Culinary Institute of America

Artisan Breads at Home

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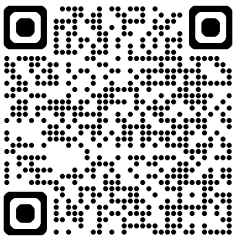

Expectations for Participants

To maintain safety/ sanitation standards and ensure you have the best experience possible…

Kitchen Responsibilities

- Silence and put away phones.
- Clean your workstation as you go.
- Place waste in proper receptacle:
  - **Green**: food scraps for compost
  - **Blue**: recyclables
  - **Gray**: trash for landfill
- Use paper towels, cleaning cloths, red sanitation bucket for spills.
- Use side towel for handling hot objects, not cleaning.
- Place dirty utensils, tools on speed rack, not in sink.
- Place anything with an edge in "Sharps Only" pan.
- Place dirty linen in linen bag.

Knife Safety

- Use a sharp knife.
- Hold the knife firmly. Place your dominant hand on the handle with three fingers gripping it. Your thumb and index finger should pinch the blade, resting on either side of the bolster.
- Cut away from your body.
- Use a cutting board.
- Place knives on flat surface, away from table edge.
- Keep knives in clear sight, never covered.
- Never grab blindly for a knife.
- Pass knives using the handle, never the blade.
- Carry knives alongside body with the point down.
- Alert others by saying "Behind you with a knife."

Recipe Mise en Place

- Read the entire recipe before starting.
- Review yield, temp., and cook times.
- Ask questions if anything is unclear.
- Visualize the cooking process from start to finish.
- Complete any pre-steps (soak, marinade, etc.).
- Gather, measure/ weigh all ingredients.
- Complete all basic prep (wash, trim, dice, etc.).

Food Safety

- Keep hair contained with toque, hair net/ tie.
- Wash hands before starting work.
- Wash hands after:
  - Touching hair, face, phone, pen, etc.
  - Coughing/ sneezing into tissue
- Wash and dry all produce.
- Wash cutting board, knives, tools after each use.
- Keep perishables refrigerated until needed.
- Per NY state law, wear gloves when handling ready-to-eat food.
- Keep raw meat, poultry, eggs, seafood separate from other foods.
- Cook food to the temperature safe zone.

PRODUCTION ASSIGNMENTS

Sourdough Bread with White Sour Feeding

Focaccia

Cinnamon-Roll Dough with Cinnamon Filling

Baguette with Poolish

Bialys

Semolina Sesame Bread

SOUR: IN A CATEGORY OF ITS OWN

Sour (also called "sourdough starter") is a preferment made without using commercial yeast. Instead, flour and water are mixed, and wild yeasts present in the air and in the flour grow and ferment enough to leaven bread. Bakers made bread this way for millennia. Commercial yeast was not invented until the mid-nineteenth century, shortly after Louis Pasteur confirmed that yeast existed. Preferments made with commercial yeast can be excellent, but the flavor and texture of bread made with sour (called *levain* in French) is incomparable. However, extra time and persistence are required.

The "base sour" is developed a week before it is needed to bake bread. It requires only about fifteen minutes of preparation each day.

The type of flour used to establish the base sour must remain consistent. Thus, it is important to calculate the total amount of flour needed and ensure there is enough to complete all 7 days of feedings. Changing the type of flour during this process will alter the results.

Ambient temperature is also a key factor in this process. Moderate room temperature (in the low 70s) is ideal. If the room temperature is warmer than 80°F, cooler water must be used to compensate. Additionally, the sour can be placed in the refrigerator for two hours after feeding.

HOW TO BUILD AND DEVELOP A SOUR TO ESTABLISH A WHITE SOUR BASE:

Day One

Ingredient	Ounces	Grams
Flour, bread	4.0	113
Water, 85°F	4.0	113

Day 1: Mix equal amounts of flour with water (at 85°F) until the mixture is homogenous. Use a bowl big enough for the mixture to double in size. The bowl should be glass or stainless steel because, unlike plastic, they are less likely to retain odors. (Plastic may be used if the vessel is reserved for this purpose.) After mixing and scraping down the bowl, cover it, and let it sit at room temperature for 18 to 24 hours. The goal is for the enzymes to break down the flour's starch into sugar. Any wild yeast present in the flour or in the air will begin feeding on this sugar.

Day 2: After this period, the fermentation process will have changed the aroma. There may be some bubbling. There should not be streaks of mold-- If there are, throw it out and start over. Use a clean hand or utensil to mix it together again. (If any foreign bacteria get into the dough, it may change the sour and overtake it.) Mixing the sour redistributes the food for the yeast, incorporating air and expelling gas, as well as equalizing the temperature and strengthening the structure. There is no need to feed the starter on Day 2. Scrape anything off the sides of the bowl into the mix, cover, and let it sit for 18 to 24 hours. It will develop more acidity and flavor.

Day Three

Ingredient	Ounces	Grams
Water, 85°F	4.0	113
Mix from Day 2	4.0	113
Flour, bread	4.0	113

Day 3: On Day 3, the sour should be very bubbly, and smell pleasantly fermented. Use a scale to weigh the amount of mixture needed and discard the rest. (This may seem wasteful, but it is necessary to maintain the same quantity of starter.) Next, place equal parts of fresh water (at 85°F) and the starter mixture from the previous day into a clean mixing bowl. Blend these together, then add an equal part of flour to the mix. Blend by hand until homogenous. Scrape down the sides of the bowl, cover, and let it sit for 18 to 24 hours.

Day Four

Ingredient	Ounces	Grams
Water, 85°F	3.0	83
Mix from Day 3	6.0	170
Flour, bread	3.0	85

Day 4: By Day 4, the mixture should be bubbly, liquid, and smell pleasantly fermented, but with a stronger aroma than the previous day. The proportions for feeding will be different from the previous day: **1:2:1** (1 part water, 2 parts starter, and 1 part flour). Keep the water warm at 85°F. Once the ingredients are blended, the mixture will be looser than the previous day. Scrape down the bowl, cover, and let it sit for another 18 to 24 hours.

Days Five to Seven

Ingredient	Ounces	Grams
Water, 55°F	6.0	170
Mix from Day 4	3.0	85
Flour, bread	9.0	255

Days 5 to 7: On Day 5, the mixture will be very aromatic and bubbly. It will also have risen higher than the previous day. The smell will be very strong.

From this stage onwards, when feeding the starter, the ratio will be **2:1:3** (2 parts water, 1 part sour and 3 parts flour) For example:

Water	4 oz.
Sour	2 oz.
Flour, bread	6 oz.

As little as 8 ounces of the starter can be saved. The remaining sour would then be discarded. Also, the water should be at 55°F. The water must be cooler to slow down fermentation, building flavor and acidity.

Place the water (at 55°F) and the previous day's mix in a bowl and stir it together. Add the flour and mix until homogenous. Scrape the bowl down, cover, and let it sit at moderate room temperature (68°F to 72°F). After feeding, the sour will be stiffer, more like a dough. For the next several days, the starter will look over-fermented and broken down.

MAINTAINING AND BAKING WITH A SOUR

Once the sour is established (meaning it has been fed for seven days and has been fermenting for about 18 hours since the last feeding), it is ready to be used.

Alternatively, the sour can be maintained until needed for baking. It can be kept at room temperature, fed once a day with a **2:1:3** ratio (2 parts water, 1 part sour, 3 parts flour). It can also be fed and immediately refrigerated until needed. In this case it will need to be "refreshed," which means feeding it for several days, before it can be used. Bring it to room temperature for one day, then give it a Day 5 feeding for 2 or 3 days. If a refrigerated sour is not refreshed before being used for baking, the yeast will be sluggish and the bread will not rise.

If the sour looks moldy, it must be discarded and the process must be started again from the beginning.

HOW TO FEED (OR REFRESH) A WHITE SOUR BASE

Plan ahead if using a refrigerated sour. It must be refreshed before it can be used to bake bread. Allow for one day of bringing the sour to room temperature, and two to three days of feedings (plus 18 hours of fermentation after the last feeding)—this means a total of four or five days of advance preparation. For just keeping the sour alive, put it immediately in the refrigerator after the last feeding. Then refresh it at least once every three weeks. A sour that is not refreshed at least every three weeks will eventually die. Whether feeding or refreshing the sour, it is ready when it appears and smells as it did when it was first developed. If feeding a sour to maintain it, a portion must be discarded. Save a minimum of 8 ounces to maintain the health of the starter. The following are directions for feeding and refreshing a sour:

1. **Place** the water in a clean stainless steel or ceramic bowl (or use a fresh plastic container reserved for this purpose). The container should be big enough for the starter to double in size.
2. **Weigh out** the portion of sour specified in the recipe (in this case, 5 ½ oz.) and put it into the bowl with the water. Dissolve it in the water, using a clean hand or spatula.
3. **Measure** the amount of base needed to feed the sour. Discard the leftover portion. Do not pour the unneeded sour mixture down the kitchen sink. (It will clog the drain.) Scoop the extra sour into a bag and throw it in the trash. It can also be composted.
4. **Add** the flour to the bowl with the sour and water. Mix by hand until homogenous.
5. **Scrape down** the bowl and cover it. Label it with the time to keep track of the fermentation process.
6. **Ferment** at room temperature for 18 hours. If not making bread after 18 hours, give it one more feeding, then immediately transfer the sour to the refrigerator. **Sours need to be refreshed at least once every three weeks.**

CHANGING A WHITE SOUR BASE INTO AN ALTERNATE TYPE

A white sour base can be altered by using a different type of flour for feeding. Changing the type of flour used will produce different characteristics in the final bread.

White bread flour produces lactic acid-- the type found in milk. Lactic acid is milder in flavor than acetic acid, which is produced by rye flour.

Rye produces a high proportion of acetic acid-- the kind found in vinegar. In addition to changing the flavor, it reduces the fermentation and therefore the volume of the bread.

Like rye, whole wheat contains both acetic acid and lactic acid, but with more lactic acid. This results in a milder, sweeter flavor than rye, but less volume than white bread. Whole wheat is more acidic than white flour, but less so than rye.

Durum will contribute a mild lactic flavor like wheat, but a sweet finish. It also produces a crispy crust, due to other characteristics in the flour. Combinations of flours can be used to produce more complex flavors and acidity profiles.

Coarser flours may absorb less liquid or ferment more slowly than finely ground flours, so the ratios must be changed accordingly. If using rye flour to feed a white sour base, for example, more water will need to be added. A small amount of salt will also need to be added. Rye absorbs water more readily and ferments more rapidly, so the salt is needed to slow down the fermentation.

CREATING A RYE SOUR FROM A WHITE SOUR BASE

Rye Sour

Ingredient	Ounces	Grams
Water, 60°F	7.5	213
White sour	2.5	71
Flour, rye, medium	7.5	213
Salt	0.1	3

1. **Place** the water and sour in the bowl of a stand mixer fitted with the paddle attachment. Blend for 1 minute on the slowest speed.
2. **Add** the rye flour and salt. Mix for 3 minutes on the slowest speed. Make sure to scrape down the bowl.
3. **Place** the mixture in a stainless-steel bowl or ceramic container that is big enough for it to double in size. Cover and label. Ferment the sour at room temperature for 18 hours.

CREATING A WHITE WHEAT SOUR FROM A WHITE SOUR BASE

Feeding a sour with 100% whole wheat is not recommended, as this tends to create too much acidity. Rather, substitute 25 to 30% of the bread flour for whole wheat. The water will not need to be adjusted.

SOURDOUGH BREAD

Yield: 3 loaves at 450 grams
FDT: 78°F | **Bulk fermentation:** 120 minutes | **Final fermentation:** 60 minutes
Retard: overnight | **Rest:** 60 to 75 minutes | **Bake:** 450°F and 35 to 45 minutes

Ingredient	Ounces	Grams	Bakers %
Water, 80°F	16.3	462	66.5%
White sour (Recipe follows)	9.6	272	39.2%
Malt syrup (Optional)	0.2	6	0.8%
Flour, bread	22.8	646	93.1%
Flour, whole-wheat	1.7	48	6.9%
Salt	0.7	20	2.9%
Total	**51.3**	**1454**	**209.4%**

1. **Make** the dough the day before serving the bread. Put the water, sour and malt in the bowl of a stand mixer fitted with a dough hook. Mix for 1 minute on low speed. Add the bread and whole-wheat flour. Mix on low speed for 2 minutes, scraping down and flipping the dough over. Cover the dough in the bowl. Let it sit for 15 minutes.
2. **Add** the salt and mix for 2 minutes on low speed, scraping down and flipping the dough over. Mix for 2 minutes on medium speed, scraping down and flipping the dough over. The dough should be a little sticky, but with good gluten development. Place the dough in a lightly oiled bowl large enough for it to double in size. Cover it with plastic wrap.
3. **Ferment** the dough in a warm place for 60 minutes, until the dough springs back halfway when lightly touched.
4. **Fold** the dough 4 times. Let the dough rest and ferment until it springs back halfway when lightly touched, about 1 hour.
5. **Divide** the dough into 3 pieces at 450 grams each. Round each dough piece against the tabletop. Place on a lightly floured surface and cover. Rest for 10 minutes.
6. **Line** a baking tray or round baskets with white cloth napkins or kitchen towels. Dust them with flour.
7. **Shape** each piece of dough into a round and place seam-side up on the cloth. Bring the cloth up between each loaf on the tray. Cover the shaped dough pieces and allow them to rest and ferment at room temperature for 60 minutes. Refrigerate overnight to help slow down fermentation and develop more flavor and acidity. (This is called *retarding the bread*.)
8. **Preheat** the oven to 475°F with a baking stone 20 minutes before baking. Ten minutes before baking, place a tray filled with 3 cups of warm water below the baking area in the oven to produce steam.

9. **Uncover** the dough and place each piece seam side down on an oven peel lined with parchment paper. Spray each loaf with water. Score each loaf ¼- to ½-inch deep. Spray each loaf again.
10. **Transfer** the loaves and parchment paper to the baking stone and immediately reduce the temperature to 450°F. Bake for 12 minutes. Remove the steam tray and parchment paper and rotate each piece. Continue baking until the crust is firm and develops a deep color, 20 to 30 minutes. Baking times will vary.
11. **Remove** the bread from the oven and transfer to a cooling rack. Cool for at least 30 minutes before slicing.

WHITE SOUR BASE FEEDING

Yield: 18 oz.

Ingredient	Ounces	Grams	Bakers %
Water, 60°F	5.9	167	64.8%
White sour starter	3.0	85	33.0%
Flour, bread	8.4	238	92.3%
Flour, whole-wheat	0.7	20	7.7%
Total	**18.0**	**510**	**197.8%**

1. **Place** the water and sour starter in the bowl of a stand mixer fitted with a dough hook. Mix on low speed for 1 minute to break up the sour.
2. **Add** the bread and whole-wheat flours. Mix for 3 minutes on low speed, making sure to scrape down and flip the sour over. The sour should be a little sticky with good gluten development.
3. **Transfer** the sour to a lightly oiled bowl large enough for it to double in size. Cover.
4. **Ferment** the sour at room temperature for 18 to 20 hours before using.

Notes: Make sure never to use **all** the sour for baking, or the process will have to be started over from the beginning. The sour feeding can also be mixed by hand until totally homogenous.

FOCACCIA / HAND MIX

Yield: 2 loaves at 500 grams
FDT: 80°F | **Biga:** 12 to 14 hours | **Bulk fermentation:** 60 to 70 minutes
Final fermentation: 20 to 30 minutes | **Bake:** 475°F 25 to 28 minutes

Ingredient	Pounds	Grams	Bakers %
Biga			
Flour, bread	0.39	178	24.0%
Water, 55°F	0.23	104	14.0%
Yeast, instant dry	pinch	0.1	0.01%
Final Dough			
Flour, bread	1.24	564	76.0%
Water, 86°F	0.98	444	59.9%
Oil, olive	0.10	44	6.0%
Yeast, dry	0.01	3	0.3%
Malt	0.001	4	0.5%
Salt	0.04	17	2.3%
Biga	0.62	282	37.9%
Total	**3**	**1361**	**183.3%**
Garnish			
Rosemary, fresh, chopped	as needed		
Salt, sea, flaked	as needed		

1. **Prepare** the biga the day before serving the focaccia. Place the water in a bowl. Mix the flour and yeast together, add to the water, and mix by hand until homogenous with no lumps. The biga will be stiff and resemble dough. Cover with plastic wrap and ferment at room temperature for 8 to 10 hours prior to mixing. At that point, the biga should be risen and not collapsed in the center.
2. **To make the dough,** use a bowl large enough for the final dough. Add 90% of the water to the bowl, reserving the rest for later (see "Basic Double Hydration Technique," below). Add the malt and biga. Break the biga into little pieces by hand. Add the flour, yeast and salt. Work the mixture by hand for about 5 minutes. The dough should have some structure at this point.
3. **Add** the remaining 10% of water, one third at a time, until it is all incorporated, making sure the dough has absorbed the water before adding more. The dough will be weak and lacking in structure. Cover and ferment in a warm place for about 30 minutes.
4. **Fold** the dough from all four sides using wet hands. Ferment until the dough springs

back halfway when lightly touched, about 30 minutes.

5. **Fold** the dough again and let the dough rest until it springs back halfway when lightly touched, about 10 minutes.
6. **Line** a baking tray with parchment paper. Prepare a small container of olive oil, a pastry brush, and a shallow pan of semolina flour.
7. **Turn** the dough out onto an oiled space on the table. Using a bench knife, divide the dough into 500-gram pieces. Lightly shape the dough into rounds and place the bottoms into the semolina flour. Transfer the dough onto the parchment-lined tray, evenly spacing the pieces of dough.
8. **Allow** the dough to rest for 10 minutes.
9. **Lightly** handle the dough to flatten it, keeping the round shape. Cover with plastic wrap and ferment until risen to full volume, about 90 minutes.
10. **Stipple** the top of each loaf with oiled fingers. Make sure to press all the way through the dough.
11. **Bake** at 450°F until evenly golden brown, about 20 minutes. Once out of the oven, brush with olive oil and sprinkle with fresh chopped rosemary and flaked sea salt.

Basic Double Hydration Technique

Delicate and viscous doughs, such as focaccia or ciabatta, require special handling. They benefit from the "double hydration" mixing method: adding the water in two stages.

Focaccia is an extremely wet dough. It can be mixed by hand and is often made with a preferment. The preferment (in this case, a biga) is made ahead of time. Biga has less water than other kinds of preferments, with a ratio of flour to water that is 2:1. For a highly hydrated dough, like focaccia, adding the entire amount of water all at once would cause the dough to be far too liquid and lack any gluten structure. To develop gluten in a dough with such high-water content, the "double hydration" technique is required. In this example, focaccia is made using a biga:

1. **Mix** the dough with clean hands. Add 80% of the recipe's water to the biga, then add the remaining ingredients. The dough should reach the "improved" stage of gluten development, in which it holds together well but is not strong enough to hold a translucent window. (Holding back 20% of the water will allow the gluten structure to develop as it mixes.)
2. **Add** the remaining 20% of the water, ⅓ at a time, squeezing the dough gently while mixing. Focaccia is a delicate dough and should not be over-worked.
3. **Bulk ferment** and proceed along with the remaining steps.

CINNAMON-ROLL DOUGH

Yield: 4 to 5 loaves at 28 oz. (will vary depending on pan size)
FDT: 82°F | **Bulk fermentation:** 55 to 70 minutes | **Final fermentation:** 75 to 90 minutes
Bake: 375°F and 35 to 40 minutes

Ingredient	Pounds	Grams	Bakers %
Cinnamon Filling (Recipe follows)	4.6	130	
Dough			
Milk, whole, 80°F	.45	808	43.3%
Eggs	0.20	372	19.9%
Butter, soft	0.18	323	17.3%
Malt syrup (Optional)	0.00	8	0.4%
Flour, bread	1.03	1867	100%
Yeast, instant dry	0.01	16	0.9%
Sugar	0.12	210	11.3%
Salt	0.01	24	1.3%
Total	**2**	**3629**	**194.4%**
Garnish			
Egg wash	as needed		

1. **Make the cinnamon filling** the day prior and store it in the refrigerator. When ready to mix the bread, remove the cinnamon filling from the refrigerator and leave it at room temperature for 60 minutes. In the bowl of a stand mixer fitted with the paddle attachment, blend on low speed to soften the filling and make it easier to spread.
2. **To make the dough**, place the milk, eggs, and malt in the bowl of a stand mixer fitted with a dough hook. Add the flour and yeast to the bowl, then add the sugar and salt. Place the butter on top of the flour. Mix for 4 minutes on low speed, making sure to scrape down and flip the dough over twice during this process. Mix for another 4 minutes on medium speed, scraping down the bowl and flipping the dough over twice during this process. Place the dough in a lightly oiled bowl large enough for it to double in size and cover it with plastic wrap.
3. **Bulk ferment** in a warm place, until the dough springs back halfway when lightly touched, 45 to 60 minutes.
4. **Place** the dough on a lightly floured work surface and roll it out to about 1 ½ inches thick. Transfer the dough to a parchment-lined tray and cover with plastic wrap. Refrigerate for at least 1 hour or overnight.
5. **Roll** the dough out to ½ in thickness, maintaining a long, rectangular shape (but not too wide). Spread a thin layer of the cinnamon filling around the entire surface. Roll the dough into a log. Check that the seam is on the bottom of the roll. Then cut the

roll to the size of the loaf pan. Cut the dough into 3 equal strands and braid or cut in half and twist (see Chef demo). Place the final shaped dough into the greased pan, seam-side down.

6. **Egg wash** each loaf and cover with lightly oiled plastic wrap. Ferment in a warm place until the dough springs back halfway when lightly pressed, 75 to 90 minutes.
7. **Preheat** the oven to 425°F about 20 minutes before the end of final fermentation.
8. **Uncover** the loaves and egg wash a second time.
9. **Transfer** the loaves to the oven and immediately reduce the temperature to 350°F. Bake for 20 minutes. Rotate the loaves and bake until golden brown and cooked through, 20 to 30 minutes. Baking times will vary depending on the oven and the size of the loaf.
10. **Remove** the bread from the oven and immediately release it from the pan. Place the loaves on a cooling rack. Cool for at least 30 minutes before slicing.

Variations:

Pumpkin: Substitute ½ of the milk with pumpkin purée.

Lemon: Add 45 g of lemon zest to the dough.

CINNAMON FILLING

Yield: 32 ounces

Ingredient	Pounds	Grams	Bakers %
Butter, melted	0.73	331	100.0%
Sugar, brown	0.70	316	95.5%
Honey	0.08	36	10.8%
Flour, pastry	0.10	44	13.2%
Cinnamon	0.10	44	13.2%
Eggs	0.30	138	41.7%
Vanilla, extract	0.01	2	0.8%
Total	**2**	**907**	**274.3%**

1. **Place** the melted butter and brown sugar in the bowl of a stand mixer fitted with a paddle attachment. Mix for 2 minutes on low speed, occasionally scraping down the bowl.
2. **Add** the honey, pastry flour, and cinnamon. Mix for 2 minutes on low speed, scraping down the bowl as needed.
3. **Add** the eggs and vanilla. Mix for 2 minutes on low speed, scraping the bowl periodically.
4. **Transfer** to a container. Cool at room temperature for 60 minutes. Cover and refrigerate overnight. It can be made ahead and stored in the refrigerator for up to a month.

EGG WASHING

A classic example of egg-washed bread is challah, recognized for its glossy braid, deep brown color, and tender, moist crust. These characteristics are achieved in part through the application of an egg wash.

When applying egg wash, it is typically done twice: first, after shaping the dough, to help seal it during fermentation, and again immediately before baking. After the initial wash, the dough should be covered to prevent drying. If using plastic wrap or a reusable covering, lightly oil the surface to prevent sticking. Generally, breads that are egg washed are not misted with water prior to baking and are not scored. Seeds may be applied to the surface after the final egg wash—for example, when preparing sunflower rolls, apply the wash after shaping, repeat the wash following proofing, and then add the seeds before baking.

A standard formula for egg wash is one whole egg plus one yolk. The additional yolk provides extra fat, which enhances shine. A small amount of salt should be added to help break down proteins, producing a smoother, more uniform mixture. Adding a small quantity of water will improve pliability. For best results, strain the mixture to remove any unincorporated egg solids.

Egg wash may be kept at room temperature during use. Avoid storing the brush in the mixture; instead, rest it on a clean saucer or spoon between applications. Once finished, thoroughly wash the brush and let it dry completely before storing.

BAGUETTE WITH POOLISH

Yield: 3 loaves 350 grams.
FDT: 82°F | **Poolish**: 12 to 14 hours

Ingredient	Ounces	Grams	Bakers %
Poolish			
Water, 55°F	7.2	204	31.4%
Flour, bread	7.2	204	31.4%
Yeast, instant dry	0.01	0.3	0.04%
Final Dough			
Water, 85°F	9.7	275	42.4%
Malt syrup (Optional)	0.2	5	0.8%
Poolish	11.7	332	51.1%
Flour, bread	15.7	445	68.6%
Yeast, instant dry	0.1	3	0.6%
Salt	0.5	14	2.3%
Total	**37.9**	**1074**	**165.8%**

Method

1. **Mix** the poolish the day before mixing the final dough. Put the water in the bowl of a stand mixer fitted with a paddle attachment. Add the flour and yeast. Mix on low speed for 2 minutes, or until homogenous. The poolish will be soft and fluid. Leave the poolish in the bowl or in an airtight container with room for it to expand and grow. Ferment at room temperature for 10 to 12 hours.
2. **To make the dough,** put the water and malt in the bowl of a stand mixer fitted with a dough hook. Add the poolish and malt syrup. Mix for 2 minutes on low speed to break down the poolish. Add the flour into the mixer and mix till homogenous. Cover with plastic wrap. Autolyse for about 20 minutes.
3. **Place** the yeast and salt on top in separate spots in the mixer. Mix the dough for 4 minutes, making sure to scrape it down and flip over the dough. More water can be added at this time (double hydration). Mix for 2 minutes on medium speed, making sure to scrape down and flip over the dough. The dough should be a little sticky, but with good (improved) gluten development. Place the dough in a lightly oiled bowl large enough for it to double in size and cover.
4. **Ferment** the dough in a warm place until the dough springs back halfway when lightly touched, 45 to 60 minutes.
5. **Gently fold** the dough to help with degassing of CO2 and to provide strength. Once folded, cover with plastic wrap. Ferment for 30 minutes.
6. **Line** a baking tray with a white cloth napkin, kitchen towel or couche. The cloth will need to be floured unless seeds are being applied to the loaf.

7. **Place** the dough on a lightly floured work surface and divide it into 350-gram pieces. Pre shape each piece into a 6-inch oblong. Rest for 10 minutes before final shaping.
8. **Final shape** into 10 to 12-inch-long baguettes. Take the ends on the left and right of each piece and bring them together, so they just meet in the center of the loaf. Then bring the top of each loaf over halfway and tuck in. Bring the top of the loaf over all the way to the bottom and close the seam tightly. (See Chef demo.) Place the loaves seam-side up on the work surface, cover lightly with plastic wrap, and rest for 10 minutes.
9. **Brush or spray** each loaf with water. Place the loaves seam-side up on the tray with the cloth. Cover the loaves with any additional cloth, then lightly cover with plastic wrap. Ferment in a warm place for 40 to 50 minutes, until the dough springs back when lightly touched.
10. **Preheat** the oven to 500°F with a baking stone twenty minutes before the end of the final fermentation. Ten minutes before baking the loaves, place a tray filled with 3 cups of warm water below the baking area in the oven to produce steam.
11. **Place** the loaves lengthwise on the back of a parchment-lined baking tray by flipping them onto a piece of thick cardboard, then sliding them onto the tray. Keeping the seam on the bottom, spray the top and sides of each loaf with water. Let sit for 5 minutes, then score the top of each loaf with a sharp razor, cutting ¼–½-inch deep. Spray the loaves with water again. This will add steam in the oven and help the loaves expand.
12. **Transfer** the loaves to the baking stone with parchment paper. Immediately reduce the temperature to 475°F. Bake for 12 minutes. Remove the parchment paper and steam tray, rotate the loaves, and bake for 8 to 10 minutes more. If at the end of the baking, the crust is not thick enough, turn the oven off and leave the bread in the oven with the door cracked open for 4 to 6 minutes.
13. **Remove** from the oven and place the loaves on a cooling rack. Cool completely before slicing.

Note: If there is not enough room to bake all loaves at once, place the extra loaves in the refrigerator for 15 minutes. This process is called "retarding," and will help to slow down the fermentation so that the bread will not over-proof.

ONION POPPY BIALYS

Yield: 24 pieces at 55 grams
FDT: 82°F | **Bulk fermentation:** 45 minutes | **Final fermentation:** 35 - 40 minutes
Bake: 375°F 15 - 18 minutes

Ingredient	Pounds	Grams	Bakers %
Poolish			
Water, 55°F	.56	252	30%
Flour, bread	.56	252	30%
Yeast, instant dry	0.01	2	.1%
Garnish			
Onion, yellow, small diced	3	1362	
Oil, vegetable	as needed		
Poppy seeds	as needed		
Final Dough			
Water, 85°F	.51	231	27.5%
Malt syrup	0.2	7	.9%
Poolish	1.12	510	60.5%
Flour, bread	1.30	589	70%
Yeast, instant dry	0.1	4	.4%
Salt	0.4	19	2.3%
Total	**3**	**1361**	**161.7%**

1. **Mix** the poolish the day before mixing the final dough. Put the water in the bowl of a stand mixer fitted with the paddle attachment. Add the flour and yeast. Mix on low speed until homogenous, about 2 minutes. The poolish will be soft and fluid. Leave the poolish in the bowl or in an airtight container with room for it to expand. Ferment at room temperature for 10 to 12 hours.
2. **Heat** the oil in a large skillet over medium heat. Add the onions and sweat until soft and translucent, 5 to 10 minutes. Set aside to cool. This can be done a day ahead, if needed. Once cooled, in a large bowl, combine the onions and the poppy seeds. Reserve.
3. **Place** the water, yeast, flour, salt, malt and poolish in the bowl of a stand mixer fitted with a dough hook. Mix for 4 minutes on low speed, making sure to scrape down and flip the dough over twice during this process. Mix for 4 minutes on medium speed, making sure to scrape down the bowl and flip the dough over. At this point, the dough should have full gluten development. Place the dough in a lightly oiled bowl large enough for it to double in size and cover with plastic wrap.

4. **Ferment** in a warm place until the dough springs back halfway when lightly touched, 30 to 45 minutes.
5. **Place** the dough on a lightly floured work surface and divide into 2-ounce pieces. Round each piece of dough against the tabletop and place the dough pieces seam-side down in 4 rows of 3 on parchment-lined baking trays. Cover with lightly oiled plastic wrap. Ferment in a warm place until the dough springs back halfway when lightly touched, 30 to 40 minutes.
6. **Preheat** the oven to 375°F twenty minutes before the end of final fermentation.
7. **Uncover** the rolls and carefully press an indent into the center of the dough. Fill the center with the cooled, sweated onion and poppy seed mixture.
8. **Transfer** the rolls to the oven. Bake for 15 minutes, then rotate the tray. Bake until golden brown, 8 to 10 minutes.
9. **Remove** the trays from the oven and transfer to a cooling rack.

SEMOLINA SESAME LOAVES

Yield: 2 large loaves at 1 lb. each or 4 small loaves at ½ lb. each
FDT: 82°F | **Bulk fermentation:** 45 minutes-FOLD- 20 minutes
Final fermentation: 40 minutes or springs back ¾ to touch.
Bake: 465°F and 18 to 20 minutes

Ingredient	Pounds	Grams	Bakers %
Final Dough			
Flour, bread	0.40	170	33.3%
Flour, semolina	0.40	170	33.3%
Flour, durum	0.40	170	33.3%
Salt	0.02	12	2.3%
Water	0.80	365	71.0%
Oil, olive	0.05	21	4.1%
Yeast	0.01	5	1.0%
Total	**2**	**913**	**178.3%**
Garnish			
Sesame seeds	as needed		

Method

1. **Place** all final dough ingredients into the bowl of a stand mixer fitted with the dough hook attachment.
2. **Mix** on low for 4 minutes and then 3 minutes on medium-high speed. It should reach full gluten development. Cover the dough with plastic wrap. Bulk ferment for 45 minutes. Fold the dough. Let it rest for 20 minutes.
3. **Fill** a shallow pan about halfway with sesame seeds. Line a second pan with a damp towel.
4. **Transfer** the dough onto a lightly floured surface. De-gas and shape into an even rectangle. Using a bench scraper, cut the dough into two pieces at 1 pound each, or four pieces at ½ pound each.
5. **Shape** each piece into an oblong loaf (*bâtard*). Roll each loaf onto the damp towel and then into the sesame seeds.
6. **Final** ferment the dough, covered, until it springs back ¾ of the way, about 40 minutes. Transfer the dough onto sheet tray or baking stone. Score one long, straight line down the center of each loaf from tip to tip.
7. **Preheat** oven to 500°F with a baking stone twenty minutes before the end of final fermentation.
8. **Lower** the temperature to 465°F. Bake for 18 to 20 minutes, venting for the last 10 minutes.
9. **Cool** completely on cooling racks before slicing.

TIME AND TEMPERATURE FORM

Bread	Liquid Temp.	Flour Temp.	Room Temp.	Taste	F.D.T.	B.F. Time	Fold Time	Divide	Shape Time	Bake Time

Weights and Measures

Weights and Measures Equivalencies		
Dash	=	less than ⅛ teaspoon
3 teaspoons (tsp.)	=	1 Tablespoon (½ fl. oz.)
2 Tablespoons (Tbsp.	=	⅛ cup (1 fl. oz.)
3 Tablespoons	=	¼ cup (2 fl. oz.)
8 Tablespoons	=	½ cup (4 fl. oz.)
16 Tablespoons	=	1 cup (8 fl. oz.)
2 cups	=	1 pint
2 pints (pt.)	=	1 quart (approximately 1 liter)
4 quarts (qt.)	=	1 gallon (gal.)

Scoop Sizes		
#	**Approximate Weight**	**Measure**
30	1 ¼ oz.	2 1/5 Tbsp.
24	1 ½ oz.	2 2/3 Tbsp.
20	1 2/3 oz.	3 1/5 Tbsp.
16	2 to 2 ½ oz.	¼ cup
12	3 oz.	3/8 cup
10	4 oz.	2/5 cup
8	5 oz.	½ cup

Metric Weights and Measures Equivalencies		
1 gram (g)	=	1/28 oz. (or 0.035 oz.)
½ ounce (oz.)	=	14 g
1 ounce	=	28.35 g (approx. 30 g)
2 ounces	=	56 g (approx. 60 g)
4 ounces	=	110 g
6 ounces	=	170 g
8 ounces	=	225 g
12 ounces	=	340 g
1 pound (16 oz.)	=	450 g
1 kilogram (kg)	=	2.21 lb.
1 liter (L)	=	33.92 fl. oz.

TEMPERATURE EQUIVALENCIES		
250 °F	**very cool**	130 °C
300 °F	**low**	150 °C
350 °F	**moderate**	180 °C
400 °F	**hot**	200 °C
450 °F	**very hot**	230 °C

METRIC CONVERSION TABLE		
To change	**To**	**Multiply by**
Ounces (oz.)	Grams (g)	28.35
Pounds (lb.)	Kilograms (kg)	.45
Teaspoons (tsp.)	Milliliters (mL)	5
Tablespoons (Tbsp.)	Milliliters (mL)	15
Fluid Ounces (fl. oz.)	Milliliters (mL)	30
Cups	Liters (L)	.24
Pints (pt.)	Liters (L)	.47
Quarts (qt.)	Liters (L)	.95
Gallons (gal.)	Liters (L)	3.8
Temperature (°F)	Temperature (°C)	5/9 after subtracting 32°

Example: 9°F above boiling equals 5°C above boiling

BAKER'S "CHEAT SHEET" GLOSSARY

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

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 by dry heat in a closed place, such as in 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 percentage.

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

Bench Scrapper: Small metal tool that is straight and sharp at one end. Used to divide/cut the dough.

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.

Bowl scrapper: 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.

Couche: A flax linen that is used to help the dough to hold its shape during proofing.

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 a center hole, made of yeast or baking powder dough and cooked in a 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 a workbench.

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. This helps to expel CO2 gases, build structure, redistribute food for yeast, and equalize the temperature of the dough.

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

French doughnuts: Doughnuts made of Pâte á 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: A machine that shapes dough pieces for various shapes.

Oatmeal: A meal made by grinding oats.

Pate Ferment: Old dough ("Pate" referring to "dough" and "Ferment" referring to "old")

Poolish: Equal parts of flour and water with yeast. Mixed 10 to 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/Final Fermentation: The time during which dough rises.

Pumpernickel: Coarse, somewhat acid rye bread.

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.

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.

These materials were developed at the Culinary Institute of America.

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