



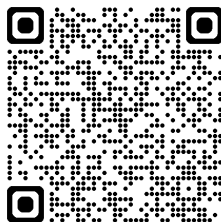
Culinary Institute of America

WOOSONG UNIVERSITY **FUNDAMENTALS OF BAKING & PASTRY**



Culinary Institute of America at Hyde Park, NY

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MENU

Pate a Choux

Pastry Cream

Sweet Dough

Cardamon Filling

Vanilla Chiffon Sponge Cake

Swiss Buttercream

Croissant Dough (3-day process)

PATE A CHOUX

Yield: Twenty-four 3-inch eclairs, round

Ingredients	Amounts
Milk, whole	113 g
Water	113 g
Butter, unsalted, cubed	113 g
Salt, kosher	2 g
Flour, bread	113 g
Egg, whole, whisked	227 g

Method: Pre-Cooked

1. Pre heat a deck oven to 375°F.
2. In a medium pot, place the milk, water, butter, and salt. Bring to a full boil.
3. Remove the pot from the heat. Add the flour all at once. Stir with a wooden spoon until homogenous.
4. Return the pot to the heat. Stir until a film forms on the bottom of the pot.
5. Transfer the mixture to the bowl of 5-quart stand mixer fitted with the paddle attachment. Mix on low/medium speed for 30 seconds.
6. Add the eggs $\frac{1}{4}$ at a time, mixing until just incorporated. It should be smooth and thick, not runny. (To check, remove the paddle attachment and hold it up; if it creates a "V" shape at the end of the paddle, it is done. You may not need to add all the eggs). Do not overmix. Check the consistency of the batter, adjust accordingly.
7. Transfer to a pastry bag fitted with an 806 tip. Pipe rounds for éclairs onto parchment-lined baking sheets. Leave at least 1 inch between puffs for proper expansion. (See Chef demo.)
8. Let them dry until they form a skin, 15 to 20 minutes. We will be adding craquelin topping at this stage.
9. Bake in the preheated oven until golden brown and hollow sounding when tapped, 35 to 40 minutes. Avoid opening the oven early to prevent collapse. Chef will demo checking of choux.

PASTRY CREAM

Yield: about 600 grams

Ingredients	Amounts
Milk, whole (Divided)	454 g
Sea Salt	3 g
Sugar, granulated (Divided)	113 g
Starch, corn	42 g
Egg, whole	3 ea.
Vanilla, extract	7 g
Butter, unsalted	43 g

Method: Boiled Custard

1. In a medium pot, place 90% of the milk and all the salt. Sprinkle half of the sugar over the milk. Do not stir. Bring the milk to a boil. Remove the pot from the heat.
2. For the slurry, in a medium bowl, whisk together the remaining sugar and corn starch. Then add the rest of the milk and whisk thoroughly.
3. Add the eggs and whisk. You have now created a liaison.
4. Temper the boiling milk into the liaison. Pour the liaison back into the pot.
5. Return the pot to medium heat, whisking constantly until the starch just begins to thicken, about 5 minutes. Remove the pot from the heat. Whisk vigorously until no lumps remain.
6. Return the pot to the heat and return it to a boil, stirring constantly for 1-3 minutes. Have spoons ready for tasting.
7. Remove the pot from the heat and taste starch. Continue boiling if starch is present.
8. Off the heat, whisk in the butter and vanilla extract.
9. Pour the cream onto a plastic-lined sheet pan. Place plastic wrap directly on the surface of the pastry cream. Cool at room temperature for 10 minutes. Chill in the refrigerator.

Note: To reconstitute, place the mixture in the bowl of a 5-quart stand mixer fitted with the paddle attachment and mix briefly.

Chocolate variation: add 113 grams of dark chocolate when adding butter and vanilla.

SWEET DOUGH

Yield: 24-30 each depending on size cut

Ingredient	Grams	Bakers %
Flour, bread	1167	100.0%
Yeast, dry	10	0.9%
Sugar, granulated	131	11.3%
Salt, kosher	15	1.3%
Butter, unsalted	202	17.3%
Eggs, whole	232	19.9%
Malt syrup	5	0.4%
Milk, whole	505	43.3%
Total	2268	194.4%

Method: Straight Dough

1. **Prep:** Make any filling prior to mixing the final dough.
2. **Mix:** In the bowl of a stand mixer fitted with the dough hook attachment, place all the ingredients- liquids first. Mix on low speed for 4 minutes, scraping down the sides. Mix on high speed for 6 minutes for full gluten development (intense).
3. **Bulk Ferment** at room temperature for 30 minutes, in an oiled metal bowl. Cover with plastic wrap. Afterwards, press gently into a rectangle with hands, on a parchment lined tray. Cover with plastic wrap.
4. **Retard-** If using the same day, cover and place into a cooler for a minimum of 30 minutes.
5. Can make cinnamon buns/babkas/loaves/coffee cakes. (See Chef.)
6. **Roll out** to a ¼ -in. thickness. (See Chef shaping demo.)
7. Proofing times vary; if making babka, the proof time will be close to 2 hours.

CARDAMON FILLING

Yield: 1 kilogram

Ingredients	Amounts
Butter, unsalted, softened	500 g
Sugar, granulated	500 g
Cardamon, coarsely ground	6 Tbsp.
Espresso, powder	6 Tbsp.
Agave	40 g

Method

1. In the bowl of a stand mixer fitted with the paddle attachment, place the softened butter and sugar. Mix at high speed until fluffy and light in color, 3 to 5 minutes.
2. Add the cardamon, espresso powder, and agave. Mix on medium speed until homogenous, 1 to 2 minutes. Scrape down the bowl as needed.
3. Transfer to a container, refrigerate, and reserve.
4. When ready to use, bring to room temperature. Transfer to the bowl of a stand mixer fitted with the paddle attachment. Paddle until pliable.

VANILLA CHIFFON SPONGE CAKE

Yield: two 8-inch cakes

Ingredients	Amounts
Egg, yolk	6 ea.
Oil, vegetable	28 g
Vanilla, extract	3 g
Flour, cake	321 g
Sugar, granulated	274 g
Baking powder	14 g
Salt, kosher	2 g
Water, warm (Divided)	152 g
Egg, white	6 ea.
Sugar, granulated	76 g
Cream of tartar	2 g

Method: Foaming Method

1. Preheat convection oven to 325°F with fans on 2. Brush cake pans with pan grease or use pan spray and lay parchment discs on the bottom. Reserve.
2. In an 8-quart bowl of a stand mixer fitted with the paddle attachment, place the egg yolks, oil, and vanilla. Sift in the flour, sugar, baking powder, and salt.
3. Add ½ of the water. Mix on medium low speed until it forms a paste, 1 to 2 minutes. Scrape the sides of the bowl as needed.
4. Add the remaining water in 3 stages to thin out the paste. Scrape the bowl down after each addition. Beat on medium speed for 2 minutes. Transfer to a large bowl. Reserve. Cover with plastic wrap.
5. In a separate 8-quart bowl of a stand mixer, place the whites. Add cream of tartar to the sugar. Create a French meringue, stiff peaks.
6. Carefully fold 1/3 of the French meringue into the egg yolk/ flour mixture until streaky. Fold in the remaining 2/3 French meringue until fully incorporated, being careful not to overmix. (1/3 – 2/3 Technique). (See Chef demo.)
7. Fill the two prepared cake pans to slightly above halfway.
8. Bake in the preheated oven until the cake springs back when gently pressed in the center, 20 to 30 minutes.

Note: For chocolate chiffon, substitute 113 g of the cake flour with Dutch process cocoa powder.

SWISS BUTTERCREAM

Yield: 1.5 kilograms

Ingredients	Amounts
Egg, white	227 g
Sugar, granulated	454 g
Butter, unsalted, 65-70°F	680 g
Vanilla, extract	7 g

Method: Meringue

1. Set up a double boiler over medium heat. Place the whites and sugar in the bowl of a stand mixer. Heat the whites and sugar over the double boiler to 160°F while constantly whisking.
2. Place the bowl on the mixer fitted with the whip attachment. Whip on medium-high speed until the meringue reaches soft peaks. Should no longer be hot. Room temperature is best.
3. Add the soft butter at a slow/steady rate while mixing on high.
4. Add the vanilla. Mix until an emulsion is formed and the buttercream is an ivory white color.
5. Use immediately or chill in a plastic wrap pillow.

Note: To reconstitute the buttercream, warm to 65-70°F and paddle on medium-low speed until the desired texture is reached.

CROISSANT DOUGH (3 DAY PROCESS)

Yield: about 48 each depending on size cut

Ingredient	Grams	Bakers%
Flour, bread	2760	100.0%
Butter, unsalted, cubed, cold	335	12.1%
Sugar, granulated	268	9.7%
Salt, kosher	67	2.4%
Yeast, dry	67	2.4%
Malt syrup	11	0.4%
Milk, whole	1765	64.0%
Roll-in Butter		
Butter, unsalted	1531	55.5%
Total	6804	246.6%

Method: Straight Dough

1. **Day 1:** In the bowl of a stand mixer bowl fitted with the hook attachment, place the liquids in the bowl first and then the dry ingredients on top. Mix on a low speed for 4 minutes, scraping down the sides. Mix on high speed for 2 minutes. (Intense development.)
2. **Bulk Ferment** for 1 hour at room temperature. Depending on the Final Dough Temperature. Divide the dough in half using a scale and press into a rectangle. Cover.
3. **Retard** overnight in the freezer, covered. Place into fridge to thaw in the morning-or once frozen, place into the fridge.
4. **Day 2: Lock-In and Folds:** Pound your lock-in fat until pliable but still cold. Build a sandwich (Dough-Fat-Dough). Use your rolling pin and press slightly so that the dough will fit in the sheeter.
5. **Sheeter:** Using the sheeter, sheet the dough to ½ -in. thickness. If good, give a **4-fold**.
6. **3-Fold:** If dough is still cold, go directly into a 3-fold. Cover with plastic and place into the freezer until frozen-about 2 hours. Then move to the fridge to store overnight.
7. **Day 3:** Thaw out the dough in the fridge. Gather all MEP for final shaping: Chef's knife, ruler, egg wash, pastry brush, sheet trays with parchment paper, chocolate batons.
8. **Cut the dough in half:** Half the dough will be for croissants and the other half for Pain au Chocolate. Place half the dough into the fridge and start with the other half.
9. **Using the sheeter,** sheet the width of the dough to 10-11 inches so that when you turn the dough you have 12 inches for the width. The final width should be 12 inches (the length does not matter). Sheet down to number 3.5mm to 4mm on the machine depending on how cold your dough is. Too thin, and you will squeeze the layers, too thick and the dough will melt/proof before you are ready.
10. See Chef Demo for final shaping of the croissant or pain au chocolat.

BAKER'S GLOSSARY

Ash: The powdery, incombustible residue left after burning matter.

Autolyse: The process of mixing the flour and water together without the salt.

Allows the dough to hydrate and then relax prior to final mixing.

Average flour value: Value composed of four factors: color of flour, loaves per barrel, size of loaf, and quality of bread as applied to any given shipment of flour.

Bake: To cook with dry heat in a closed place, as an oven.

Bakers Percentages: Baker's use percentages based off the Flour. Flour is the largest ingredient used for bread making. Flour is always 100%. Other ingredients are based off this percent.

Biga: a pre-ferment that is more flour than water with yeast. Mixed 10-15 hours prior to the final mixing.

Bleeding: Term applied to dough that has been cut and left unsealed at the cut, thus permitting the escape of air and gas.

Bolting: Sifting of ground grain to remove the bran.

Boston brown bread: A dark, sweet bread (not yeast raised) containing among its ingredients, cornmeal, and molasses, steamed, and not baked.

Bowl knife: A spatula or flexible dull-edged knife used to scrape batter or dough from bowl sides.

Bran: Skin or outer covering of the wheat berry removed during milling

Bread dough: The uncooked mass of ingredients used to make bread.

Bread: The accepted term for food of flour, sugar, shortening, salt, and liquid made light by the action of yeast.

Brioche: A light sweet dough, baked in large or small molds.

Buns: Small cakes of bread dough, sometimes slightly sweetened or flavored.

Carbon dioxide: A colorless, tasteless, edible gas obtained during fermentation or

from the combination of soda and acid

Cardamon: Angular, aromatic seeds of herb grown in India and Ceylon, and having anise-like taste. Used whole or ground in pickling, breads, cookies and many Scandinavian desserts.

Clear flour: Flour made from middlings after patent flour is taken.

Croissant: Rich crescent-shaped French roll usually served at breakfast.

Danish pastry: A flaky yeast dough having butter rolled into it and filled with almond, cheese, jam or other filling.

Divider: A machine to cut dough automatically into a required size.

Dough Temperature: Temperature of dough at different stages.

Doughnut: A round cake, usually with center hole, made of yeast or baking powder dough and cooked in deep fat fryer.

Dry milk: Milk from which water has been removed by drying.

Dry yeast: A dehydrated form of yeast.

Dusting: Distributing a film of flour on pans or work bench.

Egg wash: A mixture of eggs and water (or milk) in equal parts applied to an unbaked product by brush to produce a glazed effect and to give the product a rich brown color.

Enriched bread: Bread made from enriched flour or containing federally prescribed amounts of thiamin, riboflavin, iron, and niacin.

Enzyme: A minute substance produced by living organisms, which has the power to bring about changes in organic materials.

Fermentation: The chemical changes of an organic compound due to the action of living organisms as yeast, producing the formation of the leavening gas, carbon dioxide.

Fillings: Sweet creams, jams, etc. spread between baked layers in cakes, rolls or shaped into yeast-raised items.

Firing: Process of heating an oven with fuel.

Flour: Finely ground meal of grain (wheat, rye, etc.)

Fold: The method of lapping dough over on itself after it reaches right fermentation, as in making yeast-raised items.

Formula: In baking, a recipe giving ingredients, amounts to be used, and method of combining them.

French doughnuts: Doughnuts made of Pâte à Choux.

Fritters: Doughnuts made from cream puff paste and fried in hot deep fat fryer. Fruit-filled drops of heavy cake batter fried in deep fat.

Germ: That part of seed (such as in grain) from which the new plant grows.

Gliadin: The part of gluten that gives it elasticity.

Gluten: The protein part of flour which gives structure to bakery products by enabling flour to expand around air or gas and to hold the texture so formed, the determining quality factor.

Glutenin: The part of gluten which gives it strength

Graham flour: Unbolted wheat meal.

Greasing: Spreading a film of fat on a surface.

Hardness of water: An indication of mineral salts in greater amount than is found in soft water.

Hearth: The heated baking surface or floor of an oven.

Honey: A sweet syrup substance made by bees from flower nectar.

Hot-cross buns: Sweet, yeast-raised buns with raisins added, marked on top with a cross in dough or a frosted cross. Lenten favorite.

Humidity: Amount of moisture in the air.

Hydrogenated oil: Oil treated with hydrogen to give a type of shortening.

Hygrometer: An instrument to determine the degree of humidity.

Leavening: Raising or lightening by air, steam, or gas (carbon dioxide).

Makeup: Method of mixing ingredients or handling of dough.

Malt extract: A syrupy liquid obtained from malt mash.

Meal: Coarsely ground grain; unbolted wheat flour.

Middlings: Coarse particles of ground wheat made during rolling of the grain in flour mills.

Milk bread: White bread in which all liquid is milk or which contains not less than 8.8 parts (by weight) of milk solids for each 100 parts of flour (by weight). This is a federal standard that is rigidly enforced.

Mix: The combined ingredients of batter or dough.

Mixing bowl: A concave, hemispherical container for mixing.

Molder: Machine that shapes dough pieces for various shapes

Oatmeal: Meal made by grinding oats.

Parkerhouse rolls: Folded buns of fairly rich dough.

Pate Ferment: Pate referring to "dough" and Ferment referring to "old," meaning "old dough"

Poolish: Equal parts of flour and water with yeast. Mixed 10-15 hours ahead of final mixing.

Pre-Ferments: This is used to start the fermentation of dough ahead of the mixing time. There are 4 main pre-ferments that are most common: Poolish, Biga, Sponge, White Sour, Pate Ferment.

Proof box: Box or cabinet equipped with shelves; it also permits the introduction of heat and steam; used for fermenting dough.

Proofing period: The time during which dough rises.

Puff pastry: Rich pastry with rolled-in butter for extra flakiness.

Pumpernickel: Coarse, somewhat acid rye bread.

Rope: A spoiling bacterial growth in bread formed during production.

Rounding: Shaping of dough pieces to seal ends and prevent bleeding.

Salt: Sodium chloride; used for flavor and dough control.

Scale: An instrument for weighing.

Scaling: Apportioning batter or dough according to weight.

Score: To score is to make incisions forming a pattern on cakes or pies.

Shrink: To shrink is to roll out paste and allow it to rest before baking to prevent shrinkage.

Sifting: Passing through fine sieve for perfect blending and to remove foreign or oversize particles.

Sponge: Mixture of flour, water and yeast that is made the same day as the final dough. Made at least 30 minutes prior to mixing.

Straight flour: Flour containing all the wheat berry except the bran and seeds; termed 100% extraction flour.

Thermometer: An instrument for measuring temperature

Troughs: Large, rather shallow containers, usually on wheels, used for holding large masses of rising dough.

Turn: When puff pastry is mixed, rolled out, folded over one -third and then the other third is folded over; this operation is called giving one turn.

Wash: A liquid brushed on the surface of an unbaked product (may be water, milk, starch solution, thin syrup or egg).

Whole wheat: Unbolted wheat meal.

White Sour: Also known as the following: Liquid levain, Starter, Madre, "Baby." It is a ratio of 1:1:1 or baker's preference. Ratio is flour: water: starter and no yeast added.

Yeast: A microscopic fungus (plant) which reproduces by budding and causes fermentation and the release of carbon dioxide. There is Fresh, Instant, and Active Dry forms of yeast.

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