

chapter eight

Advanced yeast breads and rolls

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he way in which yeast is introduced into the dough—by either direct or indirect fermentation—gives the bread baker the range of techniques necessary to create simple lean dough quickly and efficiently and to create hearty breads using such indirect fermentation methods as sponges, poolishes, bigas, and sourdoughs. This chapter examines these more complex methods and presents numerous examples of their use in popular baked goods.

Indirect fermentation and pre-ferments

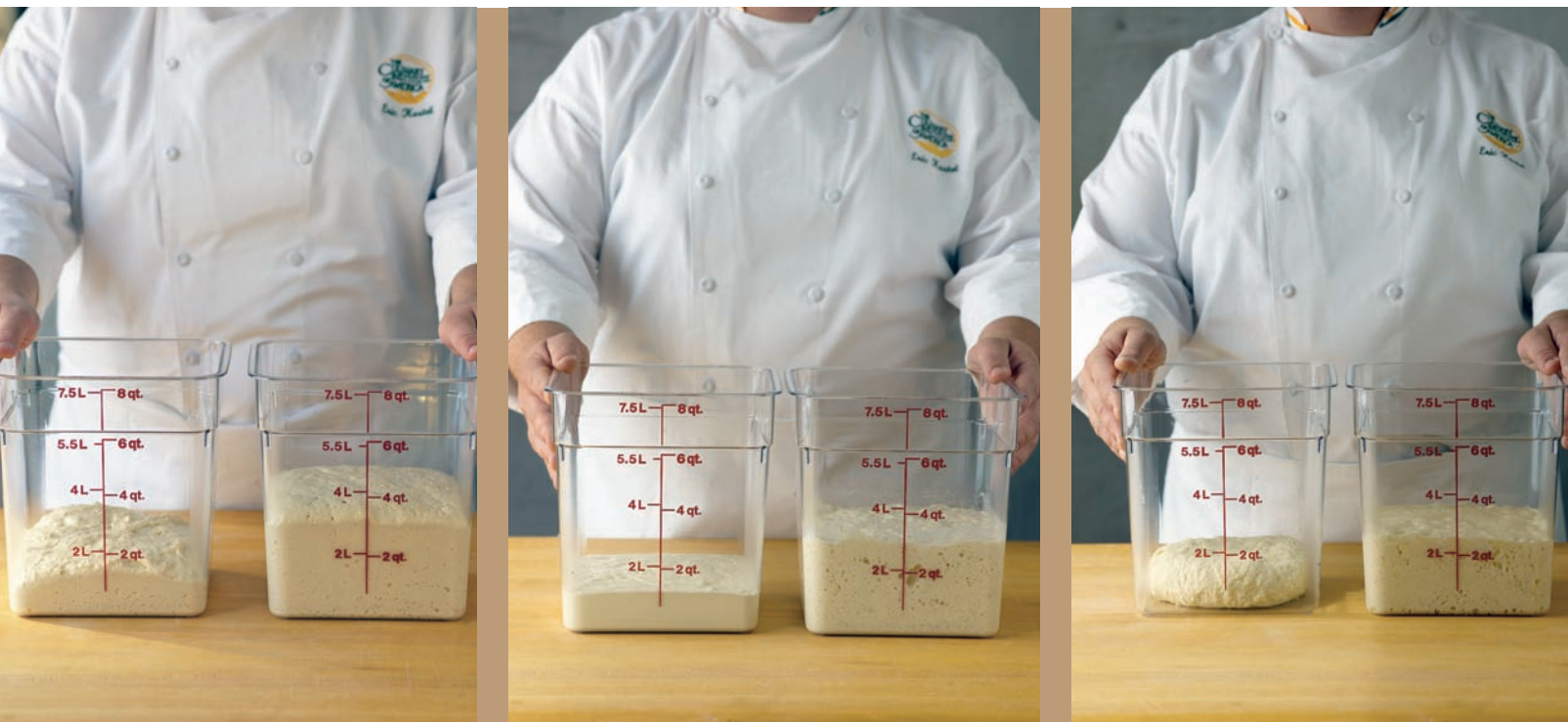
The longer the yeast in a dough remains active, the better the flavor and texture of the finished bread will be. Indirect fermentation means that some portion of the dough is allowed to ferment on its own before being mixed with the remainder of the formula's ingredients. This portion, often referred to as a *pre-ferment*, typically includes only flour, water (or milk), and some or all of the yeast called for in the final dough.

It is important to plan for pre-ferments in a production schedule. The time requirement for each type of pre-ferment is slightly different, as noted below.

PÂTE FERMENTÉE, or “old dough,” is nothing more exotic than a piece of a wheat lean dough reserved from the previous day's production. The dough is covered and refrigerated until needed, then added along with the other ingredients to make a batch of dough, as in the Lean Dough formula on page 153. The yeast in the *pâte fermentée* has undergone an extended fermentation and has developed an appealing, slightly “sour” flavor.

The **SPONGE** method combines one-third to one-half of the formula's total flour with all the yeast and enough liquid to make a stiff to loose dough. The sponge can be made directly in the mixing bowl, as the fermentation period is typically less than one hour. When the sponge has doubled in size, the remaining ingredients are mixed in to make the final dough.

A **POOLISH** combines equal parts flour and water (by weight) with some yeast (the amount varies according to the expected length of fermentation time, using less for longer, slower fermentations). The poolish is fermented at room temperature long enough to double in volume



LEFT: Sponge just after mixing and after proofing
MIDDLE: Poolish just after mixing and after proofing
RIGHT: Biga just after mixing and after proofing

and start to recede, or decrease, in volume. This may take anywhere from 3 to 15 hours depending on the amount of yeast. The poolish should be mixed in a plastic or other nonreactive container large enough to hold the mixture comfortably as it ferments.

A **BIGA** is the stiffest of the pre-ferments. It contains flour and enough water to equal 50 to 60 percent of the flour's weight, as well as 0.33 to 0.5 percent of the formula's total yeast. After the biga has properly fermented, it must be loosened with a portion of the formula's liquid to make it easier to blend into the dough.

SOURDOUGH is established by capturing wild yeast in a flour and water dough.

Sourdough starters

Sourdough starters add flavor to breads, and in some formulas that may be their primary function. But sourdough is a true leavener. Although it is time-consuming to prepare and maintain a sourdough starter to be used as a primary leavener, breads made with sourdough have a deep, complex flavor and a good texture. A sourdough is acidic enough to enhance the shelf life of breads and rolls. A strong, vigorous sourdough can be maintained indefinitely with proper feedings.

Each sourdough has its own characteristics, depending on both the ingredients selected and the type of wild yeasts in any given environment. Both wheat and rye flours are used in sourdough starters. Wheat flours generate lactic acid; rye develops acetic acid. These acids influence the flavor of the finished bread. Organic flours are easiest to use for starters since they are minimally processed and do not contain the additives found in nonorganic flours.

Establishing a starter

The initial stage of establishing a sourdough calls for mixing flour and water. The dough is then left to rest. As it rests, it attracts the ambient yeasts in the air. Grapes, potatoes, onions, and apples contain a high percentage of the natural yeasts desirable for creating a starter. Adding them to the flour and water mixture will speed the process of creating a starter. When the yeast starts to feed, grow, and reproduce in the mixture, it ferments the dough, making it bubbly and airy and giving it a tangy or sour aroma. The dough will expand to double its original volume, start to fall when the yeast activity peaks, and then begin to decline as the yeast consumes the food source.

Left unattended, the yeast will die. To keep the starter alive, or to maintain or build up an established starter, it should be given additional feedings of flour and water. These feedings should be done on a fairly regular schedule, usually once a day. It is important that the ratio of flour to water used for feeding is the same one used to establish the sour. New starters benefit from at least three and up to five feedings prior to their first use.

Replenishing a starter

Once a starter is established, it should be replenished once or more daily until the desired amount is achieved. After it is built up, it should be replenished to maintain a par level. The starter can be replenished after it has risen and begins to fall. This is the signal that the culture has digested enough nutrients, in turn causing the collapse of the mixture. Replenishing at least three to five times is usually sufficient. The amount of replenishing can vary as long as the temperature and flour-to-water ratio is correct.

Sourdough starter
just after feeding
and after proofing



When a balanced, vigorous culture is established, it will provide leavening and flavor to bread, and the presence of organic acids from the sourdough and the higher acidity of the bread will give it a better shelf life. Another benefit of a well-balanced and well-maintained culture is that it can be maintained indefinitely.

Sourdough starters that are held under refrigeration and not used frequently must be fed at least every 3 weeks if they are to remain active. To replenish a starter, use the following procedure:

1. Remove the starter from refrigeration and let it rest at 75°F/24°C for 12 to 14 hours.
2. Feed it with a mixture of flour and water; add as much of this mixture as necessary to produce the amount of starter required for your formula. Wheat starters should be fed with a mixture of flour and water that is at 66 percent hydration; for example, for every 1 lb/454 g of flour you add to the starter, add about 10½ oz/315 mL of water. Rye starters should be fed with a mixture that is at 100 percent hydration; add equal amounts of rye flour and water (by weight) to the starter.
3. Feed the starter once more on the following day at the same hydration level and allow it to ferment for 24 hours at 75°F/24°C before using it in a bread formula.

Autolyse

Autolyse mixing may be used in any lean dough, and it is especially useful when making fiber-enriched dough. It means that the flour and water, yeast and pre-ferment are briefly combined, just enough for a rough mixture to form. Then the mixture is left to rest for a period of 10 to 30 minutes, allowing the flour to absorb enough water for gluten development to begin. The gluten relaxes, since mixing is not agitating it. The dough has rested sufficiently when it appears very smooth.

One advantage of the autolyse mixing is that mixing times are shortened, and shorter mixing times produce gluten that has greater extensibility. Another advantage is the development of a sweet aroma and flavor in the baked loaf.

The salt is added to the dough after the autolyse is complete. Added earlier, the salt would tighten the gluten. The dough is mixed until the gluten is properly developed and it is ready for bulk fermentation.



In the initial stage of an autolyse, the dough is very coarse.



A finished dough made including the autolyse mixing becomes very smooth.

soakers

When adding a significant quantity of smaller grains, or any amount of large, whole grains such as wheat berries, it is best to soak the grains first before incorporating them into the final dough. Whole grains tend to deprive the dough of moisture and will also damage the developing gluten network.

A soaker can be made using one of two methods: hot or cold. A *hot soaker* pregelatinizes the starch of the soaker's grain, which can improve the crust and decrease baking time of some whole-grain breads. Hot soakers work faster, but some chefs feel that there is some loss of flavor and quality. A hot soaker is produced by bringing the liquid to a boil and then incorporating the grains.

Continue to cook the mixture for about 5 minutes over low heat. Set the soaker aside for at least 1 hour or overnight to allow it to cool before adding it to the dough.

A *cold soaker* must be prepared at least a day in advance. For a cold soaker, the grains and liquid are incorporated slightly, covered, and allowed to soak overnight.

Soakers are added to the dough after it has started to develop and are mixed into the dough on medium speed for a few minutes to develop gluten structure, just until they are fully and evenly incorporated.

Dough with a high percentage of rye should have all the grains added at the beginning of mixing.

Multigrain bread

MAKES 13 LB 8 OZ/6.13 KG DOUGH. DDT: 75°F/24°C

SOAKER			
Nine-grain cereal mix	15.6%	1 lb	454 g
Flaxseed	2.2%	2¼ oz	64 g
Sunflower seeds	3.9%	4 oz	113 g
Water	26.6%	1 lb 11 oz	771 g
FINAL DOUGH			
Pâte fermentée (see page 148)	39.1%	2 lb 8 oz	1.13 kg
Bread flour	45.1%	2 lb 14 oz	1.30 kg
Whole wheat flour	33.2%	2 lb 2 oz	964 g
Instant dry yeast	0.6%	⅔ oz	19 g
Salt	2.3%	2½ oz	71 g
Water	43.0%	2 lb 12 oz	1.2 kg
Soaker (above)	48.4%	3 lb 1½ oz	1.40 kg

- 1 To prepare the soaker, combine the nine-grain cereal mix, flaxseed, sunflower seeds, and water. Cover and soak at room temperature for 18 hours.
- 2 Let the pâte fermentée ferment at 75°F/24°C for 1 hour. Refrigerate for 16 hours.
- 3 To prepare the final dough, combine the pâte fermentée, the flours, yeast, salt, and water. Mix on low speed with the dough hook attachment for 4 minutes to incorporate. Increase the speed to medium and mix for 2 minutes. Add half of the soaker and mix on low speed for 2 minutes and on medium speed for 1 minute. Add the remaining half of the soaker and mix on low speed for 2 minutes. Knead for 2 minutes.
- 4 Bulk ferment the dough until nearly doubled, about 45 minutes. Fold gently. Ferment for another 15 minutes.
- 5 Divide the dough into pieces 1 lb 4 oz/567 g each. Preshape the dough into large oblongs (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)
- 6 Position the dough lengthwise, parallel to the edge of the work surface with the seam side up, and press lightly with your fingertips. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten.
- 7 Fold the dough lengthwise in half and use the heel of your hand to seal the two edges, keeping the seam straight. Roll the dough under your palms into a cylinder 8 in/20 cm long, moving your hands outward from the center of the cylinder toward the ends and slightly increasing the

pressure as you move outward, until both ends have an even, gentle taper. Then increase the pressure at the ends of the loaf to seal. Place on parchment-lined sheet pans.

8 Proof, covered, until the dough springs back slowly to the touch but does not collapse, 45 to 60 minutes.

9 Presteam a 460°F/238°C deck oven. Load the bread into the oven and steam for 3 seconds. Bake until the crust is golden brown and the bread sounds hollow when thumped on the bottom, 20 to 25 minutes. Vent during the final 12 minutes. Cool completely on racks.

Lean dough with pâte fermentée

MAKES 10 LB/4.54 KG DOUGH. DDT: 78°F/26°C

Bread flour	100%	5 lb	2.27 kg
Instant dry yeast	0.63%	½ oz	14 g
Water	67.2%	53¾ fl oz	1.61 L
Pâte fermentée (see page 148)	30%	1 lb 8 oz	680 g
Salt	2.2%	1¾ oz	50 g

1 Combine the flour and yeast. Add the water, pâte fermentée, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 3 minutes. The dough should be slightly soft but very smooth, with sufficient gluten development. Mix to the improved stage of gluten development.

2 Bulk ferment the dough until nearly doubled, about 40 minutes. Fold gently and ferment for another 30 minutes.

3 Divide the dough into 1-lb/454-g pieces. Preshape the dough into large rounds (for pre-shaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)

4 Working with the dough seam side down, dust lightly with medium rye flour and use a rolling pin to create a split in the dough 2 in/5 cm wide and 2 in/5 cm deep. Turn the dough, split side down, into a lightly floured banneton or couche.

5 Proof, covered, until the dough springs back slowly to the touch but does not collapse, 1 to 1½ hours. Flip the dough split side up onto a peel.

6 Presteam a 460°F/238°C deck oven. Load the bread into the oven and steam for 3 seconds. Bake until the crust is golden brown and the bread sounds hollow when thumped on the bottom, 25 to 30 minutes. Vent during the final 10 minutes. Cool completely on racks.

VARIATION BOULE WITH A CROSS After the boule has proofed, make two hollows the same size as the one in the split loaf to form a cross in the center of the loaf. The baking instructions are the same.

Baguette

MAKES 8 LB 8 OZ/3.86 KG DOUGH. DDT: 78°F/26°C

POOLISH			
Bread flour	30%	1 lb 8 oz	680 g
Water (55°F/13°C)	30%	24 fl oz	720 mL
Instant dry yeast	0.04%	pinch	pinch
FINAL DOUGH			
Bread flour	70%	3 lb 8 oz	1.59 kg
Instant dry yeast	0.63%	½ oz	14 g
Poolish (above)	60%	3 lb	1.36 kg
Water	37.2%	29¾ fl oz	893 mL
Salt	2.2%	1¾ oz	50 g

- 1 To prepare the poolish, mix the flour, water, and yeast together by hand until well incorporated. Cover and ferment at 75°F/24°C for 14 to 15 hours, until it has risen and just begun to recede; it will be bubbly and frothy on top.
- 2 To prepare the final dough, combine the flour and yeast. Add the poolish, water, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 2 minutes. The dough should be soft and smooth, with good gluten development.
- 3 Bulk ferment the dough until nearly doubled, about 40 minutes. Fold gently and ferment for another 30 minutes. Fold once more. Ferment for another 20 minutes.
- 4 Divide the dough into 14-oz/397-g pieces. Preshape the dough into large oblongs (for pre-shaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)
- 5 Position the dough lengthwise, parallel to the edge of the work surface with the seam side up. Press lightly with your fingertips to stretch it into a rectangle 10 in/25 cm long, using as little flour as possible. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten the dough. Fold the dough lengthwise in half and use the heel of your hand to seal the two edges together, keeping the seam straight. Roll the dough under your palms into a cylinder 20 in/51 cm long. Keep the pressure even and hold your hands flat and parallel to the work surface. Move your hands outward from the center of the cylinder toward the ends and slightly increase the pressure as you move outward, until both ends have an even, gentle taper. Then increase the pressure at the ends of the loaf to seal them.
- 6 Place the loaf seam side down on a linen couche. Proof, covered, until the dough springs back very slowly to the touch, 30 to 45 minutes. (Baguettes should be slightly underproofed when loaded into the oven.)

7 Score the dough with 5 or 7 diagonal lines down the center third of the loaf, overlapping each cut by ½ in/1 cm.

8 Presteam a 475°F/246°C deck oven. Load the bread into the oven and steam for 3 seconds. Bake until the crust is golden brown, the bread sounds hollow when thumped on the bottom, and you hear a crackle when you hold it next to your ear, 20 to 25 minutes. Vent during the final 10 minutes. Cool completely on racks.



TOP ROW: Fold the top edge of the dough, pressing lightly with your fingertips to tighten the dough. Use the heel of your hand to seal the two edges.

Taper the ends using increased pressure while rolling.

Roll out the dough to even out the center once the ends have been tapered.

BOTTOM ROW: Continue to roll the baguette, gently stretching to the final length.

Place finished baguettes in a couche for the final proof.

Once the baguettes are fully proofed, transfer to the oven peel and score the tops of the finished baguettes.

VARIATION EPI

- 1 Follow the main method through step 4.
- 2 Position the dough lengthwise, parallel to the edge of the work surface with the seam side up. Press lightly with your fingertips to stretch it into a rectangle 10 in/25 cm long, using as little flour as possible. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten the dough. Fold the dough lengthwise in half and use the heel of your hand to seal the two edges together, keeping the seam straight. Roll the dough under your palms into a cylinder 20 in/51 cm long, keeping the pressure even and holding your hands flat and parallel to the work surface to create a smooth, even loaf. Then taper the final 2 in/5 cm of each end by using increased pressure, tapering the ends evenly.
- 3 Place the dough seam side down on the linen couche. Proof, covered, until the dough springs back very slowly to the touch, 30 to 45 minutes. (Epi are often slightly underproofed when loaded into the oven.)
- 4 Transfer the dough to a peel. Using scissors held at a 45-degree angle, starting 2½ in/6 cm from one end of the loaf, make diagonal cuts down the center of the loaf, placing each cut piece to the side as you cut, alternating sides to create the look of a stalk of wheat.
- 5 Presteam a 475°F/246°C deck oven. Load the bread into the oven and steam for 3 seconds. Bake until the crust is golden brown, the bread sounds hollow when thumped on the bottom, and you hear a crackle when you hold it next to your ear. Vent during the final 5 minutes. Cool completely on racks.



LEFT: Make diagonal cuts down the center of the loaf, placing each cut piece to the side as you cut, alternating sides to create the look of a stalk of wheat.

MIDDLE: Three varieties of epi: single, double, and fougasse

RIGHT: These breads should be baked until crisp and deep golden brown.

Whole wheat dough with poolish

MAKES 15 LB 9¼ OZ/7.07 KG DOUGH. DDT: 79°F/26°C

POOLISH			
Whole wheat flour	100%	3 lb	1.36 kg
Water (55°F/13°C)	100%	48 fl oz	1.44 L
Instant dry yeast	0.08%	pinch	pinch
FINAL DOUGH			
Bread flour	33.3%	3 lb	1.36 kg
Whole wheat flour	33.3%	3 lb	1.36 kg
Instant dry yeast	0.35%	½ oz	14 g
Poolish (above)	66.6%	6 lb	2.72 kg
Water	37.5%	54 fl oz	1.62 L
Salt	2%	2¾ oz	78 g

- 1 To prepare the poolish, mix the flour, water, and yeast together by hand until well incorporated. Cover and ferment at 75°F/24°C until bubbly, frothy, and just starting to recede, 10 to 15 hours.
- 2 To prepare the final dough, combine the flours and yeast. Add the poolish, water, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 4 minutes. The dough should be moist, but with strong gluten development. Mix to the improved stage of gluten development.
- 3 Bulk ferment the dough until nearly doubled, about 30 minutes. Fold gently. Ferment for another 30 minutes.
- 4 Divide the dough into pieces 1 lb 4 oz/567 g each. Preshape the dough into large oblongs (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)
- 5 Position the dough lengthwise, parallel to the edge of the work surface with the seam side up, and press lightly with your fingertips. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten.
- 6 Fold the dough lengthwise in half and use the heel of your hand to seal the two edges, keeping the seam straight. Roll the dough into a cylinder 8 in/20 cm long, moving your hands outward from the center slightly increasing the pressure as you move outward, until both ends have an even, gentle taper. Then increase the pressure at the ends of the loaf to seal.
- 7 Proof, covered, in a couche until the dough springs back slowly to the touch but does not collapse, 45 minutes. Score the bâtard straight down the center.
- 8 Presteam a 460°F/238°C deck oven. Load the bread into the oven and steam for 3 seconds. Bake until the crust is golden brown and the bread sounds hollow when thumped on the bottom, 30 to 35 minutes. Vent during the final 10 minutes. Cool completely on racks.

Walnut fig dough

MAKES 7 LB 8 OZ/3.40 KG DOUGH. DDT: 78°F/26°C

Walnuts, toasted and chopped	8.3%	10 oz	284 g
Figs, dried, coarsely chopped	8.3%	10 oz	284 g
Honey	3.3%	4 oz	113 g
Whole wheat dough with polish (page 157)	80%	6 lb	2.72 kg

- 1 Combine the walnuts, figs, and honey. Fold the mixture into the dough halfway through bulk fermentation time.
- 2 Bulk ferment the dough until nearly doubled, about 30 minutes. Fold gently. Ferment for another 30 minutes and fold again. Ferment for another 15 minutes.
- 3 Divide the dough into 15-oz/425-g pieces. Preshape the dough into large oblongs (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)
- 4 Position the dough lengthwise, parallel to the edge of the work surface with the seam side up, and press lightly with your fingertips. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten.
- 5 Fold the dough lengthwise in half and use the heel of your hand to seal the two edges, keeping the seam straight. Roll the dough under your palms into a cylinder 8 in/20 cm long, moving your hands outward from the center of the cylinder toward the ends and slightly increasing the pressure as you move outward, until both ends have an even, gentle taper. Then increase the pressure at the ends of the loaf to seal.
- 6 Proof, covered, in a couche until the dough springs back slowly to the touch but does not collapse, 1 hour 20 minutes.
- 7 Score the bâtard with two parallel diagonal lines.
- 8 Presteam a 450°F/232°C deck oven. Load the bread into the oven and steam for 3 seconds. Bake until the crust is golden brown and the bread sounds hollow when thumped on the bottom, 35 to 40 minutes. Vent during the final 10 minutes. Cool completely on racks.

Tomato dough

MAKES 9 LB 9¼ OZ/4.36 KG DOUGH. DDT: 78°F/26°C

POOLISH			
Bread flour	100%	1 lb 1 oz	482 g
Water (55°F/13°C)	100%	18 fl oz	540 mL
Instant dry yeast	0.03%	pinch	pinch
ROASTED TOMATOES			
Tomatoes, cut in half	43.75%	2 lb 6½ oz	1.09 kg
Olive oil		as needed	as needed
Basil, chopped	0.85%	¾ oz	21 g
Garlic, roughly chopped	0.55%	½ oz	14 g
Salt		as needed	as needed
Cracked black pepper		as needed	as needed
FINAL DOUGH			
Bread flour	71.5%	3 lb 15 oz	1.79 kg
Whole wheat flour	9%	8 oz	227 g
Instant dry yeast	0.85%	¾ oz	21 g
Poolish (above)	38.6%	2 lb 2 oz	964 g
Water	1.7%	1½ fl oz	45 mL
Sugar	2.8%	2½ oz	71 g
Butter (75°F/24°C)	2.8%	2½ oz	71 g
Salt	2%	1¾ oz	50 g

- 1 To prepare the poolish, mix the flour, water, and yeast together by hand until well incorporated. Cover and ferment at 75°F/24°C for 10 to 15 hours, until it has risen and just begun to recede; it will be bubbly and frothy on top.
- 2 Place the tomatoes on a baking sheet, cut side up. Drizzle with olive oil and scatter with the basil, garlic, salt, and pepper. Roast the tomatoes in a 400°F/204°C oven until slightly dry, about 20 minutes. When the tomatoes are cool enough to handle, remove the skins; reserve the garlic. Drain off excess juice and oil from the tomatoes; roughly chop and reserve to add in the next step.
- 3 To prepare the final dough, combine the flours and yeast. Add the roasted tomatoes and reserved garlic, the poolish, water, sugar, butter, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 3 minutes and on medium speed for 2 minutes. The dough should be soft and smooth, with good gluten development. Mix to the improved stage of gluten development.
- 4 Bulk ferment the dough until nearly doubled, about 45 minutes. Fold gently. Ferment for another 30 minutes.

- 5 Divide the dough into pieces 1 lb 4 oz/567 g each. Preshape the dough into large rounds (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)
- 6 Cup both hands around the dough. Using your thumbs, push the dough away from you in an arc to the right, keeping a small piece of dough between the table and the edges of your palms. Using the edges of your palms as a guide, pull the dough toward you in an arc to the left. There should still be a small piece of dough that is squeezed between the table and the edges of your palms. Repeat this circular motion two or three times, applying gentle pressure while rounding the dough, to create a tight, smooth outer skin. Place the boule seam side up in a round basket or seam side down on a board dusted with cornmeal.
- 7 Proof until the dough springs back slowly to the touch, 1 to 1½ hours. Flip the dough, seam side down, onto a peel. Score the boule with a spiral.
- 8 Presteam a 460°F/238°C deck oven. Load the bread into the oven and steam for 3 seconds. Bake until the crust is golden brown and the bread sounds hollow when thumped on the bottom, 25 to 30 minutes. Vent during the final 10 minutes. Cool completely on racks.

adding flavorings and garnishes

Fresh herbs, roasted garlic, ground or whole spices, grated cheeses, dried fruits, and nuts are some of the ingredients added to bread doughs for flavor or as garnish. Formulas calling for salty or acidic ingredients may require modification so that these ingredients do not interfere dramatically with yeast activity or the desired flavor of the bread. Finely ground or dry ingredients may be added at the beginning of the mixing time. In other cases, it may be easier to work the garnish into the dough halfway through bulk fermentation. The dough can be put back in the mixer and the garnish mixed in on low speed just until evenly blended, or the garnish may be folded by hand into the dough.

Generally, the folding method is best for hard ingredients, such as nuts, that can damage the gluten strands, or for soft ingredients, such as olives, that you do not want to break.

Spread or flatten the dough on a lightly floured surface. Sprinkle the garnish ingredients evenly over the dough and fold it over gently. Continue to fold until the garnish ingredients are evenly distributed throughout the dough.



Adding garnish to a dough by folding it in

Semolina dough

MAKES 90 LB/40.90 KG DOUGH (90 LOAVES). DDT: 78°F/26°C

BIGA			
Durum flour	16.7%	8 lb 10 oz	3.91 kg
Semolina flour	16.7%	8 lb 10 oz	3.91 kg
Water	18.3%	9 lb 8 oz	4.30 kg
Fresh yeast	0.01%	¼ tsp	1.30 g
FINAL DOUGH			
Durum flour	16.7%	8 lb 10 oz	3.91 kg
Semolina flour	16.7%	8 lb 10 oz	3.91 kg
Bread flour	33.3%	17 lb 4 oz	7.82 kg
Olive oil	4.2%	2 lb 2 oz	964 g
Water	48.9%	25 lb 4 oz	11.50 kg
Instant dry yeast	0.5%	4 oz	113 g
Biga (above)	51.7%	26 lb 11 oz	12.10 kg
Salt	2.2%	1 lb 2 oz	510 g
Sesame seeds, for garnish		as needed	as needed

- 1 To prepare the biga, combine the flours, water, and yeast and mix on low speed with the paddle attachment for 3 minutes, or until thoroughly combined. Transfer to a container, cover, and ferment at 75°F/24°C for 18 hours.
- 2 To prepare the final dough, combine the flours, olive oil, water, yeast, and biga and mix on low speed with the dough hook attachment for 3 minutes. Let the dough rest in the mixer for 15 minutes. Add the salt and mix on low speed for an additional 3 minutes.
- 3 Bulk ferment the dough until nearly doubled, about 45 minutes. Fold gently and ferment for another 15 minutes.
- 4 Divide the dough into 1-lb/454-g pieces. Preshape the dough into large oblongs 8 in/20 cm long (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)
- 5 Position the dough lengthwise, parallel to the edge of the work surface with the seam side up, and press lightly with your fingertips. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten. Fold the dough lengthwise in half and use the heel of your hand to seal the two edges, keeping the seam straight. Roll the dough under your palms into a cylinder 14 in/36 cm long, moving your hands outward from the center of the cylinder toward the ends and slightly increasing the pressure as you move outward, until both ends have an even, gentle taper. Then increase the pressure at the ends of the loaf to seal.

- 6 Dip each oblong into sesame seeds and place seam side up in a couche.
- 7 Proof, covered, until the dough springs back slowly to the touch but does not collapse, 30 to 40 minutes. Score the loaves with an arc.
- 8 Presteam a 470°F/243°C deck oven. Load the bread into the oven and steam for 3 seconds. Bake until the crust is golden brown and the bread sounds hollow when thumped on the bottom, 20 minutes. Vent during the final 8 minutes. Cool completely on racks.

Lean dough with biga

MAKES 8 LB 8 OZ/3.86 KG DOUGH. DDT: 78°F/26°C

BIGA			
Bread flour	100%	1 lb 8 oz	680 g
Water (60°F/16°C)	55%	13¼ fl oz	398 mL
Instant dry yeast	0.03%	pinch	pinch
FINAL DOUGH			
Bread flour	70%	3 lb 8 oz	1.59 kg
Instant dry yeast	0.63%	½ oz	14 g
Water	50.6%	40½ fl oz	1.22 L
Biga (above)	46.6%	2 lb 5¼ oz	1.06 kg
Salt	2.2%	1¾ oz	50 g

- 1 To prepare the biga, combine the flour, water, and yeast and mix on low speed with the dough hook attachment for 3 minutes, or until thoroughly combined. Transfer to a container, cover, and ferment at 75°F/24°C for 18 to 24 hours, until the biga has risen and begun to recede.
- 2 To prepare the final dough, combine the flour and yeast. Add the water, biga, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 2 minutes. The dough should still be slightly soft but very smooth, with sufficient gluten development. Mix to the improved stage of gluten development.
- 3 Bulk ferment the dough until nearly doubled, about 40 minutes. Fold gently and ferment for another 30 minutes. Fold again. Ferment for another 20 minutes.
- 4 Divide the dough into 14-oz/397-g pieces. Preshape the dough into large oblongs (for pre-shaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)
- 5 Position the dough lengthwise, parallel to the edge of the work surface with the seam side up, and press lightly with your fingertips. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten.

6 Fold the dough lengthwise in half and use the heel of your hand to seal the two edges, keeping the seam straight. Roll the dough under your palms into a cylinder 8 in/20 cm long, moving your hands outward from the center of the cylinder toward the ends and slightly increasing the pressure as you move outward, until both ends have an even, gentle taper. Then increase the pressure at the ends of the loaf to seal.

7 Proof, covered, in a couche until the dough springs back slowly to the touch but does not collapse, 30 to 40 minutes.

8 Score the baguette 5 to 7 times down the center.

9 Presteam a 460°F/238°C deck oven. Load the bread into the oven and steam for 3 seconds. Bake until the crust is golden brown and the bread sounds hollow when thumped on the bottom, 20 to 25 minutes. Vent during the final 6 to 8 minutes. Cool completely on racks.

CLOCKWISE FROM TOP: Semolina Dough (page 161), onion-topped Focaccia (page 168), Multigrain Bread (page 152), Walnut Fig Dough (page 158), Baguette (page 154), Lean Dough with Biga (opposite).



Roasted potato bread

MAKES 11 LB 6 OZ/5.16 KG DOUGH. DDT: 78°F/26°C

WHOLE WHEAT BIGA			
Bread flour	50%	9¼ oz	262 g
Whole wheat flour	50%	9¼ oz	262 g
Water (60°F/16°C)	68%	28½ fl oz	950 mL
Instant dry yeast	0.03%	pinch	pinch
SOAKER			
Cracked wheat	100%	3¼ oz	92 g
Water (90°F/32°C)	100%	3¼ fl oz	98 mL
ROASTED POTATOES			
Yukon gold potatoes, washed and peeled	50%	2 lb 8¼ oz	1.14 kg
Olive oil		as needed	as needed
Salt		as needed	as needed
Ground black pepper		as needed	as needed
FINAL DOUGH			
Bread flour	70.5%	3 lb 8½ oz	1.60 kg
Whole wheat flour	2.5%	2 oz	57 g
Medium rye flour	4%	3¼ oz	92 g
Instant dry yeast	0.3%	¼ oz	7 g
Water	50%	24¼ fl oz	728 mL
Whole wheat biga (above)	38.6%	1 lb 15 oz	879 g
Soaker (above)	8%	6½ oz	184 g
Salt	2.5%	2 oz	57 g
Potatoes, peeled, thinly sliced, and reserved in cold water		4 oz	113 g
Olive oil		as needed	as needed

- 1 To prepare the biga, combine the flours, water, and yeast and mix on low speed with the dough hook attachment for 3 minutes, or until thoroughly combined. Transfer to a container, cover, and ferment at 75°F/24°C for 18 to 24 hours, until the biga has risen and begun to recede.
- 2 To prepare the soaker, combine the cracked wheat and water in a plastic tub. Cover and soak at room temperature for at least 8 and up to 15 hours.

- 3** To prepare the roasted potatoes, cut them into quarters and toss them with olive oil to coat lightly. Season with salt and pepper. Roast in a 400°F/204°C convection oven until soft in the center, about 25 minutes. Cool the potatoes completely.
- 4** To prepare the final dough, combine the flours and yeast. Add the water, biga, soaker, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes. Add the roasted potatoes and mix on medium speed for 2 minutes. The dough should be slightly stiff and the potatoes evenly distributed. Mix to the improved stage of gluten development.
- 5** Bulk ferment the dough until nearly doubled, about 30 minutes. Fold gently and ferment for another 30 minutes. Fold again. Ferment for another 15 minutes.
- 6** Divide the dough into pieces 1 lb 2 oz/510 g each. Preshape the dough into large oblongs (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)
- 7** Dust the work surface with rye flour. Position the dough lengthwise, parallel to the edge of the work surface with the seam side up. Fold the dough lengthwise in half and seal the two edges together by pressing firmly with the heel of your hand, keeping the seam straight. Roll the dough under your palms into an even cylinder 12 in/30 cm long with tapered ends.
- 8** Dust a small rolling pin and use it to make a depression 3 in/8 cm wide down the center of the dough; the dough at the bottom of the hollow should be only ¼ in/6 mm thick.
- 9** Roll the two long edges of the dough toward each other until they meet in the middle. Place the dough seam side up in a couronne basket, forming a horseshoe shape.
- 10** Proof, covered, until the dough springs back slowly to the touch, 45 to 60 minutes. Flip the dough seam side down onto a peel. Score it with one long slash from end to end and place a potato slice in the center of the dough at the top of the horseshoe. Brush lightly with olive oil.
- 11** Presteam a 435°F/224°C deck oven. Load the bread into the oven and steam for 3 seconds. Bake until the crust is golden brown and the bread sounds hollow when thumped on the bottom, 45 to 60 minutes. Vent the bread once it starts to brown. Cool completely on racks.

Rosemary bread

MAKES 10 LB 3¼ OZ/4.63 KG DOUGH. DDT: 78°F/26°C

BIGA			
Bread flour	100%	1 lb	454 g
Water (60°F/16°C)	55%	8½ fl oz	255 mL
Instant dry yeast	0.08%	pinch	pinch
FINAL DOUGH			
Bread flour	83.3%	5 lb	2.27 kg
Instant dry yeast	0.25%	¼ oz	7 g
Water	50%	48 fl oz	1.44 L
Biga (above)	25%	1 lb 8 oz	680 g
Milk	6.75%	6½ fl oz	195 mL
Olive oil	2.6%	2½ oz	71 g
Salt	1.6%	1½ oz	43 g
Rosemary, coarsely chopped	0.5%	½ oz	14 g

- 1 To prepare the biga, combine the flour, water, and yeast and mix on low speed with the dough hook attachment for 3 minutes, or until thoroughly combined. Transfer to a container, cover, and ferment at 75°F/24°C for 18 to 24 hours, until the biga has risen and begun to recede; it should still be bubbly and airy.
- 2 To prepare the final dough, combine the flour and yeast. Add the water, biga, milk, olive oil, salt, and rosemary in the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 3 minutes. The dough should still be slightly soft, with good gluten development. Mix to the improved stage of gluten development.
- 3 Bulk ferment the dough until nearly doubled, about 30 minutes. Fold gently, and ferment for another 30 minutes.
- 4 Divide the dough into pieces 1 lb 4 oz/567 g each. Preshape the dough into large oblongs (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)
- 5 Using the backs of your hands, stretch the dough gently and evenly into a rough rectangle 6 by 8 in/15 by 20 cm. It is very important to keep the thickness of the dough even. Place on parchment-lined sheet pans. Proof, covered, until the dough springs back slowly to the touch but does not collapse, 30 to 40 minutes.
- 6 Starting at one corner of the dough, score the dough three times, scoring from the same corner to each of the three other corners. Then score the dough two more times in between the first three slashes, radiating out from the same corner to the corresponding side.

- 7 Presteam a 450°F/232°C deck oven. Load the bread into the oven and steam for 3 seconds. Bake until the crust is golden brown and the bread sounds hollow when thumped on the bottom, 25 to 30 minutes. Vent during the final 10 minutes. Cool completely on racks.

Ciabatta

MAKES 9 LB/4.08 KG DOUGH. DDT: 78°F/26°C

BIGA			
Bread flour	100%	1 lb 10 oz	737 g
Water (60°F/16°C)	50%	13¼ fl oz	398 mL
Instant dry yeast	0.03%	pinch	pinch
FINAL DOUGH			
Bread flour	67.1%	3 lb 5¾ oz	1.52 kg
Instant dry yeast	0.3%	¼ oz	7 g
Water	56.6%	45¼ fl oz	1.36 L
Biga (above)	50%	2 lb 7¼ oz	1.11 kg
Salt	2.3%	2 oz	57 g

1 To prepare the biga, combine the flour, water, and yeast and mix on low speed with the dough hook attachment for 3 minutes, or until thoroughly combined. Transfer to a container, cover, and ferment at 75°F/24°C for 18 to 24 hours, until the biga has risen and begun to recede; it should still be bubbly and airy.

2 To prepare the final dough, combine the flour and yeast. Add the water, biga, and salt in the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 1 minute. The dough should be blended but not too elastic (ciabatta dough is a wet, slack dough).

3 Bulk ferment the dough in a tub or bowl until nearly doubled, about 30 minutes. Fold gently in half four times (the dough should feel like jelly). Ferment for another 30 minutes. Fold in half again, gently, two times. Allow the dough to ferment for another 15 minutes.

4 Place the dough on the table and dust the top of it with flour. (Reminder: Keep the work surface well floured when working with ciabatta dough.) Using the palms of your hands, gently stretch the dough into a rectangle 16 in/41 cm long and 1½ in/4 cm thick. Be careful to avoid tearing or puncturing the dough with your fingertips. Using a floured bench scraper, divide the dough into two rectangles 4½ by 10 in/11 by 25 cm.

5 Flip the dough over onto floured linen couches. Gently stretch each piece into a rough rectangle.



Stretch the dough slightly to place it onto a couche.

6 Proof, covered, until the dough springs back slowly to the touch but does not collapse, 30 to 45 minutes.

7 Lightly flour the top of the dough. Flip each ciabatta over onto a small floured board, and then slide each one onto a floured peel.

8 Presteam a 460°F/238°C deck oven. Load the ciabatta into the oven and steam for 3 seconds. Bake until the crust is golden brown and the ciabatta sounds hollow when thumped on the bottom, 25 to 30 minutes. Vent during the final 10 minutes. Cool completely on racks.

Focaccia

MAKES 11 LB 6¼ OZ/5.17 KG DOUGH. DDT: 78°F/26°C

BIGA			
Bread flour	100%	1 lb 8 oz	680 g
Water (60°F/16°C)	55.2%	13¼ fl oz	398 mL
Instant dry yeast	0.03%	pinch	pinch
FINAL DOUGH			
Bread flour	76.9%	5 lb	2.27 kg
Instant dry yeast	0.5%	½ oz	14 g
Water	53.8%	56 fl oz	1.68 L
Biga (above)	35.8%	2 lb 5¼ oz	1.06 kg
Olive oil	6.25%	6½ oz	184 g
Salt	1.9%	2 oz	57 g
Olive oil		as needed	as needed
GARNISHES (OPTIONAL)			
Fresh herbs		as needed	as needed
Garlic, sliced and sautéed		as needed	as needed
Roasted tomato slices		as needed	as needed
Onions, sliced and sautéed		as needed	as needed
Coarse salt		as needed	as needed

1 To prepare the biga, combine the flour, water, and yeast and mix on low speed with the dough hook attachment for 3 minutes, or until thoroughly combined. Transfer to a container, cover, and ferment at 75°F/24°C for about 8 hours, until the biga has risen and begun to recede; it should still be slightly bubbly and airy.

2 To prepare the final dough, combine the flour and yeast. Add the water, biga, olive oil, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes. The dough should be very loose.

3 Bulk ferment the dough until nearly doubled, about 45 minutes. Fold gently. Ferment for another 45 minutes.

4 Divide the dough into 1-lb/454-g pieces. Preshape the dough lightly into large rounds (for preshaping instructions, see page 109). (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)

5 Brush the dough lightly with olive oil. Using only your fingertips, gently press the dough down, and then stretch it into a circle 10 in/25 cm in diameter, keeping the thickness of the dough even. Place on parchment-lined sheet pans.

6 Proof, covered, until the dough springs back slowly to the touch but does not collapse, 30 to 45 minutes.

7 Brush the dough lightly with olive oil again. Gently stipple the dough, creating random indentations with your fingertips. Scatter with any optional toppings, if desired.

8 Presteam a 460°F/238°C deck oven. Load the focaccia into the oven and steam for 3 seconds. Bake until the crust is golden brown and the focaccia sounds hollow when thumped on the bottom, 25 to 30 minutes. Vent during the final 10 minutes. Brush lightly with olive oil and sprinkle with salt if desired. Cool completely on racks.



Dimple the proofed focaccia with your fingertips.

Wheat sourdough starter

MAKES 1 LB 8 OZ/680 G STARTER

INITIAL SOUR (DAYS 1 AND 2)			
Water (85°F/29°C)	100%	4 fl oz	120 mL
Organic wheat or durum flour	100%	4 oz	113 g
FIRST FEEDING (DAY 3)			
Initial sour (above)	100%	4 oz	113 g
Water (85°F/29°C)	100%	4 fl oz	120 mL
Organic wheat or durum flour	100%	4 oz	113 g
SECOND FEEDING (DAY 4)			
Sour after first feeding (above)	200%	8 oz	227 g
Water (85°F/29°C)	100%	4 fl oz	120 mL
Organic wheat or durum flour	100%	4 oz	113 g
THIRD FEEDING (DAY 5)			
Sour after second feeding (above)	33%	4 oz	113 g
Water (60°F/16°C)	66%	8 fl oz	240 mL
Organic wheat flour	100%	12 oz	340 g

- 1 Mix the ingredients for the initial sour. Cover and let rest at 75°F/24°C for 24 hours. The flour and water tend to separate overnight; recombine on the second day. Let rest for another 24 hours at 75°F/24°C.
- 2 On the third day, combine 4 oz/113 g of the initial sour mixture with the water for the first feeding and blend to fully combine; discard excess sour. Blend in the flour for the first feeding. Cover and let rest at 75°F/24°C for 24 hours.
- 3 On the fourth day, combine 8 oz/227 g of the sour mixture from step 2 with the water for the second feeding and blend to fully combine; discard excess sour. Blend in the flour for the second feeding. Cover and let rest at 75°F/24°C for 24 hours.
- 4 On the final day, combine 4 oz/113 g of the sour from step 3 with the water for the third feeding and blend to fully combine; discard excess sour. Blend in the flour for the third feeding. Let the starter rest covered at 75°F/24°C for 24 hours before using in a bread formula. Repeat step 4 two or three more times before using.

Rye sourdough starter

MAKES 19½ OZ/553 G STARTER

INITIAL SOUR (DAYS 1 AND 2)			
Water (80°F/27°C)	100%	4 fl oz	120 mL
Organic rye flour	100%	4 oz	113 g
FIRST FEEDING (DAY 3)			
Initial sour (above)	100%	4 oz	113 g
Water (80°F/27°C)	100%	4 fl oz	120 mL
Organic rye flour	100%	4 oz	113 g
SECOND FEEDING (DAY 4)			
Sour after first feeding (above)	200%	8 oz	227 g
Water (80°F/27°C)	100%	4 fl oz	120 mL
Organic rye flour	100%	4 oz	113 g
THIRD FEEDING (DAY 5)			
Sour after second feeding (above)	33%	4 oz	113 g
Water (60°F/16°C)	66%	8 fl oz	240 mL
Organic rye flour	100%	8 oz	227 g
Salt		¼ oz	7 g

Follow the method used for Wheat Sourdough Starter on page 170. Note the different hydration level for the Rye Sourdough Starter. Repeat the third feeding 2 or 3 more times before using.

Whole wheat sourdough

MAKES 16 LB 5¼ OZ/7.41 KG DOUGH. DDT: 76°F/24°C

Bread flour	50%	3 lb 12 oz	1.70 kg
Whole wheat flour	50%	3 lb 12 oz	1.70 kg
Water	75%	90 fl oz	2.70 L
Wheat sourdough starter (page 170)	40%	3 lb	1.36 kg
Salt	2.7%	¾ oz	92 g

- 1 Combine the flours, water, and sourdough and mix on low speed with the dough hook attachment for 4 minutes. Let the dough rest for 15 minutes. Add the salt and mix 1 minute on low speed and 2 minutes on medium speed. The dough should be slightly soft but elastic. Mix to the improved stage of gluten development.
- 2 Bulk ferment the dough until nearly doubled in volume, about 1 hour. Fold gently and ferment for another hour. Fold again. Ferment for another 20 minutes.
- 3 Divide the dough into pieces 1 lb 8 oz/680 g each. Preshape the dough into large oblongs (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)
- 4 Position the dough lengthwise, parallel to the edge of the work surface with the seam side up, and press lightly with your fingertips. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten.
- 5 Fold the dough lengthwise in half and use the heel of your hand to seal the two edges, keeping the seam straight. Roll the dough under your palms into a cylinder 8 in/20 cm long, moving your hands outward from the center of the cylinder toward the ends and slightly increasing the pressure as you move outward, until both ends have an even, gentle taper. Then increase the pressure at the ends of the loaf to seal.
- 6 Proof, covered, until the dough springs back slowly to the touch but does not collapse, 45 minutes.
- 7 Score the bâtard with an arc.
- 8 Presteam a 470°F/243°C deck oven. Load the bread into the oven and steam for 3 seconds. Bake until the crust is golden brown and the bread sounds hollow when thumped on the bottom, 35 to 40 minutes. Vent during the final 15 minutes. Cool completely on racks.

White wheat sourdough

MAKES 15 LB 4 OZ/6.92 KG DOUGH. DDT: 79°F/26°C

Bread flour	92.8%	6 lb 10½ oz	3.02 kg
Water	68%	78 fl oz	2.34 L
Wheat sourdough starter (page 170)	41.8%	3 lb	1.36 kg
Whole wheat flour	7.2%	8¼ oz	234 g
Salt	2.8%	3¼ oz	92 g

- 1 Combine the flour, water, and sourdough and mix on low speed with the dough hook attachment for 4 minutes. Let the dough rest for 15 minutes. Add the salt and mix 1 minute on low and 2 minutes on medium speed. The dough should be slightly soft but elastic. Mix to the improved stage of gluten development.
- 2 Bulk ferment the dough until nearly doubled in volume, about 1 hour. Fold gently and ferment for another hour. Fold again. Ferment for another 20 minutes.
- 3 Divide the dough into pieces 1 lb 8 oz/680 g each. Preshape the dough into large oblongs (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)
- 4 Position the dough lengthwise, parallel to the edge of the work surface with the seam side up, and press lightly with your fingertips. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten.
- 5 Fold the dough lengthwise in half and use the heel of your hand to seal the two edges, keeping the seam straight. Roll the dough under your palms into a cylinder 8 in/20 cm long, moving your hands outward from the center of the cylinder toward the ends and slightly increasing the pressure as you move outward, until both ends have an even, gentle taper. Then increase the pressure at the ends of the loaf to seal.
- 6 Proof, covered, until the dough springs back slowly to the touch but does not collapse, 45 minutes.
- 7 Score the bâtard with an arc.
- 8 Presteam a 470°F/243°C deck oven. Load the bread into the oven and steam for 3 seconds. Bake until the crust is golden brown and the bread sounds hollow when thumped on the bottom, 35 to 40 minutes. Vent during the final 15 minutes. Cool completely on racks.

Apple and walnut sourdough

MAKES 15 LB 13% OZ/7.19 KG DOUGH. DDT: 77°F/25°C

Bread flour	83.1%	6 lb 5 oz	2.86 kg
Whole wheat flour	16.9%	14 oz	397 g
Water	84.3%	70 fl oz	2.10 L
Wheat sourdough starter (page 170)	49.4%	2 lb 9 oz	1.16 kg
Salt	3.3%	2¾ oz	78 g
Granny Smith apples, coarsely chopped	14.5%	12 oz	340 g
Walnuts, lightly toasted and coarsely chopped	14.5%	12 oz	340 g
Ground cinnamon	1.2%	1 oz	28 g

- 1 Combine the flours, water, and sourdough and mix on low speed with the dough hook attachment for 4 minutes. Let the dough rest for 15 minutes. Add the salt and mix for 1 minute on low speed and 3 minutes on medium speed. The dough should be slightly soft but elastic.
- 2 Bulk ferment the dough until nearly doubled, about 1 hour. Fold gently and ferment for another hour. Fold again. Ferment for another 20 minutes. Toss together the apples, walnuts, and cinnamon and fold into the dough (see “Adding Flavorings and Garnishes,” page 160).
- 3 Divide the dough into pieces 1 lb 4 oz/567 g each. Preshape the dough into large oblongs (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)
- 4 Position the dough lengthwise, parallel to the edge of the work surface with the seam side up, and press lightly with your fingertips. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten.
- 5 Fold the dough lengthwise in half and use the heel of your hand to seal the two edges, keeping the seam straight. Roll the dough under your palms into a cylinder 8 in/20 cm long, moving your hands outward from the center of the cylinder toward the ends and slightly increasing the pressure as you move outward, until both ends have an even, gentle taper. Then increase the pressure at the ends of the loaf to seal.
- 6 Proof, covered, in a couche until the dough springs back slowly to the touch but does not collapse, 30 minutes.
- 7 Score the bâtard with a slash down the center.
- 8 Presteam a 470°F/243°C deck oven. Load the bread into the oven and steam for 3 seconds. Bake until the crust is golden brown and the bread sounds hollow when thumped on the bottom, 35 minutes. Vent during the final 10 minutes. Cool completely on racks.

Sourdough with rye flour

MAKES 15 LB 9¼ OZ/7.08 KG DOUGH. DDT: 76°F/24°C

Bread flour	60%	4 lb 8 oz	2.04 kg
Medium rye flour	40%	3 lb	1.36 kg
Water	65%	78½ fl oz	2.36 L
Wheat sourdough starter (page 170)	40%	3 lb	1.36 kg
Salt	2.7%	¾ oz	92 g

- 1 Combine the flours, water, and sourdough and mix on low speed with the dough hook attachment for 3 minutes. Let the dough rest for 15 minutes. Add the salt and mix on medium speed for 3 minutes, or until the dough is slightly soft but elastic.
- 2 Bulk ferment the dough until nearly doubled, about 1 hour. Fold gently and ferment for another hour. Fold again. Ferment for another 20 minutes.
- 3 Divide the dough into pieces 1 lb 8 oz/680 g each. Preshape the dough into large oblongs (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)
- 4 Position the dough lengthwise, parallel to the edge of the work surface with the seam side up, and press lightly with your fingertips. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten.
- 5 Fold the dough lengthwise in half and use the heel of your hand to seal the two edges, keeping the seam straight. Roll the dough under your palms into a cylinder 8 in/20 cm long, moving your hands outward from the center of the cylinder toward the ends and slightly increasing the pressure as you move outward, until both ends have an even, gentle taper. Then increase the pressure at the ends of the loaf to seal.
- 6 Proof, covered, in a couche until the dough springs back slowly to the touch but does not collapse, 30 minutes.
- 7 Score the bâtard with an arc in the center.
- 8 Presteam a 475°F/246°C deck oven. Load the bread into the oven and steam for 3 seconds. Bake until the crust is golden brown and the bread sounds hollow when thumped on the bottom, 25 to 30 minutes. Vent during the final 10 minutes. Cool completely on racks.

Multigrain sourdough

MAKES 12 LB 5 OZ/5.58 KG DOUGH. DDT: 78°F/26°C

SOAKER			
Nine-grain cereal mix	30.33%	1 lb	454 g
Sunflower seeds	12.32%	6½ oz	184 g
Oats	12.32%	6½ oz	184 g
Water	60.66%	32 fl oz	960 mL
FINAL DOUGH			
Bread flour	100%	3 lb 5 oz	1.50 kg
Instant dry yeast	1.23%	¼ oz	7 g
Water	45.5%	24 fl oz	720 mL
Pâte fermentée (see page 148)	75.83%	2 lb 8 oz	1.13 kg
Wheat sourdough starter (page 170)	30.33%	1 lb	454 g
Molasses, unsulfured	2.37%	1¼ oz	35 g
Soaker (above)	115%	3 lb 13 oz	1.73 kg
Salt	2.84%	1½ oz	43 g

- 1 To prepare the soaker, combine the nine-grain cereal mix, sunflower seeds, and oats with the water in a plastic tub and cover. Soak at room temperature until the soaker has absorbed the water and is slightly dry, 8 to 12 hours.
- 2 To prepare the final dough, combine the flour and yeast. Add the water, pâte fermentée, sourdough, molasses, soaker, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes. Let the dough rest for 15 minutes. Mix on medium speed for 3 minutes, or until the dough is slightly stiff. Mix to the improved stage of gluten development.
- 3 Bulk ferment the dough until nearly doubled, about 30 minutes. Fold gently and ferment for another 30 minutes. Fold again. Ferment for another 30 minutes.
- 4 Divide the dough into 1-lb/454-g pieces. Preshape the dough into large oblongs (for pre-shaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)
- 5 Position the dough lengthwise, parallel to the edge of the work surface with the seam side up, and press lightly with your fingertips. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten.
- 6 Fold the dough lengthwise in half and use the heel of your hand to seal the two edges, keeping the seam straight. Roll the dough under your palms into a cylinder 8 in/20 cm long, moving your hands outward from the center of the cylinder toward the ends and slightly increasing the

pressure as you move outward, until both ends have an even, gentle taper. Then increase the pressure at the ends of the loaf to seal.

7 Proof, covered, in a couche until the dough springs back slowly to the touch but does not collapse, 45 minutes.

8 Score the bâtard with three parallel diagonal lines.

9 Presteam a 470°F/243°C deck oven. Load the bread into the oven and steam for 3 seconds. Bake until the crust is golden brown and the bread sounds hollow when thumped on the bottom, 25 to 30 minutes. Vent during the final 10 minutes. Cool completely on racks.

Chocolate cherry sourdough

MAKES 19 LB 6½ OZ/8.80 KG DOUGH. DDT: 78°F/26°C

Espresso beans, ground	5.3%	4¼ oz	120 g
Water	81.25%	65 fl oz	1.95 L
Wheat sourdough starter (page 170)	63.2%	3 lb 2½ oz	1.43 kg
Pâte fermentée (see page 148)	40%	2 lb	907 g
Bread flour	100%	5 lb	2.27 kg
Cocoa powder	10.6%	8½ oz	241 g
Instant dry yeast	0.95%	¾ oz	21 g
Salt	3.2%	2½ oz	71 g
Chocolate chunks	41.9%	2 lb 1½ oz	950 g
Dried cherries	41.9%	2 lb 1½ oz	950 g

1 Line a fine-mesh strainer with cheesecloth and place the ground espresso in it. Pour 26½ fl oz/795 mL boiling water over the coffee. Cool to room temperature.

2 Combine the cooled espresso, the remaining water, the sourdough, and pâte fermentée and mix on low speed just until blended, about 1 minute. Add the flour, cocoa powder, yeast, and salt and mix on low speed for 4 minutes and then on medium speed for 4 minutes. Add the chocolate chunks and dried cherries and mix on low speed until well combined, about 1 minute. The dough should be slightly loose. Mix to the improved stage of gluten development.

3 Bulk ferment the dough until nearly doubled, about 45 minutes. Fold gently. Let the dough ferment for another 45 minutes.

4 Divide the dough into pieces 1 lb 8 oz/680 g each.

5 To shape as a boule: Cup both hands around the dough. Using your thumbs, push the dough away from you in an arc to the right, keeping a small piece of dough between the table

and the edges of your palms. Using the edges of your palms as a guide, pull the dough toward you in an arc to the left. There should still be a small piece of dough that is squeezed between the table and the edges of your palms. Repeat this circular motion two or three more times, applying gentle pressure while rounding the dough, to create a tight, smooth outer skin. Place the boule seam side up in a round basket or seam side down on a board dusted with cornmeal.

6 Proof until the dough springs back slowly to the touch, 45 minutes. Flip the dough seam side down onto a peel. Score the boule with three parallel horizontal lines.

7 Presteam in a 425°F/218°C deck oven. Load the bread into the oven and steam for 3 seconds. Bake until the crust is golden brown and the bread sounds hollow when thumped on the bottom, 25 to 30 minutes. Vent during the final 5 minutes. Cool completely on racks.

Durum sourdough

MAKES 22 LB ½ OZ/9.99 KG DOUGH. DDT: 75°F/24°C

Durum flour	50%	5 lb	2.27 kg
Bread flour	50%	5 lb	2.27 kg
Instant dry yeast	0.32%	½ oz	14 g
Water	82.5%	132 fl oz	3.96 L
Wheat sourdough starter (see page 170)	35%	3 lb 8 oz	1.59 kg
Salt	2.5%	4 oz	113 g

1 Combine the flours and yeast. Add the water and sourdough to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes. Allow the dough to rest for 15 minutes. Add the salt and mix on low speed with the dough hook attachment for 4 minutes. The dough should be fairly loose.

2 Bulk ferment the dough until nearly doubled, about 2 hours, folding the dough gently every 30 minutes, for a total of three folds.

3 Divide the dough into pieces 2 lb 6 oz/1.08 kg each. Preshape the dough into large rounds (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)

4 To shape as a boule: Cup both hands around the dough. Using your thumbs, push the dough away from you in an arc to the right, keeping a small piece of dough between the table and the edges of your palms. Using the edges of your palms as a guide, pull the dough toward you in an arc to the left. There should still be a small piece of dough that is squeezed between the table and the edges of your palms. Repeat this circular motion two or three more times, applying gentle pressure while rounding the dough, to create a tight, smooth outer skin. Place the boule seam side up in a round basket or seam side down on a board dusted with cornmeal.

5 Proof, covered, until the dough springs back slowly to the touch, 1 to 1½ hours. Flip the dough seam side down onto a peel. Score the boule with an arc.

6 Presteam in a 450°F/232°C deck oven. Load the bread into the oven and steam for 3 seconds. Bake until the crust is golden brown and the bread sounds hollow when thumped on the bottom, 40 to 50 minutes. Vent during the final 15 minutes. Cool completely on racks.

100 percent rye sourdough

MAKES 10 LB 14 OZ/4.93 KG DOUGH. DDT: 80°F/27°C

Medium rye flour	100%	3 lb 13¾ oz	1.75 kg
Instant dry yeast	0.8%	½ oz	14 g
Rye sourdough starter (page 171)	92.7%	3 lb 9¼ oz	1.62 kg
Water	85.4%	52¾ fl oz	1.58 L
Salt	2.8%	1¾ oz	50 g

1 Combine the flour and yeast. Add the sourdough, water, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 5 to 6 minutes. The dough should be loose and clay-like, with no elasticity or gluten development.

2 Bulk ferment the dough until nearly doubled, 30 minutes.

3 Divide the dough into 2-lb/907-g pieces. Preshape the dough into large oblongs (for preshaping instructions, see page 109). Lightly grease five 2-lb/907-g loaf pans (4½ in/11 cm wide, 8 in/20 cm long, and 3 in/8 cm deep). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)

4 Place the dough lengthwise parallel to the edge of the worktable with the seam side up. Press lightly with your fingertips to stretch it into a rectangle 8 in/20 cm long, using as little flour as possible. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten the dough.

5 Fold the dough lengthwise in half and use the heel of your hand to seal the two edges together, keeping the seam straight. Roll the dough under your palms into a cylinder 10 in/25 cm long, keeping the pressure even and holding your hands flat and parallel to the work surface to create a smooth, even loaf.

6 Place the dough seam side down in a greased loaf pan. Proof, covered, until the dough fills the pan and starts to crack at the surface, 30 to 40 minutes.

7 Presteam a 450°F/232°C deck oven. Load the bread into the oven and steam for 5 seconds. Bake until the crust is a deep golden brown and the sides of the bread spring back when pressed, about 1 hour. Vent during the final 20 minutes. Remove the bread from the pan and cool completely on racks.

Multigrain rye sourdough

MAKES 15 LB/6.80 KG DOUGH. DDT: 79°F/26°C

SOAKER			
Nine-grain cereal mix	21.5%	18¾ fl oz	563 mL
Flaxseed	13.8%	12 oz	340 g
Sunflower seeds	7.8%	7 oz	198 g
Water (90°F/32°C)	56.9%	49½ fl oz	1.49 L
FINAL DOUGH			
Bread flour	61.6%	3 lb 2½ oz	1.43 kg
Medium rye flour	38.4%	1 lb 15½ oz	893 g
Instant dry yeast	1.2%	1 oz	28 g
Rye sourdough starter (page 171)	42.5%	2 lb 5 oz	1.05 kg
Water	36.9%	30¼ fl oz	908 mL
Soaker (above)	106%	5 lb 7 oz	2.47 kg
Salt	3.4%	2¼ oz	78 g

- 1 To prepare the soaker, combine the nine-grain cereal mix, flaxseed, and sunflower seeds with the water in a plastic tub. Soak at 75°F/24°C until the soaker has absorbed the water and is slightly dry, 8 to 12 hours.
- 2 To prepare the final dough, combine the flours and yeast. Add the sourdough, water, soaker, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 3 minutes. Mix to the improved stage of gluten development.
- 3 Bulk ferment the dough until nearly doubled, about 30 minutes.
- 4 Divide the dough into pieces 1 lb 8 oz/680 g each. Preshape the dough into large oblongs (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 5 minutes.
- 5 Position the dough lengthwise, parallel to the edge of the work surface with the seam side up, and press lightly with your fingertips. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten.
- 6 Fold the dough lengthwise in half and use the heel of your hand to seal the two edges, keeping the seam straight. Roll the dough under your palms into a cylinder 8 in/20 cm long, moving your hands outward from the center of the cylinder toward the ends and slightly increasing the pressure as you move outward, until both ends have an even, gentle taper. Then increase the pressure at the ends of the loaf to seal.
- 7 Proof, covered, in a couche until the dough springs back slowly to the touch but does not collapse, 35 minutes.
- 8 Score the bâtard straight down the center.

9 Presteam in a 470°F/243°C deck oven. Load the bread into the oven and steam for 3 seconds. Bake until the crust is golden brown and the bread sounds hollow when thumped on the bottom, 35 to 40 minutes. Vent during the final 10 minutes. Cool completely on racks.

Rustic rye sourdough

MAKES 12 LB 4 OZ/5.556 KG DOUGH. DDT: 78°F/26°C

Medium rye flour	56.25%	2 lb 13 oz	1.28 kg
Bread flour	43.75%	2 lb 3 oz	992 g
Instant dry yeast	0.63%	½ oz	14 g
Water	75%	60 fl oz	1.80 L
Rye sourdough starter (page 171)	41.9%	2 lb 1½ oz	950 g
Salt	2.5%	2 oz	57 g
Sunflower seeds, lightly toasted	25%	1 lb 4 oz	567 g

- 1 Combine the flours and yeast. Add the water, sourdough, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes. Allow the dough to rest for 15 minutes. Add the sunflower seeds and mix on medium speed for 3 minutes. The dough should be slightly wet but elastic. Mix to the improved stage of gluten development.
- 2 Bulk ferment the dough until nearly doubled, about 30 minutes.
- 3 Divide the dough into pieces 1 lb 8 oz/680 g each. Preshape the dough into oblongs (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 5 minutes.
- 4 Position the dough lengthwise, parallel to the edge of the work surface with the seam side up, and press lightly with your fingertips. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten.
- 5 Fold the dough lengthwise in half and use the heel of your hand to seal the two edges, keeping the seam straight. Roll the dough under your palms into a cylinder 8 in/20 cm long, moving your hands outward from the center of the cylinder toward the ends and slightly increasing the pressure as you move outward, until both ends have an even, gentle taper. Then increase the pressure at the ends of the loaf to seal.
- 6 Proof, covered, in a couche until the dough springs back slowly to the touch but does not collapse, 30 minutes.
- 7 Score the bâtard straight down the center.
- 8 Presteam in a 470°F/243°C deck oven. Load the bread into the oven and steam for 3 seconds. Bake until the crust is golden brown and the bread sounds hollow when thumped on the bottom, 30 to 40 minutes. Vent during the final 10 minutes. Cool completely on racks.

Whole-grain carrot dough

MAKES 13 LB 13¼ OZ/6.29 KG DOUGH. DDT: 80°F/27°C

SOAKER			
Nine-grain cereal mix	46.3%	2 lb 12 oz	1.25 kg
Rolled oats	7.4%	9 oz	255 g
Water	46.3%	44 fl oz	1.32 L
FINAL DOUGH			
High-gluten flour	52.6%	2 lb 3¼ oz	999 g
Medium rye flour	47.4%	1 lb 15¾ oz	900 g
Instant dry yeast	1.5%	1 oz	28 g
Rye sourdough starter (page 171)	63%	2 lb 10¼ oz	1.20 kg
Water	47.7%	32 fl oz	960 mL
Soaker (above)	144.7%	6 lb 1 oz	2.75 kg
Pumpkin seeds, lightly toasted	10.5%	7 oz	198 g
Carrots, grated	6.7%	4½ oz	128 g
Salt	3%	2 oz	57 g
Malt syrup	1.5%	1 oz	28 g
Rolled oats, for sprinkling		as needed	as needed

- 1 To prepare the soaker, combine the nine-grain cereal mix and rolled oats with the water in a plastic tub. Soak at room temperature until the soaker has absorbed the water and is slightly dry, 8 to 12 hours.
- 2 To prepare the final dough, combine the flours and yeast. Add the sourdough and water to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes. Allow the dough to rest for 15 minutes. Add the soaker, pumpkin seeds, carrots, salt, and malt syrup and mix on medium speed for 3 minutes. The dough should be slightly sticky but have sufficient gluten development. Mix to the improved stage of gluten development.
- 3 Bulk ferment the dough until nearly doubled, about 30 minutes.
- 4 Divide the dough into 1-lb/454-g pieces. Preshape the dough into large oblongs (for pre-shaping instructions, see page 109). Let the dough rest, covered, until relaxed, 5 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)
- 5 Position the dough lengthwise, parallel to the edge of the work surface with the seam side up, and press lightly with your fingertips. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten.

- 6** Fold the dough lengthwise in half and use the heel of your hand to seal the two edges, keeping the seam straight. Roll the dough under your palms into a cylinder 8 in/20 cm long, moving your hands outward from the center of the cylinder toward the ends and slightly increasing the pressure as you move outward, until both ends have an even, gentle taper. Then increase the pressure at the ends of the loaf to seal. Place on parchment-lined sheet pans that have been lightly dusted with cornmeal.
- 7** Proof, covered, until the dough springs back slowly to the touch but does not collapse, 30 minutes.
- 8** Sprinkle the top of each loaf with rolled oats.
- 9** Presteam in a 450°F/232°C deck oven. Load the bread into the oven and steam for 3 seconds. Bake until the crust is golden brown and the bread sounds hollow when thumped on the bottom, 25 to 30 minutes. Vent during the final 10 minutes. Cool completely on racks.

Vollkornbrot European pumpernickel

MAKES 19 LB 8 OZ/8.85 KG DOUGH. DDT: 80°F/27°C

CRACKED RYE SOURDOUGH STARTER			
Rye sourdough starter (page 171)	10%	6½ oz	184 g
Steel-cut cracked rye	100%	3 lb 13¾ oz	1.75 kg
Water	100%	61¾ fl oz	1.85 L
SOAKER			
Steel-cut cracked rye	52.75%	1 lb 10½ oz	751 g
Water, boiling	47.25%	23¾ fl oz	713 mL
FINAL DOUGH			
Cracked rye sourdough starter (above)	162.2%	8 lb 1¾ oz	3.68 kg
Instant dry yeast	1.25%	1 oz	28 g
Steel-cut cracked rye	100%	5 lb	2.27 kg
Soaker (above)	62.8%	3 lb 2¼ oz	1.42 kg
Water	60%	48 fl oz	1.44 L
Salt	3.75%	3 oz	85 g

- 1 To prepare the cracked rye sourdough starter, mix the rye sourdough starter, cracked rye, and water in a plastic tub. Cover and ferment for 18 to 20 hours at 75°F/24°C. The starter should be bubbly and have a light alcohol aroma.
- 2 To prepare the soaker, combine the cracked rye with the water in a plastic tub. Soak at 75°F/24°C until the rye has absorbed the water and is slightly dry, 8 to 12 hours.
- 3 To prepare the final dough, combine the cracked rye sourdough starter, yeast, cracked rye, soaker, water, and salt and mix on low speed with the dough hook attachment for 8 minutes and on medium speed for 5 minutes. The dough should be very loose and very sticky.
- 4 Bulk ferment the dough in the mixing bowl until nearly doubled, 30 minutes.
- 5 After the dough has fermented, mix on low speed for 15 seconds to expel the carbon dioxide that has built up.
- 6 Grease nine or ten 3-lb/1.36-kg Pullman loaf pans and lids generously. Divide the dough into pieces 2 lb/907 g each. Preshape the dough into large rounds (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)
- 7 Place the dough lengthwise with the seam side up. Press lightly with your fingertips to stretch it into a rectangle 8 in/20 cm long, using as little flour as possible. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten the dough.

8 Fold the dough lengthwise in half and use the heel of your hand to seal the two edges together, keeping the seam straight. Roll the dough under your palms into a cylinder 10 in/25 cm long, keeping the pressure even and holding your hands flat and parallel to the work surface to create a smooth, even loaf.

9 Let the dough rest, covered, until relaxed, 15 to 20 minutes.

10 Turn the dough seam side up and position it so that a long side is parallel to the edge of the work surface. Work the dough lightly with your fingertips to release some of the gas, then gently stretch it into a rectangle 2½ in/6 cm wide and 16 in/41 cm long. Fold 1 in/3 cm of each short end in toward the center of the dough. Fold the long sides into the center, overlapping them slightly, and use the heel of your hand to seal the two edges together, keeping the seam straight. Fold the dough lengthwise in half and use your fingertips to seal the edges together, keeping the seam straight.

11 Roll the dough under your palms into a cylinder 18 in/46 cm long, keeping the pressure even and holding your hands flat and parallel to the work surface to create a smooth, even loaf. Push the ends of the loaf toward the center until the cylinder is 16 in/41 cm long. Place the dough seam side down in the greased loaf pan. The dough will spring back on itself slightly and fit snugly in the pan. Proof, uncovered, until the pan is three-quarters full and the dough springs back slowly to the touch, about 1 hour. Lightly spray with water.

12 Place the lids on the pans and let the dough to proof for an additional 15 minutes.

13 Bake in a 425°F/218°C deck oven for 1 hour and 15 minutes. Cool completely on racks.

CLOCKWISE FROM
TOP CENTER:

Six-Braid Challah
(page 135), Brioche
Loaf round (page
186), Gugelhopf
(page 192)
Christmas Stollen
(page 194), Day of
the Dead Bread
(page 207), Hot
Cross Buns (page
201), Panettone
(page 190)



Brioche loaf

MAKES 11 LB 10% OZ/5.29 KG DOUGH. DDT: 75°F/24°C

Bread flour	100%	5 lb	2.27 kg
Instant dry yeast	1.7%	1½ oz	38 g
Eggs	40%	2 lb	907 g
Milk, room temperature	20%	16 fl oz	480 mL
Sugar	10%	8 oz	227 g
Salt	2%	1½ oz	43 g
Butter, soft but still pliable	60%	3 lb	1.36 kg
Egg wash (page 892)		as needed	as needed

- 1 Combine the flour and yeast. Add the eggs, milk, sugar, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes.
- 2 Gradually add the butter with the mixer running on medium speed, scraping down the sides of the bowl as necessary. After the butter has been fully incorporated, mix on medium speed for 15 minutes or until the dough begins to pull away from the sides of the bowl.
- 3 Line a sheet pan with parchment paper and grease the paper. Place the dough on the sheet pan. Cover tightly with plastic wrap and refrigerate overnight.
- 4 Lightly grease ten to twelve 2-lb/907-g loaf pans (4½ in/11 cm wide, 8 in/20 cm long, and 3 in/8 cm deep).
- 5 Remove the dough from the refrigerator and divide it by hand into 2-oz/57-g pieces. Pre-shape each piece into a round, lightly flouring the work surface as needed. (Reminder: Refrigerate the dough as necessary during shaping to keep it cool and workable.) Refrigerate the rolls until cool, about 15 minutes.
- 6 Place the pieces of dough in the loaf pan in two rows of four. Brush lightly with egg wash, brushing away any excess that accumulates in the crevices. Proof, covered, until the dough is almost double in size and springs back slowly to the touch but does not collapse, 1 to 2 hours.
- 7 Gently brush the dough again with egg wash. Bake in a 375°F/191°C deck oven until the crust is a rich golden brown and the sides of the bread spring back fully when pressed, 30 to 35 minutes. Remove from the pans and cool completely on racks.

VARIATIONS CRAQUELIN DOUGH Add 3 lb/1.36 kg sugar cubes to orange brioche dough after step 3. Cut up the dough into small chunks. Place half the dough into the mixer. Add the sugar cubes and then the other half of the dough (see Craquelin, at right).

ORANGE BRIOCHE DOUGH Add 1 oz/28 g finely grated orange zest to the brioche dough with the butter in step 2.

Craquelin

MAKES 1 LOAF. DDT: 82°F/28°C

Craquelin dough (at left)	12 oz	340 g
Orange brioche dough (at left)	3 oz	85 g
Crystal sugar, for sprinkling	as needed	as needed

1 Coat a panettone wrapper (5 in/13 cm in diameter and 6 in/15 cm high) with a light film of fat. Preshape the craquelin into a large round (for preshaping instructions, see page 109). Let the craquelin dough rest, covered, until relaxed, about 45 minutes. Meanwhile, preshape the brioche dough into a round and let it rest, covered and under refrigeration, until relaxed, about 30 minutes.

2 Roll the orange brioche dough into a 6-in/15-cm circle. Egg wash and wrap it around the craquelin dough to enclose it completely, and gather the edges together at the bottom to form a boule. Place the loaf seam side down in the prepared paper wrapper. Egg wash.

3 Proof, covered, until the dough springs back slowly to the touch but does not collapse, 2 to 3 hours.

4 Egg wash and sprinkle crystal sugar. Score the loaf with an X in the center or snip the entire surface with scissors.

5 Presteam a 375°F/191°C convection oven. Load the bread into the oven and steam for 5 seconds. Bake until the crust is golden brown and the sides of the bread spring back fully when pressed through the wrapper, 25 to 30 minutes. Cool completely on a rack.

VARIATION To make small craquelin, divide the craquelin dough into 2½-oz/71-g pieces and the orange brioche dough into 1-oz/28-g pieces. Follow the method above but when preshaping, use the method for small rounds on page 109.



Form a thin sheet of brioche dough around the craquelin.

Honey challah

MAKES 1 LOAF. DDT: 78°F/26°C

SPONGE			
Bread flour	11.4%	3½ oz	95 g
Instant dry yeast	1.4%	½ oz	14 g
Water	11.6%	3½ oz	95 g
FINAL DOUGH			
Bread flour	88.6%	1 lb 9½ oz	723 g
Water	11.6%	3½ oz	95 g
Eggs	22.4%	6½ oz	184 g
Egg yolks	5.7%	1½ oz	43 g
Vegetable oil	9.2%	2¾ oz	78 g
Sugar	10%	2¾ oz	78 g
Honey	5.7%	1¾ oz	47 g
Salt	2.1%	¾ oz	19 g
Sponge (above)	24.3%	7 oz	198 g
White rye flour, for dusting		as needed	as needed
Egg wash (page 892), made with yolks only		as needed	as needed

- 1 To prepare the sponge, combine the flour, yeast, and water and mix on low speed with the dough hook attachment for 3 minutes. Ferment at 75°F/24°C for 20 minutes.
- 2 To prepare the final dough, combine the flour, water, eggs, egg yolks, oil, sugar, honey, salt, and sponge and mix on low speed with the dough hook attachment for 6 minutes. Scrape down the bowl and mix on high speed for 6 minutes for full gluten development.
- 3 Bulk ferment the dough until nearly doubled, about 35 minutes.
- 4 Divide the dough into 2½-oz/76-g pieces. Preshape the dough into small oblongs (for pre-shaping instructions, see page 110). Let the dough to rest, covered, for 15 to 20 minutes.
- 5 Start with the first piece of dough that you shaped and work sequentially. Starting at the center of the dough, roll each piece outward, applying gentle pressure with your palms. Apply very little pressure at the center of the dough, but increase the pressure as you roll toward the ends of the dough. Roll each piece of dough into an evenly tapered strand 12 in/30 cm long. It is imperative that all of the strands be the same length. If they are not, the finished braid will be uneven.
- 6 Dust the top of the strands very lightly with white rye flour. (This will keep the dough dry as you braid and help maintain the overall definition of the braid.)
- 7 Lay three strands of dough vertically parallel to each other. Begin braiding in the center of the strands. Place the left strand over the center strand, then place the right strand over

the center strand. Repeat this process until you reach the end of the dough. Pinch the ends together tightly.

8 Turn the braid around and flip it over so that the unbraided strands are facing you. Starting again from the left, repeat the braiding process until you reach the end of the dough. Pinch the ends together tightly. Place on parchment-lined sheet pans.

9 Brush the dough lightly with egg wash made solely from egg yolks. Allow the dough to proof, covered, until the dough springs back lightly to the touch but does not collapse, about 1 hour. There should be a small indentation left in the dough. Make sure that the egg wash is dry before you apply a second coat. Brush very gently with egg wash a third time before baking.

10 Bake in a 375°F/204°C oven until the braids are dark golden brown and shiny, about 20 minutes, or until the internal temperature is 195°F/91°C. Cool completely on a rack.

Chocolate and pecan babka

MAKES 4 LOAVES (1 LB 5 OZ/595 G EACH) DDT: 75°F/24°C

Brioche Loaf dough (page 186)	100%	3 lb 5 oz	1.5 kg
Chocolate filling (page 895)	34%	1 lb 2 oz	510 g
Pecans, toasted and coarsely chopped	26.4%	14 fl oz	397 g

1 Scale the brioche dough into two 1 lb 10½ oz/750 g pieces and roll each into a 10 by 12-inch/25 by 30-cm rectangle. Place on a parchment-lined sheet pan, cover, and refrigerate overnight.

2 Allow the brioche dough and chocolate filling to stand at room temperature for 30 minutes.

3 Start with one piece of dough and work sequentially. Place on a floured work surface and roll to an 18-inch/46-cm square. Spread half of the filling on the dough, leaving a ½-inch/1-cm border at the top and bottom. If the filling is too stiff to spread, warm slightly in the microwave. Sprinkle half the pecans evenly over the filling.

4 Fold the top edge of the dough down to the bottom, pressing lightly with your fingertips to tighten. Repeat folding the top onto the bottom until there is no more dough to fold over. Press on the seam to seal it.

5 Place the dough seam side down on a work surface and lightly flour the dough. Cut the dough in half crosswise and place each half with the cut end facing you. Lightly press on the dough with your fingertips to flatten it and create more surface area. Cut the dough into three strands, keeping the strands connected at the top with an uncut portion.

6 To braid the three strands together, place the left strand over the center strand, then place the right strand over the center strand. Repeat this process until you reach the end of the dough. Pinch the ends together tightly. Repeat with the remaining dough, filling, and nuts.

7 Place in four 2-lb/907-g loaf pans (4½ in/11 cm wide, 8 in/20 cm long, and 3 in/8 cm deep) greased loaf pans. Proof covered until the dough is almost double in size and springs back slowly to the touch but does not collapse, 2½ to 3 hours.

8 Bake in a 400°F/204°C oven for 45 to 50 minutes, to an internal temperature of 205°F/96°C.

9 Remove from the oven and let sit in the pans from 5 minutes. Remove from the pans and cool completely on a rack.

Panettone

MAKES 10 LB 4½ OZ/4.66 KG DOUGH. DDT: 78°F/26°C

SPONGE			
Bread flour	100%	1 lb 5 oz	595 g
Milk (80°F/27°C)	66.7%	14 fl oz	420 mL
Instant dry yeast	6%	1¼ oz	35 g
FINAL DOUGH			
Sponge (above)	57%	2 lb 4¼ oz	1.03 kg
Bread flour	67%	2 lb 10½ oz	1.20 kg
Eggs	25.2%	1 lb	454 g
Milk	18.9%	12 fl oz	360 mL
Sugar	14.6%	9¼ oz	262 g
Salt	2.75%	1¾ oz	50 g
Glucose syrup	2%	1¼ oz	35 g
Orange zest, grated	0.75%	½ oz	14 g
Lemon zest, grated	0.75%	½ oz	14 g
Instant dry yeast	0.75%	½ oz	14 g
Butter (55°F/13°C)	18.9%	12 oz	340 g
Candied orange peel	12.75%	8 oz	227 g
Candied lemon peel	12.75%	8 oz	227 g
Raisins	12.6%	8 oz	227 g
Golden raisins	12.6%	8 oz	227 g
Egg wash (page 892)		as needed	as needed
Unsalted butter		as needed	as needed

- 1** To prepare the sponge, mix the flour, milk, and yeast on low speed with the dough hook attachment until blended, about 2 minutes. Cover and ferment until the sponge has risen and just begun to recede, about 45 minutes at 75°F/24°C.
- 2** To prepare the final dough, combine the sponge, flour, eggs, milk, sugar, salt, glucose, orange and lemon zests, and yeast. Mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 2 minutes. Gradually add the butter, then mix on medium speed for 10 minutes. The dough should be soft but very elastic. Blend in the orange and lemon peels and raisins.
- 3** Bulk ferment the dough until nearly doubled, about 1 hour.
- 4** Divide the dough into pieces 1 lb 4 oz/567 g each. Grease a large paper panettone wrapper. Round the dough to create a tight, smooth boule. Place the dough seam side down in the panettone wrapper. Lightly brush the top of the loaf with egg wash.
- 5** Proof, covered, until the dough springs back slowly to the touch but does not collapse, about 1 hour 15 minutes.
- 6** Lightly brush the bread with egg wash again. Score the bread with an X in the center. Insert a small pat of unsalted butter in the center of the cut.
- 7** Bake in a 385°F/196°C convection oven until the panettone is golden brown and the sides spring back fully when touched through the wrapper, 22 to 25 minutes. Cool completely on racks.

Gugelhopf

MAKES 15 LB 8¼ OZ/7.04 KG DOUGH. DDT: 79°F/26°C

SPONGE			
Bread flour	100%	2 lb 4 oz	1.02 kg
Milk (75°F/24°C)	100%	36 fl oz	1.08 L
Instant dry yeast	7.6%	2¾ oz	78 g
Vanilla beans, split and scraped (seeds only)		4 each	4 each
FINAL DOUGH			
Sugar	20.75%	1 lb 6 oz	624 g
Salt	1.4%	1½ oz	43 g
Butter, soft	20.75%	1 lb 6 oz	624 g
Eggs	13.2%	2 lb	907 g
Bread flour	66%	4 lb 6 oz	1.98 kg
Sponge (above)	70.5%	4 lb 10¾ oz	2.12 kg
Raisins	20.75%	1 lb 6 oz	624 g
Almonds, chopped	3.75%	4 oz	113 g
Egg wash (page 892)		as needed	as needed
Unsalted butter		as needed	as needed

- 1 To prepare the sponge, mix the flour, milk, yeast, and vanilla bean seeds on low speed with the dough hook attachment until blended, about 2 minutes. Cover and ferment until the sponge has risen and just begun to recede, about 30 minutes at 75°F/24°C.
- 2 To prepare the final dough, cream the sugar, salt, and butter on medium speed with the dough hook attachment, scraping down the bowl periodically until smooth, fluffy, and lighter in color, about 5 minutes. Gradually add the eggs, scraping down the bowl periodically.
- 3 Add the bread flour and the sponge. Mix on low speed for 4 minutes and on medium speed for 4 minutes, until the dough is completely smooth.
- 4 Add the raisins and almonds. Mix on low speed for about 2 minutes. The dough should be moist but have strong gluten development.
- 5 Bulk ferment the dough until nearly doubled in size, 30 to 40 minutes.
- 6 Divide the dough into pieces 1 lb 4 oz/567 g each. Preshape the dough into large rounds (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 10 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)

- 7** Grease a large paper panettone wrapper. Reround the dough to create a tight, smooth boule. Place the dough seam side down in the panettone wrapper. Lightly brush the top of the loaf with egg wash.
- 8** Proof, covered, until the dough springs back slowly to the touch but does not collapse, about 1 hour 40 minutes.
- 9** Lightly brush the bread with egg wash again. Score the bread with an X in the center. Insert a small pat of unsalted butter in the center of the cut.
- 10** Bake in a 385°F/196°C convection oven until the gugelhopf is golden brown and the top springs back when touched, 35 to 40 minutes. Cool completely on a rack.

Christmas stollen

MAKES 9 LB 10¼ OZ/4.39 KG DOUGH. DDT: 80°F/27°C

FRUIT AND NUT MIXTURE			
Golden raisins	53.2%	2 lb 3¼ oz	9.99 kg
Candied lemon peel	15.5%	10½ oz	298 g
Candied orange peel	0.6%	4½ oz	128 g
Dark rum	5.2%	3½ fl oz	105 mL
Almonds, whole, blanched	19.5%	13¼ oz	376 g
SPONGE			
Bread flour	100%	1 lb 6 oz	624 g
Milk (50°F/10°C)	60.3%	13¼ fl oz	398 mL
Instant dry yeast	0.5%	1 oz	28 g
FINAL DOUGH			
Sponge (above)	88%	2 lb 4¼ oz	1.03 kg
Bread flour	50%	1 lb 6 oz	624 g
Butter	54.5%	1 lb 8 oz	680 g
Almond paste	4.5%	2 oz	57 g
Sugar	4.5%	2 oz	57 g
Salt	2.25%	1 oz	28 g
Lemon zest, grated	0.57%	1¼ tsp	6.75 g
Ground cloves	0.15%	pinch	pinch
Ground ginger	0.15%	pinch	pinch
Ground allspice	0.15%	pinch	pinch
Ground cinnamon	0.15%	pinch	pinch
Fruit and nut mixture (above)	154.5%	4 lb 3 oz	1.90 kg
GARNISH			
Clarified butter, melted		as needed	as needed
Vanilla sugar (page 901), for coating		as needed	as needed
Confectioners' sugar, for dusting		as needed	as needed

1 To prepare the fruit and nut mixture, rinse the raisins and lemon and orange peels with warm water and combine them with the rum in a plastic container. Cover and let the mixture soak at 75°F/24°C for at least 8 and up to 24 hours. Reserve the almonds to be added later.

- 2** To prepare the sponge, mix the flour, milk, and yeast on low speed with the dough hook attachment until blended, about 2 minutes. Cover and ferment at 75°F/24°C until the sponge has risen and just begun to recede, 30 to 40 minutes.
- 3** To prepare the final dough, mix the sponge, flour, butter, almond paste, sugar, salt, lemon zest, cloves, ginger, allspice, and cinnamon on medium speed with the dough hook attachment for 3 minutes. The dough should be sticky but have sufficient gluten development.
- 4** Bulk ferment the dough until nearly doubled, about 35 minutes. Add the almonds to the fruit mixture and very carefully fold it into the dough (see “Adding Flavorings and Garnishes,” page 160). Bulk ferment the dough until nearly doubled again, about 15 minutes.
- 5** Divide the dough into 1-lb/454-g pieces. Preshape the dough into large rounds (for pre-shaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)
- 6** Gently flatten the dough with your fingertips. Working with the seam side up, fold the dough in half. Seal the two edges by pressing firmly with the heel of your hand, keeping the seam straight. Roll the dough under your palms into a cylinder 8 in/20 cm long, keeping the pressure even and holding your hands flat and parallel to the work surface to create a smooth, even roll.
- 7** Turn the dough lengthwise, parallel to the edge of the worktable with the seam side down. Roll half of the dough into a flap $\frac{1}{4}$ in/6 mm thick in the shape of a semicircle. The edges of the flap should be $\frac{1}{2}$ in/1 cm thick.
- 8** Fold $\frac{1}{2}$ in/1 cm of the left and right sides of the dough toward the center of the dough. Roll the folded left and right edges of the dough so that they are the same thickness as the rest of the flap of dough.
- 9** Make an indentation lengthwise down the center of the thicker half of the dough with a straight rolling pin. Fold the flap over and insert the thicker edge of the flap into the indentation. Press into place by gently rolling with the rolling pin. Place on parchment-lined sheet pans.
- 10** Proof, covered, until the dough relaxes slightly, about 30 minutes.
- 11** Bake in a 350°F/177°C deck oven until the stollen is golden brown and sounds hollow when thumped on the bottom, 30 to 35 minutes. Cool on racks just until the bread can be handled; it should still be warm.
- 12** While the bread is still hot, remove any burnt fruit or nuts from the outside. Brush the sides, top, and bottom of the bread with clarified butter and roll in vanilla sugar. Cool completely on racks.
- 13** Dust the stollen with sifted confectioners’ sugar just before wrapping or slicing.

Soft pretzels

MAKES 8 LB 13¾ OZ/4.02 KG DOUGH. DDT: 75°F/24°C

Bread flour	100%	5 lb 8 oz	2.49 kg
Instant dry yeast	1.7%	1½ oz	43 g
Water	50%	44 fl oz	1.32 L
Butter, soft, cubed	5.1%	4½ oz	128 g
Malt syrup	2.25%	2 oz	57 g
Salt	2%	1¾ oz	50 g
LYE SOLUTION			
Water (105°F/41°C)		32 fl oz	960 mL
Sodium hydroxide pellets		1¼ oz	35 g
Coarse salt, for garnish		as needed	as needed

- 1 Combine the flour and yeast. Add the water, butter, malt syrup, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 2 minutes and on medium speed for 8 minutes. The dough should be stiff, with strong gluten development.
- 2 Bulk ferment the dough until nearly doubled, about 50 minutes.
- 3 Divide the dough into 5½-oz/156-g pieces. Preshape the dough into small oblongs (for pre-shaping instructions, see page 110). Let the dough rest, covered, until relaxed, 5 to 10 minutes.
- 4 Work sequentially, starting with the first piece of dough you divided and rounded. One at a time, stretch each piece of dough into a rectangle 10 in/25 cm long. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips. Fold the top edge of the dough to the bottom edge. Using the heel of your hand, seal the two edges together.
- 5 Turn the dough seam side down. Starting with each of your hands 2 in/5 cm from the center of the dough, roll the dough under your palms until it is 30 in/76 cm long, with a thicker portion 4 in/10 cm long in the center.
- 6 Lay the dough on the table and cross the ends over each other, leaving 3 in/8 cm of dough on each side of the crossing point (the thicker center of the dough should be closest to you). Twist the ends together once. Bring the ends of the dough over and attach them to either side of the thicker center of the dough, pressing gently to seal them. Transfer to a parchment-lined sheet pan.
- 7 Proof, covered, until the dough gives slightly when touched, about 30 minutes.
- 8 Relax the dough under refrigeration until it forms a skin, about 25 minutes.
- 9 To prepare the lye solution, combine the water and sodium hydroxide pellets, stirring until the pellets are completely dissolved. (Reminder: Wear protective gloves and goggles; be careful not to get any of the solution on your skin.)

10 Remove the pretzels from the refrigerator and allow them to stand for 5 to 10 minutes. (Reminder: If you dip the pretzels right away, the water temperature will drop and the sodium hydroxide will be less likely to stay in solution.)

11 Using tongs, dip the pretzels in the lye solution and then place them on screens to drain. Discard the lye solution once you have finished removing the pretzels by pouring it down the drain; it cannot be reused. Sprinkle the pretzels immediately with coarse salt. Make an incision 3 in/8 cm long and ¼ in/6 mm deep in the thickest part of each pretzel.

12 Place the pretzels on sheet pans lined with a silicone mat or lightly oiled parchment paper and bake in a 475°F/246°C deck oven (with the vent open) until deep golden brown, 12 to 15 minutes. Cool completely on racks.



FROM LEFT TO RIGHT:

Place the dough in a U shape on the table and cross the ends.

Twist the ends together once.

Bring the ends back down and gently press to adhere.

Pita with poolish

MAKES 7 LB/3.18 KG DOUGH DDT: 78°F/26°C

POOLISH			
Bread flour	23.1%	15 oz	425 g
Water	23.1%	15 oz	428 g
Instant dry yeast	0.03%	¼ oz	7 g
FINAL DOUGH			
Bread flour	76.9%	3 lb 2½ oz	1.43 kg
Water	46.2%	1 lb 14¼ oz	856 g
Instant dry yeast	0.3%	¼ oz	7 g
Salt	1.5%	1 oz	28 g
Poolish (above)	46.2%	1 lb 14¼ oz	858 g

- 1 To prepare the poolish, combine the flour, water, and yeast and mix on low speed with the dough hook attachment for 3 minutes. Ferment for 18 hours.
- 2 To prepare the final dough, combine the flour, water, yeast, salt, and poolish and mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 3 minutes. Mix to the improved stage of gluten development.
- 3 Bulk ferment the dough until nearly doubled in volume, about 1 hour.
- 4 Divide the dough into 3-oz/85-g pieces. Preshape the dough into small rounds (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes.
- 5 Work sequentially, starting with the first piece of dough you divided and rounded. Using a rolling pin, roll each piece of dough into a round 7 in/18 cm in diameter. Transfer to parchment-lined sheet pans, cover, and let the rounds relax for 20 minutes.
- 6 Bake in a 500°F/260°C deck oven until puffed but not browned, 3 to 4 minutes. Stack the pitas five high and wrap each stack in a cloth. Cool in a cloth to retain moisture before serving.

Naan with biga

MAKES 13 LB 5 OZ/6.04 KG DOUGH. DDT: 74°F/23°C

BIGA			
Bread flour	17.3%	1 lb 3¼ oz	546 g
Instant dry yeast	0.01%	0.02 oz	0.5 g
Water	11.2%	12½ oz	355 g
FINAL DOUGH			
Bread flour	77.7%	5 lb 6½ oz	2.45 kg
Whole wheat flour	5%	5⅔ oz	161 g
Water	33.3%	2 lb 5 oz	1.05 kg
Plain yogurt	41.4%	2 lb 14 oz	1.30 kg
Olive oil	3.1%	3½ oz	99 g
Instant dry yeast	0.4%	½ oz	14 g
Salt	1.9%	2 oz	57 g
Biga (above)	28.6%	1 lb 15¾ oz	900 g

- 1 To prepare the biga, mix together the flour, yeast, and water on low speed with the dough hook attachment for 4 minutes and on medium speed for 2 minutes. Ferment for 18 hours.
- 2 To make the final dough, combine the flours, water, yogurt, olive oil, yeast, salt, and biga and mix on low speed with the dough hook attachment for 4 minutes. The dough should be very elastic but still wet.
- 3 Bulk ferment the dough until nearly doubled, about 1 hour. Gently fold. Let the dough ferment for another 30 minutes.
- 4 Divide the dough into 6 equal portions. Ferment the dough, covered, for 45 minutes.
- 5 At the oven, cut each portion into 6 pieces and stretch each to 3 in/8 cm wide and 10 in/25 cm long. If desired, gently depress the centers. Spray with water and place garnish such as seeds, if desired, in the center of each bread.
- 6 Bake in a 500°F/260°C deck oven for 8 to 10 minutes, or until a light golden brown. Cool completely on racks.

Filled flatbread

MAKES 8 FLATBREADS (9 OZ/255 G EACH). DDT: 75°F/24°C

Olive oil	2 oz	57 g
Garlic, minced	1 oz	28 g
Green peppers, minced	11 oz	312 g
Canned plum tomatoes, drained, seeded, and coarsely chopped	1 lb 1½ oz	496 g
Green onions, minced	2 oz	57 g
Salt	1 tsp	5 g
Red pepper flakes	1 tsp	2 g
Ground caraway	¼ tsp	0.50 g
Ground coriander	¼ tsp	0.50 g
Ground cumin	¼ tsp	0.50 g
Flat-leaf parsley, minced	2 oz	57 g
Naan dough (page 199)	3 lb 5½ oz	1.52 kg
Olive oil, for frying	as needed	as needed

- 1 To prepare the filling, heat the olive oil in a sauteuse. Add the garlic and cook over medium heat until it just begins to lightly brown. Add the peppers and cook for 2 minutes, or until they soften, stirring occasionally. Add the tomatoes and simmer for 15 minutes, or until the mixture thickens, stirring occasionally.
- 2 Add the green onions, salt, red pepper flakes, caraway, coriander, and cumin and simmer for 1 minute. Stir in the parsley. Transfer the filling to a stainless-steel bowl and allow to cool to room temperature.
- 3 Divide the dough into sixteen 3¼-oz/92-g pieces. Preshape the dough into small rounds (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 10 to 15 minutes.
- 4 Work sequentially, starting with the first piece of dough you divided and rounded. Using a rolling pin, roll each piece of dough into a round 6 in/15 cm in diameter. Spread 3 oz/85 g filling in the center of each of 8 rounds, leaving a 1-in/3-cm border all around. Brush the exposed border with water.
- 5 Place one of the remaining 8 rounds on top of each of the filled pieces of dough. Pinch the edges of each bread together and then stretch the dough gently into a round 9 in/23 cm in diameter.
- 6 Heat a small amount of olive oil in a sauteuse until it is almost smoking. Add one bread and cook for 1 minute, then flip it over. Fry for another 2 to 2½ minutes, or until there are light brown specks on the bottom. Flip the bread over once again and fry for another minute, or until lightly browned. Fry the remaining breads, adding more oil as necessary.
- 7 Keep the breads warm by wrapping them in a cotton cloth and shingling them in a basket.

Hot cross buns

MAKES 9 LB 8 OZ/4.31 KG DOUGH. DDT: 75°F/24°C

SPONGE			
Bread flour	39.9%	1 lb 9¾ oz	730 g
Instant dry yeast	2.5%	1½ oz	43 g
Milk	50%	2 lb ⅛ oz	914 g
FINAL DOUGH			
Bread flour	60.1%	2 lb 6¾ oz	1.10 kg
Eggs	15.3%	10 oz	298 g
Lemon zest, puréed	1.5%	1 oz	28 g
Butter	15.3%	10 oz	298 g
Honey	3.2%	2 oz	57 g
Malt syrup	0.5%	⅓ oz	9 g
Sugar	15.3%	10 oz	298 g
Ground cinnamon		pinch	pinch
Ground nutmeg	0.1%	pinch	pinch
Ground allspice	0.05%	pinch	pinch
Salt	2.5%	1½ oz	43 g
Sponge (above)	92.4%	3 lb 11½ oz	1.69 kg
Currants	30%	1 lb 3⅓ oz	548 g
Candied lemon peel	12.1%	7½ oz	205 g
Egg wash (page 892)		as needed	as needed
Hot cross topping (page 202)		as needed	as needed
Danish glaze (page 898)		as needed	as needed

- 1 To prepare the sponge, combine the flour, yeast, and milk and mix on low speed with the dough hook attachment for 2 minutes and on medium speed for 1 minute. Ferment for 30 minutes.
- 2 To prepare the final dough, combine the flour, eggs, lemon zest, butter, honey, malt syrup, sugar, cinnamon, nutmeg, allspice, salt, and sponge and mix for 4 minutes on low speed with the dough hook attachment and for 4 minutes on high speed. Mix in currants and candied peel for 1 minute on low speed until smooth.
- 3 Ferment the dough until nearly doubled, about 45 minutes.
- 4 Divide the dough into 2-oz/57-g pieces. Shape each piece of dough into a tight round. Ferment for another 15 minutes.

- 5 Reshape the pieces of dough into tight rounds and place on a sheet tray lined with parchment paper, leaving approximately 3 in/8 cm between each bun. Lightly brush the dough with egg wash. Ferment the dough for another 45 minutes.
- 6 Brush the tops of the dough pieces with egg wash and let them dry for 5 minutes. Fill a pastry bag fitted with a #2 tip with the topping and pipe across the top of each roll.
- 7 Bake in a 375°F/191°C deck oven until golden brown, 18 minutes.
- 8 Heat the glaze. Remove the buns from the oven and brush with the hot glaze. Cool completely on racks.

Hot cross topping

MAKES 3 LB/1.36 KG

Butter, melted	8 oz	227 g
Sugar	8 oz	227 g
Eggs	1½ oz	43 g
Milk	6 oz	168 g
Vanilla extract	½ oz	14 g
Lemon zest, puréed	⅓ oz	9 g
Cake flour	1 lb	454 g

Make the topping the day of baking. In a mixer with the paddle attachment, mix the butter, sugar, eggs, milk, vanilla, and lemon zest, scraping down the bowl occasionally. Add the flour and mix thoroughly, scraping down the bowl. Use immediately.

Bagel dough with sponge

MAKES 20 LB/9 KG DOUGH (ENOUGH FOR 60 BAGELS). DDT: 78°F/26°C

SPONGE			
High-gluten flour	30%	3 lb 11 oz	1.67 kg
Water	30%	3 lb 11½ oz	1.69 kg
Instant dry yeast	0.1%	1¼ tsp	5 g
Malt syrup	0.5%	1 oz	28 g
FINAL DOUGH			
High-gluten flour	70%	8 lb 11 oz	3.94 kg
Water	27%	3 lb 5½ oz	1.52 kg
Instant dry yeast	0.4%	¾ oz	21 g
Salt	2.3%	4½ oz	128 g
Diastatic malt syrup, for dough	0.9%	1¾ oz	50 g
Sponge (above)	60.6%	7 lb 8½ oz	3.41 kg
Malt syrup, for boiling (per 1 gal/3.84 L water)		1 fl oz	30 mL
Garnishes such as sesame seeds, poppy seeds, salt		as needed	as needed

- 1 Mix the sponge the same day as the final dough. Combine all the sponge ingredients and mix on low speed with the dough hook attachment for 4 minutes. Ferment until doubled in size, about 1½ hours.
- 2 To prepare the final dough, add the flour, water, yeast, salt, and diastatic malt syrup to the sponge and mix on low speed with the dough hook attachment for 4 minutes. Mix on medium speed for 6 minutes, until smooth. The dough should be stiff, dry, and elastic and have strong gluten development.
- 3 Divide the dough into 5-oz/142-g pieces. Preshape each piece of dough into a small 5-in/13-cm oblong (for preshaping instructions, see page 110). Cover and ferment for 5 minutes.
- 4 Shape each piece into a 10-in/25-cm oblong. Moisten 1 in/3 cm of an end with water and overlap with the other end, working the shape until even throughout. Place on a tray sprinkled with semolina, with the seam down.
- 5 Retard the dough, covered, in the refrigerator or store in the freezer overnight.
- 6 If the bagels have been frozen, thaw overnight under refrigeration. Cook the bagels by dropping them into boiling water with malt syrup added. After they float, 15 to 20 seconds cooking time, remove and place them on a parchment-lined tray. Garnish, if desired, while still wet. Air-dry slightly. Transfer the bagels to a peel and load them into a 500°F/260°C deck oven. Bake until golden brown but still soft and slightly springy to the touch, 14 minutes. Cool completely on racks.

Bialys

MAKES 18 LB 8 OZ/8.40 KG DOUGH. DDT: 78°F/26°C

SPONGE			
High-gluten flour	30%	3 lb 6 oz	1.53 kg
Instant dry yeast	0.1%	1¼ tsp	5 g
Water	30%	3 lb 6¼ oz	1.5 kg
FINAL DOUGH			
High-gluten flour	70%	7 lb 14 oz	3.60 kg
Water	31%	3 lb 8 oz	1.59 kg
Instant dry yeast	0.4%	¾ oz	21 g
Salt	2.3%	4 oz	113 g
Malt syrup	0.4%	¾ oz	21 g
Sponge (above)	60%	6 lb 12½ oz	3.07 kg
Flour, for dusting		as needed	as needed
TOPPING			
Onions, medium dice		1 lb 4 oz	567 g
Olive oil		1 oz	28 g
Salt		2 tsp	10 g
Poppy seeds		1¾ tsp	3.50 g
Olive oil		as needed	as needed

- 1 To prepare the sponge, combine the flour, yeast, and water and mix on low speed with the dough hook attachment for 4 minutes. Ferment until nearly doubled in size, about 1½ hours.
- 2 To prepare the final dough, combine the flour, water, yeast, salt, malt syrup, and sponge and mix on low speed with the dough hook attachment for 4 minutes and on high speed for 6 minutes until smooth.
- 3 Divide the dough into 4½-oz/128-g pieces. Preshape the dough into small rounds (for pre-shaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 minutes.
- 4 Dust both sides of each piece of dough with flour and make a depression in the center with your fingers, or use a round 2-lb/907-g balance beam counterweight wrapped with plastic wrap. This will make a flat center 3 in/8 cm in diameter. Place the pieces of dough on trays sprinkled with semolina. Retard the dough, covered, in the refrigerator or freezer overnight.
- 5 If the dough is frozen, place it in the refrigerator to thaw overnight. Keep the dough at room temperature for 30 minutes before shaping.
- 6 To prepare the topping, sauté the onions in the olive oil until translucent. Add the salt and poppy seeds. Allow to cool completely.

- 7 Shape each piece of bialy dough into an oblong and place 9 bialys on a parchment-lined sheet pan (3 across and 3 down).
- 8 Brush with olive oil and place the filling on top. Transfer the bialys to a peel.
- 9 Presteam a 450°F/232°C oven. Load the bialys in the oven and steam for 3 seconds. Bake until golden brown but still soft and slightly springy to the touch, 12 to 14 minutes. Vent during the final 10 minutes. Cool completely on racks.



CLOCKWISE FROM TOP RIGHT: Soft Pretzels (page 196), Bialys with caramelized onions (page 204), Bialys with poppy seeds and onions (page 204), plain Bagel (page 116), sesame seed Bagel (page 116), cinnamon raisin bagel.

Corn rolls

MAKES 25 ROLLS (2 OZ/57 G EACH) DDT: 82°F/28°C

CORN SOAKER			
Milk (1st)	59.3%	14¾ oz	417 g
Cornmeal	21.4%	5¼ oz	150 g
Milk (2nd), room temperature	32.3%	8 oz	227 g
FINAL DOUGH			
Soaker	112.9%	1 lb 12 oz	794 g
Vegetable oil	5.0%	1¼ oz	35 g
Honey	10%	2¼ oz	62 g
Malt syrup	0.4%	¾ tsp	3 g
Bread flour (1st)	62.5%	15½ oz	439 g
Corn flour	16.1%	4 oz	113 g
Instant dry yeast	0.4%	¾ tsp	3 g
Salt	2.8%	¾ oz	20 g
Corn, whole kernels	16.1%	4 oz	113 g
Bread flour (2nd)	2.4%	⅔ oz	17 g
Egg wash (page 892)		as needed	as needed
Salt, for garnish		as needed	as needed
Cornmeal, for garnish		as needed	as needed

- 1 To prepare the corn soaker, bring the first milk to a hard boil. Pour over the cornmeal in a mixer bowl. Stir to combine and let sit for 2 minutes. Mix on high speed for 3 minutes using the paddle attachment. Mix in the second milk in three additions. Cover and refrigerate overnight.
- 2 To prepare the final dough, warm the soaker over a water bath to 85°F/29°C. Add the oil, honey, and malt and mix on medium speed for 1 minute.
- 3 With the mixer off, add the first bread flour, corn flour, and yeast. Toss the corn with the second bread flour and add to the mixer. Add the salt on top.
- 4 Mix on medium speed for 6 minutes with the dough hook attachment. Mix on high speed for 4 minutes. The dough will have good gluten development but will be tacky. Place in a lightly oiled bowl and cover with plastic wrap.
- 5 Bulk ferment the dough until nearly doubled, 45 to 60 minutes. Fold gently.
- 6 Preshape the dough into small rounds (for preshaping instructions, see page 109). Line sheet pans with parchment. Let the dough rest covered until relaxed, 15 to 20 minutes.

7 Divide the dough into 25 pieces (2 oz/57 g each) by hand or using a dough divider. Shape each piece into a round, lightly flouring the work surface as needed.

8 Arrange the rolls in rows on the lined sheet pans, spacing them 4 in/10 cm apart. Proof covered until the dough springs back slowly to the touch but does not collapse, 45 to 60 minutes.

9 Lightly brush the rolls with egg wash and sprinkle with salt and cornmeal.

10 Bake in a 450°F/232°C convection oven until the rolls are golden brown and shiny, 15 to 20 minutes. Cool completely on the pans.

Day of the Dead bread

MAKES 16 LB 10 OZ/7.57 KG DOUGH. DDT: 75°F/24°C

SPONGE			
Bread flour	50%	2 lb 6¼ oz	1.08 kg
Instant dry yeast	1.5%	1¼ oz	35 g
Milk	30.9%	1 lb 7⅞ oz	671 g
FINAL DOUGH			
Sponge (above)	82.4%	3 lb 15 oz	1.79 kg
Eggs	33.8%	1 lb 10 oz	737 g
Bread flour	50%	2 lb 6¼ oz	1.08 kg
Malt syrup	0.5%	½ oz	9 g
Salt	2.3%	1¾ oz	50 g
Butter, soft but still pliable	49.5%	2 lb 6 oz	1.08 kg
Sugar	24.8%	1 lb 3 oz	539 g
Lemon zest, puréed	1.5%	1¼ oz	35 g
Orange zest, puréed	4.5%	3½ oz	99 g
Vanilla extract	0.9%	⅝ oz	19 g
Ground cinnamon	0.2%	1½ tsp	3 g
Orange blossom water	0.5%	2 tsp	10 mL
BONES AND FINISHING			
Bread flour		as needed	as needed
Egg wash (page 892)		as needed	as needed
Melted butter		as needed	as needed
Vanilla sugar (page 901), for rolling		as needed	as needed

- 1** To prepare the sponge, combine the flour, yeast, and milk and mix on low speed with the paddle attachment for 2 minutes. Ferment for 1 hour.
- 2** To prepare the final dough, combine the sponge, eggs, flour, malt syrup, and salt with one-third of the butter. Mix on low speed with the paddle attachment for 4 minutes, then on high speed for 4 minutes. Add half of the remaining butter, keeping the dough on the hook and scraping the bowl often. Add the sugar, lemon and orange zests, vanilla, cinnamon, and orange blossom water in 2 additions. Add the remainder of the butter and mix until fully incorporated.
- 3** To make the “bone dough,” remove 18 percent of the main dough. Add 30 percent of that dough’s weight in bread flour and mix until a homogeneous dough is formed.
- 4** Ferment the doughs separately for 20 minutes, or until doubled in size. Gently fold over. Ferment for another 20 minutes, or until doubled in size.
- 5** Divide the main dough into 9-oz/255-g pieces; divide the bone dough into ¾-oz/21-g portions. You will need 3 or 4 bones for each loaf.
- 6** Shape the main dough pieces into tight rounds and roll the bones out to 3-in/8-cm oblongs. Take each large round and make a hole in the center. Place on parchment-lined sheet pans. For each loaf, roll out 3 of the bone pieces into long ropes that are the diameter of the loaf, spreading your fingers and pressing them into the ropes so that they take on a wavy appearance. Drape the ropes over the loaves at even intervals so that the round is visually divided into sixths, like a sliced pie. Take a final bone piece for each loaf and round it up into a tight ball. Place a ball in the hole in the center of each loaf. Brush the loaf with egg wash. Ferment the dough for another 45 to 60 minutes, or until doubled in size.
- 7** Lightly brush the dough with egg wash.
- 8** Bake in a 365°F/185°C convection oven until golden brown, 20 to 25 minutes. Remove from the oven, brush with melted butter, and roll in vanilla sugar. Cool completely on racks.

part three

Baking building blocks

