilipinas

SYRUPS

Universal Robina Flourish Pilipinas

SYRUPS

Syrup provides more than sweetness. Its full-bodied character makes it an excellent flavor enhancer in cooking. Used in baking, syrup gives bread a good crust and a longer life. With its thick consistency, syrup is also ideal for making various dessert sauces.

TYPES OF SYRUPS

1. MAPLE SYRUP

Real maple syrup is produced by boiling down the sap of a maple tree until it is thick and sweet. Artificial maple syrup is common today, as it is much less expensive than the real kind. Maple syrup is most commonly used as a breakfast sweetener, poured over pancakes, waffles and oatmeal.

2. SIMPLE SYRUP

Mix together 1 lb. of white sugar and 13 oz. of water. Stir this mixture over medium heat until the sugar dissolves completely. Let this mixture cool and you have simple syrup, useful for bartenders all over the world. This syrup is used to sweeten cocktails and mixed drinks because granulated sugar won't easily dissolve in cold liquids.

TYPES OF SYRUPS

3. CORN SYRUP

This sweetener, made from corn starch, is in almost every home in America in the form of soft drinks, ketchup, ice cream and thousands of other commercially made food products. Baked goods made with corn syrup turn out moister and have a better texture, while the syrup itself is economical because it won't crystallize, giving it a long shelf life.

4. GLUCOSE

Glucose syrup is a substance primarily used in commercial food production as a sweetener and thickener. It is made by breaking down glucose molecules in starchy foods through hydrolysis. This chemical reaction yields a concentrated, sweet product with a high glucose content. Although corn is the most common source, potatoes, barley, cassava, and wheat can also be used.

Universal Robina Flourish Pilipinas

TYPES OF SYRUPS

5. CHOCOLATE SYRUP

Without chocolate syrup we could never have chocolate sundaes, a staple of ice cream stands all over the country. Chocolate syrup is made from cocoa powder, flavorings and corn syrup. This versatile chocolate topping is used on ice cream, cake, in milk and in many other dessert applications.

6. HONEY

Honey is a naturally-made syrup, created in beehives. The flavor of various honeys depends on the flowers from which they were made. Honey is used worldwide as a sweetener for baked goods and beverages.

TYPES OF SYRUPS

7. MOLASSES

Molasses is the leftover product after cane sugar crystals have been removed during sugar cane refining. Molasses is used in baking, candy-making and in the production of rum. The better grades of molasses have a lighter color and flavor, while the darkest molasses, blackstrap, is used mainly as an additive to cattle feed.

EGGS

EGGS

The egg is an excellent source of protein of high biological value, high ratio of unsaturated fatty acids to saturated fatty acids, and excellent source of minerals and all the vitamins except for Vitamin C.

The yolk provides all of the fat and contains half of the protein, most of the calcium, phosphorus, iron, zinc, and vitamins B6, B12, A, and folic acid, and half of the riboflavin and thiamine. Egg white contains about half of the protein and riboflavin.

POWDERED EGGS

Powdered eggs are eggs that have been dehydrated and turned into an easy-to-store powder.

Since the eggs have been dehydrated, it can last for a long time if stored in a cool, dry environment within a properly sealed container.

The powdered form also makes it easy to store, transport, and mix with other ingredients.

There are several varieties of powdered eggs. For example, there are powdered eggs that are made from both yolk and egg whites. Other varieties only contain egg whites or the yolks.

USES OF EGGS IN BAKING

Eggs add food value, color and flavor to breads. They also help make the crumb fine and the crust tender. Eggs add richness and protein. Some recipes call for eggs to be used as a wash, which adds a golden shiny luster on top.

Beaten eggs serve as leavening agent as they incorporate air into the batter or as thickening agent.

IODIZED SALT

Iodized salt is an important ingredient in bread baking because it slows rising time allowing the flavor of the dough to develop, and it adds to the flavor of the baked product. For best results, we do not recommend omitting the salt in a yeast recipe.

SHORTENING

Shortening is a type of solid fat that is made from vegetable oils, such as soybean and cottonseed oil. The ingredient is called Shortening because it shortens gluten strands in wheat by adding fat.

Since it is 100%, as opposed to the 80% fat content of butter or lard, it results in a very tender baked good.

Shortening is made by a process called hydrogenation, which involves adding extra hydrogen atoms to the aforementioned vegetable fats which turns them into solids. Shortening can be melted or softened and creamed into a mixture. Since it is all fat, it usually produces the most tender and crumbly results in a cake, cookie or pie crust.

Universal Robina Flourish Pilipinas

SHORTENING

Shortening is an edible fat that is solid at room temperature. It shortens the gluten strands in wheat, which provides three textural attributes in baked goods:

- A short bite
- A lubricative moist texture
- The crunchy or crispy auditory sounds

When used in a product, or a the medium to be cooked in, these three textural characteristics are heightened. Because shortening provides the breakage in or ‘shortens’ the gluten-starch network, it reduces starch retrogradation in baked goods. Since it is 100% fat, as opposed to the 80% fat content of butter, it aids in producing a very tender baked product.

TYPES OF SHORTENING IN BAKING

SOLID - Recommended for use in pastries, pie crusts and bread.

LIQUID – Mainly used in recipes that call for melted shortening, such as cake and bread formulas.

ALL-PURPOSE – Non-emulsified hydrogenated shortening. Used successfully in hi-ratio cakes with the addition of emulsifiers.

CAKE OR ICING SHORTENING – All-purpose hydrogenated shortening with one or two combinations of emulsifiers added by manufacturer. Emulsifiers blended into a shortening assist in forming an emulsion allowing the baker to add more water to the cakes making the cake more moist

USES OF SHORTENING IN BAKING

1. Shorten baked goods like pastries and pie crusts by preventing the cohesion of wheat gluten strands during mixing to create a tender and flaky final product
2. Serves to deliver flavor as well as richness to bread and cakes
3. Used for creaming due to its ability to incorporate large volumes of air bubbles which creates a fine, delicate structure in the end product
4. In cake making, it is used to tenderize the product by incorporating air in the finished cake batter as well as lubricating the other ingredients allowing the cake to rise more freely and increase the shelf life of the product

FATS

Oils and fats are used in a baked product to reduce the development of gluten giving the foods a crumbly texture. The fats and oils break down the gluten into “shorter strands” hence the term shorteners. Coating the flour in fat prevents the flour from absorbing water hindering the formation of gluten. If too much gluten developed, the food would be stretchy and elastic. Butter, margarine, shortening or oil add flavor and make bread tender and moist. Fat slows moisture loss, helping bread stay fresh longer.

OILS

Liquid oils (commonly neutral-flavored oils such as vegetable or canola oil) can be used in many different recipes for baking. Oil is frequently used in quick breads and certain types of cake (such as carrot cake). It results in a slightly more airy, coarse-textured crumb.

USES OF OILS

The basic function of oil in most baking recipes is to keep your product moist.

It captures the gases that are released from the interaction of the baking powder and baking soda, and slows down gluten formation to keep certain baked goods tender and fluffy in texture.

It also helps with binding your other ingredients together in the right way.

TYPES OF OILS

Canola oil is a type of vegetable oil derived from a variety of rapeseed that is low in erucic acid. It was invented by Canadians with canola originating from the combination of the two words “Canadian” and “oil.”

Canola oil can withstand the high temperatures required for baking. It will not considerably alter the texture or taste of foods when used in baking.

Containing no trans fats, low in saturated fat and high in both omega-3 fatty acids and unsaturated fats, canola oil can be safely used in both cooking and baking without adverse effects on health.

TYPES OF OILS

Coconut oil is unique because it’s solid when cool but becomes liquid when exposed to slightly higher than room temperatures. It can be used in cookies, cakes and even pie crust, and imparts a delicate coconut flavor that can add a unique element to the goodies. However, its different texture can sometimes yield slightly heavier baked goods.

LEAVENING AGENTS

YEAST

“Baker’s yeast” is a single-cell organism, called *Saccharomyces cerevisiae*, which needs food, warmth, and moisture to thrive. It converts its food—sugar and starch—through fermentation, into carbon dioxide and alcohol. It's the carbon dioxide that makes baked goods rise.

Baker’s yeast is available in several forms such as active dry, fresh (or cake), liquid, and instant.

TYPES OF YEAST FOR BAKING

1.ACTIVE DRY: This yeast requires dissolving it in warm liquid prior to adding to a recipe and should not be substituted with or for instant yeast. Active Dry yeast should not be exposed to liquids hotter than 110 degrees Fahrenheit, or else it will kill off the yeast, a live culture. This yeast is usually sold in 1/4-ounce envelopes or 4-ounce jars.

2. FRESH: Fresh yeast is sold in compressed or cake form. This type of yeast is extremely perishable, so it must be kept refrigerated and used within a couple weeks of purchase. To use fresh yeast, it must be dissolved into a liquid prior to adding to a recipe. Fresh yeast should be proofed, or tested for potency, before each use. To proof yeast, dissolve in warm water and add a pinch of sugar. If the yeast does not begin to foam within 5-10 minutes, it is no longer active.

Universal Robina Flourish Pilipinas

TYPES OF YEAST FOR BAKING

3.LIQUID: This was the most popular form used prior to the invention of compressed or cake yeast in the early 19th century. Liquid yeast is basically a slurry of live yeast organisms, flour (or other carbohydrates), and water, similar to a sourdough or bread starter. As long as fresh carbohydrate is added on a regular basis, the organisms will continue to live and replicate.

4. **INSTANT:** Instant yeast is the most active form that's commercially available. This yeast does not require dissolving into a liquid before adding to a recipe and often only requires one rise. This form of yeast is very shelf-stable and can be stored in a dry, airtight container at room temperature until the expiration date. Instant yeast can be referred to also as rapid rise or bread machine yeast. Labeling instant yeast as “bread machine yeast” makes it easier for consumers to choose the correct yeast to use in their bread machines.

BAKING SODA

Baking soda is 100 percent bicarbonate of soda and it's a prime ingredient in baking powder. It is alkaline in nature and creates carbon dioxide bubbles when it's combined with an acid, giving rise to dough and batters—it acts as a leavening agent. Baking soda and baking powder are not interchangeable in recipes.

Baking soda should be mixed thoroughly with dry ingredients before adding liquids because it reacts with water. This will ensure even leavening, the process by which dough and bread rise. Baking soda is normally used alone when sour milk, buttermilk, or other acidic liquid is included in the recipe.

BAKING POWDER

Baking powder is a raising agent that is commonly used in cake-making. It is made from an alkali, bicarbonate of soda, and an acid, cream of tartar, plus a filler like corn flour or rice flour which absorbs moisture.

The powder is activated when liquid is added, producing carbon dioxide and forming bubbles that cause the mixture to expand. For this reason, it is important to get your cake mixture into the oven quickly once the 'wet' ingredients have been added to the 'dry' ingredients.

Self-raising flour is made from plain flour combined with a small amount of baking powder.

AMMONIUM BICARBONATE

Ammonium bicarbonate is a white crystalline salt NH_4HCO_3 made by passing carbon dioxide through an aqueous ammonia solution.

Ammonium bicarbonate is used in the food industry as a leavening agent for flat baked goods, such as cookies and crackers. It was commonly used in the home before modern-day baking powder was made available.

FLAVORS

VANILLA EXTRACT

- Real vanilla extract contains the complete spectrum of oils, aromas and flavour compounds found in real vanilla beans.
- In genuine vanilla extract, much of the amazing fragrance and intense flavor comes from vanillin – a molecule found in vanilla beans.
- Vanilla beans usually contain around 3 – 5% vanillin however climate, curing and variety impact on the potency of the vanillin.

SUBSTITUTES FOR VANILLA EXTRACT

All these methods will work depending on the recipe you're trying.

- **MAPLE SYRUP**: Replace the vanilla extract with an equal amount of maple syrup or pancake syrup. Any changes in flavor will be subtle.
- **ALMOND EXTRACT**: Swap out the vanilla with half as much almond extract. Almond has a stronger flavor so less is required. Other flavor extracts such as orange, lemon or peppermint can also be used in place of vanilla. Just pick a flavor that will complement the other ingredients in the recipe. If you use one of these extracts, replace the vanilla with an equal amount of the substitute.

SUBSTITUTES FOR VANILLA EXTRACT

- **VANILLA MILK**: If you happen to have vanilla-flavored almond or soymilk in the fridge, you can use either one to replace the vanilla measure for measure.
- **RUM OR BRANDY**: Try an equal amount of rum or brandy if you aren't trying to avoid the alcohol.
- **VANILLA BEAN**: Scrape out the seeds from half a vanilla bean and use them as a stand-in for one teaspoon of vanilla extract.
- **VANILLA PASTE/POWDER**: Replace the vanilla extract with an equal amount of vanilla paste or vanilla powder.

Universal Robina Flourish Pilipinas

References

Chemical Composition of Eggs and Egg Products. https://link.springer.com/referenceworkentry/10.1007%2F978-3-642-36605-5_28 Accessed in July 2019

Eight Types of Yeast for Cooking, Baking and Brewing. https://www.thespruceeats.com/yeast-varieties-1328651 Accessed in July 2019

PROOF. The Philippine Baker's Guide. Philippine Society of Baking, Inc., 2017.

Shortening. https://bakerpedia.com/ingredients/shortening/ Accessed in July 2019

Shortening. https://bakerpedia.com/ingredients/shortening/ Accessed in July 2019

Substitutes for Vanilla Extract https://www.thespruceeats.com/cheap-and-easy-vanilla-extract-substitutes-4144717 Accessed in July 2019

The Function of Sugar in Baking. https://bakerbettie.com/function-of-sugar-in-baking/. Accessed in July 2019

What is glucose syrup? https://www.healthline.com/nutrition/glucose-syrup#what-it-is . Accessed in November 2019

END OF PRESENTATION