Culinary Institute of America

Fundamentals of Baking and Pastry

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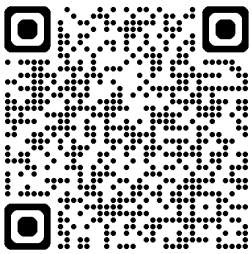

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Welcome to the CIA!

Education is a gift. And those of us in the foodservice industry have a chance to "pay it forward" by sharing our gifts with others. For over 70 years, The Culinary Institute of America has provided students with unparalleled training, setting the gold standard for culinary excellence.

Whether you are here to learn new skills and techniques, develop an appreciation for a global cuisine, or are in pursuit of ProChef Certification, our continuing education courses provide the training you need to achieve your personal and professional development goals.

While on campus, we want you to have the best experience possible. If you have any questions along the way, please ask your chef-instructor or anyone on the Continuing Education staff. Once your training is complete, please feel free to stay in touch - we always enjoy hearing your success stories.

And, because so many of our students ask how they can keep in touch with each other after class is over, we've made it easy to do through our Facebook page. Just log in and search for "CIA ProChef."

Wishing you all the best,

David Kamen '88 MBA PC[III]
Director CIA Consulting
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P.S. Did you know that the CIA is an independent, not-for-profit college? As such, your tuition supports our core mission of providing the world's best professional culinary education. If you'd like to further support the future of food with the gift of education, please visit www.ciagiving.org.

EXPECTATIONS FOR PARTICIPANTS

- ☑ Silence and put away phones during class.
- ☑ Actively participate.
- ☑ Return promptly from breaks.
- ☑ Remain in attendance for the class duration.
- ☑ Complete the course evaluation.
- ☑ Follow all established health and safety regulations.
    - In addition to the precautions necessary to guard against food-borne illness, care must also be taken to avoid accidents. The following safety measures should be practiced.
        - Wash hands before beginning work in the kitchen.
        - Keep all perishable items refrigerated until needed.
        - NYS law – when handling "ready-to-eat" food items, if you don't cook it, glove it!
        - Wash hands, cutting boards, knives, etc. when switching between meats and vegetables.
- ☑ Maintain CIA uniform standards.
- ☑ Act within the guidelines of the CIA's policy on harassment.
    - The Culinary Institute of America (CIA) is committed to providing a working and learning environment free from harassment. Members of the CIA community, guests, and visitors have the right to be free from any form of harassment (which includes sexual misconduct and sexual harassment) or discrimination; all are expected to conduct themselves in a manner that does not infringe upon the rights of others.

CIA UNIFORM POLICY

To foster a professional working environment and to maintain the highest standards of safety and sanitation, the CIA has adopted the following uniform code. Each item has been designed with a practical function in mind. These items must be worn in all production classes unless otherwise stated.

- ☑ Chef's jacket
  - Double-breasted structure creates a two-layer cloth barrier to help prevent steam burns, splashes, and spills
  - Can be re-buttoned on the opposite side to cover spills
  - Sleeves are long to cover as much arm as possible to reduce burns
- ☑ Pants
  - Hounds-tooth helps camouflage stains
  - Best without cuffs, which can trap hot liquids and debris
- ☑ Shoes and Socks
  - Shoes
    - Should be made of hard leather, with low heels, slip-resistant soles, and no open toes
    - Prevent slips and falls in the kitchen
    - Offer support
    - Protect feet from falling pots
  - Socks
    - Must be worn for hygienic purposes and to prevent burns
- ☑ Neckerchief (optional)
  - Helps to absorb sweat
- ☑ Toque (provided in class)
  - Contains hair
  - Absorbs sweat
- ☑ Apron (provided in class)
  - Protects jacket and pants from excessive staining
- ☑ Side towel (provided in class)
  - Protects hands when working with hot pans, dishes, and equipment
- ☑ Jewelry
  - Not permitted except for one plain ring to minimize exposure to potential hazards
- ☑ Hair
  - Should be neatly maintained, clean, and under control at all times

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COURSE INFORMATION

This class is designed to provide you with the baking and pastry techniques you will need to incorporate baked goods into your operation. The emphasis is on essential techniques that are required at all levels of baking, from beginning to advanced. Classroom lectures will focus on baking theory and ingredient function. Chef demonstrations will feature fundamental baking methods and techniques, which you will then practice under chef supervision. At the end of each session, the class will review and evaluate the day's production. Topics covered in the course include ingredient function, creaming method, custards, foaming method, lamination, cake assembly, and more. This class will give you the foundation upon which you can make your baking visions a reality.

DAY ONE:
BAKING INGREDIENT FUNCTION, CREAMING AND FOAMING, MIXING METHODS, AERATION

LEARNING OBJECTIVES

By the end of this day, you should be able to…

- accurately scale recipes up or down.
- demonstrate accuracy in weights and measures.
- categorize baking ingredients as liquefiers or stabilizers.
- explain the functions of basic baking ingredients.
- explain the steps of the creaming method.
- describe how to repair a creaming method batter that has separated.
- recognize fully baked pastry item.
- utilize the foaming method to make sponge cake.
- determine doneness of sponge cake.
- name and describe three techniques for making a meringue.
- describe the relationship between the amount of sugar in a meringue and its stability.
- list the usual uses for each type of meringue.
- make Italian buttercream.

LEARNING ACTIVITIES

Lecture and Discussion
Demonstrations
Hands-on Production
Product Evaluation

KEY TERMS

Batter
Breaking (separating)
Creaming
Emulsifier
Italian buttercream
Italian meringue
Liquefiers
Maximum volume
Paddle
Recede
Scraping
Stabilizer

INSTRUCTOR DEMONSTRATIONS

Scale operation
Creaming batter repair
Determining doneness of baked goods
Foaming method
Meringues

SUGGESTED READING ASSIGNMENTS

The Professional Chef (9th Edition)

pp. 1015-1021, 1052-1053, 1058-1061, 1108-1110

Baking and Pastry: Mastering the Art and Craft

pp. 237-248, 404-409

SUGGESTED AUDIOVISUAL ASSIGNMENTS

The Bakeshop Series
Meringues # 2818

FUNCTION OF INGREDIENTS

FIVE MAJOR COMPONENTS

There are five major components found in baking. It is unusual for baked goods to contain each component. However, it is possible. The five components are:

- Flour
- Liquid
- Fat/ Oil
- Eggs
- Sugar

FLOUR

Flour is probably the most important ingredient used in the production of baked goods. Few items can be produced without this ingredient. Flour serves five primary functions in baking:

- **Backbone and structure**: Flour is used in greater quantities than any other ingredient, forming the bulk of most bakeshop formulas.
- **Characteristic texture and appearance**: Derived by the different strengths and varieties of flour available.
- **Binding and absorbing agent**: Flour doesn't dissolve when it comes in contact with a liquid; it absorbs it.
- **Flavor**: Derived from the different types of flour
- **Nutritional value:** Contains proteins, carbohydrates, vitamins, minerals and fats.

Flour is derived from a number of grain and vegetable sources, but it is the flour milled from wheat that is most commonly used. Flour can vary considerably, yielding correspondingly different results in the finished product.

WHEAT FLOUR OVERVIEW

Bread can be made from different grains, such as rye, barley and buckwheat, but only wheat flour contains the protein that can be converted into gluten. Strong or hard flour makes better bread; white soft flour has a high-starch, low-gluten content and is better suited for baking cake. Hard wheat flour has a higher protein content and feels more granular; in contrast, soft flour can feel like talcum powder. Hard flour makes bread with better rise and more open texture. Flour is the main ingredient of a loaf and determines its flavor and texture. Brown flour makes heavier bread than white flour. Whole-wheat flour makes denser bread than white flour, because it contains not only endosperm, but the bran and wheat germ as well.

WHEAT FLOUR - HARD AND SOFT

- **Hard**: Spring wheat or winter wheat contains 11-15% protein
- **Soft**: Spring wheat contains 6-10% protein

The hardness is determined by the ratio of gluten to starch.

HARD FLOURS: HIGHER GLUTEN CONTENT, LOWER STARCH CONTENT

- **Straight** (high gluten flour): The hardest of all flours, used for hard rolls.
- **Patent** (bread flour): Used for breads and soft rolls.
- **First clear**: High in gluten, darker in color, used as a wheat component in rye breads.
- **Bran flour**: The bran separated from the above flours during milling, used to make flour for muffins and specialty breads.
- **Whole wheat** (graham): The entire wheat kernel, higher in fat and other nutrients than other flours, used for breads, rolls and muffins.

Soft Flours: Higher Starch Content, Lower Gluten Content

- **Cake flour**: Used for cakes and cookies
- **Pastry flour**: Used for pie doughs

Specialty Flours

Rye, pumpernickel, barley, buckwheat, potato, rice, corn and soy flours all contribute distinctive tastes and textures as well as nutrition and variety but are low in gluten content and generally have a percentage of wheat flour added to achieve proper leavening.

All-purpose Flour

A blend of approximately 50% hard and 50% soft wheat flour used in a wide variety of baked goods.

Additional Information for Wheat Flour

In general, hard wheat flour is used for breads and other yeast-raised products, where a higher gluten content is necessary to hold the carbon dioxide that leavens the item. Bakers prefer to blend their own flours to meet their specific needs, or else use the hard or soft flour that is best suited to a particular formula.

Gluten

Two proteins in wheat flour form gluten:

- Gliadin
- Glutenin

When the two proteins are mixed with a liquid, they undergo a molecular change to create a new protein, gluten. Mixing and kneading causes the gluten to form elastic strands that allow doughs and batters to stretch and hold the expanding gases that are produced during leavening; this creates breads that are light and airy. Only wheat contains enough gliadin and glutenin to produce the quantities of gluten necessary for this to occur.

LIQUIDS

When the protein of flour is mixed with water, gluten is formed. This feels sticky and rubbery and is an elastic framework of protein molecules. In bread making, the gluten stretches and traps, within the dough, the carbon dioxide released by the yeast. When the loaf is baked, the gluten coagulates and sets into the airy, spongy form of the bread. Water makes a plain, crusty loaf. The addition of milk not only flavors the bread but also gives the crust a softer, more golden texture. Bread made with milk has enriched food value and keeps longer than plain bread. For certain breads, this softer texture may be desirable.

WATER EXISTS IN THREE DISTINCT FORMS

Solid: as in ice

Liquid: its most common form

Gas: when heated above 212°F

The liquid and gaseous states are most useful to the baker.

WATER AS A LIQUID

Solvent for the water-soluble ingredients (salt, sugar)

Helps even distribution of other ingredients (yeast, spices)

Changes proteins in flour to gluten

WATER AS A GAS

Changes to steam upon reaching 212°F in the oven (steam expands and helps leaven the product). Generally, in bread making, the greater the water content, the more open the grain and softer the crumb. In bread making, water often serves as the primary liquefier. In recipes for other baked goods, milk is usually used.

MILK AND MILK PRODUCTS IN BAKING

Functions

Milk helps in the development of gluten because it is a liquid. It contributes to texture, flavor, crust color, and richness. It increases keeping qualities and nutritional value.

- **Develops Crust and Color**: Sugar (lactose) in milk caramelizes and creates a rich color on the product's surface; it can also aid in development of a firm crust as well.
- **Develops Grain and Texture**: Lactic acid in milk has a tightening effect on gluten, increasing stability. The result is an item with fine grain and texture.
- **Improves Appearance**: The opaque whiteness of the milk itself is imparted to the interior of breads and cakes; this together with the effects of the first two functions creates a more attractive product.
- **Adds Food Value**: Whole milk contains approximately:

  3.7% Milk sugar
  2.9% Butterfat
  2.9% Protein
  6% Minerals
- **Improves Eating Quality**: Richer, better flavor than water.

Milk-88% water, 3½% fat, 8½% milk solids. One-gallon whole milk weighs about 8½ lb., contains 7/8 water and 1/8 milk solids.

Pasteurization is the process of heating the milk to 161°F for 15 seconds then cooling rapidly. This kills harmful bacteria. Milk products with a higher % of fat are heated to either 150°F for 30 minutes or 166°F for 30 seconds for ultra pasteurization. Date stamp is 10 days after the date of pasteurization. Homogenization is the process of forcing the milk through tiny holes to break up the fat particles, so they remain evenly dispersed throughout the milk.

Skim Milk-(or nonfat)-all or most of the fat removed. ½% or less fat.

Lowfat-0.5% - 3%

Buttermilk-the liquid remaining after cream is churned to make butter.

Cultured Buttermilk-skim milk to which a bacteria culture has been added which converts the milk sugar to lactic acid.

Evaporated Milk-whole or skim milk heated to remove 60% of the water, then sterilized & canned.

Condensed Milk-the same as evaporated with the addition of 45-50% sugar. 30% water, 40% sugar, remaining milk solids (8% fat, 7 ¾% protein, 10 ½% milk sugar), 1¾% mineral.

Dried Milk-milk that is rapidly evaporated by heat. It shouldn't contain more than 5% moisture.

Cream

- Whipping cream 30 - 36% butterfat
- Heavy cream 36 - 40% fat
- Light cream 18 - 30% fat
- Half and Half 10½ - 12% fat

Ultra pasteurized lasts longer but doesn't whip as well. It may contain vegetable gums to compensate.

Sour Cream-16 - 22% fat. Made by adding a bacteria to pasteurized cream to produce lactic acid, then left for a couple of days.

FATS/OILS IN BAKING

Fat/Oil is not an essential ingredient but may be added for flavor, and to enrich the bread. Fat softens the gluten and makes closer-textured, moister loaves. Bread enriched with fat keeps better.

Shortening agents can be of the following classifications:

Animal fats (e.g. Butter and Lard)

Vegetable oils (after various degrees of processing)

Hydrogenated form (solid shortenings)

Natural (oil)

SHORTENING PERFORMS FOUR FUNCTIONS

- **Alters Eating Qualities**: Results in products that are more tender and less chewy than lean dough products; in addition, some fats or oils add flavor.
- **Alters Appearance**: Shortening agents do not dissolve in doughs but become evenly dispersed and incorporate air, resulting in soft crumb in breads, making the products visually distinct compared to lean dough products.
- **Improves Keeping Quality**: Shortening acts as an emulsifier and makes it possible to incorporate greater quantities of liquids; this prevents rapid drying out of products.
- **Adds Food Value**: Fats constitute a concentrated source of energy for the body.

EGGS IN BAKING

Eggs add flavor and color to bread and contribute to the leavening process. A glaze of egg bakes golden, like a layer of varnish, and gives a more tender crust.

EGGS FIVE PRIMARY FUNCTIONS IN BREAD BAKING

- **Color**: This is the primary function of the yolk. Color plays a major role in the eye appeal of such items as custards, yellow sponge cakes and egg breads.
- **Texture and Grain**: The coagulating, foaming and emulsifying properties of eggs all help to incorporate and distribute air into mixtures and hold it there during baking, as well as promote an even grain and fine texture in the finished product.

- **Structure**: The proteins in eggs reinforce the gluten in flour to help maintain the stability and structure of the product during baking.
- **Flavor**: This is mostly the function of the yolk as egg whites have relatively little flavor. The fat and other nutrients in the yolk contribute aroma as well as taste, resulting in products with enhanced appeal.
- **Nutritional Value**: Eggs contain 75% moisture. The remaining 25% of the egg contains protein, fat, sugar, potassium, sodium, calcium and iron.

SUGARS IN BAKING

While sugar sweetens bread, it also makes the texture tender by softening the gluten. Sugar also gives the loaf a browner crust. A little sugar added to bread dough accelerates the yeast's action, but high concentrations of sugar can kill the yeast. It should be kept in mind that both wild and commercial yeasts obtain needed sugars by converting the starch in the grain into simple sugars, and it is not necessary to add granulated sugar to bread doughs in order to obtain a good finished product.

SIX MAIN FUNCTIONS OF SUGARS IN BAKING

- **Adds Sweetness**
- **Affects Grain and Texture**: Sugar has a denaturing effect on the gluten in flour, acting together with the delay in gelatinization; this produces a softer crumb and finer grain in breads. For certain breads this may be desirable.
- **Retains Moisture and Prolongs Freshness**: Sugar absorbs moisture from other ingredients as well as from the atmosphere; this keeps a finished product moist and delays drying out.
- **Imparts Crust Color**: Sugar caramelizes and helps form a browner, firmer crust during baking.
- **Contributes Food Value**: Sugar in moderate amounts can supply some of the carbohydrate requirements of a normal diet.
- **Aids in Fermentation of Yeast**: A small amount of sugar supplies a source of food for yeast.

CREAMING METHOD

It is used primarily for cookie doughs and pound cakes and in recipes where the flour is equal to or greater than the sugar content.

CHARACTERISTICS

- Air is introduced during the creaming or first step of this method. Sugar's crystalline structure introduces thousands of small air cells into the fat during creaming where they are held throughout mixing and during baking. As the batter is heated, these air cells expand to leaven the item.
- The increased ratio of stabilizers requires the additional mechanical leavening of the incorporated air as well as the chemical leavening produced by baking powder or baking soda.
- A greater ratio of stabilizers can also result in batters that are thick enough to require being piped out from a pastry bag, such as cookies.

MIXING PROCEDURE

1. Cream fat and sugar together.
2. Add flavorings, mix well.
3. Gradually add eggs.
4. Add liquid (if adding a large amount of liquid, alternate with additions of flour).
5. Add dry ingredients.
6. Mix until smooth (do not overmix).
7. Bake.

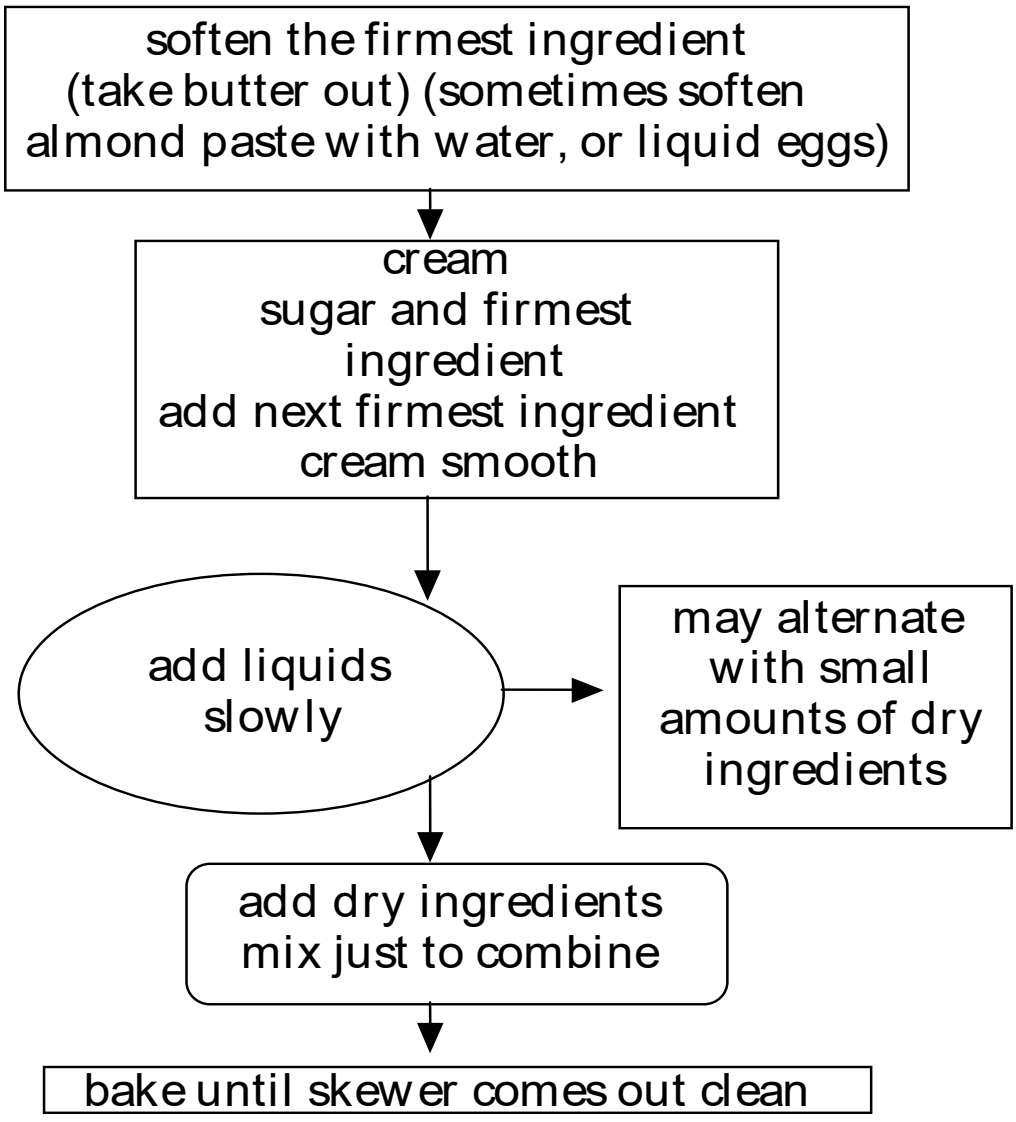
CHART OF CREAMING MIXING METHOD

Ingredient	Action	Reason
Sugar Butter	Combine and cream until smooth and light.	To incorporate air into the fat and sugar mixture
Eggs	Gradually add and scrape as necessary.	To allow the eggs to mix in and emulsify with the fat and the sugar.
Flour (or other dry ingredients)	Sift together. Add on low speed. Mix until combined. Do not overmix.	To incorporate the dry ingredients smoothly and thoroughly without overmixing.

COMBINATION CREAMING METHOD

This method is most commonly used to produce the Sacher cake. It is a creamed-type cake batter, which employs the foaming mixing method in addition to the creaming method to lighten the texture of the finished cake. This is done in the form of a meringue (egg whites and sugar) which is folded into the creamed fat, sugar and egg mixture. The sifted dry ingredients are folded in last using the proper folding technique, as when folding flour into a sponge cake batter. The batter can be baked in cake pans for the classical Sacher torte or in sheet pans for individual pastry applications, like a Sacher slice.

CREAMING METHOD: CAKES, DOUGH, BATTERS



FOAMING METHOD

The objective of the foaming method is to create a batter containing a maximum amount of air. The more air that a batter can be made to hold, the greater its volume and the lighter the finished product. Recipes with a balance of ingredients high in egg and low in flour achieve the greatest volume and the lightest product. The foaming method of mixing is based on the foaming property of eggs, which have the capacity to absorb more air than any of the other basic baking ingredients. This accounts for their presence in such large proportion in batter recipes prepared by this method. The egg foam holding all this air is extremely fragile and may be easily destroyed (a thick dense mixture would collapse its structure and knock the air out of it). This is why flour accounts for so little of the recipe's total composition.

Since flour is the ingredient most responsible for a baked product's structure, one would assume that a cake made with so little flour would collapse. However, in foaming recipes the structural function of the flour is performed by the other stabilizing ingredient: eggs. The result of foaming method in items such as sponge cake is a light and airy structure that is resilient enough to be rolled into roulades or sliced into layers to form the body of various cakes.

COLD FOAMING METHOD

1. Place eggs and sugar in a mixer bowl, whip on high speed until maximum volume is reached.
2. Turn mixer to medium speed for 2 minutes.
3. Sift all dry ingredients.
4. Fold the sifted dry ingredients into the egg mixture.
5. Temper melted butter into a small portion of the batter.
6. Slowly fold tempered batter into sponge base.

WARM FOAMING METHOD

1. Combine eggs and sugar in a mixer bowl, place over a double boiler, and lightly whip eggs until mixture has reached 110°F.
2. Whip the egg mixture at high speed until it begins to recede.
3. Reduce speed of mixer to low, whip for an additional 2 minutes (Note: the mix can be left at this stage for considerably longer if necessary.)
4. Sift all dry ingredients.
5. Fold sifted dry ingredients into the egg mixture.
6. Temper in melted butter.
7. Portion into cake pans.

SEPARATION FOAMING METHOD

1. Separate the eggs, putting the yolks in one mixer bowl and the whites in another.
2. Add ⅓ of the sugar to the yolks and whip until doubled in size.
3. Whip the whites to soft peaks, then slowly add the remaining ⅔ of the sugar.
4. Sift the dry ingredients.
5. Add seasonings to the yolks.
6. Fold the egg yolk foam and the egg white foam together.
7. Fold in the dry ingredients.
8. Fold in oil/fat via a liaison (if included in the formula).
9. Bake.

Note: This method will give the most volume to a recipe. If you are making a roulade or a product that must be rolled, leave the butter out, as the butter will become firm under refrigeration and cause the cake to break when rolled.

CHART OF FOAMING MIXING METHODS:
COLD, WARM, AND SEPARATED

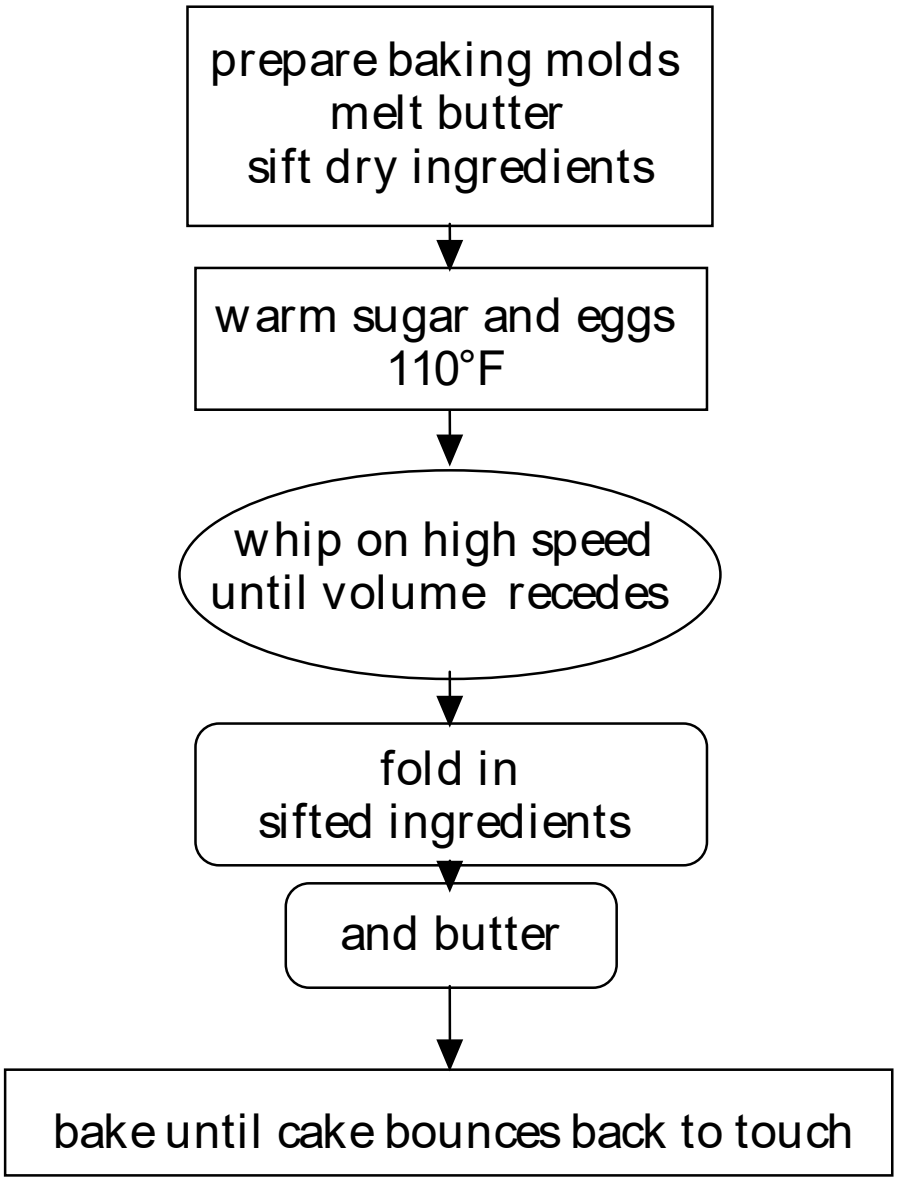
Ingredient	Cold Method	Warm Method	Separated Method
Sugar Eggs (and flavoring)	Whip together 20-30 minutes.	Combine and warm to 110º. Whip together until reaches maximum volume.	Separate egg whites and yolks. Whip each with ½ sugar. Fold egg whites into egg yolk mixture.
Flour (or other dry ingredients)*	Sift and fold in by hand.	Sift and fold in by hand.	Sift and fold in by hand.
Butter	Fold tempered fat in by hand.	Fold tempered fat in by hand.	Fold tempered fat in by hand.
	Fill into prepared cake pans and bake immediately.	Fill into prepared cake pans and bake immediately.	Fill into prepared cake pans and bake immediately.

*Flour may be substituted with a mixture of cornstarch and flour.

EXPLANATION OF STEPS FOR FOAMING MIXING METHOD

Ingredient	Action	Reason
Sugar Eggs	Whip	To incorporate air into the mixture, creating a foam-like structure.
Flour (Starch) (Baking powder) (other dry ingredients)	Sift and fold in	To aerate, remove lumps, and evenly distribute ingredients. To allow dry ingredients to be mixed in without knocking the air from the foam or incorporating lumps into the mixture.
Butter	Melt, temper and fold in.	To incorporate butter without knocking air from the foam.

FOAMING METHOD FOR SPONGE CAKE



MERINGUES

DEFINITION

Meringue can be loosely defined as a mixture of beaten egg whites and granulated sugar. While the name is French, the origin is not documented, although history tells us that meringue may have been named for either the Swiss town of *Meringen* or the German city of *Mehrinyghen*. We do know that meringue has been around since the early sixteenth century.

COMPOSITION

Meringue is made of egg whites and sugar whipped together to incorporate air and form soft or stiff peaks. Egg whites whipped without sugar are not meringue; they are simply egg whites whipped to a dry consistency. In the recipes that follow, egg whites are measured by volume rather than by number. This measurement is not only more precise, but it is also easier in professional kitchens where a supply of egg whites is usually on hand. There are 7 to 8 egg whites in 1 cup (240 ml.). Using the even number makes it easier to divide when measuring fractions of a cup and is simple to remember, along with 4 whole eggs and 12 egg yolks per cup.

HOW EGG WHITES EXPAND

Eggs have excellent foaming ability. They contain a fatty substance that destroys the albumen's ability to foam. When egg whites are removed, they alone can increase in volume by up to eight times. This is possible through close teamwork by the proteins albumen and ovalbumin. When the egg whites are beaten, the albumen protein forms a very stable mass of tiny air bubbles while part of the protein molecules bond together and form a fragile network that holds the moisture in place (an egg white contains about 85 percent water). This alone would suffice if the beaten egg whites were not to be cooked, but because air expands when it is heated, the network of

denatured proteins on the surface would be destroyed and immediately collapse if it were not for the ovalbumin protein. While the ovalbumin does not play such an important role when the egg whites are beaten, it coagulates when heated, forming its own network in the meringue and making it resistant to collapse as the water evaporates. In other words, the ovalbumin protein is what makes it possible to change a liquid foam into a solid dry mass with heat.

THE EFFECTS OF SUGAR

Meringue would be very bland without the addition of sugar and sugar also helps to stabilize the foam, especially in the oven. However, the addition of sugar is something of a mixed blessing since sugar also delays the foaming process and decreases the volume and lightness of the meringue. This is especially noticeable when meringue is whipped by hand. Even when using an electric mixer, the granulated sugar must be introduced gradually, and in most cases never before the whipped egg whites have increased approximately four times in volume, so that the sugar will not prevent the albumen from working to stiffen the foam. As an example of what it means to add the sugar gradually, when making the recipe for French Meringue, which uses 2 pounds of sugar, it should take approximately 3 minutes to add this amount of sugar to the egg whites (a little longer if the egg whites are cold). The amount of sugar used in a meringue will vary in accordance with the desired texture and intended use of the finished product. Soft meringues, which are typically used for toppings on tarts and pies, can be made with equal quantities of sugar and egg white by weight. Hard meringues, which are baked dry, usually have a sugar-to-egg white ratio of 2:1.

Salt

Just like sugar, salt has a mixed effect. While it acts as a flavor enhancer, it increases the amount of time needed to whip the whites and decreases the foam's stability, although both occur only to a very small degree.

The Addition of Acid

Citric acid (lemon juice), tartaric acid solution, and cream of tartar have no effect on the volume of the meringue, but they help to stabilize the foam by decreasing the pH level in the albumen, making the foam less apt to collapse. Only a small amount of any of these acids should be used. Too much acid will both adversely change the taste of the meringue and impede coagulation during baking. Historically, bakers have believed that a copper mixing bowl produces a superior egg white foam in less time. However, current research indicates that the degree to which a copper mixing bowl is preferable to a stainless bowl is questionable. Some studies dispute the belief that copper imparts an acidity to the whites as it comes in contact with the albumen. Although there is no disadvantage to using a copper bowl, the addition of any of the acids previously mentioned will generate the same result.

Whipping

Meringue whipped to a soft peak will not hold its shape; it will slowly settle or fall. Meringue properly whipped to a stiff peak will not change shape as you pipe it from a pastry bag or work with it; you should be able to turn the bowl of meringue upside down after it is finished whipping with no problem (or mess). Be observant; there is a fine line between stiff peaks and overwhipped, dry, peaks. Meringue that is overwhipped and dry is hard to pipe out into precise shapes and is impossible to fold into a batter without getting small lumps of meringue throughout. Meringue whipped to stiff peaks should still appear shiny, not dry or broken.

PRECAUTIONS

FOR PERFECT MERINGUE, FOLLOW THESE GUIDELINES:

- Although it is not critical, use egg whites at room temperature when possible.
- Be sure the egg whites are not so old that they have started to deteriorate. The substance becomes thinner and clearer as the protein starts to diminish.
- Because fat prevents the albumen in egg whites from expanding, make certain they are clean and free of any egg yolk particles. The mixing bowl and whip or whisk must also be perfectly clean.
- Make sure there are no foreign particles (such as flour) in the sugar.
- Using a copper bowl and/or a balloon whisk may be helpful when making meringue, but they are not necessary.

USES

Meringue is a key ingredient in the pastry kitchen. Baked layers of meringue are used in cakes and pastries, such as the famous Marjolaine. It is piped into ornate shapes for Vacherin and Dacquoise. It is made into cookies, added to buttercream, and used to top desserts such as Baked Alaska and Lemon Meringue Pie. In Europe today, many pastry shops do not make their own meringue. To save time and money, they buy it from companies that specialize in baked meringue products. This makes sense, since the meringue formulas are basically generic, and it is what you create with them that makes the difference.

VARIETIES OF MERIGUE

There are three basic types of meringue: French (Common), Swiss, and Italian. The ingredients for each of the three types are essentially the same, but the methods of preparation and the end results are different. A fourth type, Japonaise, is a hybrid of French meringue with the addition of almond meal and a small amount of cornstarch.

FRENCH (COMMON) MERINGUE

French Meringue is best for baking *au naturel,* for mixing with nuts, and for use as a cake base. If it is made and baked correctly, French Meringue is very tender, light, and fragile. It should be piped or spread out immediately after whipping, or the egg whites may start to separate from the sugar. This type of meringue should not be added to fillings that will not be baked, or eaten raw, unless the meringue is made with pasteurized egg whites to guard against salmonella.

ITALIAN MERINGUE

Italian Meringue is a better choice if the meringue must stand for some time. It is denser because the egg whites are partially cooked, and therefore it holds up longer before starting to deflate. Italian Meringue is also preferable to use in a dessert when the meringue is eaten raw, or with only partial further cooking as, for example, when it is added to a filling or when only the outside is browned as in Baked Alaska. When Italian Meringue is baked all the way through, it is harder than French Meringue and unpleasant to eat.

SWISS MERINGUE

Swiss Meringue could be described as a mixture between the French and Italian Meringues. It can be eaten raw since the egg whites have been pasteurized by being heated to 140°F (60°C) with the sugar. Swiss Meringue is quicker and easier to produce than its Italian counterpart, but it is not as stable and should be used soon after it has been prepared. It is typically used in buttercream and fillings, but it can also be piped out into cookies or made into other shapes, then baked or dried in the same way as French Meringue. However, for this use, Swiss Meringue should be made with less sugar to ensure a better volume and a stiff peak.

BUTTERCREAM

Buttercream is a necessary basic preparation in the pastry shop. Although buttercream has a negative image with some consumers, when it is made using fresh sweet butter, natural flavorings, and other top-quality ingredients, it is excellent as ea filling or icing for cakes and pastries. Whatever style of buttercream you make, it is important to remember that it is very rich and should not be used excessively. Moreover, always use the best ingredients available to make and flavor it.

Italian buttercream is made using meringue, sweet butter, and flavorings. It is referred to as Italian buttercream regardless of whether it is made using an Italian meringue or not. If buttercream is made using meringue of any type, it is an Italian buttercream. Italian buttercream is relatively white in color and has a light mouth feel. It is ideal for wedding cakes iced with buttercream or pastries where a white appearance is desired.

Swiss buttercream is made using either fondant or cooked sugar, butter, and flavorings. Swiss buttercream is simpler to make than Italian buttercream. It also has a relatively white appearance but has a somewhat less light mouthfeel than the Italian does because it does not contain meringue.

German buttercream combines pastry cream with sweet butter and flavorings. German buttercream has a smooth melt-in-the-mouth texture that is desirable. The major disadvantages to this style of buttercream are that it has a short shelf life and therefore cannot be made in large quantities and stored. Also, it is not white, which makes it unsuitable for some purposes such as wedding cakes.

French buttercream is made with either whole eggs or egg yolks, cooked sugar, flavorings and sweet butter. It is similar in characteristics to Italian buttercream, but the addition of yolks makes it richer and gives it a yellow color.

DAY ONE:
TEAM PRODUCTION ASSIGNMENTS

EACH TEAM WILL PRODUCE…

One Variety of Pound Cake
Original Pound Cake
Marble Pound Cake
Almond Pound Cake
Cranberry Pound Cake
Pumpkin Pound Cake

One Variety of Quick Bread
Corn Bread or Muffins
Banana Bread or Muffins
Zucchini Bread or Muffins

One Flavor of Sponge Cake
Vanilla Sponge Cake
Chocolate Sponge Cake

One Batch of Italian Buttercream

Demonstration Recipe: Common Meringue

POUND CAKE

Yield: 2 large or 4 small loaves

Ingredients	Amounts		
Butter, unsalted	1	lb.	4 oz.
Sugar, granulated	1	lb.	5 oz.
Egg, whole	1	lb.	
Vanilla, extract	½	oz.	
Salt, kosher	¼	oz.	
Flour, pastry	1	lb.	4 oz.
Baking powder	3	g	
Sour cream	4 ½	oz.	

Method

1. Preheat oven to 350°F.
2. On low speed, cream the butter and sugar. Make sure there are no lumps in the butter.
3. Scrape down the bowl. On medium speed, whip the mixture to incorporate air.
4. In a small bowl, place the eggs and vanilla. Mix to combine. Add it to the butter mixture on medium speed in 3 to 4 parts. Scrape down the bowl and paddle after each addition of eggs.
5. In a medium bowl, sift together the salt, flour, and baking powder. Add it to mixture all at once. Place the softened sour cream on top. Mix on low speed until incorporated. Scrape down the bowl.
6. Place 1 pound 12 ounces of pound cake mixture in a greased and lined pan.
7. Bake in the preheated oven for 60 to 65 minutes.

Variation: *Marble Pound Cake*

In a small bowl, place 2 ounces of cocoa, 1 ounce of confectioners' sugar, and 5 ounces of milk. Mix to form a paste. Fold in ¼ of the plain batter to make chocolate batter. Lightly fold the two together.

Variation: *Almond Pound Cake*

Add 12 ounces of almond paste to the batter. Reduce the amount of sugar to 2 pound 4 ounces and reduce the butter to 2 pounds 5 ounces.

Variation: *Cranberry Pound Cake*

Add 2 ounces of orange zest and 1 ½ pounds of frozen cranberries to batter.

PUMPKIN POUND CAKE

Yield: 2 large or 4 small loaves

Ingredients	Amounts		
Cinnamon, ground	4	oz.	
Ginger, ground	2	oz.	
Allspice, ground	1	oz.	
Nutmeg, grated	1	oz.	
Butter, unsalted	14	oz.	
Sugar, granulated	1	lb.	14 oz.
Egg, whole	10 ½	oz.	
Flour, pastry	2	lb.	
Baking powder	1 ¼	oz.	
Pumpkin pie spice*	½	oz.	
Salt, kosher	¼	oz.	
Water	14	oz.	
Pumpkin purée	1	lb.	
Chocolate, chips	14	oz.	
Walnuts	7	oz.	

Method

1. Preheat oven to 350°F.
2. For the pumpkin pie spice, in a small bowl, place the cinnamon, ginger, allspice, and nutmeg. Mix well to combine. Reserve.
3. In a large bowl, cream the butter and sugar.
4. Gradually add the eggs.
5. In a mixing bowl, place the flour, baking powder, pumpkin pie spice, and salt. Mix to combine.
6. In a separate mixing bowl, combine the water and pumpkin purée.
7. Add the dry and liquid ingredients to the creamed butter mixture in stages as follows: dry, liquid, dry, liquid, dry. Mix for 1 minute on low speed, then for 1 minute on medium speed.
8. Add the chocolate chips and walnuts.
9. Place 1 pound 12 ounces of batter in a greased and lined pan.
10. Bake in the preheated oven for 50 to 60 minutes.

CORN MUFFINS

Yield: 15 muffins

Ingredients	Amounts
Egg, whole	88 g
Milk, whole	213 g
Oil, vegetable	128 g
Orange, juice, concentrate	11 g
Sugar, granulated	198 g
Flour, bread	128 g
Flour, pastry	128 g
Cornmeal	106 g
Salt, kosher	7 g
Baking powder	11 g
Cheese, Cheddar, shredded (Optional)	100 g
Corn, kernels, frozen (Optional)	200 g

Method

1. Preheat convection oven to 330°F.
2. In a mixer, place the eggs, milk, oil, and orange juice. Mix to combine on low speed.
3. In a medium bowl, sift together the sugar, flours, cornmeal, salt, and baking powder.
4. Add the dry ingredients into the liquid ingredients. Mix until fully incorporated.
5. Fold in the cheese and corn, if desired.
6. Bake in the preheated oven until done.

BANANA BREAD

Yield: 2 large or 4 small loaves

Ingredients	Amounts		
Banana	2	lb.	2 oz.
Sugar, granulated	1	lb.	7 oz.
Egg, whole	6	oz.	
Oil, vegetable	7	oz.	
Flour, pastry	1	lb.	6 ½ oz.
Baking soda	¼	oz.	
Baking powder	1.4	g	
Salt, kosher	3.5	g	
Pecans	4	oz.	

Method

1. Preheat oven to 350°F.
2. In the bowl of an electric mixer with the paddle attachment, blend the bananas to form a purée. Remove the banana purée from the bowl and set it aside.
3. Mix the sugar, eggs, and oil for 5 minutes on medium speed.
4. In a large bowl, sift together the flour, baking soda, baking powder, and salt.
5. Add banana purée and dry ingredients to the sugar mixture. Mix on medium speed for 2 minutes.
6. Fold in the pecans.
7. Place 1 pound 12 ounces in a prepared bread pan.
8. Bake in the preheated oven until done, 55 to 65 minutes.

ZUCCHINI BREAD

Yield: 2 large or 4 small loaves

Ingredients	Amounts		
Sugar, granulated	1	lb.	3 oz.
Oil, vegetable	13	oz.	
Egg, whole	8	ea.	
Flour, pastry	1	lb.	3 oz.
Baking soda	¼	oz.	
Salt, kosher	½	oz.	
Baking powder	1	oz.	
Cinnamon, ground	½	oz.	
Nutmeg, grated	1	pinch.	
Zucchini, grated	14	oz.	
Pecans	10	oz.	

Method

1. Preheat oven to 350°F.
2. In the bowl of an electric mixer, place the sugar, oil, and eggs. Mix on medium speed for 3 minutes.
3. In a large bowl, sift together the pastry flour, baking soda, salt, baking powder, cinnamon, and nutmeg.
4. Add the dry ingredients to the sugar mixture. Mix until incorporated.
5. Add the zucchini and nuts. Mix until incorporated.
6. Place 1 pound 12 ounces in a prepared bread pan.
7. Bake in the preheated oven until done, 55 to 65 minutes.

VANILLA SPONGE CAKE

Yield: two 8-inch cakes

Ingredients	Amounts
Egg, whole	9 ea.
Sugar, granulated	9 oz.
Flour, cake	9 oz.
Oil, vegetable	3 oz.
Vanilla, extract	¼ oz.

Method

1. Preheat oven to 375°F (325°F for a convection oven).
2. In a mixing bowl, place the eggs and sugar. Set over a hot water bath and stir until the sugar is dissolved and the mixture is warm (120 F).
3. Whip the eggs on high speed to maximum volume until they start to recede slightly.
4. Stabilize the foam by whipping on the second speed for 15 minutes.
5. Sift the flour and prepare the baking pans.
6. Gradually fold the sifted flour into the foam.
7. Add some of the mix to the oil and vanilla. Mix it until homogenous.
8. Temper the mixture by adding the oil mixture into the mass.
9. Bake in the preheated deck oven until done, 25 to 30 minutes.

Variations

For chocolate sponge, replace 2 1/2 oz. of flour with cocoa powder and add 1/2 tsp of baking soda with the other dry ingredients.

CHOCOLATE SPONGE CAKE

Yield: two 8-inch cakes

Ingredients	Amounts
Flour, cake	4 oz.
Corn starch	2 oz.
Cocoa powder	2 oz.
Egg, whole	9 ea.
Sugar, granulated	9 oz.
Vanilla, extract	½ tsp.
Oil, vegetable	4 oz.

Method

1. Preheat oven to 360°F.
2. In a medium bowl, sift together the cake flour, cornstarch, and cocoa powder 3 to 4 times. Set it aside.
3. In a 20-quart bowl, place the eggs, sugar, and vanilla. Mix to combine. Heat over a hot water bath to 120°F.
4. Whip the eggs on high speed for 5 minutes.
5. Stabilize the mixture by whipping on medium speed for 15 minutes.
6. Gradually fold the sifted dry ingredients into the mixture by hand.
7. Temper the oil and fold it into the sponge batter.
8. Portion the batter into 8-inch prepared pans.
9. Bake in the preheated oven until done, 25 to 30 minutes.

ITALIAN BUTTERCREAM

Yield: 6 pounds

Ingredients	Amounts
Sugar, granulated	1 lb.
Water	8 oz.
Egg, white	8 oz.
Butter, unsalted, softened, cut into pieces	1 lb. 8 oz.
Flavoring (Optional)	as needed

Method

1. For the Italian meringue, in a heavy saucepan, place the sugar. Cook over medium heat, without stirring, until the mixture reaches 230°F.
2. In the bowl of an electric mixer fitted with a whisk attachment, place the egg whites. Whip until the egg whites form soft peaks.
3. Continue to cook the sugar until the temperature reaches 240°F (the soft ball stage).
4. In a slow, steady stream, add the cooked sugar to the egg whites and whip on low speed.
5. Increase the speed to high and continue to whip until the mixture has cooled to room temperature.
6. Add the soft butter, a few pieces at a time, until all the butter is incorporated. Continue to whip until buttercream is smooth and light.
7. Flavor as desired.

COMMON MERINGUE

Yield: 3 quarts

Ingredients	Amounts
Egg, white	1 lb.
Sugar, granulated	2 lb.

Method

1. In a medium bowl, place the egg whites. Beat them until frothy.
2. Slowly add the sugar while whipping. Continue whipping until soft peaks form.
3. For a hard meringue, continue whipping until hard peaks form.

DAY TWO:
CUT-IN MIXING METHOD AND LAMINATION

LEARNING OBJECTIVES

By the end of this day, you should be able to…

- state the key principles necessary to producing laminated dough.
- demonstrate the lock-in technique for puff pastry.
- demonstrate the 4-fold.
- describe how layers of fat in laminated dough act as a leavener.
- describe how cut-in fat pieces act as a leavener.
- list the basic components of a baked good made by the cut-in method.
- list the ratio of flour, fat, and water used for basic pie dough.
- describe the differences between flaky dough and mealy dough.

LEARNING ACTIVITIES

Lecture and Discussion
Demonstrations
Hands-On Production
Product Evaluation

KEY TERMS

4-fold
Flaky dough
Lard
Lock-in
Rest
Rubbed dough
Cut-in
Lamination
Layers
Mealy dough
Roll-in fat
Steam

INSTRUCTOR DEMONSTRATIONS

Puff dough preparation
Roll-in butter preparation
Puff pastry lock-in
Puff pastry folding
Pie dough preparation

SUGGESTED READING ASSIGNMENTS

The Professional Chef (9th Edition)

pp. 1048-1051, 1056-1057

Baking and Pastry: Mastering the Art and Craft

pp. 212-215, 511-515

SUGGESTED VIDEO ASSIGNMENTS

Lamination # 2663

LAMINATED DOUGHS

Laminated doughs include croissant, puff pastry, and Danish dough. Through a series of sheetings/rollings, folds and turns, numerous layers of dough and fat are created that help to leaven the dough and contribute to the crisp, tender and light qualities characteristic of laminated dough. The fat separates the layers of dough and traps steam released during baking. The number of fat layers is critical to the success of laminated doughs. With too few layers, the steam will escape, and the pastry will not rise. Too many layers can also be a problem because the layers of fat and dough merge together resulting in a loss of separation between dough and fat. Thus, the dough will not lift.

The fat that separates the layers of dough must be handled carefully prior to and during lamination. When working with the roll-in fat, follow the following principles:

- Keep the fat at or below 65°F/18°C.
- Mix the fat with some flour to create a workable or "plastic" roll-in fat.
- Make sure that the dough is kept cool before and after the fat is folded in.

The process to make these layers of fat and dough, **lamination**, can be broken down into two main stages:

1. Incorporating the fat
2. Sheeting/rolling and folding to create layers

INCORPORATING THE FAT OR "LOCKING IN"

The fat, also known as *beurrage,* roll-in fat, or fat dough, can be added by several methods: all-in method, two-fold, three-fold, or envelope method. This stage is also known as "locking in" the fat. The choice of method depends on the type of laminated dough (puff pastry, croissant or Danish). The all-in method mixes the fat

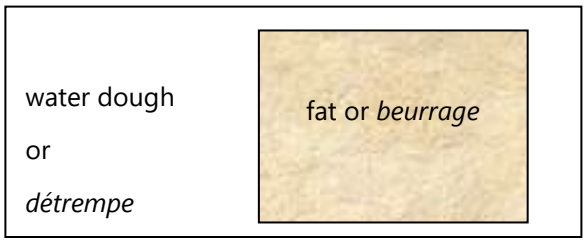
directly into the flour. The other three methods use two separate "doughs" – the water dough and the fat dough (butter) – and then combine the two doughs through a series of folds.

ALL-IN OR "SCOTCH" METHOD

The all-in method is similar to making pie dough because the fat is "cut" into the flour mixture. However, the pieces of fat should remain relatively large and **randomly** distributed throughout the dough. If the dough is mixed too long resulting in small pieces of fat **uniformly** distributed throughout the dough, the fat layers will not form properly, and the dough will not achieve maximum lift during baking. This method is commonly used for incorporating the fat into puff pastry.

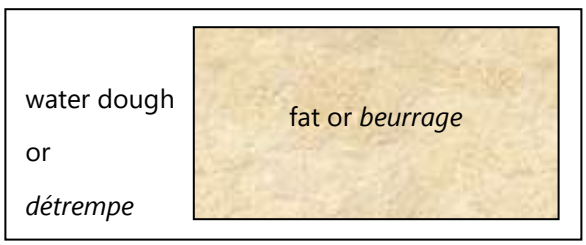
TWO-FOLD LOCK IN METHOD

In the two-fold lock in method, the fat is incorporated into the dough by using a two-fold (see Types of Folds). The fat covers half of the dough. A continuous layer of fat is produced.



THREE-FOLD LOCK IN METHOD

In the three-fold method, the fat is incorporated into the dough by using a three-fold (see Types of Folds, Laminated Dough Method). The fat covers two-thirds of the dough. As in the two-fold lock in method, a continuous layer of fat is produced.

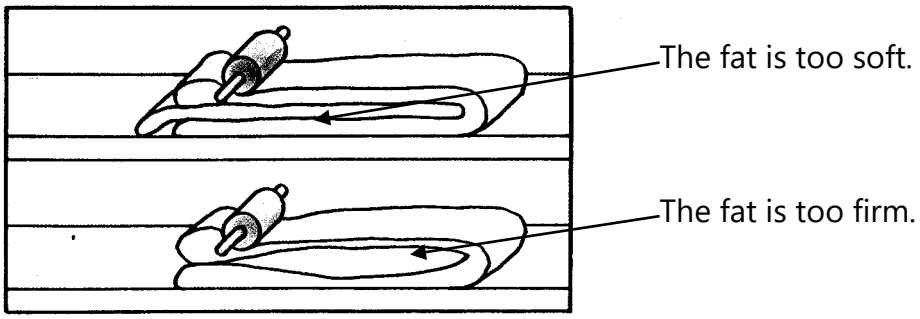


ENVELOPE LOCK IN METHOD

In the envelope lock in method, the dough is rolled into a square. The fat (**F**) is formed into a smaller square. The dough (**D**) acts as an envelope and wraps around the fat "letter" creating a **continuous** layer of fat.

SHEETING/ROLLING AND FOLDING

Sheeting and folding (see Types of Folds) reduces the thickness of the dough and distributes the fat layers evenly throughout the dough. Again, the thickness and the temperature of the layers of fat are crucial to the dough's success or failure. If the fat layers are too thin, they tear during folding, make the dough stick together and prevent the formation of layers of dough. If the layers of fat are too thick, they will melt out of the dough during proofing and baking.



After each session of sheeting and folding, the dough must rest to relax the gluten strands. Before the next session of sheeting and folding, the dough must be turned 90° to work the gluten strands in a different direction. This process of sheeting, folding, and turning continues until the desired number of layers of dough and fat are reached.

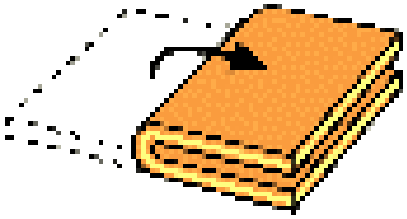
The finished quality of the layers depends on:

- the quality and temperature of the dough.
- the quality and temperature of the roll-in fat.
- the ratio of roll-in fat to layers of dough – high proportions of roll-in fat require more folds during the lamination process.
- the degree of uniformity and continuity of layers.

TYPES OF FOLDS

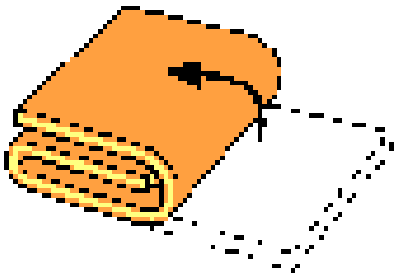
Laminated dough can be folded in several different ways including the two-fold, three-fold, and book-fold. Each method creates a different number of layers. The number and type of folds used during the lamination process influences the amount of fat layers.

Two-Fold or Single-Fold

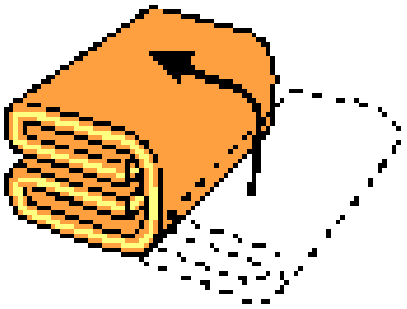


Visually divide the sheet of dough in half. Fold the sheet of pastry onto itself to form two layers. This type of fold doubles the number of layers in the pastry.

Three-Fold or Half-Fold

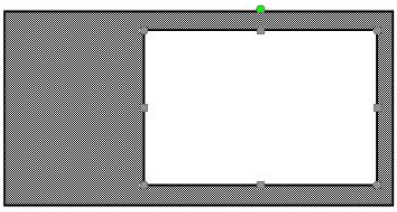


Visually divide the sheet into thirds. Fold one-third of the pastry sheet onto the middle third of the pastry. Fold the remaining unfolded one-third of dough onto the middle third. This type of fold forms three layers and triples the number of layers in the pastry.

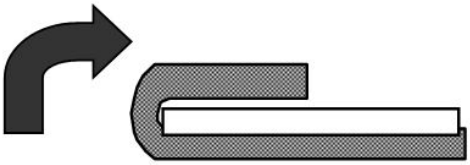


Visually divide the sheet of pastry into quarters. Fold the outer quarters into the middle so that their edges meet. Then fold the sheet as if closing a book. This type of fold quadruples the number of layers in the pastry.

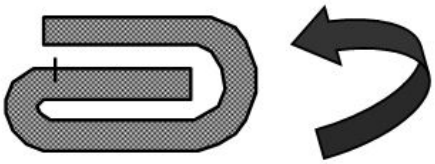
LAMINATED DOUGH METHOD



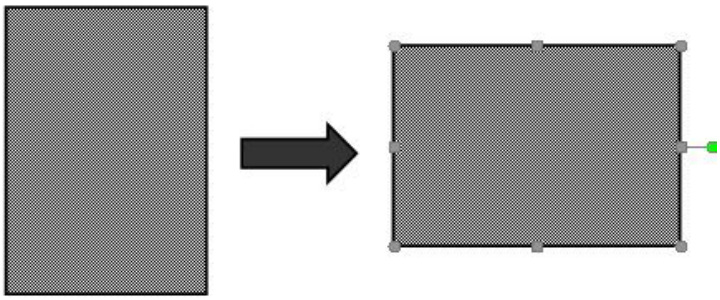
Place the butter on top of the dough, covering 2/3 of it.



Fold over the uncovered end of the dough to the center of the butter.



Fold over the remaining side of the dough. Seal the edges.

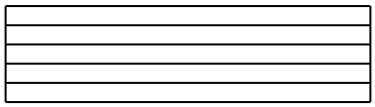


After resting the dough, turn 90º, re-roll and proceed with remaining folds.

BAKING LAMINATED DOUGHS

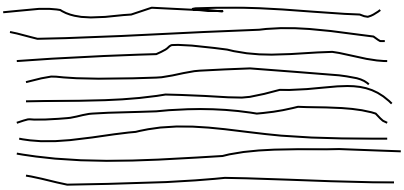
Baking a product made from laminated dough is the moment of truth because it allows the baker to see the success or failure of the lamination process. During baking, the layers of fat insulate the layers of dough. Around 140°F/60°C, the starches gelatinize and form a network of support. At 160°F/71°C, the gluten strands begin to coagulate and adhere to the gelatinized starches. When the temperature of the oven reaches 212°F/100°C, the water in the dough changes to steam expanding the gas bubbles in the dough. The gas bubbles move to the layers of fat, expand and push the layers of dough apart. After the steam evaporates, the temperature of the pastry rises above 212°F/100°C, sugars caramelize, and browning occurs.

DOUGH BEFORE BAKING



Fat rolled between layers of dough

DOUGH AFTER BAKING



Moisture in fat and dough layers turns to steam and raises the layers of dough.

PIE DOUGH

DOUGH COMPONENTS

Flour: Pastry flour is the best choice, but any low protein flour can be used successfully.

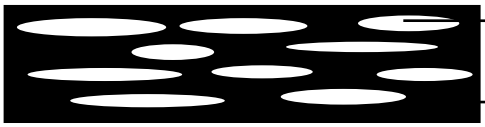
Fat: Butter will provide the best flavor, but it is difficult to handle. The most popular fat is regular hydrogenated shortening. To achieve both a desirable flavor and ease of handling, butter, lard, and other fats are often blended with the shortening.

Liquid: Water is used and must be cold to keep fat from melting.

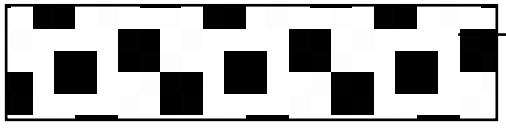
Temperature: The dough must be kept cool during mixing and make-up

TWO TYPES OF PIE/TART DOUGHS:

Flaky dough: The fat or shortening is "cut" into the dry ingredients until the fat is approximately the size of dried lentils. Water is then added and worked just enough to allow the flour to absorb the liquid. At this point, the dough needs to rest and cool. Rolling the dough causes flakes or layers of flour and fat to develop. As the dough bakes, the fat melts and separates the mixture of flour and water into layers.



Mealy dough: Fat and flour are combined and rubbed together until the mixture is homogeneous. This even distribution of fat results in a mealy/crumbly texture. Liquid is then added, and the mixture is worked just to combine.



ROLLING PIE AND TART DOUGH:

Be sure the dough is well chilled so that the fat does not melt, and the dough is much easier to handle. The dough should be rolled on a clean work surface that has been lightly dusted with flour to prevent it from sticking to the rolling pin and bench. Bread flour is the choice for this application because it is lower in starch than pastry, cake, and all-purpose flours and will not be readily absorbed into the raw dough.

Regularly turn the dough while rolling to help prevent the dough from sticking to the work surface. This will ensure uniform shape and thickness, as well as reduce the amount of dusting necessary. Evenly rolled dough is very important for uniform baking and browning. It is essential that you work quickly to prevent the fat from softening, which can ruin the texture of the dough. Some doughs that are particularly delicate or tender may have to be refrigerated intermittently during rolling and forming to prevent this from occurring. If the dough should tear during the rolling process, it can be patched by placing a small piece of dough over the tear and then rolling over it until the patch is concealed and dough is smooth.

Dough for large pies and tarts (8-inches/20 ⅓-cm and above) should be rolled to ⅛-inch/3 mm. thickness. Dough to be used for smaller or individual pastries should be rolled to 1/16-inch/⅛-cm thickness. If the dough for a pie or tart is too thick, it may not bake completely or properly, and its flavor and texture can overwhelm the flavors in the filling.

To move the dough into the pan, pick it up by wrapping it around the rolling pin, then gently unroll it over the pan. Scraps of leftover dough may be combined and reused one time. Lay them flat, pile them up, roll into a cohesive mass, then refrigerate until firm before using a second time.

DAY TWO:
TEAM PRODUCTION ASSIGNMENTS

EACH TEAM WILL MAKE…

3-2-1 Pie Dough
Mealy Pie Crust
Flaky Pie Crust

Rolled Pie Shells

Puff Pastry

Biscuits

Scones

3-2-1 PIE DOUGH

Yield: seven 10-inch pie crusts

Ingredients	Amounts		
Flour, pastry	1	lb.	8 oz.
Salt, kosher	½	oz.	
Butter, unsalted	1	lb.	
Water, ice-cold	8	oz.	

Method

1. Preheat oven to 400°F.
2. In a medium bowl, place the flour and salt. Mix to combine.
3. For flaky pie dough, rub the butter into the flour to form large nuggets. For mealy pie dough, work the butter into the flour to resemble crumb topping.
4. Add the cold water to the flour mixture. Mix just enough to form a dough.
5. Place 10 ounces of dough into each 10-inch pie pan.
6. Bake in the preheated oven for 25 to 35 minutes or until done if you need a pre-baked pie shell.
7. For unbaked shells, prepare dough through step number 4, using 1 ounces of pie dough for every inch of the diameter of the pie tin. Fill shell with amount of filling recipe calls for.

Note: This dough does not have to be refrigerated before use.

PUFF PASTRY DOUGH

Yield: 3 pounds

Ingredient	Amount
Butter, unsalted	1 lb. 2 oz.
Flour, bread	as needed
Flour, bread	1 lb.
Pastry Flour	4 oz.
Salt, kosher	½ oz.
Butter, unsalted, soft	4 oz.
Water, cold	10 oz.

Method

1. For the roll-in, combine the butter and flour and knead until smooth.
2. Spread the roll-in evenly over parchment paper to form a 9-inch x 7-inch shape and refrigerate.
3. For the dough, in the bowl of an electric mixer, place the water, flour, salt, and butter. Mix on the 1st speed until a smooth dough is formed, about 4 minutes. Do not overmix.
4. Let the dough rest at room temperature for 10 minutes. Roll out the dough to twice the length of the roll-in. This shape would be 9-inch x 14-inch.
5. Cover the dough with plastic wrap and place in the refrigerator to relax for about 30 minutes.
6. Lock in the roll-in using a simple ½ fold. Follow immediately with a 4-fold.
7. Allow the dough to rest for 15 minutes in the refrigerator.
8. Give the dough a 4-fold. Return the dough to the refrigerator to rest for 30 minutes.
9. Give the dough a 4-fold. Rest the dough for 30 minutes in the refrigerator.
10. Give the dough a final 4-fold. Cover with plastic wrap, label the dough, and place in the freezer for 2 hours.
11. Remove the dough from the freezer and place in the refrigerator until needed.
12. Roll and shape as desired.

BISCUITS

Yield: 32 each

Ingredients	Amounts
Flour, bread	2 lb.
Flour, pastry	1 lb.
Salt, kosher	¾ oz.
Baking powder	3 oz.
Sugar, granulated	6 oz.
Butter, unsalted	14 oz.
Buttermilk	1 lb. 9 oz.
Egg, whole	4 ea.
Egg, whole, beaten	2 ea.
Water	2 Tbsp.

Method

1. In the bowl of an electric mixer, place the flours, salt, baking powder, and sugar. Mix to combine.
2. Add the butter on speed #1 and mix until the dough forms walnut-sized pieces.
3. In a medium bowl, place the buttermilk and eggs. Mix to combine. Add it to the flour and butter mixture. Mix just until combined.
4. Transfer the dough to a sheet pan and cover. Refrigerate for 30 minutes.
5. Roll the dough to ½-inch thickness, then give the dough a 3-fold. Roll dough to 16-inch x 10-inch. Refrigerate for 30 minutes.
6. Preheat oven to 400°F.
7. For the egg wash, in a small bowl, place the eggs and water. Mix to combine.
8. Cut the dough into 8 squares, then cut each square into 4 triangles. Brush with the egg wash, let sit for 5 minutes, then apply egg wash again.
9. Bake in the preheated oven until the tops and bottoms of the biscuits are golden brown, 15 to 20 minutes.

Note: Alternatively, flaky biscuits can be made using the Shaggy Mass/ Lamination Method: Rub the butter into the dry ingredients. Combine the liquids and add to the flour and butter mixture. Mix just enough to make a "shaggy mass." Place the dough on a floured table and roll with a rolling pin to ½-inch thickness. Fold the dough over on itself, turn, and repeat this several times to make a smooth but flaky dough. The dough should be about 1-inch thick when cut.

SCONES

Yield: 6 pounds

Ingredients	Amounts	
Flour, pastry	13	oz.
Salt, kosher	1	tsp.
Baking powder	½	oz.
Sugar, granulated	1 ½	oz.
Butter, unsalted	6	oz.
Egg, whole	½	ea.
Egg yolks	1	ea.
Heavy cream	7 ½	oz.
Egg, whole, beaten	2	ea.
Water	2	Tbsp.

Method

1. Preheat oven to 375°F.
2. In a large bowl, place the flour, salt, baking powder, and sugar. Mix to combine.
3. Cut the butter into the dry ingredients until it is in ½-inch pieces.
4. In a medium bowl, place the eggs, yolks, and heavy cream. Mix to combine.
5. Add the liquids to the butter and dry ingredients. Mix just until a dough forms.
6. Roll to approximately 1-inch thick.
7. Cut the dough into the desired shape.
8. For the egg wash, in a small bowl, place the eggs and water. Mix to combine. Brush the egg wash on the dough.
9. Refrigerate for 15 minutes.
10. Bake in the preheated oven until the tops and bottoms of the scones are golden brown, 20 to 25 minutes.

Note: Garnishes may include currants, raisins, dried cherries or cranberries, chocolate chunks, nuts and savory items

DAY THREE
PRE-COOKED BATTERS, CUSTARDS, AND FILLINGS

LEARNING OBJECTIVES

By the end of this day, you should be able to …

- formulate custard based upon its intended use.
- determine when pâte à choux is fully baked.
- pipe pâte à choux for cream puffs, éclairs, and swans.
- identify the key differences in pâte à choux made using milk, and one made using water.
- identify the differences in ingredients and techniques between pastry cream and vanilla sauce.

LEARNING ACTIVITIES

Lecture and Discussion
Demonstrations
Hands-On Production
Product Evaluation

KEY TERMS

Cream puffs
Eclairs
Nappé
Pâte à choux
Waterbath
Curdle
Gelatinization
Pastry cream
Profiteroles

INSTRUCTOR DEMONSTRATIONS

Pastry cream
Pâte à choux piping
Determining doneness of pâte à choux

SUGGESTED READING ASSIGNMENTS

The Professional Chef (9th Edition)

pp. 1062-1065, 1093-1097

Baking and Pastry: Mastering the Art and Craft

pp. 355-356, 216-221

SUGGESTED VIDEO ASSIGNMENTS

The Bakeshop Series

Vanilla Sauce and Pastry Cream # 2754

CUSTARDS

Custards generally contain eggs, liquid, sugar, and other flavorings and sometimes a starch. Custards can be cooked on the stovetop or baked/poached. Baked/Poached custards steam in an oven. Baked custards may or may not contain starch.

TYPES OF COOKED CUSTARDS:

Nappé - for custards without the presence of a starch

Boiled - for custards containing starch

EXAMPLES OF COOKED CUSTARDS

Vanilla Sauce

Ice Cream

Gelato

Sabayon

Rice Pudding

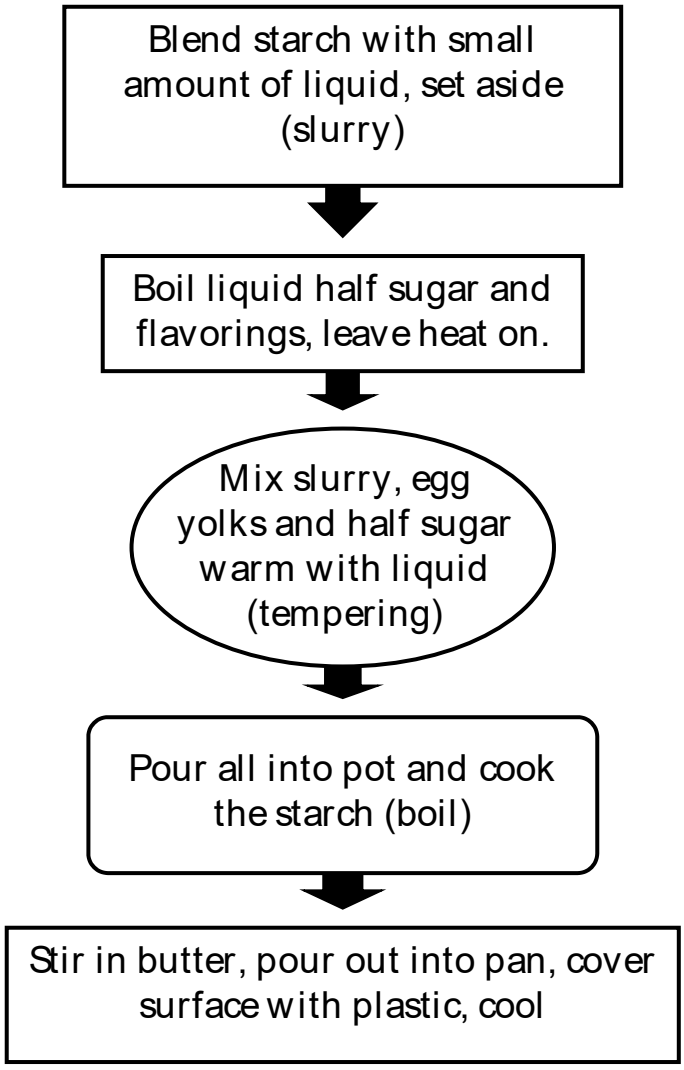
Pastry Cream

Cream Puddings

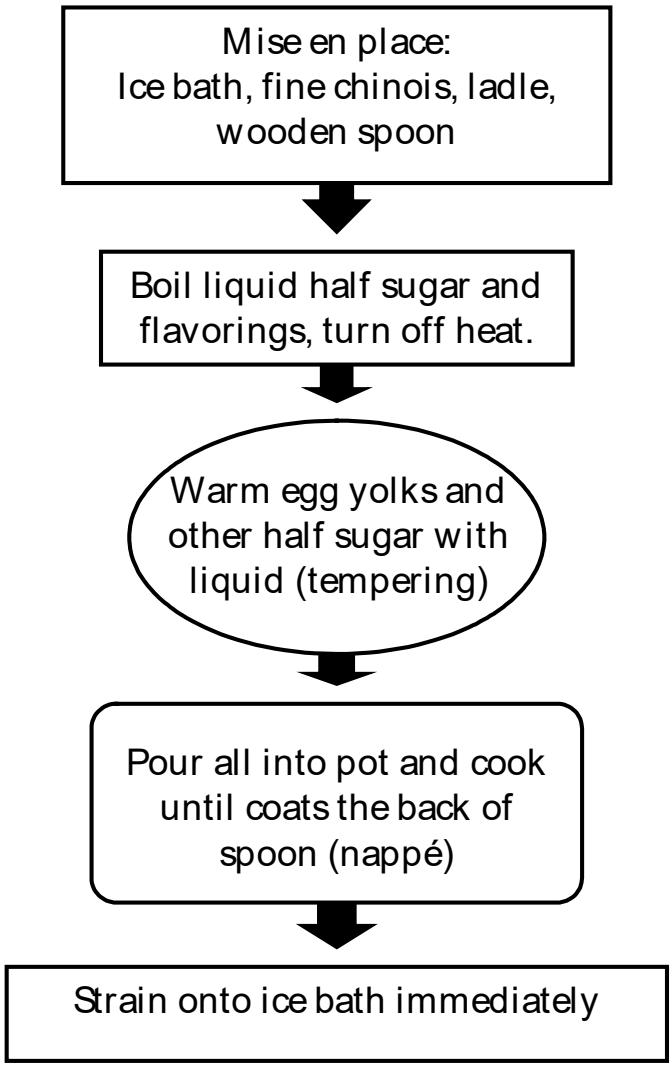
EXAMPLES OF BAKED/POACHED CUSTARDS

Cheesecake	Crème Brûlée
Crème Caramel	Clafoutis
Bread Pudding	Petit Pôt de Crème

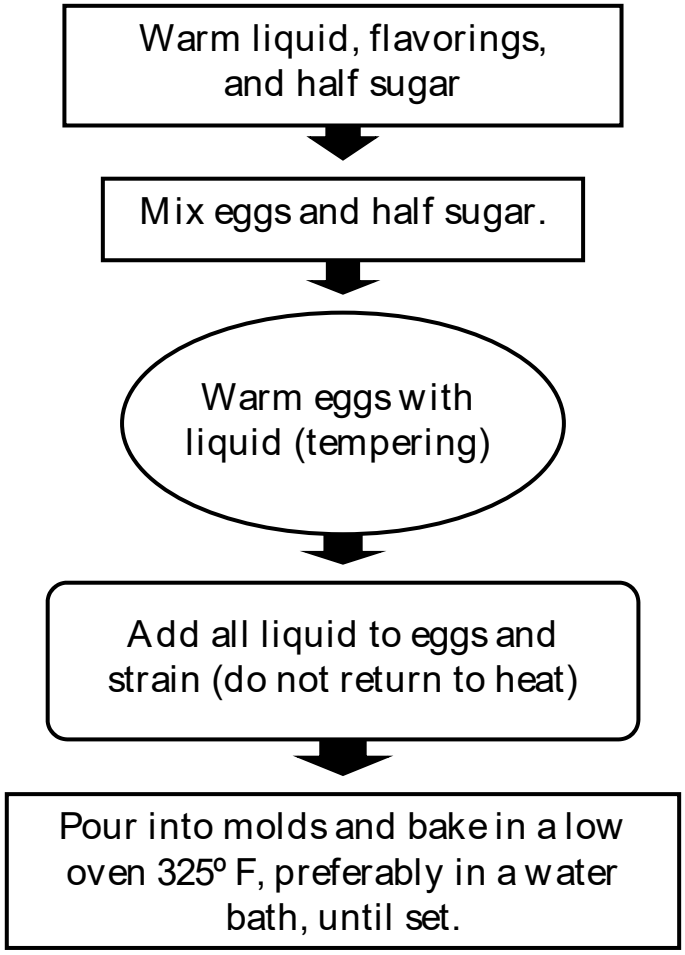
CUSTARD: BOILED METHOD



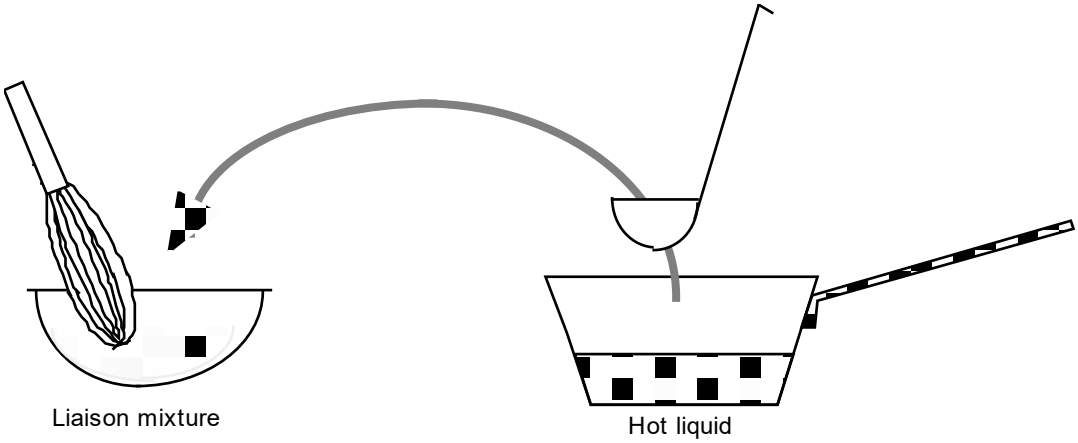
CUSTARD: NAPPÉ METHOD



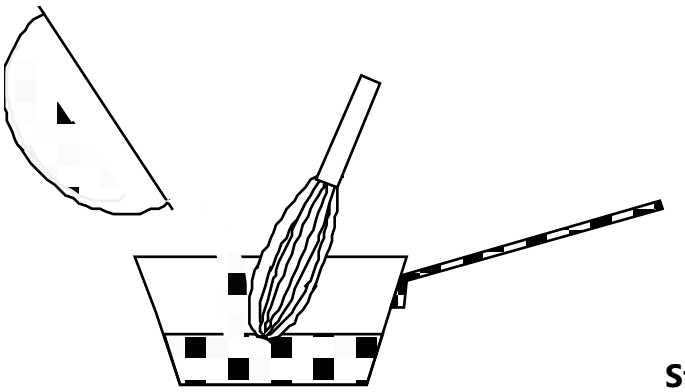
CUSTARD: BAKED/POACHED METHOD



TEMPERING METHOD FOR CUSTARDS



Step one: add some of the hot liquid to the liaison, whisking or stirring constantly to prevent scrambling/curdling



Step Two: Add the liaison back to the hot liquid, whisking or stirring constantly to prevent scrambling/curdling, cook until desired temperature/consistency, remove from heat, cool.

VANILLA SAUCE

Vanilla sauce, also known as Crème Anglaise, Sauce Anglaise, or Custard Sauce, is a fundamental bakeshop preparation. It can be used as a dessert sauce or as the basis for other dessert items such as Bavarian cream, parfait, or even baked custards. Vanilla sauce can be made using milk, heavy cream or a combination of the two. Either egg yolks or whole eggs may be used to thicken the sauce. It is most commonly made using milk and egg yolks. The most important step in making a vanilla sauce is to cook it to the proper consistency; the sauce must be cooked until it coats the back of a spoon, or *nappé* consistency. A vanilla sauce that is undercooked will be too thin to effectively use as a sauce and may present a food-borne illness hazard. An overcooked sauce will curdle as the eggs coagulate, leaving a sauce that is not smooth. Straining the sauce immediately after removing from the heat removes any overcooked egg and stops the cooking process, preventing any carryover cooking. As with any dairy product, it is important to cool the sauce as quickly as possible, preferably in an ice bath, and to refrigerate after it has cooled.

PASTRY CREAM

Pastry cream is a fundamental pastry shop preparation. It is used as a filling either by itself or mixed with another ingredient such as whipped cream. The ingredients in pastry cream are similar to those used in vanilla sauce, but it has a starch added to it. The most common starch for pastry cream is cornstarch, although flour, arrowroot, or tapioca may also be used. The addition of starch thickens the mixture to a pudding-like consistency, rather than the sauce consistency of vanilla sauce. Adding starch makes it necessary to boil the mixture, rather than just cooking it to *nappé* as you do with vanilla sauce. Pastry cream is a highly perishable product and must be cooled quickly and stored properly to prevent spoilage. To cool pastry cream, pour the cooked cream into a hotel pan, cover the surface with plastic wrap, and cool on an ice bath to below 45º F before refrigerating.

BAVARIAN CREAM

Bavarian cream, also known as *bavarois*, is made by stabilizing vanilla sauce with gelatin and then lightening the mixture with whipped cream. Historians are not clear on its origins. Some believe that it was brought to France by a French chef working in Bavaria.

Before making a Bavarian cream, make sure that your mise en place is ready. Having a complete mise en place will make the process go smoothly. The mise en place includes:

- bloomed gelatin
- heavy cream whipped to soft peaks
- vanilla sauce
- flavorings
- ice bath
- whisk
- rubber spatula

The steps to make a Bavarian cream are:

1. Combine the vanilla sauce with the bloomed gelatin and flavorings. The gelatin can be bloomed in water or in the flavoring.
2. Cool the base to 75°F over an ice bath. Stir constantly until it begins to gel.
3. Fold in the whipped cream. The mixture should be smooth and creamy without lumps. The Bavarian is now ready to use as a cake filling, parfait or frozen soufflé. The gelatin will take several hours to set up.

PÂTE À CHOUX

Pâte à choux is a precooked batter that expands into a hollow shell when baked. It can be filled, as for cream puffs, or not, as for gougère. Pâte à choux is made by combining water, butter, flour, and eggs into a smooth batter, then shaping and baking it. The shapes expand during baking to create a delicate shell. Pâte à choux is soft enough that a pastry bag can be used to pipe it into different shapes. Among the most common shapes are cream puffs, profiteroles, and éclairs.

SELECT AND PREPARE THE INGREDIENTS AND EQUIPMENT

- Sift the flour and line the sheet pans with parchment.
- Select a pot for cooking the batter that is large enough to hold the liquid, fat, and flour with enough room to be able to stir vigorously using a wooden spoon with no spillage.
- Assemble a mixer fitted with a mixing bowl and paddle attachment.

MAKE THE PÂTE À CHOUX

1. **Bring the liquid and butter to a full boil. Add the flour and cook, stirring constantly.** Be sure to have the liquid at a rolling boil before adding the flour all at once. Cook until the mixture pulls away from the pan, forming a ball. Transfer the mixture to a mixer bowl. Using the paddle attachment, mix the dough for a few minutes to cool it slightly. This will prevent the heat of the dough from cooking the eggs as they are worked into the mixture.
2. **Add the eggs.** Add the eggs gradually, in three or four additions, working the dough until it is smooth each time. Scrape down the sides and bottom of the bowl as necessary. Continue until all the eggs are incorporated.
3. **Portion and bake the dough.** Pipe the dough onto prepared sheet pans according to the desired result. Bake until the dough is puffed and golden brown with no beads of moisture on the sides. Begin by baking at a high temperature (375° to 400°F/190° to 204°C). Reduce the heat to 325°F/165°C once the dough begins to take on color. Continue to bake the pâte à choux until it is completely dry. Remove the pâte à choux from the oven. If the item is to be filled, slice it open and pull away any loose dough from the interior.

4. **Evaluate the quality of the finished item.** When properly prepared and baked, pâte à choux has a golden color because of the high proportion of eggs. This color does not change drastically during baking. Properly baked pâte à choux appears perfectly dry, without moisture beads on the sides or top. It will swell to several times its original volume during baking. Proper baking produces a dry, delicate texture. Remove the moist interior before adding filling for éclairs or puffs of any kind. Eggs are the predominant flavor of pâte à choux.

DAY THREE:
TEAM PRODUCTION ASSIGNMENTS

EACH TEAM WILL…

Make Pastry Cream

Roll, Cut, Shape, Bake, and Finish Puff Pastry Items

Make, Pipe, and Bake Pâte à Choux

Make Finishing Glaze

PASTRY CREAM

Yield: ½ quarts

Ingredients	Amounts
Sugar, granulated	2 oz.
Cornstarch	1 ½ oz.
Milk, whole (Divided)	1 lb.
Egg, whole	3 ea.
Sugar, granulated	2 oz.
Salt, kosher	1 pinch
Butter, unsalted	1 ½ oz.
Vanilla, extract	¼ oz.

Method

1. In a large bowl, place the sugar and the cornstarch. Mix to combine.
2. Add about 10% of the milk. Mix until dissolved.
3. Add the eggs and mix to blend.
4. In a saucepan, place the remaining milk, sugar, and salt. Bring it to a boil.
5. Temper the egg mixture with the boiling milk.
6. Return all to the pot and bring the mixture to a boil, whisking constantly. Cook for 1 minute.
7. Remove the pot from heat, then whisk in the butter and vanilla.
8. Place in a hotel pan over an ice bath to cool.
9. Cover the surface with plastic wrap. Label and refrigerate.

Note: The pastry cream should be used within three days.

PÂTÉ À CHOUX

Yield: 1 ½ pounds (24 eclairs)

Ingredients	Amounts
Milk, whole	4 oz.
Water	4 oz.
Butter, unsalted	4 oz.
Salt, kosher	1 pinch
Flour, bread	4 oz.
Egg, whole	8 oz.
Fondant	1 lb.
Chocolate, melted	4 oz.
Simple Syrup	1 ½ oz.
Corn Syrup	1 ½ oz.

Method

1 Preheat a deck oven to 375°F.
2 In a medium saucepan, place the milk, water, butter, and salt. Bring it to a boil.
3 Remove the pan from the heat and add the flour all at once, stirring to incorporate.
4 Return the pan to the heat and continue to stir until the mixture forms a mass and leaves a thin film behind on the bottom of the pan.
5 Place the contents of the pan in the mixer with paddle attachment on low speed.
6 Gradually add the eggs in 3 to 4 parts, scraping the bowl down after each addition.
7 To finish, pipe the dough into the desired shape.
8 Bake the pâté à choux in the preheated oven until it is even in color, with a very small band of lighter yellow running along the sides.
9 To make the chocolate fondant for éclairs, combine the fondant, melted chocolate, simple syrup, and corn syrup.

FINISHNG GLAZE

Yield: 3 pounds

Ingredients	Amounts
Apricot, jam	2 lb.
Water	1 lb.

Method

1. In a saucepan, place the apricot jam and water. Bring it to a boil. Stir until combined.
2. Store until needed.
3. When glazing, bring just the amount of glaze needed to a boil.
4. Immediately brush the glaze onto the items.

DAY FOUR:
PIE FILLINGS AND FINISHING

LEARNING OBJECTIVES

By the end of this day, you should be able to …

- list and describe three items made from puff pastry.
- fill and finish puff pastry items.
- explain the technique for using fondant to finish éclairs.
- describe the difference between a cooked fruit pie filling, cooked juice fruit pie filling, and an uncooked fruit pie filling.
- assemble and bake pies.

LEARNING ACTIVITIES

Lecture and Discussion
Demonstrations
Hands-On Production
Product Evaluation

KEY TERMS

Fondant

INSTRUCTOR DEMONSTRATIONS

Filling and finishing pâte à choux
Filling and finish puff pastry
Filling and finishing pies

SUGGESTED READING ASSIGNMENTS

The Professional Chef (9th Edition)

pp. 1111-1115

Baking and Pastry: Mastering the Art and Craft

pp. 511-518

Finishing Pies

The treatment to the top of a pie or tart makes it more interesting and appealing. Streusel or crumb crusts are appropriate for fruit pies. They are quick and easy and add flavor and texture. Pastry crusts are more versatile and are also appropriate for fruit pies. A pastry top for a pie may be made to completely cover the pie or tart or may be cut into strips and woven over the top to create a lattice pattern. Cut vents into the pastry if it covers the entire top. This will allow steam to escape during baking allowing the top crust to be crisp and flaky. Cut pastry doughs into shapes and use them to adorn the top of a pie or tart.

Pie Fillings

Pie fillings can be divided into three main categories based on their ingredients and how they are handled: **fruit**, **custard**, and **cream**. Understanding these categories and their guidelines will allow you to always know how to properly handle and bake any variety of pie.

Fruit Pie Fillings

Fruit pie fillings can be divided into two categories: **pre-cooked** and **uncooked**. These names refer to the way the fillings go into the shells, not the way they are served. The advantages of the pre-cooked filling method are that the filling can be made in quantity and then placed into pie shells and baked as needed. Additionally, pre-cooked fillings are easier for the baker to control and adjust for differences in fruit. If a batch of fruit is particularly tart, the baker can easily compensate by adding more sugar to taste. The same is true of the liquid content of the fruit that can be compensated for by altering the starch in the filling. In using the uncooked method, such variations would not be discovered until after the pie is baked. Finally, due to

the filling being pre-cooked, the baking time is greatly reduced in pre-cooked fillings.

When using the **uncooked** pie filling method, raw fruit, sugars, spices, binder, and usually a type of starch are combined in a bowl. That mixture is then deposited into unbaked pie shells, topped with a crust or a crumb topping, and the pie is baked. Because the binder is a starch, it is imperative to bake this type of pie until the center of the filling comes to a boil to gelatinize the starch, thicken the filling, and remove any starchy flavor. Because of this need, these pies are typically baked at a slightly lower temperature than pre-cooked filling pies so that the filling boils at the same time the crust reaches a golden-brown color.

To produce **pre-cooked** pie fillings, liquids such as juice or water are boiled with sugar. A starch slurry is then added, and the mixture is returned to a boil to cook the starch, thus thickening the juice. The fruit is then added, and depending on the formula, it may be returned to a boil or not. This pre-cooked mixture must be chilled before pouring into the shells and may be stored for several days in the refrigerator. Before baking, the pie is topped with a crust or crumb topping. These pies are typically baked at a high temperature for a shorter length of time to bake and caramelize the crust without boiling the filling.

CUSTARD-TYPE PIE FILLINGS

Any mixture that contains uncooked eggs and thickens through the baking process can be considered a custard-type pie filling. Pecan pie, pumpkin pie, and quiche are all classic examples. To prepare, the pie filling is generally poured into an unbaked shell then placed into a very hot oven for a short period to allow the crust to bake. Once the crust has browned, the temperature is reduced to moderate heat and the pie is left to slowly continue baking until the custard is just set. If the custard overbakes, it will take on a curdled texture and will cause cracks on the surface of the pie to form. Mealy pie

dough is preferred with this type of filling as the finely distributed fat coats the flour and prevents it from soaking up excessive liquid thus preventing a soggy crust.

Cream-Type Pie Fillings

Cream-type pies encompass a wide variety of fillings. The common denominator among them, however, is that the filling is always poured into a pre-baked shell, and the pie is not further baked. Examples of cream-type pie fillings include banana cream, chocolate cream, lemon meringue, and chiffon pies. In each of these varieties, the filling contains some type of binding agent that causes the filling to set with no further baking required. In the case of cream pies and lemon meringue filling, the starch that is cooked with the filling sets into shape as it cools. Therefore, it is critical to pour these fillings into the pre-baked shells while the filling is hot. In the case of chiffon pies, gelatin is used as the binding agent, and the filling must be poured into the pre-baked shell before the gelatin has a chance to set.

DAY FOUR:
TEAM PRODUCTION ASSIGNMENTS

ALL TEAMS WILL…

Make Chocolate Fondant

Fill and Finish Pâte à Choux

Prepare Fillings, Assemble, and Bake Pies

Apple Pie Variation 1
Apple Pie Variation 2
Cherry Pie
Lemon Meringue Pie
Pumpkin Pie
Pecan Pie

CHOCOLATE FONDANT

Yield: 1 ½ pounds

Ingredients	Amounts
Chocolate, chopped	3 oz.
Fondant	1 lb.
Water	1 lb.
Sugar, granulated	1 lb.
Corn syrup, light	1 lb.

Method

1. Melt the chocolate over a water bath.
2. Heat the fondant over a water bath to 105°F.
3. Add the chocolate to the fondant.
4. For the fondant syrup, in a pot, place the water, sugar, and corn syrup. Bring it to a boil.
5. Thin the fondant and chocolate mixture as needed using the fondant syrup.
6. When applying, keep the fondant at 100°F.

APPLE PIE
VARIATION 1

Yield: one 9-inch pie

Ingredients	Amounts
Pie dough	1 lb. 4 oz.
Sugar, granulated	5 oz.
Tapioca starch	½ oz.
Cornstarch	1 oz.
Salt, kosher	½ tsp.
Nutmeg, grated	½ tsp.
Cinnamon, ground	½ tsp.
Lemon, juice	½ fl. oz.
Butter, unsalted, melted	1 oz.
Apple, golden delicious, peeled, cored, sliced 1/8-in. x 3 mm thick	1 lb. 8 oz.
Egg, whole, beaten	1 ea.
Water	1 Tbsp.

Method

1. Preheat oven to 375˚F.
2. Divide the dough in half. Roll out one-half of the dough to 1/8 inch by 3 millimeters thick and line the pie pan. Reserve the other half, wrapped tightly, under refrigeration.
3. For the filling, in a large bowl, place the sugar, tapioca, cornstarch, salt, nutmeg, cinnamon, lemon juice, and melted butter. Mix to combine.
4. Add the apples and toss to coat them with the mixture.
5. For the egg wash, in a small bowl, place the egg and water. Mix to combine.
6. Fill the pie shell with the apple mixture. Brush the rim of the dough with the egg wash.
7. Roll out the remaining dough to a thickness of 1/8 inch by 3 millimeters and place it over the filling. Crimp the edges to seal, and then cut a few vents in the top of the pie.
8. Bake in the preheated oven until the filling is bubbling and the crust is a rich golden brown, about 45 minutes.
9. Serve warm or cool to room temperature.

Note: Variations could be other fresh fruit, such as peaches or nectarines, can be substituted for the apples.

APPLE PIE (FRESH FRUIT)

VARIATION 2

Yield: three 9-inch pies

Ingredients	Amounts
Apples, peeled and cored	1 lb. 8 oz.
Sugar, granulated	5 oz
Cornstarch	1 ½ oz.
Butter, unsalted (melted)	1 oz.
Cinnamon, ground	1 tsp.
Salt, kosher	¼ tsp.
Egg, whole, beaten	1 ea.
Water	1 Tbsp.
Sugar, coarse	as needed

Method

1. Preheat oven to 375°F.
2. Slice the apples ¼ to ½ inch thick.
3. Do not mix the filling until ready to fill and bake pies.
4. In a large bowl, place the sugar, cornstarch, melted butter, cinnamon, and salt. Mix to combine.
5. Add apples and toss to coat them with the mixture.
6. Add the lemon juice and toss to combine.
7. Place the filling in one pie shell.
8. For the egg wash, in a small bowl, place the egg and water. Mix to combine.
9. Add the top crust. Brush the top with the egg wash and sprinkle with coarse sugar.
10. Bake in the preheated oven until the crust is golden brown and the apples are tender, about 55 minutes.

Note: For a peach pie, replace the apples with fresh peaches.

CHERRY PIE

Yield: 2 pies (9-inches each)

Ingredients	Amounts
Cherries, #30 can, frozen, defrosted drained, juice reserved	1 ea.
Cherry, juice	1 lb. 2 oz.
Sugar, granulated	4 oz.
Salt, kosher	1 pinch
Clear gel	2 oz.
Cherry, juice	6 oz.
Cherries, drained well	2 lb. 2 oz.
Lemon, juice	1 ea.
Egg, whole	1 ea.
Water	2 Tbsp.
Butter, unsalted, melted	3 Tbsp.

Method

1. Preheat oven to 420°F.
2. Prepare unbaked, fluted pie shells and set them aside.
3. For the filling, in a saucepan, place the cherry juice, sugar, and salt. Stir to combine. Bring to a boil.
4. In a small bowl, dissolve the clear gel in the cherry juice. Slowly add it to the boiling mixture.
5. Return the cherry mixture back to a boil and cook until the mixture becomes clear, about 5 minutes. Remove the pan from the heat.
6. Using a wooden spoon, gently fold in the cherries and lemon juice. Taste the filling. If not sweet enough, add more sugar. Allow it to cool.
7. Scale 2 pounds of filling for the pie. Add the filling to the reserved pie shells.
8. Add a top or lattice crust.
9. For the wash, in a small bowl, place the egg and beat well. Add the water and stir until combined. Add the melted butter and stir until combined. Brush the wash onto the top surface of the pie.
10. Bake in the preheated oven until the crust is golden brown and the filling is bubbling, about 45 minutes.

Note: Cornstarch can be substituted for the clear jell.

LEMON MERINGUE PIE

Yield: two 9-inch pies

Ingredient	Amount
Pie dough	24 oz.
Butter, unsalted	14 oz.
Sugar, granulated	12 oz.
Lemon, Juice	14 oz.
Lemon Zest	2 tsp.
Egg Yolks	20 ea.
Egg Whites	8 oz.
Sugar, granulated	12 oz.
Cream of tartar	1 Pinch

Method

1. Preheat oven to 350°F.
2. For the dough, roll out the dough and line 10" pie shells. Crimp the edges.
3. Fill 1/3 of the pie shell with pie weights.
4. Blind bake the pie crust in the preheated oven until it is half baked.
5. Remove from the oven, remove the weights, and return the pie shell to the oven until it is fully baked. The pie shell must be fully baked BEFORE the filling is started.
6. For the filling, in a small saucepan, place the butter, sugar, juice, and zests, Bring it to a boil.
7. Temper the yolks and return them to the pan. Bring the product to a boil, stirring constantly with a wire whisk. Boil until the product comes to a full boil.
8. Pour the filling into the pre-baked shells. Chill it completely.
9. For the meringue, heat the egg whites, sugar, and cream of tartar over a double boiler. (Swiss meringue). Whip until stiff peaks form.
10. Top the tart with the meringue and use a blowtorch to achieve the desired color.

PUMPKIN PIE

Yield: 2 pies (9-inches each)

Ingredients	Amounts
Sugar, granulated	1 ½ cups
Cinnamon, ground	2 tsp.
Salt, kosher	1 tsp.
Ginger, ground	1 tsp.
Clove, ground	½ tsp.
Egg, whole, large	4 ea.
Pumpkin, can, 15 oz.	2 ea.
Evaporated milk, can, 12 oz.	2 ea.
Deep-dish pie crust, unbaked	2 ea.
Whipped cream (Optional)	as needed

Method

1. Preheat oven to 425°F.
2. In a small bowl, place the sugar, cinnamon, salt, ginger, and cloves. Mix to combine.
3. In a large bowl, place the eggs. Beat the eggs.
4. Stir in the pumpkin and the sugar-spice mixture.
5. Gradually stir in the evaporated milk.
6. Pour the filling into the pie crust.
7. Bake in the preheated oven for 15 minutes.
8. Reduce the temperature to 350°F. Bake until a knife inserted into the center comes out clean, 40 to 50 minutes or.
9. Cool on a wire rack for 2 hours. Serve immediately or refrigerate. Top with whipped cream, if desired.

Source: Libby's

PECAN PIE

Yield: two 9-inch pies

Ingredients	Amounts
Pie dough	20 oz.
Sugar, granulated	1 oz.
Flour, bread	1 oz.
Corn syrup, dark	21 oz.
Egg, whole, beaten	7 oz.
Vanilla, extract	2 tsp.
Salt, kosher	1 tsp.
Butter, unsalted, melted	2 oz.
Pecans, halves, toasted	8 oz.

Method

1. Preheat oven to 450˚F.
2. Roll out the dough 1/8-inch by 3-millimeters thick. Line two 9-inch pie pans.
3. For the filling, in a large bowl, place the sugar and flour and whisk together.
4. Add the corn syrup and blend thoroughly.
5. Add the eggs, vanilla, and salt. Mix until incorporated. Stir in the melted butter.
6. Spread the pecans evenly in the pie shell. Pour the corn syrup mixture over the top.
7. Bake in the preheated oven until the crust begins to brown, about 15 minutes.
8. Reduce the oven temperature to 325˚F and bake until the filling is set, about 25 minutes.
9. Cool completely before serving.

Variations: For a **chocolate pecan pie**, add 6 ounces of chocolate chunks to the pecans. For a **pecan cranberry pie**, add 5 ounces of fresh or frozen cranberries to the pecans.

FORMULA INDEX

These materials were developed at the Culinary Institute of America.

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