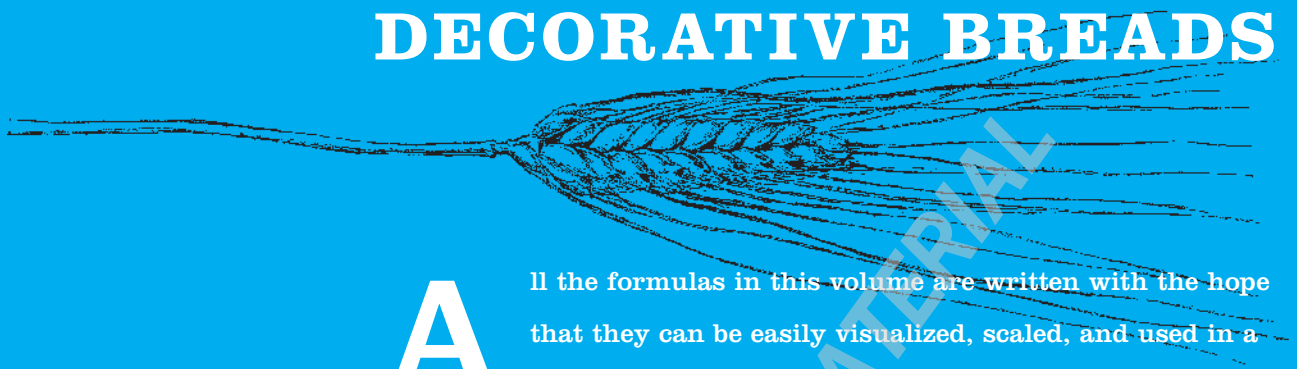
PART TWO

FORMULAS and DECORATIVE BREADS



All the formulas in this volume are written with the hope that they can be easily visualized, scaled, and used in a baking situation. In almost every case (with the exception of the formulas presented in Chapter 10, "Decorative and Display Projects," and some of those used in Chapter 8, "Miscellaneous Breads"), the formulas are all based on 20 pounds, 10 kilograms, or 2 pounds of flour. Although 10 kilograms is clearly not the exact equivalent of 20 pounds, by using these weights the overall proportion of ingredients can be readily assessed. For example, when 7.5 kilograms of water are used with 10 kilograms of flour, we see instantly that we have a dough hydration of 75 percent. Further, with these flour weights most dough yields in the book are between 34 and 40 pounds (15 and 18 kilograms), a fairly baker-friendly weight when trying out new doughs. For home use, an additional column is included that yields one-tenth the weight of the American column—roughly 3½ to 4 pounds of dough—a good quantity for a home mixer or for hand kneading.

(continued on page 90)

Baking at Home

Baking hundreds of loaves of bread a day has always been a deeply enriching experience for me—the world of bread is not merely beautiful, it also seems to connect me to some deeper truths about life. On the other hand, those times when I have baked just two or three loaves, quietly focused in the kitchen at home, have had their own measure of satisfaction—each loaf a real birth. The baker of hundreds of loaves has quite a set of challenges, because the overall choreography of the production, from the mixing to the end of the bake, can be somewhat unforgiving—when the bread says "Now!" it means just that, and the oven better be empty and hot. But in many ways, it is the home baker who faces the greater challenges. Lucky the production baker who refreshes and bakes with his sourdough culture 5, 6, or 7 times each week—it stays vigorous and enthusiastic with all that attention. The home baker has to make a concerted commitment to keeping the starter fed and happy on a continual basis, even when it is not going to be used for days at a time. Then there is the equipment: The professional baker has mixers and ovens that almost always surpass those of the home baker in terms of quality and durability—the equipment most of us have at home just can't begin to compete (most of us would have to remortgage the house just to buy a good professional oven). And this brings me to a specific point.

I have often maintained that few people in the United States bake bread at home through motives of subsistence or necessity; people bake at home because they love the process, love to be connected to this very instinctive and fundamental work, and love to share their results with friends and family—the delicious breads of their labors. That said, the home baker should do everything possible to achieve consistency in his or her endeavors, and work to overcome the challenges of small batches and somewhat deficient mixers and ovens. I have a small list of ways that I think the home baker can do this:

- **RESPECT TIME AND TEMPERATURE AS THE FOREMOST TOOLS FOR PRODUCING CONSISTENT BREADS.** The yeast is alive, and if dough temperatures are too cool or too warm, everything suffers. Always use a thermometer, and learn the simple calculation needed to achieve the desired dough temperature (see page 382 for a full discussion). Never force the bread—above all bread needs *time* in order for it to develop its full potential. An excessive use of yeast will always be to the detriment of the finished product.
- **WEIGH INGREDIENTS RATHER THAN MEASURE THEM.** An electronic scale is a huge ally in the quest for consistency. When you buy a bag of flour from the supermarket, if the flour has been stacked on the shelf standing up, a cup of flour from the top of the bag will weigh less than a cup scooped from the bottom, where more of it has settled and become compacted. An ounce of coarse salt brings as much saltiness to bread as an ounce of fine granular salt, but a tablespoon of coarse salt contributes less saltiness than a tablespoon of fine salt, simply because of the difference in particle size. These and other variables make measuring a dicey affair.
- **AVOID THE TEMPTATION OF ADDING FLOUR TO THE DOUGH AS IT MIXES.** This is a common mistake, and often re-

sults in doughs that are sluggish, dense, and deficient in volume, flavor, and keeping quality. Of course, there will be times when some small addition is necessary, and some doughs (challah, for instance) are by nature dry, but in general, most doughs should have perceptible dough strength but a moderate looseness to the tug. At the other extreme, superhydrated doughs are in fashion these days, and some, like ciabatta, make quite delicious loaves, but beyond those breads that rightly fall into the genre of wet and slack, there is no special virtue to adding water for water's sake.

- **GIVE AN EXTRA FOLD IF NEED BE.** It's difficult to mix doughs to optimum gluten development using a home stand mixer. If you feel that there is insufficient dough strength after mixing, don't hesitate to add an extra fold during bulk fermentation. Something as simple as that can have a significant effect on increasing dough strength and, later, loaf volume. So if a formula in the book calls for 1 fold during a 2-hour bulk fermentation, and you sense that the dough has inadequate gluten development, fold it 2 or even 3 times (spread the folds evenly throughout the duration of the bulk fermentation). And always make a point of trying to ascertain the effect of your actions. Did the extra fold give you favorable results? If it did, remember that the next time you make bread, and now you will be joining experience with intuition—a good combination!
- **DEVELOP A METHOD FOR STEAMING YOUR BREAD.** One method that works well is described on page 27. Other methods may work just as well, but use them only if they give your breads good shine and color, and much better volume.
- **FOR HEARTH BREADS, BAKE ON A PREHEATED BAKING STONE AND BAKE HOT.** When bread is baked on a sheet pan, the pan must first heat up before the bottom of the bread does, and the loaf will never be as full and expanded as it would if baked directly on the hearth. You might lower the oven temperature partway through the bake, but you will make breads with much better volume and much more flavorful crust if you start them in a hot oven. Remember that the bread that you just loaded is at room temperature, sucking away lots of oven heat, and if the initial bake temperature isn't hot enough, both volume and crust color will be meager. All the breads in this book should be loaded into an oven that has been thoroughly preheated. Expect the preheating of a home oven to take a minimum of 30 minutes. If you are using a baking stone, begin to preheat the oven 45 minutes before loading your bread. For most breads in this book, that means no more than 5 or 10 minutes after shaping the loaves.
- **IF YOU KEEP A SOURDOUGH STARTER, LOVE IT.** Do you have a pet? That's just a single being, but think how much care and consideration it gets. One minuscule gram of sourdough has billions of beings—they need attention too if they are going to be happy for years. Your sourdough will feel very reassured if you feed it often.
- **A LAST WAY TO BAKE CONSISTENTLY IS SIMPLY TO BAKE OFTEN.** There is a definite language to bread, and it takes practice and lots of patience to learn it, but if you are attentive and receptive, you will see that the language is clear and accessible. I hope that this book in time comes to smell of bread.

Cups and tablespoons are inherently inaccurate, and serious home bakers should buy a good scale. Nevertheless, in the Home column cups and tablespoons have been entered in parentheses adjacent to the corresponding weights of the ingredients. If you are making the formulas in this book using cup measures, however, note that the cup measurements in the Home column have been rounded either up or down as necessary, so please take extra care when checking the consistency of the dough.

Most of the formulas have a section titled Overall Formula, which lists the total percentage of each ingredient in the bread. This enables the baker who is fluent in baker's math to determine at a glance different aspects of the dough, for example the proportion of yeast and salt, the amount of other grains present in the dough, the percentages of nuts or dried fruits, and so on. (For an explanation of baker's percentage, see page 376.) If the dough has a pre-ferment, the baker's percentages for it are also included. Although seeing the percentages for a pre-ferment is not as important as seeing them for the overall formula, it can help the baker see if the pre-ferment is stiff—is it 50 percent hydration? 55 percent? 60 percent—or is it liquid—100 percent? 125 percent? Using a baker's-percentage column for the final dough does not give much useful information to the baker, and in fact can be downright confusing, so none is offered in the formulas in this book.

Fresh yeast continues to be the standard among professional bakers, and for that reason it is used in the present formulas, except in the Home column, where instant dry yeast is called for. If you are making one of the formulas using 10 kilograms or 20 pounds of flour and don't have access to reliable fresh yeast, don't

be deterred. If using active dry yeast (the kind that must first be dissolved in water before using), convert from fresh to active by multiplying the weight of fresh yeast by .4. With instant dry yeast, convert from fresh by multiplying the weight of the fresh yeast by .33 (refer to page 57).

Occasionally, some doughs may seem to have an elevated percentage of salt in the Overall Formula section. For the most part, these breads contain an abundant portion of various grains or seeds (or in the case of brioche, a considerable amount of unsalted butter). Since these added grains or butter also need salt to balance the bread's flavor, the seemingly elevated salt percentage is appropriate in these formulas.

With the same goal of providing a baker-friendly format, the percentage of pre-fermented flour is listed in all the formulas where sourdoughs or some other pre-ferment is used. It should be an easy matter for a baker conversant in the language of baker's math to adjust a formula to suit either his individual taste or that of his clientele. For example, a bread presented here may be made with 25 percent pre-fermented flour; with little effort, that formula can be altered to increase or decrease the percentage of pre-fermented flour, thereby accommodating the tastes of each baker. Similarly, a baker might decide to alter, say, the percentage of whole wheat or soaked grains, or the hydration of a dough, changes that are easily accomplished when he is fluent in baker's math.

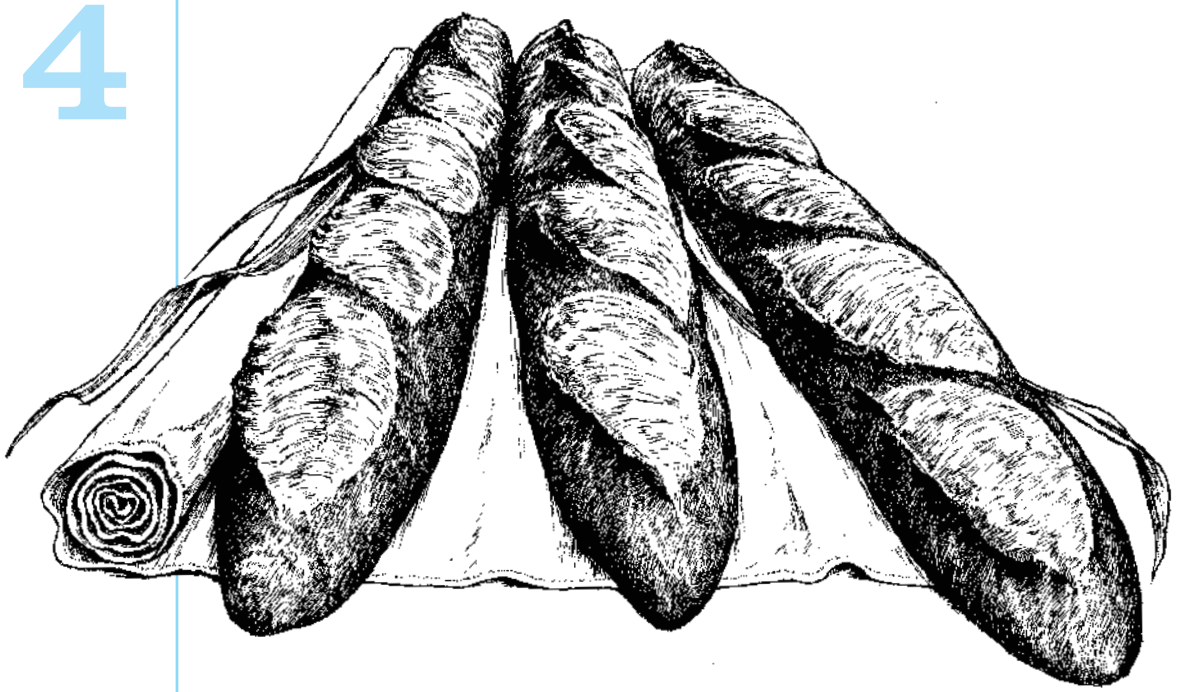
A comparison of approximate mixing times for different style mixers can be found on page 11.

One last note: Flour absorption varies considerably, from one season to the next and from one part of the country to the next. So,

even though the liquid percentage in the formulas seems so inflexibly precise, the baker should always check the dough as soon as the ingredients have come together, in order to ascertain that dough consistency is correct for that particular mix. A formula with 66 percent hydration might need 68 percent or even more water in the dry Southwest, and the same formula might only need 64 percent water in a humid climate. Hydrations are approximations; the hand of the baker, experience, and final dough performance are the surer guides.

BREADS MADE with YEASTED PRE-FERMENTS

4



Wheat seed is received by the earth as it is preparing to hibernate. The shoots sprout slowly, feeling the warmth underneath the snow and preserving the evanescence of dreams as they grow.

—GIANCARLO CONSONNI, AUTHOR

In this chapter, we will look at a selection of breads made with yeasted pre-ferments. The benefits of using pre-ferments are undeniable, from the perspective of flavor, dough strength, keeping quality, and reduced production time (see Chapter 1, "The Bread-Making Process from Mixing through Baking," for a full explanation of the benefits of pre-ferments).

Yeasted Pre-Ferments

Before discussing the specifics of bread production, we will clarify the basic types of yeasted pre-ferments and explain their predominant characteristics.

Pâte Fermentée

Pâte fermentée, or simply "old dough," is just that: a piece of white-flour dough that is reserved after mixing and incorporated into the next batch of bread. Although the name is French, the practice exists wherever bread is made. (If your customers ask why your baguettes taste so good, you can probably charge an extra quarter if you tell them it's because you use *pâte fermentée;* telling them you put "old dough" into the mix just doesn't sound as good!) Aside from the flavor benefits of using some old dough in the new mix, it is obvious that using it is economically preferable to throwing it away. Of the major yeasted pre-ferments, this is the only one that contains salt.

Like other yeasted pre-ferments such as poolish and biga, pâte fermentée has a limited life expectancy, unlike natural sourdough cultures, which can be perpetuated for years. Refrigerated, *pâte fermentée* will last at most 48 hours before its leavening potential is expended. With ample freezer space, it can be frozen, although within a week the yeast spores in it will begin to die off and the *pâte*

fermentée will suffer a loss of vigor. For the home baker who bakes once a week or so, freezing may be an option. The effort required to make a *pâte fermentée* the night before a bake day is minimal, however, and is justified by the superior bread that will result.

Poolish

Poolish is a mixture of equal weights flour and water, with a very small portion of yeast added (in the .08 to 1 percent range, depending on how long the poolish will ripen before the final dough is mixed, and the temperature of the room in which the poolish will ripen). Being of equal weight in flour and water, it has 100 percent hydration—more like a batter than a dough. Salt is not included in poolish. Protease is an enzyme whose function is to denature protein, and in a loose mixture like poolish, protease activity is relatively high. It has the effect of increasing the extensibility of bread dough, which not only makes shaping easier (though perhaps harder during the early stages of hand-skill development), but also results in increased loaf volume. The aroma of a bowl of ripe poolish is intoxicating—sweet and nutty with a delicate hint of acidity—and the texture of the dough is beautifully silken, a true delight for the hands. As the name suggests, poolish is of Polish origin. Originally used in pastry production, it eventually found a place in bread making, and today is used by bakers around the world.

Biga

Biga is a generic Italian term for "pre-ferment." It can be stiff textured at 50 to 60 percent hydration, or it can be essentially the same as a poolish when made with 100 percent hydration and a small portion of yeast. In either case, there is no salt in a biga, just flour, water, and a bit of yeast. The yeast quantity is determined by ambient temperature, and by the length of time it will be left to ripen before the final dough is mixed. As with poolish, the yeast in a biga is generally in the .08 to 1 percent range.

Production Notes for the Formulas in This Chapter

Preparing the Pre-Ferment. The pre-ferment is made at least 6 hours or up to 16 hours before the final dough is mixed (*pâte*

fermentée is usually an exception to this, as it is simply dough removed from the prior batch, but it too, of course, can be mixed on its own). The flour, water, and yeast are mixed for about 3 minutes on first speed. Gluten development is not the goal at this point, so first speed is all that is required. Be certain that all the flour has been hydrated, turn off the mixer, and cover the pre-ferment with plastic to prevent a crust from forming on the surface. The pre-ferment will ripen at room temperature.

Knowing the signs of ripeness is very important: When the poolish is ripe, the surface will be covered with small bubbles—in fact, you should see bubbles breaking through to the surface, indicating the continuing activity of the yeast. If there is evidence that the poolish has risen and then collapsed (you may see a "high-water" mark on the sides of the bowl), then the poolish is past its prime. A stiff-textured biga and a *pâte fermentée* are ripe when they have domed and are just beginning to recede in the center. The goal is to have the pre-ferment at its full ripeness when you are ready to use it, and therefore the correct yeast quantities will increase and decrease as the seasons come and go. The amount of yeast necessary for a poolish to ripen in 16 hours at 80°F might be .08 percent of the poolish flour weight, but the same poolish might need .25 percent yeast at 65°F. The other factor determining yeast quantity is the duration of the ripening phase, with longer ripenings needing less yeast. Below is a general guideline, based on a room temperature of 70° to 75°F: The percentage of yeast is based on the weight of the flour used in the pre-ferment, not the flour in the overall formula. The percentages given are for fresh yeast.

LENGTH OF RIPENING	% YEAST
Up to 8 hours	.7 to 1%
Up to 12 hours	.3 to .6%
Up to 16 hours	.1 to .25%

When a portion of a fully mixed batch of bread is removed for use as *pâte fermentée* in a subsequent mix, this portion is fully yeasted, as is of course the rest of the dough from which it has been removed, and is therefore in a special category. If the *pâte fermentée* will not be used within about 6 hours, it must be refrigerated—if it stays at room temperature for too long, it will completely lose its vigor because it contains a full proportion of yeast. Let it stand at room temperature for an hour or so in order for it to begin fer-

menting, then degas and refrigerate it. It should be cooled as quickly as possible, and degassed once or twice more over the next few hours. When it is used in the new mix, its temperature must be accounted for when computing the correct water temperature for the final dough.

The amount of fresh yeast used in the pre-ferments for all the formulas in this chapter is .2 percent. This often amounts to little more than .1 ounce. Further, for the sake of consistency, the yeast in the pre-ferments is expressed in units of pounds and kilograms, even though this means there are weights like .007 kg or .013 lb, as in the Baguettes with Poolish formula. A review of kilogram-to-gram and pound-to-ounce conversions will be helpful here; let's do it using the Baguettes with Poolish formula (more metric-to-U.S. conversions are given in the Appendix on page 387). To convert kilograms to grams, multiply the portion of a kilogram by 1,000 (the .007 kg needed for the pre-ferment in the Baguettes with Poolish formula converts to .007 × 1,000 = 7 grams). To convert from pounds to ounces, multiply the portion of a pound by 16 (the .013 lb of yeast in the formula converts to .013 × 16 = .2 ounces). The biggest difficulty arises with the Home column: Since baking is not usually done in quantities that justify the use of fresh yeast for most home bakers, instant dry yeast is called for in the formulas. In the Home column of the Baguettes with Poolish formula, the amount of instant yeast needed for the poolish is .0067 ounces. Clearly, this can't be accurately scaled. The solution: Use a speck of instant yeast in the pre-ferment, pay careful attention to temperature and to time duration, and closely observe the signs of ripeness. If, for instance, the pre-ferment ripens in 10 hours and you had hoped it would need 16 hours, use a smaller speck or a cooler ripening temperature next time. And conversely, if you want to ripen the pre-ferment in 12 hours and it seems not to have budged after that time, your speck should be a bit bigger next time, or the ripening room warmer.

Preparing the Soaker. A few of the formulas in this chapter use soakers. The soaking makes hard grains palatable, reduces their tendency to break the developing gluten network during mixing, and also reduces their tendency to "rob" moisture from the dough once it has finished mixing. Cold soakers are made by simply pouring water over the grains, mixing everything together, and covering the container with plastic to prevent evaporation. Hot soakers are made when any of the soaker grains are particu-

larly hard and won't soften sufficiently in cold water (for example, cracked wheat and millet). In this case, bring the water to the boil and pour it over the grains. Stir and cover, as for a cold soaker. Salt is sometimes incorporated into the soaker in order to lessen enzymatic activity that might otherwise develop, with the potential of bringing some off flavors to the soaker. It's easiest to make a soaker when the pre-ferment is mixed. Both can then be left at room temperature until the time of the final mix.

Mixing the Final Dough. All the ingredients are placed in the mixing bowl. (There are some exceptions, for instance when ingredients like raisins or nuts are part of the formula; these are added at the end of the mix. Another exception is when dough is mixed using the autolyse technique. In that case, the salt and *pâte fermentée,* if used, are not incorporated at the beginning of the mix. There is a full discussion of the autolyse technique on page 9.) If using a spiral mixer, mix on first speed for about 3 minutes to thoroughly incorporate the ingredients (mixing guidelines for other kinds of mixers are given on page 11). Check the dough's hydration and make corrections as necessary, adding small amounts of water or flour as needed. (The formulas are balanced, but minor adjustments may be necessary; for instance, in very humid months it is a good practice to hold back a small portion of the dough water to compensate for the extra moisture held by the flour. It is best not to add flour if possible, since it would alter the overall proportion of salt in the formula.) It is also a good practice to taste for salt at this time to be certain it has not inadvertently been left out. Once satisfied that dough consistency is good, turn the mixer to second speed and mix for approximately 3 minutes, until a moderate gluten development has been achieved. Full gluten development in the mixer would mean overoxidizing the carotenoid pigments and loss of both the wheaty flavor of the flour and the creamy color we see in well-made breads. Rather than mixing fully, effective folding of the dough during bulk fermentation will complete the process of building dough strength, with no loss of color or flavor. There are a few exceptions to the 3-minute mix on second speed: First, when mixing doughs with soakers, another 30 to 60 seconds of mixing may be necessary, since the dough develops a bit more slowly in the presence of soaker grains; second, when using the autolyse technique, only 1½ to 2 minutes of second-speed mixing will be necessary. The dough develops miraculously well during the autolyse, in spite of the lack of mechanical action, and surprisingly little time is needed on second speed to finish the mix. It will,

in fact, break down rather quickly if overmixed. Since flour absorption rates can vary significantly from season to season and from mill run to mill run, and since soakers lose sometimes more and sometimes less water to evaporation, it isn't possible to be exact about water quantities in the formulas. It should be noted, however, that looser doughs tend to ferment better and have better volume and better flavor. For the most part, the doughs in this chapter should have a moderately loose feel to them. Each formula's hydration percentage will serve as a guide initially; your hands and experience will ultimately be the best guide.

Bulk Fermentation. Ripe pre-ferments contribute acidity to the finished mix, which in turn helps mature the dough and strengthen it. Bulk fermentation time can therefore be reduced. For the most part, 1 to 2 hours is long enough to fully mature the dough. As the percentage of pre-ferment increases, bulk fermentation time can be accordingly reduced. Some doughs, such as ciabatta, favor a lengthy bulk fermentation and seem to attain their fullest potential with as much as a 3-hour fermentation.

Folding is a fundamental requirement, and is a topic that is not without complexity. See page 15 for a full discussion of folding.

Dividing and Shaping. Breads like baguettes are typically divided into 12- to 16-ounce pieces, while other breads might weigh up to a few pounds. Once divided, all the doughs are preshaped round and left to relax, seams up, on a floured work surface, covered in plastic to prevent crust formation on the surface. Depending on the tightness of the preshaping and the nature of the individual dough, the pieces may need to relax from 10 to 30 minutes before the final shaping. For the most part, the breads in this chapter can be shaped round or oval (exceptions being breads like baguettes or ciabatta), and are suitable as well for pan loaves and rolls. The shaped breads take their final proofing in floured *bannetons* or between folds of baker's linen (or in loaf pans, as the case may be). Cover the loaves with baker's linen and plastic for the final proofing to prevent a surface skin from forming. When making rolls, proof them on sheet pans that have been sprinkled with coarse cornmeal or semolina, and later bake them on the sheet pans or directly on the hearth or baking stone.

Final Fermentation. For the most part, breads made with pre-ferments need about 1 to 1½ hours of final fermentation at 75°F. They should look well risen and feel light. Loading the breads

when they are about 90 percent risen gives them the opportunity to spring proudly once exposed to the fierce heat of the oven.

Steaming and Baking. The proofed loaves are transferred to the loading conveyor or baker's peel and placed with their seams down. Breads like baguettes or oval-shaped loaves that are scored like baguettes (that is, so that only thin flaps of dough are cut on the surface) should be slashed with a curved blade held at about a 30-degree angle to the surface of the bread. Round and oval loaves that receive non-baguette-style scoring should be slashed with a straight blade, held vertically to the surface. The oven is then steamed prior to the load, the bread loaded, and the oven steamed again. From 4 to 6 seconds of steam is ample. Temperatures in the vicinity of 460°F are suitable for most of the breads, with variations noted in the individual formulas. Once the bread shows color, open the oven vents and allow the bread to finish the bake in a drying environment (this promotes a thin, crispy crust). In a home oven, you may open the oven door very slightly with a metal spoon. Bake times given for the individual bread formulas are for round loaves weighing 1½ pounds, except where otherwise noted. A full bake coaxes full flavor from the bread.

Eating. Like all well-made breads, these breads should cool fully before eating. Because they have pre-ferments, they tend to keep fairly well—not as well, perhaps, as sourdough breads, but better than straight doughs. Once sliced, store the loaves cut side down on a wooden cutting board. If the bread won't be eaten for a few days, a better storage technique is to wrap the bread tightly in a paper bag, then put the paper bag inside a plastic bag. Leave the plastic bag partially open; the slight air circulation will allow the crust to remain distinct from the crumb, while the plastic will help prevent the loaf from drying out.

Baguettes with Poolish

PRE-FERMENTED FLOUR: 33%

DOUGH YIELD | U.S.: About 38 baguettes at 14 oz each | Metric: About 42 baguettes at .4 kg each | Home: 4 baguettes

OVERALL FORMULA

	U.S.	METRIC	HOME	BAKER'S %
Bread flour	**20 lb**	**10 kg**	**2 lb**	**100%**
Water	**13.2 lb**	**6.6 kg**	**1 lb, 5.2 oz**	**66%**
Salt	**.4 lb**	**.2 kg**	**.6 oz**	**2%**
Yeast	**.22 lb, fresh**	**.11 kg, fresh**	**.13 oz, instant dry**	**1.1%**
TOTAL YIELD	**33.82 lb**	**16.91 kg**	**3 lb, 5.9 oz**	**169.1%**

POOLISH

Bread flour	6.6 lb	3.3 kg	10.6 oz (2⅜ cups)	100%
Water	6.6 lb	3.3 kg	10.6 oz (1⅜ cups)	100%
Yeast	.013 lb, fresh	.007 kg, fresh	(⅛ tsp, instant dry)	.2%
TOTAL	**13.213 lb**	**6.607 kg**	**1 lb, 5.2 oz**	

FINAL DOUGH

Bread flour	13.4 lb	6.7 kg	1 lb, 5.4 oz (4⅞ cups)
Water	6.6 lb	3.3 kg	10.6 oz (1⅜ cups)
Salt	.4 lb	.2 kg	.6 oz (1 T)
Yeast	.207 lb, fresh	.104 kg, fresh	.13 oz, instant dry (1¼ tsp)
Poolish	13.213 lb	6.067 kg	1 lb, 5.2 oz (all of above)
TOTAL	**33.82 lb**	**16.91 kg**	**3 lb, 5.8 oz**

The simplest breads are the most difficult to produce, and the baguette is high on the list of "simple" breads: simple, in that it is made with a minimum of ingredients; there are no strong flavors that dominate, and it is above all the flavor of the flour that prevails. Properly made, it is magnificent; poorly made, it is bland and insipid. One of the more beautiful aspects of the

1. POOLISH: Disperse the yeast in the water, add the flour, and mix until smooth. Cover the bowl with plastic and let stand for 12 to 16 hours at about 70°F.

2. MIXING: Add all the ingredients to the mixing bowl, including the poolish. In a spiral mixer, mix on first speed for 3 minutes in order to incorporate the ingredients. If necessary, correct the hydration by adding water or flour in small amounts. Finish mixing on second speed for 3 to 3½ minutes. The dough should be supple and moderately loose. Desired dough temperature: 76°F.

3. BULK FERMENTATION: 2 hours.

4. FOLDING: Fold the dough once after 1 hour.

baguette is the amount of crust it has. A finished baguette should have a rich, russet crust, crackling and fragrant—don't underestimate the virtue of a bold bake. At the same time, the crumb should be creamy and aromatic, with a cell structure characterized by lots of random-sized holes, with translucent cell walls (if the holes are big enough to hide a mouse, though, your shaping skills need some attention).

Production time can be reduced by 30 to 60 minutes, but the most superior results are obtained with a full 2-hour bulk fermentation. As with all breads, careful attention to detail throughout production is the best method to achieve consistently tasty results. Round loaves (*boules*), oval loaves (*bâtards*), and rolls can be made with this dough. Round and oval loaves of 1 to 1.5 pounds, and rolls scaled at 2.5 to 3.25 ounces give nice results.

5. DIVIDING AND SHAPING: Divide the dough into 12- to 16-ounce pieces. Preshape lightly into rounds and leave on a lightly floured work surface, seams up, covered with plastic. Once the dough has relaxed sufficiently (10 to 30 minutes, depending on how tightly it was preshaped), shape into long, slender, and graceful baguettes. Place them between folds of baker's linen, leaving enough space between each baguette so they can expand without tearing during final fermentation. Cover the loaves with baker's linen and plastic to protect them from air currents and prevent the formation of a crust on the surface of the loaves.

6. FINAL FERMENTATION: 1 to 1½ hours at 76°F.

7. BAKING: With normal steam, 460°F for 24 to 26 minutes for baguettes, depending on dough weight. Round and oval loaves: about 30 minutes for a 1-pound loaf, with round loaves taking slightly longer than oval ones.

Baker's Notes

In the 1840s, a Herr Zang brought the poolish style of bread making to Paris from Austria. A great deal of flavor was enticed from the bread thanks to the presence of the poolish, and only a small amount of yeast was required, which suited the bakers of the day, who had little access to fresh baker's yeast. Vienna bread, as it was called, as well as *viennoiserie*—lightly sweetened yeasted goods whose production fell under the domain of the bread baker—took root in France and spread throughout Europe. Gradually, a complete genre of breads developed that used yeasted pre-ferments in place of, or along with, sourdough, and today we are the fortunate recipients of those advances made almost two centuries ago.

Baguettes with Pâte Fermentée

PRE-FERMENTED FLOUR: 25%

DOUGH YIELD | U.S.: About 38 baguettes at 14 oz each | Metric: About 42 baguettes at .4 kg each | Home: 4 baguettes

OVERALL FORMULA

	U.S.	METRIC	HOME	BAKER'S %
Bread flour	**20 lb**	**10 kg**	**2 lb**	**100%**
Water	**13.2 lb**	**6.6 kg**	**1 lb, 5.1 oz**	**66%**
Salt	**.4 lb**	**.2 kg**	**.6 oz**	**2%**
Yeast	**.25 lb, fresh**	**.125 kg, fresh**	**.13 oz, instant dry**	**1.25%**
TOTAL YIELD	**33.85 lb**	**16.93 kg**	**3 lb, 5.8 oz**	**169.25%**

PÂTE FERMENTÉE

Bread flour	5 lb	2.5 kg	8 oz (1¾ cups)	100%
Water	3.3 lb	1.65 kg	5.3 oz (⅝ cup)	66%
Salt	.1 lb	.05 kg	.2 oz (1 tsp)	2%
Yeast	.01 lb, fresh	.005 kg, fresh	(⅛ tsp, instant dry)	.2%
TOTAL	**8.41 lb**	**4.21 kg**	**13.5 oz**	

FINAL DOUGH

Bread flour	15 lb	7.5 kg	1 lb, 8 oz (5½ cups)
Water	9.9 lb	4.95 kg	15.8 oz (2 cups)
Salt	.3 lb	.15 kg	.4 oz (2 tsp)
Yeast	.24 lb, fresh	.12 kg, fresh	.13 oz, instant dry (1¼ tsp)
Pâte fermentée	8.41 lb	4.21 kg	13.5 oz (all of above)
TOTAL	**33.85 lb**	**16.93 kg**	**3 lb, 5.8 oz**

1. PÂTE FERMENTÉE: Disperse the yeast in the water, add the flour and salt, and mix until just smooth. Cover the bowl with plastic and let stand for 12 to 16 hours at about 70°F. Alternatively, remove a portion from a previous mix for use as *pâte fermentée*. In this case, refer to "Preparing the Pre-Ferment" (page 96), for correct handling of the pre-ferment.

2. MIXING: Add all the ingredients to the mixing bowl except the *pâte fermentée*. In a spiral mixer, mix on first speed for 3 minutes in order to incorporate the ingredients. As the dough is coming together, add the *pâte fermentée* in chunks. If necessary, correct the hydration by adding water or flour in small amounts. Finish mix-

Baguettes produced with *pâte fermentée* share certain qualities with those made with poolish: rich crust color, creamy crumb, subtle nutty fragrance. The cell structure tends to be slightly more open with poolish baguettes due to the higher proportion of the protease enzyme in poolish, which also results in a more extensible bread. Nevertheless, production can be simplified when the *pâte fermentée* comes from a previous mix, and the overall bread quality can be of the highest quality. Round loaves (*boules*), oval loaves (*bâtards*), pan loaves, and rolls can be made with this dough. Scale the round and oval loaves at 1 to 1.5 pounds, and the rolls at 2.5 to 3.25 ounces.

ing on second speed for 3 to 3½ minutes. The dough should be supple and moderately loose. Desired dough temperature: 76°F.

3. BULK FERMENTATION: 2 hours.

4. FOLDING: Fold the dough once after 1 hour.

5. DIVIDING AND SHAPING: Divide the dough into 12- to 16-ounce pieces. Preshape lightly into rounds and let stand on a lightly floured work surface, seams up, covered with plastic. Once the dough has relaxed sufficiently (10 to 30 minutes, depending on how tightly it was preshaped), shape into baguettes. Place them between folds of baker's linen, leaving sufficient space between each baguette so they can expand without tearing during final fermentation. Cover the loaves with baker's linen and plastic to protect them from air currents and prevent the formation of a crust on the surface of the loaves.

6. FINAL FERMENTATION: 1 to 1½ hours at 76°F.

7. BAKING: With normal steam, 460°F for 24 to 26 minutes for baguettes, depending on dough weight. Round and oval loaves: about 30 minutes for a 1-pound loaf, with round loaves taking slightly longer than oval ones.

Ciabatta with Stiff Biga

PRE-FERMENTED FLOUR: 20%

DOUGH YIELD | U.S.: About 31 loaves at 1 lb, 2 oz each | Metric: About 34 loaves at .51 kg each | Home: 3 loaves

OVERALL FORMULA

	U.S.	METRIC	HOME	BAKER'S %
Bread flour	**20 lb**	**10 kg**	**2 lb**	**100%**
Water	**14.6 lb**	**7.3 kg**	**1 lb, 7.4 oz**	**73%**
Salt	**.4 lb**	**.2 kg**	**.6 oz**	**2%**
Yeast	**.24 lb, fresh**	**.12 kg, fresh**	**.13 oz, instant dry**	**1.2%**
TOTAL YIELD	**35.24 lb**	**17.62 kg**	**3 lb, 8.1 oz**	**176.2%**

BIGA

Bread flour	4 lb	2 kg	6.4 oz (1½ cups)	100%
Water	2.4 lb	1.2 kg	3.8 oz (½ cup)	60%
Yeast	.008 lb, fresh	.004 kg, fresh	(⅛ tsp, instant dry)	.2%
TOTAL	**6.408 lb**	**3.204 kg**	**10.2 oz**	

FINAL DOUGH

Bread flour	16 lb	8 kg	1 lb, 9.6 oz (5¾ cups)
Water	12.2 lb	6.1 kg	3.5 oz (½ cup)
Salt	.4 lb	.2 kg	.6 oz (1 T)
Yeast	.232 lb, fresh	.116 kg, fresh	.13 oz, instant dry (1¼ tsp)
Biga	6.408 lb	3.204 kg	10.2 oz (all of above)
TOTAL	**35.24 lb**	**17.62 kg**	**3 lb, 8.1 oz**

Ciabatta is a bread that America has learned to love dearly. Its domestic popularity rose quickly after it was chosen as one of the five breads that were baked in 1996 in Paris, at the Coupe du Monde de la Boulangerie, the World Cup of Baking. The exceptional quality of the ciabatta helped earn the United States first prize for breads at that memorable competition.

1. BIGA: Disperse the yeast in the water, add the flour, and mix until just smooth. The biga should be stiff and dense, but add a few drops of water if it is so stiff that it can't "breathe." Cover the bowl with plastic and leave for 12 to 16 hours at about 70°F. When ripe, the biga will be domed and just beginning to recede in the center.

2. MIXING: Add all the ingredients to the mixing bowl except the biga. In a spiral mixer, mix on first speed for 3 minutes in order to incorporate the ingredients. As the dough is coming together, add the biga in chunks. If necessary, correct the hydration by adding water or flour in small amounts. The dough will be quite sticky and slack at this point. Finish mixing on second speed for 3½ to 4 minutes. Wetter doughs develop more slowly in the bowl than dry

Ciabatta dough is unique in many ways: First, it is a very wet and sticky dough, with often upwards of 80 percent or even higher hydration. This requires some special handling (like locking all the doors so the bakers can't run for the exits). Further, there is no preshaping or final shaping—once divided, the dough is simply placed onto a floured work surface for its final proofing. And last of all, ciabatta dough is left unscored when loaded into the oven. The ciabatta formulas printed here all have a deep, suffusing wheaty aroma; large air holes due to both the high hydration and lack of degassing that occurs when breads are shaped; and a thin, blistered crust. When well made, it yields splintered crumbs when cut, and a long and memorable flavor, as the bread vanishes into happy bellies.

In the formulas, the ciabatta dough is scaled at 18 ounces. Other possibilities are little rolls—ciabattini—weighing 2 or 3 ounces each, large round loaves of a few pounds (these are sometimes called "pugliese"), or slender loaves weighing a few pounds that are 4 or 5 feet long. I call these impressive sights "Vermont cordwood."

ones, and the extra mixing helps to develop the dough structure a little more. The dough will be rather loose and sticky, but when tugged on, some definite dough strength will be noted—there should be some "muscle" to the dough. Desired dough temperature: 75°F.

3. BULK FERMENTATION: 3 hours.

4. FOLDING: Folding the ciabatta dough has an enormous impact on strengthening it. Fold the dough twice, after 1 hour of bulk fermentation and again after 2 hours. Spread a considerable amount of flour on the work surface for the folds, and fold quickly and assertively. Be sure no extra flour is incorporated into the dough as it is folded. Good folding is essential to eventual bread volume, and since there will be no final shaping to the dough, the folding represents the baker's last chance to increase dough strength.

5. DIVIDING AND SHAPING: Flour the work surface copiously. Invert the dough onto the work surface and gently pat out the larger air bubbles—but remember that for the most part the fermentation gases and the associated interior holes and pockets in the dough should remain intact. Lightly flour the top surface of the dough. Have ready a sufficient number of bread boards that are thoroughly (but not too thickly) covered with sifted bread flour. Cut a narrow strip, about 4 inches wide, down the length of the dough. Then cut the strip into rectangles weighing 18 ounces. If the dough is too light, place the additional bits of dough needed to correct the weight onto the top of the main dough piece. Place the dough piece onto the floured bread board, with the scrap on top. If it is more square than rectangular, give a gentle stretch, but be careful not to tear the dough. When all the dough has been scaled, cover the boards with baker's linen and then plastic.

6. FINAL FERMENTATION: Approximately 1½ hours at 75°F.

7. BAKING: The dough will be very light and fragile when risen (don't sneeze in its vicinity—it may collapse). To transfer the proofed ciabatta dough to the loading conveyor or baker's peel, spread the fingers of both your hands wide. Bring them alongside the long length of the dough and, with a quick, deft stroke, invert the dough piece so that the side that was touching the bread board is now on top. Now, place one hand at each end of the dough piece, bring your fingers underneath, and pick it up. Here you will slightly bunch the dough for easier transport; there should be wrinkles in the center of the loaf as you transfer it to the conveyor

or peel. Carefully place the loaf onto the conveyor and, as you do so, unbunch your hands so the loaf is again at its full length. Take care to place the loaf exactly where you want it on the conveyor or peel—it is so fragile that you must minimize any excess moving of the loaves. Fill the oven with steam, load the trembling ciabattas, steam again, and bake at 460°F for 34 to 38 minutes. An important note: One of the greatest attributes of ciabatta is its crisp crust. As hydration increases, so too does baking time. If the ciabatta is taking on too much color in the oven too soon, lower the oven temperature by 10° or 20°F. But by all means give a full bake—if taken out too soon, the considerable internal moisture in the bread will soften the crust, greatly impairing eating quality.

Ciabatta with Poolish

PRE-FERMENTED FLOUR: 30%

DOUGH YIELD | U.S.: About 31 loaves at 1 lb, 2 oz each | Metric: About 34 loaves at .51 kg each | Home: 3 loaves

OVERALL FORMULA

	U.S.	METRIC	HOME	BAKER'S %
Bread flour	**20 lb**	**10 kg**	**2 lb**	**100%**
Water	**14.6 lb**	**7.3 kg**	**1 lb, 7.4 oz**	**73%**
Salt	**.4 lb**	**.2 kg**	**.6 oz**	**2%**
Yeast	**.22 lb, fresh**	**.11 kg, fresh**	**.13 oz, instant dry**	**1.1%**
TOTAL YIELD	**35.22 lb**	**17.61 kg**	**3 lb, 8.2 oz**	**176.1%**

POOLISH

Bread flour	6 lb	3 kg	9.6 oz (2 1/4 cups)	100%
Water	6 lb	3 kg	9.6 oz (1 1/4 cups)	100%
Yeast	.012 lb, fresh	.006 kg, fresh	(1/8 tsp, instant dry)	.2%
TOTAL	**12.012 lb**	**6.006 kg**	**1 lb, 3.2 oz**	

FINAL DOUGH

Bread flour	14 lb	7 kg	1 lb, 6.4 oz (5 1/8 cups)
Water	8.6 lb	4.3 kg	13.8 oz (1 3/4 cups)
Salt	.4 lb	.2 kg	.6 oz (1 T)
Yeast	.208 lb, fresh	.104 kg, fresh	.13 oz, instant dry (1 1/4 tsp)
Poolish	12.012 lb	6.006 kg	1 lb, 3.2 oz (all of above)
TOTAL	**35.22 lb**	**17.61 kg**	**3 lb, 8.1 oz**

Although the percentages in the Overall Formula section in this formula are virtually identical to the preceding one, there are some distinct differences between the two breads. In the present formula, 30 percent of the flour is pre-fermented, compared to 20 percent in the Ciabatta with Stiff Biga, and an increase in aroma may be noted. With the extra pre-fermented flour in the Ciabatta with Poolish, the slight reduction of yeast to 1.1 percent is appropriate. Because of the high level of protease activity in the poolish, the consistency of the present formula's dough may seem just slightly looser, even though the overall water percentage is identical.

1. POOLISH: Disperse the yeast in the water, add the flour, and mix until smooth. Cover the bowl with plastic and let stand for 12 to 16 hours at about 70°F.

2. MIXING: Add all the ingredients to the mixing bowl, including the poolish. In a spiral mixer, mix on first speed for 3 minutes in order to incorporate the ingredients. If necessary, correct the hydration by adding water or flour in small amounts. Finish mixing on second speed for 3½ to 4 minutes, until gluten development is evident. The dough will be rather loose and sticky, but when tugged on, some definite dough strength should be noted—there should be some "muscle" to the dough. Desired dough temperature: 75°F.

3. BULK FERMENTATION: 3 hours.

4. FOLDING: Fold the dough twice, after 1 hour of bulk fermentation and again after 2 hours. The folds will give a final strengthening to the dough.

5. DIVIDING AND SHAPING: Flour the work surface copiously. Invert the dough onto the work surface and gently pat out the larger air bubbles—but remember that for the most part the fermentation gases and the associated interior holes and pockets in the dough should remain intact. Lightly flour the top surface of the dough. Have ready a sufficient number of bread boards that are thoroughly (but not too thickly) covered with sifted bread flour. Cut a narrow strip, about 4 inches wide, down the length of the dough. Then cut the strip into rectangles, each weighing 18 ounces. If the dough is too light, place the additional bits of dough needed to correct the weight onto the top of each dough piece. Place the dough pieces on the floured bread boards, with the scrap on top. If they are more square than rectangular, give a gentle stretch, but be careful not to tear the dough. When all the dough has been scaled, cover the boards with baker's linen and then plastic.

6. FINAL FERMENTATION: About 1½ hours at 75°F.

7. BAKING: With normal steam, 460°F for 34 to 38 minutes for a loaf scaled at 18 ounces. (Refer to step 7 in Ciabatta with Stiff Biga, page 106.) If the ciabatta is taking on too much color in the oven too soon, lower the oven temperature by 10° or 20°F. Be sure to bake fully.

Ciabatta with Olive Oil and Wheat Germ

PRE-FERMENTED FLOUR: 30%

DOUGH YIELD | U.S.: About 31 loaves at 1 lb, 2 oz each | Metric: About 35 loaves at .51 kg each | Home: 3 loaves

OVERALL FORMULA

	U.S.	METRIC	HOME	BAKER'S %
Bread flour	**19 lb**	**9.5 kg**	**1 lb, 14.4 oz**	**95%**
Wheat germ, toasted	**1 lb**	**.5 kg**	**1.6 oz**	**5%**
Water	**14.4 lb**	**7.2 kg**	**1 lb, 7 oz**	**72%**
Extra-virgin olive oil	**.6 lb**	**.3 kg**	**1 oz**	**3%**
Salt	**.4 lb**	**.2 kg**	**.6 oz**	**2%**
Yeast	**.24 lb, fresh**	**.12 kg, fresh**	**.13 oz, instant dry**	**1.2%**
TOTAL YIELD	**35.63 lb**	**17.82 kg**	**3 lb, 7 oz**	**178.2%**

POOLISH

Bread flour	6 lb	3 kg	9.6 oz (2 1/4 cups)	100%
Water	6 lb	3 kg	9.6 oz (1 1/4 cups)	100%
Yeast	.012 lb, fresh	.006 kg, fresh	(1/8 tsp, instant dry)	.2%
TOTAL	**12.012 lb**	**6.006 kg**	**1 lb, 3.2 oz**	

FINAL DOUGH

Bread flour	13 lb	6.5 kg	1 lb, 4.8 oz (4 3/4 cups)
Wheat germ, toasted	1 lb	.5 kg	1.6 oz (3/8 cup)
Water	8.4 lb	4.2 kg	13.4 oz (1 5/8 cups)
Salt	.4 lb	.2 kg	.6 oz (1 T)
Yeast	.228 lb, fresh	.114 kg, fresh	.13 oz, instant dry (1 1/4 tsp)
Poolish	12.012 lb	6.006 kg	1 lb, 3.2 oz (all of above)
Extra-virgin olive oil	.6 lb	.3 kg	1 oz (2 T)
TOTAL	**35.64 lb**	**17.82 kg**	**3 lb, 7 oz**

1. POOLISH: Disperse the yeast in the water, add the flour, and mix until smooth. Cover the bowl with plastic and let stand for 12 to 16 hours at about 70°F.

2. MIXING: Add all the ingredients to the mixing bowl, including the poolish and the toasted wheat germ, but not the olive oil. In a spiral mixer, mix on first speed for 3 minutes in order to incorporate the ingredients. If necessary, correct the hydration by adding water or flour in small amounts. Turn the mixer to second speed and be-

What might seem to be an insignificant addition of olive oil and wheat germ here results in a distinct change of flavor. The oil lends a smooth but almost slightly bitter quality to the bread, and the presence of the toasted wheat germ adds a subtle nutty note to the flavor. Combined, this bread stands apart from the two preceding ciabattas. There is a slight improvement in keeping quality, albeit at the slight expense of crust vigor, due to the olive oil in the dough.

gin to add the olive oil in a slow, steady stream. Mix on second speed for 3½ to 4 minutes, until gluten development is evident. The dough will be rather loose and sticky, but when tugged on, some definite dough strength should be noted—there should be some "muscle" to the dough. Notice the nice flecks of wheat germ spread throughout the dough. Desired dough temperature: 75°F.

3. BULK FERMENTATION: 3 hours.

4. FOLDING: Fold the dough twice, after 1 hour of bulk fermentation and again after 2 hours. The folds will give a final strengthening to the dough.

5. DIVIDING AND SHAPING: Flour the work surface copiously. Invert the dough onto the work surface and gently pat out the larger air bubbles—but remember that for the most part the fermentation gases and the associated interior holes and pockets in the dough should remain intact. Lightly flour the top surface of the dough. Have ready a sufficient number of bread boards that are thoroughly (but not too thickly) covered with sifted bread flour. Cut a narrow strip, about 4 inches wide, down the length of the dough. Cut the strip into rectangles, each weighing 18 ounces. If the dough is too light, place the additional bits of dough needed to correct the weight on top of the dough pieces. Place each dough piece on a floured bread board, with the scrap on top. If they are more square than rectangular, give a gentle stretch, but be careful not to tear the dough. When all the dough has been scaled, cover the boards with baker's linen and then plastic.

6. FINAL FERMENTATION: Approximately 1½ hours at 75°F.

7. BAKING: For a loaf scaled at 18 ounces, with normal steam, 460°F for 20 minutes, then, because of the olive oil in the dough, lower the oven temperature to 440°F and bake 16 to 20 minutes longer. This prevents the loaves from getting too dark. (Refer to step 7 in Ciabatta with Stiff Biga, page 106.)

Pain Rustique

PRE-FERMENTED FLOUR: 50%

DOUGH YIELD | U.S.: About 30 loaves at 1 lb, 2 oz each | Metric: About 33 loaves at .51 kg each | Home: 3 medium loaves

OVERALL FORMULA

	U.S.	METRIC	HOME	BAKER'S %
Bread flour	**20 lb**	**10 kg**	**2 lb**	**100%**
Water	**13.8 lb**	**6.9 kg**	**1 lb, 6.1 oz**	**69%**
Salt	**.4 lb**	**.2 kg**	**.6 oz**	**2%**
Yeast	**.3 lb, fresh**	**.15 kg, fresh**	**.17 oz, instant dry**	**1.5%**
TOTAL YIELD	**34.5 lb**	**17.25 kg**	**3 lb, 6.9 oz**	**172.5%**

POOLISH

Bread flour	10 lb	5 kg	1 lb (3⅝ cups)	100%
Water	10 lb	5 kg	1 lb (2 cups)	100%
Yeast	.02 lb, fresh	.01 kg, fresh	(⅛ tsp, instant dry)	.2%
TOTAL	**20.02 lb**	**10.01 kg**	**2 lb**	

FINAL DOUGH

Bread flour	10 lb	5 kg	1 lb (3⅝ cups)
Water	3.8 lb	1.9 kg	6.1 oz (¾ cup)
Poolish	20.02 lb	10.01 kg	2 lb (all of above)
Salt	.4 lb	.2 kg	.6 oz (1 T)
Yeast	.28 lb, fresh	.14 kg, fresh	.17 oz, instant dry (1½ tsp)
TOTAL	**34.5 lb**	**17.25 kg**	**3 lb, 6.9 oz**

Pain Rustique, or Rustic Bread, is unique in its own way. After bulk fermentation, the dough is divided into pieces large enough to fit into wooden or plastic frames, where it rests for a short period before being removed and divided into smaller units. The dough receives no pre-shaping or final shaping, so in that respect it is similar to ciabatta dough. The cell structure of Pain

1. POOLISH: Disperse the yeast in the water, add the flour, and mix until smooth. Cover the bowl with plastic and let stand for 12 to 16 hours at about 70°F.

2. MIXING: Pain Rustique is mixed with an autolyse: Add the Final Dough flour, water, and the ripe poolish to the mixing bowl. Do not add the salt or yeast. In a spiral mixer, mix on first speed just until the ingredients come together in a shaggy mass. Cover the mixing bowl with a sheet of plastic and let this rough dough rest for 20 to 30 minutes. At the end of the rest period, sprinkle the salt and yeast over the dough and turn the mixer to second speed. Mix until the dough is fairly well developed, 1½ to 2 minutes (adjust the mixing time accordingly for other types of mixers).

Rustique is open and airy, the crumb is delightfully creamy, and this humble bread, while a good companion to a wide assortment of foods, is also flavorful enough to be eaten alone. Half the flour in the formula is pre-fermented, which enables the baker to produce good bread in less than 3 hours, not including the ripening time for the poolish. The bread's origin is attributed to Professor Raymond Calvel, author of *Le Goût du pain* and widely considered the world's foremost expert on French breads. The present formula is the work of James MacGuire of Montreal, with a couple of changes I've made through work at the bench.

The frames used for Pain Rustique can be shallow dough tubs or pan extenders (plastic frames about 4 inches high that fit inside a full-sized sheet pan); lacking either of these, frames can be made with 1-by-4-inch lumber (be sure the wood is untreated, and smooth enough so splinters can't enter the dough). Note that the purpose of the frames is to yield a large dough piece of reliably even dimensions that can be easily cut. I have found that the dough is often strong enough so that it can simply be upended out of the tub it is rising in, and cut directly on the work surface without the use of frames.

The dough should be supple and moderately loose. Desired dough temperature: 76°F.

3. BULK FERMENTATION: 70 minutes.

4. FOLDING: Give a quick fold to the dough twice, once after 25 minutes of bulk fermentation, and again after 50 minutes.

5. DIVIDING: Twenty minutes after the second fold, divide the Pain Rustique: Place the frames onto well-floured bread boards or sheet pans. Divide the dough into rectangles that are slightly smaller than the frames, and place the dough pieces in them, with the better side resting on the floured surface. For frames the size of bread boards or standard sheet pans (24 by 16 inches), the dough weight is 22 pounds (10 kilograms). The dough will be strong enough to stand alone, so the frames serve primarily to achieve more regular dough pieces once the final dough divide is made. Rest the dough for 15 minutes in the frames, then carefully remove the frames. Gently divide the rectangles into even pieces, also rectangular, weighing 1 pound, 2 ounces (larger or smaller pieces can be cut too, with good results). Place scrap pieces of dough on top (on the unfloured side of the dough). Place the weighed-out pieces onto lightly floured baker's linen, with the floured side of the dough still down and the scrap side up, and cover with plastic.

6. FINAL FERMENTATION: The dough will only need 20 to 25 minutes of final proofing at 76°F.

7. BAKING: Invert the dough onto the loading conveyor or peel so that the floured side is up. Slash the bread with one quick stroke of the blade. Lightly presteam the oven, load the bread, and steam again. Bake at 460°F for about 35 minutes, opening the oven vents about halfway through the bake in order to finish the bake in a drying oven.

Country Bread

PRE-FERMENTED FLOUR: 50%

DOUGH YIELD | U.S.: About 22 loaves at 1.5 lb each | Metric: About 25 loaves at .68 kg each | Home: 2 large loaves

OVERALL FORMULA

	U.S.	METRIC	HOME	BAKER'S %
Bread flour	**20 lb**	**10 kg**	**2 lb**	**100%**
Water	**13.6 lb**	**6.8 kg**	**1 lb, 5.8 oz**	**68%**
Salt	**.36 lb**	**.18 kg**	**.6 oz**	**1.8%**
Yeast	**.12 lb, fresh**	**.06 kg, fresh**	**.06 oz, instant dry**	**.6%**
TOTAL YIELD	**34.08 lb**	**17.04 kg**	**3 lb, 6.4 oz**	**170.4%**

PRE-FERMENT

Bread flour	10 lb	5 kg	1 lb (3⅝ cups)	100%
Water	6 lb	3 kg	9.6 oz (1¼ cups)	60%
Salt	.18 lb	.09 kg	.3 oz (½ T)	1.8%
Yeast	.05 lb, fresh	.025 kg, fresh	(⅛ tsp, instant dry)	.5%
TOTAL	**16.23 lb**	**8.115 kg**	**1 lb, 10 oz**	

FINAL DOUGH

Bread flour	10 lb	5 kg	1 lb (3⅝ cups)
Water	7.6 lb	3.8 kg	12.2 oz (1½ cups)
Salt	.18 lb	.09 kg	.3 oz (½ T)
Yeast	.07 lb, fresh	.035 kg, fresh	.06 oz, instant dry (½ tsp)
Pre-ferment	16.23 lb	8.115 kg	1 lb, 10 oz (all of above)
TOTAL	**34.08 lb**	**17.04 kg**	**3 lb, 6.4 oz**

1. PRE-FERMENT: Disperse the yeast in the water, add the flour and yeast, and mix until just smooth. At 60 percent hydration, it will be stiff and dense. Add a few drops of water if the pre-ferment seems too stiff to move. Cover the bowl with plastic and let stand for 12 to 16 hours at about 70°F. When ripe, the pre-ferment will be domed and just beginning to recede in the center.

2. MIXING: Add all the ingredients to the mixing bowl except the pre-ferment. In a spiral mixer, mix on first speed for 3 minutes in order to incorporate the ingredients. As the dough is coming together, add the pre-ferment in chunks. If necessary, correct the hydration by adding water or flour in small amounts. Finish mix-

A small percentage of yeast, a high percentage of pre-fermented flour, and long fermentation characterize Country Bread. It keeps well due to the high level of pre-ferment, and has a good clean flavor that supports many different foods. It is an attractive bread, with its floured surface and confident scoring pattern. Ovals or rounds are the shapes of choice, although small crusty rolls or large, substantial *boules* can also be made.

ing on second speed for about 2½ minutes. The dough should be supple and moderately loose, with moderate gluten development. Desired dough temperature: 75°F.

3. BULK FERMENTATION: 2½ hours.

4. FOLDING: Fold the dough twice, once after 50 minutes of bulk fermentation and again 50 minutes later.

5. DIVIDING AND SHAPING: Divide the dough into 1.5-pound pieces. Preshape lightly into rounds and place on a floured work surface, seams up. Cover the rounds with plastic. When the dough has relaxed sufficiently (10 to 20 minutes), shape into round or oval loaves, place them either into floured *bannetons* or between folds of floured baker's linen, and cover with plastic.

6. FINAL FERMENTATION: Approximately 1¼ to 1½ hours at 75°F.

7. BAKING: Transfer the risen loaves onto the loading conveyor or peel. Slash the desired scoring pattern with a blade. Presteam the oven, load the bread, and steam again. Bake at 450°F. Open the oven vents after the loaves show color, in order to finish the bake in a drying oven. Loaves scaled at 1.5 pounds will bake in approximately 35 minutes.

Rustic Bread

PRE-FERMENTED FLOUR: 50%

DOUGH YIELD | U.S.: About 22 loaves at 1.5 lb each | Metric: About 25 loaves at .68 kg each | Home: 2 large loaves

OVERALL FORMULA

	U.S.	METRIC	HOME	BAKER'S %
Bread flour	**16 lb**	**8 kg**	**1 lb, 9.6 oz**	**80%**
Whole-rye flour	**2 lb**	**1 kg**	**3.2 oz**	**10%**
Whole-wheat flour	**2 lb**	**1 kg**	**3.2 oz**	**10%**
Water	**13.8 lb**	**6.9 kg**	**1 lb, 6.1 oz**	**69%**
Salt	**.36 lb**	**.18 kg**	**.6 oz**	**1.8%**
Yeast	**.12 lb, fresh**	**.06 kg, fresh**	**.06 oz, instant dry**	**.6%**
TOTAL YIELD	**34.28 lb**	**17.14 kg**	**3 lb, 6.7 oz**	**171.4%**

PRE-FERMENT

Bread flour	10 lb	5 kg	1 lb (3⅝ cups)	100%
Water	6 lb	3 kg	9.6 oz (1¼ cups)	60%
Salt	.18 lb	.09 kg	.3 oz (½ T)	1.8%
Yeast	.05 lb, fresh	.025 kg, fresh	(⅛ tsp, instant dry)	.5%
TOTAL	**16.23 lb**	**8.115 kg**	**1 lb, 10 oz**	

FINAL DOUGH

Bread flour	6 lb	3 kg	9.6 oz (2¼ cups)
Whole-rye flour	2 lb	1 kg	3.2 oz (⅞ cup)
Whole-wheat flour	2 lb	1 kg	3.2 oz (¾ cup)
Water	7.8 lb	3.9 kg	12.5 oz (1½ cups)
Salt	.18 lb	.09 kg	.3 oz (½ T)
Yeast	.07 lb, fresh	.035 kg, fresh	.06 oz, instant dry (½ tsp)
Pre-ferment	16.23 lb	8.115 kg	1 lb, 10 oz (all of above)
TOTAL	**34.28 lb**	**17.14 kg**	**3 lb, 6.7 oz**

1. PRE-FERMENT: Disperse the yeast in the water, add the flour and yeast, and mix until just smooth. At 60 percent hydration, it will be stiff and dense, but add water if necessary to correct the hydration. Cover the bowl with plastic and let stand for 12 to 16 hours at about 70°F. When ripe, the pre-ferment will be domed and just beginning to recede in the center.

Rustic Bread shares many of the visual and flavor attributes as the preceding Country Bread. With the inclusion of 20 percent whole-grain flour, however, it has a more robust and distinctive flavor. Since absorption levels vary considerably with whole-grain flour, check the dough carefully once the ingredients are incorporated and make adjustments to hydration as necessary. As with Country Bread, ovals or rounds are the shapes of choice, although small crusty rolls or sizeable *boules* can also be made.

2. MIXING: Add all the ingredients to the mixing bowl except the pre-ferment. In a spiral mixer, mix on first speed for 3 minutes in order to incorporate the ingredients. As the dough is coming together, add the pre-ferment in chunks. If necessary, correct the hydration by adding water or flour in small amounts. Finish mixing on second speed for about 2½ minutes. The dough should be supple and moderately loose, with moderate gluten development. Desired dough temperature: 75°F.

3. BULK FERMENTATION: 2½ hours.

4. FOLDING: Fold the dough twice, once after 50 minutes of bulk fermentation and again 50 minutes later.

5. DIVIDING AND SHAPING: Divide the dough into 1.5-pound pieces. Preshape lightly into rounds and place on a lightly floured work surface, seams up. Cover the rounds with plastic. When the dough has relaxed sufficiently (10 to 20 minutes), shape into round or oval loaves, place them either into floured *bannetons* or between folds of floured baker's linen, and cover with plastic.

6. FINAL FERMENTATION: Approximately 1¼ to 1½ hours at 75°F.

7. BAKING: Invert the risen loaves onto the loading conveyor or peel. Slash the desired scoring pattern with a blade. Presteam the oven, load the bread, and steam again. Bake at 450°F. Open the oven vents after the loaves show color, in order to finish the bake in a drying oven. Loaves scaled at 1.5 pounds should bake for 35 to 38 minutes.

Roasted-Potato Bread

PRE-FERMENTED FLOUR: 30%

DOUGH YIELD | U.S.: About 25 loaves at 1.5 lb each | Metric: About 27 loaves at .68 kg each | Home: 2 large loaves

OVERALL FORMULA

	U.S.	METRIC	HOME	BAKER'S %
Bread flour	**17 lb**	**8.5 kg**	**1 lb, 11.2 oz**	**85%**
Whole-wheat flour	**3 lb**	**1.5 kg**	**4.8 oz**	**15%**
Water	**12.2 lb**	**6.1 kg**	**1 lb, 3.5 oz**	**61%**
Salt	**.48 lb**	**.24 kg**	**.8 oz**	**2.4%**
Yeast	**.25 lb, fresh**	**.125 kg, fresh**	**.13 oz, instant dry**	**1.25%**
Potatoes, roasted	**5 lb**	**2.5 kg**	**8 oz**	**25%**
TOTAL YIELD	**37.93 lb**	**18.965 kg**	**3 lb, 12.4 oz**	**189.65%**

PÂTE FERMENTÉE

Bread flour	6 lb	3 kg	9.6 oz (2 1/4 cups)	100%
Water	3.9 lb	1.95 kg	6.2 oz (3/4 cup)	65%
Salt	.12 lb	.06 kg	.2 oz (1 tsp)	2%
Yeast	.012 lb, fresh	.006 kg, fresh	(1/8 tsp, instant dry)	.2%
TOTAL	**10.032 lb**	**5.016 kg**	**1 lb**	

FINAL DOUGH

Bread flour	11 lb	5.5 kg	1 lb, 1.6 oz (4 cups)
Whole-wheat flour	3 lb	1.5 kg	4.8 oz (1 cup)
Water	8.3 lb	4.15 kg	13.3 oz (1 5/8 cups)
Salt	.36 lb	.18 kg	.6 oz (1 T)
Yeast	.238 lb, fresh	.119 kg, fresh	.13 oz, instant dry (1 1/4 tsp)
Potatoes, roasted (see headnote)	5 lb	2.5 kg	8 oz (1 cup)
Pâte fermentée	10.032 lb	5.016 kg	1 lb (all of above)
TOTAL	**37.93 lb**	**18.965 kg**	**3 lb, 12.4 oz**

1. PÂTE FERMENTÉE: Disperse the yeast in the water, add the flour and salt, and mix until just smooth. Cover the bowl with plastic and let stand for 12 to 16 hours at about 70°F. Alternatively, remove a portion from a previous mix for use as *pâte fermentée*. In this case, refer to "Preparing the Pre-Ferment," page 96, for correct handling of the pre-ferment.

Toward the end of the eighteenth century, numerous grain failures had taken a devastating toll on the populations of Europe. People were hungry, civil unrest lurked in the poorer classes of society, and governments were scared. In an effort to fill bellies and keep the peace, attempts were made to develop breads that included other ingredients, from barley and oats to peas to potatoes. Most of those experiments amounted to little, but somehow potato bread found a place of acceptance among bread bakers and consumers alike.

Flavorful potatoes such as Yukon Gold or Yellow Finn are best for this bread. I find that oven roasting them concentrates the flavor in a way that boiling them does not. Once roasted, they can be chopped with a knife or dough cutter into small pieces. Leaving the skins on saves time, and the dark skin bits contrast nicely with the crumb color once the bread is sliced. I am very fond of the taste of potato bread, and eating it makes me think of how tenuous the food supply always is, and how hunger has always been a fact of life for so many people at all times.

2. MIXING: Add all the ingredients to the mixing bowl, including the potatoes, but not the *pâte fermentée*. In a spiral mixer, mix on first speed for 3 minutes in order to incorporate the ingredients. As the dough is coming together, add the *pâte fermentée* in chunks. If necessary, correct the hydration by adding water or flour in small amounts. The dough should feel slightly stiff, but since the potatoes hold a fair amount of moisture, which they will eventually contribute to the dough, be careful not to add much extra water as the dough mixes. Finish mixing on second speed for 3 to 3½ minutes. The dough should be supple and the gluten moderately developed. Desired dough temperature: 75°F.

3. BULK FERMENTATION: 1½ hours.

4. FOLDING: Fold the dough after 45 minutes of bulk fermentation.

5. DIVIDING AND SHAPING: Divide the dough into 1.5-pound pieces. Preshape lightly into rounds and place on a lightly floured work surface, seams up. Cover the rounds with plastic. When the dough has relaxed sufficiently (10 to 20 minutes), shape into round or oval loaves, place them either into floured *bannetons* or between folds of floured baker's linen, and cover with plastic wrap. A nice effect for potato bread is to shape it in the *fendu* style, by pressing deeply into the dough with a rolling pin to bisect it (see page 82). Proof these loaves top side down. The bread can also be baked in loaf pans.

6. FINAL FERMENTATION: Approximately 1¼ hours at 75°F.

7. BAKING: Transfer the risen loaves onto the loading conveyor or peel. Slash the desired scoring pattern with a blade; *fendu*-style loaves do not require slashing. Presteam the oven, load the bread, and steam again. Bake at 450°F. Open the oven vents after the loaves show color, in order to finish the bake in a drying oven. Loaves scaled at 1.5 pounds will bake in approximately 40 minutes. The potatoes will bring a great deal of color to the bread, so if the loaves are darkening too quickly, lower the oven temperature by 10° or 20°F. A comparatively long bake is necessary due to the moisture in the potatoes.

HERBED POTATO BREAD: Different herbs can be used to bring a subtle alteration to the flavor of potato bread. Rosemary is a common addition. Being quite strong, it is best used with restraint. About 1 percent of fresh rosemary based on the overall weight of the flour is a good starting point. Chives add a bit of color and a slight bite

to the bread. They can be chopped and added at the rate of about 1.5 to 2 percent of the flour weight. Last, chopped dill is occasionally added to the bread. About 1.5 percent of the flour weight is a good starting point. With all of these herbs, add them at the outset of mixing. Adjust the percentage used based on personal preferences, keeping in mind that the bread should be adaptable to a variety of foods, and this is best achieved if the herbs are not too potent a flavor in the bread.

ROASTED GARLIC POTATO BREAD: Garlic is another possible addition to potato bread. Use about 3 percent garlic based on the overall flour weight. To prepare the garlic, cut about ½ inch off the top of whole bulbs, and place them right side up on a sheet pan. There is no need to peel the bulbs. Sprinkle a light coat of olive oil on the exposed cloves. Cover the sheet pan with aluminum foil and bake at about 350°F until the garlic is soft. Remove the garlic from its husk by squeezing the individual cloves. Add the garlic to the dough at the beginning of the mix. Brushed with olive oil and grilled, or simply toasted and buttered, potato bread with garlic is a special treat. Any of the herbs listed above can of course be added in conjunction with the garlic.

Potato Bread with Roasted Onions

PRE-FERMENTED FLOUR: 30%

DOUGH YIELD | U.S.: About 29 loaves at 1.5 lb each | Metric: About 32 loaves at .68 kg each | Home: 3 medium loaves

OVERALL FORMULA

	U.S.	METRIC	HOME	BAKER'S %
Bread flour	**17 lb**	**8.5 kg**	**1 lb, 11.2 oz**	**85%**
Whole-wheat flour	**3 lb**	**1.5 kg**	**4.8 oz**	**15%**
Water	**12 lb**	**6 kg**	**1 lb, 3.2 oz**	**60%**
Salt	**.48 lb**	**.24 kg**	**.8 oz**	**2.4%**
Yeast	**.25 lb, fresh**	**.125 kg, fresh**	**.13 oz, instant dry**	**1.25%**
Onions, roasted	**6 lb**	**3 kg**	**9.6 oz**	**30%**
Olive oil, as needed				
Potatoes, roasted	**5 lb**	**2.5 kg**	**8 oz**	**25%**
TOTAL YIELD	**43.73 lb**	**21.865 kg**	**4 lb, 3 oz**	**218.65%**

PÂTE FERMENTÉE

Bread flour	6 lb	3 kg	9.6 oz (2¼ cups)	100%
Water	3.9 lb	1.95 kg	6.2 oz (¾ cup)	65%
Salt	.12 lb	.06 kg	.2 oz (1 tsp)	2%
Yeast	.012 lb, fresh	.006 kg, fresh	(⅛ tsp, instant dry)	.2%
TOTAL	**10.032 lb**	**5.016 kg**	**1 lb**	

FINAL DOUGH

Bread flour	11 lb	5.5 kg	1 lb, 1.6 oz (4 cups)
Whole-wheat flour	3 lb	1.5 kg	4.8 oz (1 cup)
Water	8.1 lb	4.05 kg	13 oz (1⅝ cups)
Salt	.36 lb	.18 kg	.6 oz (1 T)
Yeast	.238 lb, fresh	.119 kg, fresh	.13 oz, instant dry (1 ¼ tsp)
Onions, roasted (see headnote)	6 lb	3 kg	9.6 oz (1¼ cups)
Potatoes, roasted (see headnote, page 118)	5 lb	2.5 kg	8 oz (1 cup)
Pâte fermentée	10.032 lb	5.016 kg	1 lb (all of above)
TOTAL	**43.73 lb**	**21.865 kg**	**4 lb, 3 oz**

1. PÂTE FERMENTÉE: Disperse the yeast in the water, add the flour and salt, and mix until just smooth. Cover the bowl with plastic and let stand for 12 to 16 hours at about 70°F. Alternatively, remove

By adding richly roasted onions to the preceding formula for Roasted Potato Bread, the result is a bread that is both sweet from the full cooking of the onions, and rich in flavor from both the onions and the olive oil in which they are coated.

The bread is handled in the same manner as Roasted Potato Bread, with a couple of adjustments. First, thinly slice the onions, toss them in the minimum amount of olive oil needed to coat them thoroughly, place in a baking pan with aluminum foil or a lid on top, and place them in a 350° to 400°F oven. Stir occasionally, and roast them until they are wilted and brown. They will be fragrant and sweet. Allow them to cool before adding to the bread dough (this step is best done a day ahead). One small note: The hydration in the present bread is 60 percent, while in the preceding one it is 61 percent. The onions and the oil in which they are roasted compensate for the slight reduction of overall water in the dough.

a portion from a previous mix for use as *pâte fermentée*. In this case, refer to "Preparing the Pre-Ferment," page 96, for correct handling of the pre-ferment.

2. MIXING: Add all the ingredients except the *pâte fermentée* and onions to the mixing bowl. In a spiral mixer, mix on first speed for 3 minutes in order to incorporate the ingredients. As the dough is coming together, add the *pâte fermentée* in chunks. If necessary, correct the hydration by adding water or flour in small amounts. The dough should feel slightly stiff, but since the potatoes hold a fair amount of moisture, which they will eventually contribute to the dough, be careful not to add much extra water as the dough mixes. Finish mixing on second speed for 3 to 3½ minutes. The dough should be supple and the gluten moderately developed. Finally, add the onions and mix on first speed until they are evenly incorporated. Desired dough temperature: 75°F.

3. BULK FERMENTATION: 1½ hours.

4. FOLDING: Fold the dough after 45 minutes of bulk fermentation.

5. DIVIDING AND SHAPING: Divide the dough into 1.5-pound pieces. Preshape lightly into rounds and place on a lightly floured work surface, seams up. Cover the rounds with plastic. When the dough has relaxed sufficiently (10 to 20 minutes), shape into round or oval loaves, place them either into floured *bannetons* or between folds of floured baker's linen, and cover with plastic. A nice effect for potato bread is to shape it in the *fendu* style, by pressing deeply into the dough with a rolling pin to bisect it (see page 82). Proof these loaves top side down. The bread can also be baked in loaf pans.

6. FINAL FERMENTATION: Approximately 1¼ hours at 75°F.

7. BAKING: Transfer the risen loaves onto the loading conveyor or peel. Slash the desired scoring pattern with a blade; *fendu*-style loaves do not require slashing. Presteam the oven, load the bread, and steam again. Bake at 450°F. Open the oven vents after the loaves show color, in order to finish the bake in a drying oven. Loaves scaled at 1.5 pounds will bake in approximately 40 minutes. The potatoes will bring a great deal of color to the bread, so if the loaves are darkening too quickly, lower the oven temperature by 10° or 20°F. A comparatively long bake is necessary due to the moisture in the potatoes.

Whole-Wheat Bread

PRE-FERMENTED FLOUR: 25%

DOUGH YIELD | U.S.: About 23 loaves at 1.5 lb each | Metric: About 25 loaves at .68 kg each | Home: 2 large loaves

OVERALL FORMULA

	U.S.	METRIC	HOME	BAKER'S %
Whole-wheat flour	**10 lb**	**5 kg**	**1 lb**	**50%**
Bread flour	**10 lb**	**5 kg**	**1 lb**	**50%**
Water	**13.6 lb**	**6.8 kg**	**1 lb, 5.8 oz**	**68%**
Salt	**.4 lb**	**.2 kg**	**.6 oz**	**2%**
Yeast	**.22 lb, fresh**	**.11 kg, fresh**	**.13 oz, instant dry**	**1.1%**
Honey	**.6 lb**	**.3 kg**	**1 oz**	**3%**
TOTAL YIELD	**34.82 lb**	**17.41 kg**	**3 lb, 7.5 oz**	**174.1%**

PÂTE FERMENTÉE

Bread flour	5 lb	2.5 kg	8 oz (1¾ cups)	100%
Water	3.25 lb	1.625 kg	5.2 oz (⅝ cup)	65%
Salt	.1 lb	.05 kg	.2 oz (1 tsp)	2%
Yeast	.01 lb, fresh	.005 kg, fresh	(⅛ tsp, instant dry)	.2%
TOTAL	**8.36 lb**	**4.18 kg**	**13.4 oz**	

FINAL DOUGH

Whole-wheat flour	10 lb	5 kg	1 lb (3⅝ cups)
Bread flour	5 lb	2.5 kg	8 oz (1¾ cups)
Water	10.35 lb	5.175 kg	1 lb, .6 oz (2 cups)
Salt	.3 lb	.15 kg	.4 oz (2 tsp)
Yeast	.21 lb, fresh	.105 kg, fresh	.13 oz, instant dry (1¼ tsp)
Honey	.6 lb	.3 kg	1 oz (1 T + 1 tsp)
Pâte fermentée	8.36 lb	4.18 kg	13.4 oz (all of above)
TOTAL	**34.82 lb**	**17.41 kg**	**3 lb, 7.5 oz**

1. PÂTE FERMENTÉE: Disperse the yeast in the water, add the flour and salt, and mix until just smooth. Cover the bowl with plastic and let stand for 12 to 16 hours at about 70°F. Alternatively, remove a portion from a previous mix for use as *pâte fermentée*. In this case, refer to "Preparing the Pre-Ferment," page 96, for correct handling of the pre-ferment.

This whole-wheat bread is clean-flavored and light. The comparatively long fermentation and low percentage of yeast help bring out the intrinsic wheat flavor of the flour. Using a small amount of honey helps balance the flavor. The bread has just the slightest sense of sweetness, a nice balance to the strong flavor of the whole-wheat flour.

2. MIXING: Place all the ingredients except the *pâte fermentée* in the mixing bowl. In a spiral mixer, mix on first speed for 3 minutes in order to incorporate the ingredients. As the dough is coming together, add the *pâte fermentée* in chunks. If necessary, correct the hydration by adding water or flour in small amounts (the absorption of whole-wheat flour varies considerably; don't hesitate to add a fair bit of water if the dough seems dry). Finish mixing on second speed for 3 minutes. The dough should be supple and slightly loose, and the gluten should be moderately developed. Desired dough temperature: 75°F.

3. BULK FERMENTATION: 2 hours.

4. FOLDING: Fold the dough after 1 hour of bulk fermentation.

5. DIVIDING AND SHAPING: Divide the dough into 1.5-pound pieces. Preshape lightly into rounds and place on a lightly floured work surface, seams up. Cover the rounds with plastic. When the dough has relaxed sufficiently (10 to 15 minutes), shape into round or oval loaves, place them either into floured *bannetons* or between folds of floured baker's linen, and cover with plastic. The bread can also be baked in loaf pans or shaped into rolls.

6. FINAL FERMENTATION: 1 to 1½ hours at 75°F.

7. BAKING: Transfer the risen loaves onto the loading conveyor or peel. Slash the desired scoring pattern with a blade. Presteam the oven, load the bread, and steam again. Bake at 450°F. Open the oven vents after the loaves show color, in order to finish the bake in a drying oven. Loaves scaled at 1.5 pounds will bake in approximately 40 minutes. The honey contributes color to the bread, so if the loaves are darkening too quickly, lower the oven temperature by 10° or 20°F.

Whole-Wheat Bread with Hazelnuts and Currants

PRE-FERMENTED FLOUR: 25%

DOUGH YIELD | U.S.: About 28 loaves at 1.5 lb each | Metric: About 31 loaves at .68 kg each | Home: 3 medium loaves

OVERALL FORMULA

	U.S.	METRIC	HOME	BAKER'S %
Whole-wheat flour	10 lb	5 kg	1 lb	50%
Bread flour	10 lb	5 kg	1 lb	50%
Water	14.6 lb	7.3 kg	1 lb, 7.4 oz	73%
Salt	.4 lb	.2 kg	.6 oz	2%
Yeast	.25 lb, fresh	.125 kg, fresh	.13 oz, instant dry	1.25%
Honey	.6 lb	.3 kg	1 oz	3%
Hazelnuts, roasted and skinned	3.2 lb	1.6 kg	5.1 oz	16%
Dried currants	3.2 lb	1.6 kg	5.1 oz	16%
TOTAL YIELD	**42.25 lb**	**21.125 kg**	**4 lb, 3.3 oz**	**211.25%**

PÂTE FERMENTÉE

Bread flour	5 lb	2.5 kg	8 oz (1¾ cups)	100%
Water	3.25 lb	1.625 kg	5.2 oz (⅝ cup)	65%
Salt	.1 lb	.05 kg	.2 oz (1 tsp)	2%
Yeast	.01 lb, fresh	.005 kg, fresh	(⅛ tsp, instant dry)	.2%
TOTAL	**8.36 lb**	**4.18 kg**	**13.4 oz**	

FINAL DOUGH

Whole-wheat flour	10 lb	5 kg	1 lb (3⅝ cups)
Bread flour	5 lb	2.5 kg	8 oz (1¾ cups)
Water	11.35 lb	5.675 kg	1 lb, 2.2 oz (2¼ cups)
Salt	.3 lb	.15 kg	.4 oz (2 tsp)
Yeast	.24 lb, fresh	.12 kg, fresh	.13oz, instant dry (1¼ tsp)
Honey	.6 lb	.3 kg	1 oz (1 T + 1 tsp)
Pâte fermentée	8.36 lb	4.18 kg	13.4 oz (all of above)
Hazelnuts	3.2 lb	1.6 kg	5.1 oz (1⅛ cups)
Dried currants	3.2 lb	1.6 kg	5.1 oz (1 cup, packed)
TOTAL	**42.25 lb**	**21.125 kg**	**4 lb, 3.3 oz**

This tasty variation on whole-wheat bread incorporates two ingredients—roasted hazelnuts and dried currants—whose flavors provide both a contrast and a complement, not only to each other, but to the overall flavor of the bread as well. The hazelnuts can be left whole or chopped slightly before being added to the dough.

1. PREPARING THE HAZELNUTS AND CURRANTS: Roast the hazelnuts in a medium oven, about 375°F, shaking the pan back and forth once or twice, for 12 to 15 minutes, until the nuts have turned light brown. Let cool. Rub the nuts vigorously between your hands to skin them, and set aside. Break up the currants so they are separated. If they are very moist, toss them with a small amount of flour in order to keep them separated.

2. PÂTE FERMENTÉE: Disperse the yeast in the water, add the flour and salt, and mix until just smooth. Cover the bowl with plastic and let stand for 12 to 16 hours at about 70°F. Alternatively, remove a portion from a previous mix for use as *pâte fermentée*. In this case, refer to "Preparing the Pre-Ferment," page 96, for correct handling of the pre-ferment.

3. MIXING: Add all the ingredients except the *pâte fermentée,* hazelnuts, and currants to the mixing bowl. In a spiral mixer, mix on first speed for 3 minutes in order to incorporate the ingredients. As the dough is coming together, add the *pâte fermentée* in chunks. If necessary, correct the hydration by adding water or flour in small amounts. The dough will firm up a bit once the nuts and currants are added, so be sure it is slightly loose at the early stages of mixing. Turn the mixer to second speed and mix for 3 minutes. The dough should be supple and somewhat loose, and the gluten should be moderately developed. Now add the hazelnuts and currants all at once, and mix on first speed just until they are evenly incorporated. In a spiral mixer, the reverse function of the bowl can be used to encourage speedy incorporation. Desired dough temperature: 75°F.

4. BULK FERMENTATION: 2 hours.

5. FOLDING: Fold the dough after 1 hour of bulk fermentation.

6. DIVIDING AND SHAPING: Divide the dough into 1.5-pound pieces. Preshape lightly into rounds and place on a lightly floured work surface, seams up. Cover the rounds with plastic. When the dough has relaxed sufficiently (10 to 15 minutes), shape into round or oval loaves, place them either into floured *bannetons* or between folds of lightly floured baker's linen, and cover with plastic. Very nice rolls can also be made with the dough. If you are making just a few loaves, take a few moments and pick out the currants on the surface. This prevents them from overbaking and becoming bitter. This is not practical for large production.

7. FINAL FERMENTATION: Approximately 1 to 1½ hours at 75°F.

8. BAKING: Transfer the risen loaves onto the loading conveyor or peel. A simple scoring pattern is best, as the blade will be running into hazelnuts and currants as you slash the surface. Presteam the oven, load the bread, and steam again. Bake at 450°F. Lower the oven temperature by 10° to 20°F after about 20 minutes to prevent the extra sugars in the dough from coloring the bread too quickly. Open the oven vents after the loaves show color, in order to finish the bake in a drying oven. Loaves scaled at 1.5 pounds will bake in approximately 40 minutes.

Whole-Wheat Bread with a Multigrain Soaker

PRE-FERMENTED FLOUR: 35%

DOUGH YIELD | U.S.: About 27 loaves at 1.5 lb each | Metric: About 30 loaves at .68 kg each | Home: 3 medium loaves

OVERALL FORMULA

	U.S.	METRIC	HOME	BAKER'S %
Whole-wheat flour	10 lb	5 kg	1 lb	50%
Bread flour	10 lb	5 kg	1 lb	50%
Cracked wheat	1 lb	.5 kg	1.6 oz	5%
Coarse cornmeal	1 lb	.5 kg	1.6 oz	5%
Millet	1 lb	.5 kg	1.6 oz	5%
Oats	1 lb	.5 kg	1.6 oz	5%
Water	15.6 lb	7.8 kg	1 lb, 9 oz	78%
Salt	.48 lb	.24 kg	.8 oz	2.4%
Yeast	.26 lb, fresh	.13 kg, fresh	.13 oz, instant dry	1.3%
Honey	1 lb	.5 kg	1.6 oz	5%
TOTAL YIELD	**41.34 lb**	**20.67 kg**	**4 lb, 1.9 oz**	**206.7%**

SOAKER

Cracked wheat	1 lb	.5 kg	1.6 oz (⅜ cup)	25%
Coarse cornmeal	1 lb	.5 kg	1.6 oz (⅜ cup)	25%
Millet	1 lb	.5 kg	1.6 oz (¼ cup)	25%
Oats	1 lb	.5 kg	1.6 oz (½ cup)	25%
Water, boiling	5 lb	2.5 kg	8 oz (1 cup)	125%
TOTAL	**9 lb**	**4.5 kg**	**14.4 oz**	

PÂTE FERMENTÉE

Bread flour	7 lb	3.5 kg	11.2 oz (2½ cups)	100%
Water	4.55 lb	2.275 kg	7.3 oz (⅞ cup)	65%
Salt	.14 lb	.07 kg	.2 oz (1 tsp)	2%
Yeast	.014 lb, fresh	.007 kg, fresh	(⅛ tsp, instant dry)	.2%
TOTAL	**11.704 lb**	**5.852 kg**	**1 lb, 2.7 oz**	

FINAL DOUGH

Whole-wheat flour	10 lb	5 kg	1 lb (3⅝ cups)
Bread flour	3 lb	1.5 kg	4.8 oz (1 cup)
Water	6.05 lb	3.025 kg	9.7 oz (1¼ cups)
Salt	.34 lb	.17 kg	.6 oz (1 T)
Yeast	.246 lb, fresh	.123 kg, fresh	.13 oz, instant dry (1¼ tsp)
Honey	1 lb	.5 kg	1.6 oz (2 T)
Soaker	9 lb	4.5 kg	14.4 oz (all of above)
Pâte fermentée	11.704 lb	5.852 kg	1 lb, 2.7 oz (all of above)
TOTAL	**41.34 lb**	**20.67 kg**	**4 lb, 1.9 oz**

This version of whole-wheat bread is more robust than its soakerless cousins, and keeps quite well because of the high moisture level. By pre-fermenting 35 percent of the flour, the dough has an extra boost of not only flavor but leavening potential as well. What may seem at first glance like a high percentage of salt is in fact a balanced measure, since the soaker grains need salt in order for the bread to be balanced. Other grains and seeds, such as flax, sesame, sunflower, and cracked rye, can be used in lieu of or in addition to the grains used in the present formula.

1. SOAKER: Prepare the soaker by measuring the grains into a bowl and pouring the boiling water over them. Stir to incorporate, then cover the bowl with a sheet of plastic. In hot weather, the dough's overall salt can be used to prevent enzymatic activity from commencing. Make the soaker at least 4 hours before mixing the final dough so the grains have enough time to absorb the water and soften. A finer-textured bread can be made if the soaker ingredients are ground in a food processor before adding the water.

2. PÂTE FERMENTÉE: Disperse the yeast in the water, add the flour and salt, and mix until just smooth. Cover the bowl with plastic and let stand for 12 to 16 hours at about 70°F. Alternatively, remove a portion from a previous mix for use as *pâte fermentée*. In this case, refer to "Preparing the Pre-Ferment," page 96, for correct handling of the pre-ferment.

3. MIXING: Place all the ingredients, including the soaker but not the *pâte fermentée*, in the mixing bowl. In a spiral mixer, mix on first speed for 3 minutes in order to incorporate the ingredients. As the dough is coming together, add the *pâte fermentée* in chunks. If necessary, correct the hydration by adding water or flour in small amounts. Soakers tend to have quite a range of water absorption; don't hesitate to add a fair amount of water if the dough seems too dry. Turn the mixer to second speed and mix for

3 to 3½ minutes. The dough should be supple and lively to the pull, and the gluten moderately developed. Desired dough temperature: 75°F.

4. BULK FERMENTATION: 2 hours.

5. FOLDING: Fold the dough after 1 hour of bulk fermentation.

6. DIVIDING AND SHAPING: Divide the dough into 1.5-pound pieces (or make rolls with smaller pieces). Preshape lightly into rounds and place on a lightly floured work surface, seams up. Cover the rounds with plastic. When the dough has relaxed sufficiently (10 to 20 minutes), shape into round or oval loaves, place them either into floured *bannetons* or between folds of floured baker's linen, and cover with plastic. The dough can also be placed in loaf pans.

7. FINAL FERMENTATION: Approximately 1 to 1½ hours at 75°F.

8. BAKING: Transfer the risen loaves onto the loading conveyor or peel. Score the loaves as desired, presteam the oven, load the bread, and steam again. Bake at 450°F. Open the oven vents after the loaves show color, in order to finish the bake in a drying oven. If the breads are taking on too much color early in the bake (due to the presence of the honey), lower the oven temperature by 10° or 20°F. Loaves scaled at 1.5 pounds will bake in approximately 40 minutes.

Five-Grain Bread with Pâte Fermentée

PRE-FERMENTED FLOUR: 30%

DOUGH YIELD | U.S.: About 29 loaves at 1.5 lb each | Metric: About 32 loaves at .68 kg each | Home: 3 medium loaves

OVERALL FORMULA

	U.S.	METRIC	HOME	BAKER'S %
Bread flour	**20 lb**	**10 kg**	**2 lb**	**100%**
Rye chops	**1.6 lb**	**.8 kg**	**2.6 oz**	**8%**
Flaxseeds	**1.6 lb**	**.8 kg**	**2.6 oz**	**8%**
Sunflower seeds	**1.4 lb**	**.7 kg**	**2.2 oz**	**7%**
Oats	**1.4 lb**	**.7 kg**	**2.2 oz**	**7%**
Water	**17 lb**	**8.5 kg**	**1 lb, 11.2 oz**	**85%**
Salt	**.52 lb**	**.26 kg**	**.8 oz**	**2.6%**
Yeast	**.32 lb, fresh**	**.16 kg, fresh**	**.17 oz, instant dry**	**1.6%**
TOTAL YIELD	**43.84 lb**	**21.92 kg**	**4 lb, 5.8 oz**	**219.2%**

SOAKER

Rye chops	1.6 lb	.8 kg	2.6 oz (½ cup)	26.7%
Flaxseeds	1.6 lb	.8 kg	2.6 oz (½ cup)	26.7%
Sunflower seeds	1.4 lb	.7 kg	2.2 oz (½ cup)	23.3%
Oats	1.4 lb	.7 kg	2.2 oz (⅝ cup)	23.3%
Water	7.5 lb	3.75 kg	12 oz (1½ cups)	125%
TOTAL	**13.5 lb**	**6.75 kg**	**1 lb, 5.6 oz**	

PÂTE FERMENTÉE

Bread flour	6 lb	3 kg	9.6 oz (2¼ cups)	100%
Water	3.9 lb	1.95 kg	6.2 oz (¾ cup)	65%
Salt	.12 lb	.06 kg	.2 oz (1 tsp)	2%
Yeast	.012 lb, fresh	.006 kg, fresh	(⅛ tsp, instant dry)	.2%
TOTAL	**10.032 lb**	**5.016 kg**	**1 lb**	

FINAL DOUGH

Bread flour	14 lb	7 kg	1 lb, 6.4 oz (5 cups)
Water	5.6 lb	2.8 kg	9 oz (1⅛ cups)
Salt	.4 lb	.2 kg	.6 oz (1 T)
Yeast	.308 lb, fresh	.154 kg, fresh	.17 oz, instant dry (1½ tsp)
Soaker	13.5 lb	6.75 kg	1 lb, 5.6 oz (all of above)
Pâte fermentée	10.032 lb	5.016 kg	1 lb (all of above)
TOTAL	**43.84 lb**	**21.92 kg**	**4 lb, 5.8 oz**

Fragrant and full of flavor, this multigrain bread is a pleasure to make, a pleasure to look at with all the soaker grains studding the loaf, and a pleasure to eat—a bread that is at once flavorful yet light. As a variation, toast the sunflower seeds rather than soaking them with the other grains, and notice the deep nuttiness that pervades the loaf.

1. SOAKER: Prepare the soaker by measuring the grains into a bowl and pouring the water over them. Stir to incorporate, then cover the bowl with a sheet of plastic. In hot weather, the dough's overall salt can be used to prevent enzymatic activity from commencing. Make the soaker at least 4 hours before mixing the final dough so the grains have enough time to absorb the water and soften. If rye chops are not available, cracked rye can be used, but use boiling water in the soaker.

2. PÂTE FERMENTÉE: Disperse the yeast in the water, add the flour and salt, and mix just until smooth. Cover the bowl with plastic and let stand for 12 to 16 hours at about 70°F. Alternatively, remove a portion from a previous mix for use as *pâte fermentée*. In this case, refer to "Preparing the Pre-Ferment," page 96, for correct handling of the pre-ferment.

3. MIXING: Place all the ingredients, including the soaker but not the *pâte fermentée,* in the mixing bowl. In a spiral mixer, mix on first speed for 3 minutes in order to incorporate the ingredients. As the dough is coming together, add the *pâte fermentée* in chunks. If necessary, correct the hydration by adding water or flour in small amounts. Turn the mixer to second speed and mix for 3 to 3½ minutes. The dough should be somewhat loose, but with definite dough strength and gluten development. Desired dough temperature: 75°F.

4. BULK FERMENTATION: 2 hours.

5. FOLDING: Fold the dough after 1 hour of bulk fermentation.

6. DIVIDING AND SHAPING: Divide the dough into 1.5-pound pieces (or make rolls with smaller pieces). Preshape lightly into rounds and place on a lightly floured work surface, seams up. Cover the rounds with plastic. When the dough has relaxed sufficiently (10 to 20 minutes), shape into round or oval loaves, place them either into floured *bannetons* or on lightly floured baker's linen, and cover with plastic. The dough can also be baked in loaf pans.

7. FINAL FERMENTATION: Approximately 1 to 1½ hours at 75°F.

8. BAKING: Transfer the risen loaves onto the loading conveyor or peel. Score the loaves as desired, presteam the oven, load the bread, and steam again. Bake at 460°F. Open the oven vents after the loaves show color, in order to finish the bake in a drying oven. Lower the oven temperature by 10° or 20°F if the loaves color too strongly. Loaves scaled at 1.5 pounds will bake in approximately 40 minutes.

Sunflower Seed Bread with Pâte Fermentée

PRE-FERMENTED FLOUR: 20%

DOUGH YIELD | U.S.: About 30 loaves at 1.5 lb each | Metric: About 33 loaves at .68 kg each | Home: 3 medium loaves

OVERALL FORMULA

	U.S.	METRIC	HOME	BAKER'S %
Bread flour	**20 lb**	**10 kg**	**2 lb**	**100%**
Rye chops	**4 lb**	**2 kg**	**6.4 oz**	**20%**
Sunflower seeds	**4 lb**	**2 kg**	**6.4 oz**	**20%**
Water	**16 lb**	**8 kg**	**1 lb, 9.6 oz**	**80%**
Salt	**.46 lb**	**.23 kg**	**.7 oz**	**2.3%**
Yeast	**.3 lb, fresh**	**.15 kg, fresh**	**.17 oz, instant dry**	**1.5%**
Malt syrup	**.3 lb**	**.15 kg**	**.5 oz**	**1.5%**
TOTAL YIELD	**45.06 lb**	**22.53 kg**	**4 lb, 7.8 oz**	**225.3%**

SOAKER

Rye chops	4 lb	2 kg	6.4 oz (1 3/8 cups)	100%
Water	5 lb	2.5 kg	8 oz (1 cup)	125%
TOTAL	**9 lb**	**4.5 kg**	**14.4 oz**	

PÂTE FERMENTÉE

Bread flour	4 lb	2 kg	6.4 oz (1 1/2 cups)	100%
Water	2.6 lb	1.3 kg	4.2 oz (1/2 cup)	65%
Salt	.08 lb	.04 kg	.1 oz (1/2 tsp)	2%
Yeast	.008 lb, fresh	.004 kg, fresh	(1/8 tsp, instant dry)	.2%
TOTAL	**6.688 lb**	**3.344 kg**	**10.7 oz**	

FINAL DOUGH

Bread flour	16 lb	8 kg	1 lb, 9.6 oz (5 3/4 cups)
Water	8.4 lb	4.2 kg	13.4 oz (1 5/8 cups)
Salt	.38 lb	.19 kg	.6 oz (1 T)
Yeast	.292 lb, fresh	.146 kg, fresh	.17 oz, instant dry (1 1/2 tsp)
Malt syrup	.3 lb	.15 kg	.5 oz (2 tsp)
Sunflower seeds	4 lb	2 kg	6.4 oz (1 3/8 cups)
Soaker	9 lb	4.5 kg	14.4 oz (all of above)
Pâte fermentée	6.688 lb	3.344 kg	10.7 oz (all of above)
TOTAL	**45.06 lb**	**22.53 kg**	**4 lb, 7.8 oz**

This traditional German bread's name is *Sonnenblumenbrot* (*Sonnen* = sun; *Blumen* = flower; *Brot* = bread). Hearty and aromatic, it is particularly delightful with hard cheeses, peanut butter, various jams and preserves, or just toasted with butter. Malt syrup is thick and flavorful and adds just a wisp of sweetness to the loaf. If unavailable, good honey will do in its place.

1. SOAKER: Pour water over the rye chops and stir to incorporate. Cover the bowl with a sheet of plastic. In hot weather, the dough's overall salt can be used to prevent enzymatic activity from commencing. Make the soaker at least 4 hours before mixing the final dough so the grains have enough time to absorb the water and soften. If rye chops are not available, cracked rye can be used. In this case, use boiled water for the soaker to ensure that the cracked rye softens sufficiently. While making the soaker, toast the sunflower seeds, about 10 minutes in a 350°F oven, until they are fragrant.

2. PÂTE FERMENTÉE: Disperse the yeast in the water, add the flour and salt, and mix until just smooth. Cover the bowl with plastic and let stand for 12 to 16 hours at about 70°F. Alternatively, remove a portion from a previous mix for use as *pâte fermentée*. In this case, refer to "Preparing the Pre-Ferment," page 96, for correct handling of the pre-ferment.

3. MIXING: Place all the ingredients, including the soaker and the toasted sunflower seeds, but not the *pâte fermentée*, in the mixing bowl. In a spiral mixer, mix on first speed for 3 minutes in order to incorporate the ingredients. As the dough is coming together, add the *pâte fermentée* in chunks. If necessary, correct the hydration by adding water or flour in small amounts. Turn the mixer to second speed and mix for 3 to 3½ minutes. The dough should be somewhat loose, but with definite dough strength and gluten development. Desired dough temperature: 75°F.

4. BULK FERMENTATION: 2 hours.

5. FOLDING: Fold the dough after 1 hour of bulk fermentation.

6. DIVIDING AND SHAPING: Divide the dough into 1.5-pound pieces (or make rolls with smaller pieces). Preshape lightly into rounds and place on a lightly floured work surface, seams up. Cover the rounds with plastic. When the dough has relaxed sufficiently (10 to 20 minutes), shape it into tight round loaves. Dip the top side of each loaf into a dampened cloth, then into a sheet pan of raw sunflower seeds (don't dip the outer surface of the bread into the toasted seeds, since they will be vigorously toasted in the oven). Place the loaves in floured *bannetons* or onto lightly floured baker's linen, top side up, and cover with plastic.

7. FINAL FERMENTATION: Approximately 1 to 1½ hours at 75°F.

8. BAKING: Transfer the risen loaves onto the loading conveyor or peel. Because the loaves are topped with sunflower seeds, scoring is a little difficult. A few quick strokes with a straight razor blade or

some snips with scissors are sufficient. Presteam the oven, load the bread, and steam again. Bake at 460°F. Open the oven vents after the loaves show color, in order to finish the bake in a drying oven. The malt syrup contributes color along with flavor, and the oven temperature can be lowered by 10° or 20°F if the loaves color too quickly. Loaves scaled at 1.5 pounds will bake in approximately 40 minutes.

Golden Raisin and Walnut Bread

PRE-FERMENTED FLOUR: 25%

DOUGH YIELD | U.S.: About 27 loaves at 1.5 lb each | Metric: About 30 loaves at .68 kg each | Home: 3 medium loaves

OVERALL FORMULA

	U.S.	METRIC	HOME	BAKER'S %
Bread flour	**16 lb**	**8 kg**	**1 lb, 9.6 oz**	**80%**
Whole-wheat flour	**4 lb**	**2 kg**	**6.4 oz**	**20%**
Water	**14.4 lb**	**7.2 kg**	**1 lb, 7 oz**	**72%**
Salt	**.4 lb**	**.2 kg**	**.6 oz**	**2%**
Yeast	**.24 lb, fresh**	**.12 kg, fresh**	**.13 oz, instant dry**	**1.2%**
Golden raisins	**3.2 lb**	**1.6 kg**	**5.1 oz**	**16%**
Walnuts	**3.2 lb**	**1.6 kg**	**5.1 oz**	**16%**
TOTAL YIELD	**41.44 lb**	**20.72 kg**	**4 lb, 1.9 oz**	**207.2%**

STIFF BIGA

Bread flour	2.5 lb	1.25 kg	4 oz (7/8 cup)	50%
Whole-wheat flour	2.5 lb	1.25 kg	4 oz (7/8 cup)	50%
Water	3.1 lb	1.55 kg	5 oz (5/8 cup)	62%
Yeast	.01 lb, fresh	.005 kg, fresh	(1/8 tsp, instant dry)	.2%
TOTAL	**8.11 lb**	**4.055 kg**	**13 oz**	

FINAL DOUGH

Bread flour	13.5 lb	6.75 kg	1 lb, 5.6 oz (5 cups)
Whole-wheat flour	1.5 lb	.75 kg	2.4 oz (1/2 cup)
Water	11.3 lb	5.65 kg	1 lb, 2 oz (2 1/4 cups)
Salt	.4 lb	.2 kg	.6 oz (1 T)
Yeast	.23 lb, fresh	.115 kg, fresh	.13 oz, instant dry (1 1/4 tsp)
Biga	8.11 lb	4.055 kg	13 oz (all of above)
Walnuts	3.2 lb	1.6 kg	5.1 oz (1 1/4 cups)
Golden raisins	3.2 lb	1.6 kg	5.1 oz (1 cup, packed)
TOTAL	**41.44 lb**	**20.72 kg**	**4 lb, 1.9 oz**

The bite of walnuts in this bread is nicely rounded by the concentrated sweetness of golden raisins, which also give a lovely random flecking of color to the bread's crumb. Adjusting the proportion of whole-wheat flour gives a correspondingly more or less whole-grain flavor to the bread. If adjustments with the whole wheat are made, pay careful attention to the hydration—slightly more water may be needed as the percentage of whole-wheat flour increases.

1. BIGA: Mix the bread flour, whole-wheat flour, water, and yeast on first speed until evenly incorporated. The biga will be stiff, but a small addition of water may be necessary depending on the absorption of the whole-wheat flour. Cover the bowl with plastic to prevent a crust from forming, and leave at about 70°F for 12 to 16 hours.

2. MIXING: Place all the ingredients in the mixing bowl, with the exception of the biga, the walnuts, and the golden raisins. In a spiral mixer, mix on first speed for 3 minutes in order to incorporate the ingredients. As the dough is coming together, add the biga in chunks. If necessary, correct the hydration by adding water or flour in small amounts. Turn the mixer to second speed and mix for another 3 minutes. The dough should be of medium consistency, but with perceptible dough strength and gluten development. Add the walnuts and golden raisins and mix on first speed just until they are evenly incorporated. Desired dough temperature: 75°F.

3. BULK FERMENTATION: 2 hours.

4. FOLDING: Fold the dough after 1 hour of bulk fermentation.

5. DIVIDING AND SHAPING: Divide the dough into 1.5-pound pieces (or make rolls with smaller pieces). Preshape lightly into rounds and place on a lightly floured work surface, seams up. Cover the rounds with plastic. When the dough has relaxed sufficiently (10 to 20 minutes), shape it into tight round or oval loaves. Place the loaves into floured *bannetons* or on lightly floured baker's linen and cover with plastic.

6. FINAL FERMENTATION: Approximately 1 to 1½ hours at 75°F.

7. BAKING: Invert the risen loaves onto the loading conveyor or peel. Score the loaves with the desired pattern using a straight *lame*. Presteam the oven, load the bread, and steam again. Bake at 460°F. Open the oven vents after the loaves show color, in order to finish the bake in a drying oven. The sugars in the raisins will add color to the dough, so the oven temperature can be lowered by 10° or 20°F after about 20 minutes of baking. Loaves scaled at 1.5 pounds will bake in approximately 40 minutes.

Semolina (Durum) Bread

PRE-FERMENTED FLOUR: 40%

DOUGH YIELD | U.S.: About 22 loaves at 1.5 lb each | Metric: About 25 loaves at .68 kg each | Home: 2 large loaves

OVERALL FORMULA

	U.S.	METRIC	HOME	BAKER'S %
Durum flour	**10 lb**	**5 kg**	**1 lb**	**50%**
Bread flour	**10 lb**	**5 kg**	**1 lb**	**50%**
Water	**12.4 lb**	**6.2 kg**	**1 lb, 3.8 oz**	**62%**
Salt	**.36 lb**	**.18 kg**	**.6 oz**	**1.8%**
Yeast	**.24 lb, fresh**	**.12 kg, fresh**	**.13 oz, instant dry**	**1.2%**
Sugar	**.4 lb**	**.2 kg**	**.6 oz**	**2%**
Extra-virgin olive oil	**1 lb**	**.5 kg**	**1.6 oz**	**5%**
TOTAL YIELD	**34.4 lb**	**17.2 kg**	**3 lb, 4 oz**	**172%**

SPONGE

Durum flour	4 lb	2 kg	6.4 oz (1½ cups)	50%
Bread flour	4 lb	2 kg	6.4 oz (1½ cups)	50%
Water	5.6 lb	2.8 kg	9 oz (1⅛ cups)	70%
Yeast	.24 lb, fresh	.12 kg, fresh	.13 oz (1¼ tsp)	3%
Sugar	.4 lb	.2 kg	.6 oz (½ tsp)	5%
TOTAL	**14.24 lb**	**7.12 kg**	**1 lb, 6.5 oz**	

FINAL DOUGH

Durum flour	6 lb	3 kg	9.6 oz (2⅛ cups)
Bread flour	6 lb	3 kg	9.6 oz (2¼ cups)
Water	6.8 lb	3.4 kg	10.8 oz (1⅜ cups)
Salt	.36 lb	.18 kg	.6 oz (1 T)
Extra-virgin olive oil	1 lb	.5 kg	1.6 oz (3 T)
Sponge	14.24 lb	7.12 kg	1 lb, 6.5 oz (all of above)
TOTAL	**34.4 lb**	**17.2 kg**	**3 lb, 4 oz**

1. **SPONGE:** Mix the durum flour, bread flour, water, yeast, and sugar on first speed until evenly incorporated. The sponge will be fairly loose. Since the ripening is accomplished in a short time, a sponge temperature of 78° to 80°F is required. The sponge is ripe after about 1¼ hours, when it is on the verge of collapse.

2. **MIXING:** Add all of the ingredients, including the sponge, to the mising bowl. In a spiral mixer, mix on first speed for 3 minutes in

The sponge in this bread is unusual: It is an old-fashioned type of sponge, once common in Austria and England, known as a "flying sponge." I assume that it is "flying" because all the yeast is used in it, and the duration of ripening is usually not much more than 1 hour. It may be, though, that the bakers in the shops of old, having much less to rely on in terms of mechanical equipment compared with the bakers of today, were the ones who were flying! In any case, although a flying sponge might not have all the virtues of a long and gradually fermenting sponge, it does impart a lightness and comparative depth of flour flavor to finished bread.

order to incorporate the ingredients. Correct the dough consistency as necessary. Turn the mixer to second speed and mix for another 2½ to 3 minutes. The dough should be of medium consistency, but with perceptible dough strength and gluten development. Desired dough temperature: 76°F.

3. BULK FERMENTATION: 1½ hours.

4. FOLDING: Fold the dough after 45 minutes of bulk fermentation.

5. DIVIDING AND SHAPING: Divide the dough into 1.5-pound pieces (or make rolls with smaller pieces). Preshape lightly into rounds and place on a lightly floured work surface, seams up. Cover the rounds with plastic. When the dough has relaxed sufficiently (10 to 20 minutes), shape it into tight round or oval loaves. For a variation, the top of the loaves can be pressed into a damp cloth and then into a tray of raw sesame seeds. Place the loaves into floured *bannetons* or on lightly floured baker's linen and cover with plastic.

6. FINAL FERMENTATION: Approximately 1 to 1¼ hours at 75°F.

7. BAKING: Invert the risen loaves onto the loading conveyor or peel. Score the loaves as desired. Presteam the oven, load the bread, and steam again. Bake at 460°F. Open the oven vents after the loaves show color, in order to finish the bake in a drying oven. Loaves scaled at 1.5 pounds will bake in 35 to 40 minutes.

SEMOLINA BREAD STICKS: Cut individual dough pieces at 1.33 ounces (38 g) (with a 36-part divider, dough weight per press is 3 pounds (1.36 kg)). Relax the dough, covered with plastic, for 10 or 15 minutes, then roll the individual pieces to about 16 inches long (shorter bread sticks, weighing less, can of course also be scaled). Once rolled, the bread sticks can be left plain, or rolled into a damp cloth and then into a tray of raw sesame seeds or fine semolina. An alternative method for making bread sticks is to take the desired weight of dough and press it into a flat rectangle. Using a pizza roller or sharp knife, individual bread sticks can be cut off the main bulk of dough. This is possibly the quickest method, but take care that the bread sticks are as close as possible to being equal in weight so that they bake uniformly. Whatever method is chosen, allow the shaped bread sticks to rest for 15 to 20 minutes, then bake at 380°F for about 20 minutes, until evenly browned and crisp. They will keep well for several days in an airtight container, and can be re-crisped by warming for a few minutes at 350°F.

Semolina (Durum) Bread with a Whole-Grain Soaker

PRE-FERMENTED FLOUR: 40%

DOUGH YIELD | U.S.: About 27 loaves at 1.5 lb each | Metric: About 30 loaves at .68 kg each | Home: 3 medium loaves

OVERALL FORMULA

	U.S.	METRIC	HOME	BAKER'S %
Durum flour	**10 lb**	**5 kg**	**1 lb**	**50%**
Bread flour	**10 lb**	**5 kg**	**1 lb**	**50%**
Coarse cornmeal	**1.6 lb**	**.8 kg**	**2.6 oz**	**8%**
Millet	**1.2 lb**	**.6 kg**	**1.9 oz**	**6%**
Sesame seeds	**1.2 lb**	**.6 kg**	**1.9 oz**	**6%**
Water	**15.8 lb**	**7.9 kg**	**1 lb, 9.3 oz**	**79%**
Salt	**.44 lb**	**.22 kg**	**.7 oz**	**2.2%**
Yeast	**.34 lb, fresh**	**.17 kg, fresh**	**.17 oz, instant dry**	**1.7%**
TOTAL YIELD	**40.58 lb**	**20.29 kg**	**4 lb, .6 oz**	**202.9%**

SOAKER

Coarse cornmeal	1.6 lb	.8 kg	2.6 oz (⅝ cup)	40%
Millet	1.2 lb	.6 kg	1.9 oz (⅜ cup)	30%
Sesame seeds	1.2 lb	.6 kg	1.9 oz (⅜ cup)	30%
Water, boiling	5 lb	2.5 kg	8 oz (1 cup)	125%
TOTAL	**9 lb**	**4.5 kg**	**14.4 oz**	

SPONGE

Durum flour	4 lb	2 kg	6.4 oz (1½ cups)	50%
Bread flour	4 lb	2 kg	6.4 oz (1½ cups)	50%
Water	5.6 lb	2.8 kg	9 oz (1⅛ cups)	70%
Yeast	.34 lb, fresh	.17 kg, fresh	.17 oz (1½ tsp)	4.3%
TOTAL	**13.94 lb**	**6.97 kg**	**1 lb, 6.2 oz**	

FINAL DOUGH

Durum flour	6 lb	3 kg	9.6 oz (2⅛ cups)
Bread flour	6 lb	3 kg	9.6 oz (2⅛ cups)
Water	5.2 lb	2.6 kg	8.3 oz (1 cup)
Salt	.44 lb	.22 kg	.7 oz (1 T + ½ tsp)
Soaker	9 lb	4.5 kg	14.4 oz (all of above)
Sponge	13.94 lb	6.97 kg	1 lb, 6.2 oz (all of above)
TOTAL	**40.58 lb**	**20.29 kg**	**4 lb, .6 oz**

Here is another semolina bread, this one made with a grain-and-seed soaker. Like the preceding bread, it incorporates a flying sponge. The yeast percentage is slightly higher to accommodate the presence of the soaker, but the sugar is eliminated in this formula; as a result, the sponge ripens in just about the same time as in the preceding semolina bread.

1. SOAKER: At least 4 hours before mixing the final dough, pour boiling water over the soaker grains. Cover the soaker with plastic to prevent evaporation, and let stand at room temperature.

2. SPONGE: Mix the durum flour, bread flour, water, and yeast on first speed until evenly incorporated. The sponge will be fairly loose. Since the ripening is accomplished in a short time, a sponge temperature of 78° to 80°F is required. The sponge is ripe after about 1¼ hours, when it will be on the verge of collapse.

3. MIXING: Place all the ingredients in the mixing bowl, including the soaker and sponge. In a spiral mixing bowl, mix on first speed for 3 minutes in order to incorporate the ingredients. Check the dough consistency and make corrections as necessary. Turn the mixer to second speed and mix for about 3 minutes. The dough should be of medium consistency, with a resisting tug when pulled on. Desired dough temperature: 76°F.

4. BULK FERMENTATION: 1½ hours.

5. FOLDING: Fold the dough after 45 minutes of bulk fermentation.

6. DIVIDING AND SHAPING: Divide the dough into 1.5-pound pieces (or make rolls with smaller pieces). Preshape lightly into rounds and place on a lightly floured work surface, seams up. Cover the rounds with plastic. When the dough has relaxed sufficiently (10 to 20 minutes), shape it into tight round or oval loaves. As in the preceding formula for Semolina Bread, the top of the loaves can be pressed into a damp cloth and then into a tray of raw sesame seeds. Place the loaves into floured *bannetons* or on lightly floured baker's linen and cover with plastic.

7. FINAL FERMENTATION: Approximately 1 to 1¼ hours at 75°F.

8. BAKING: Invert the risen loaves onto the loading conveyor or peel. Score the loaves as desired. Presteam the oven, load the bread, and steam again. Bake in a 460°F oven. Open the oven vents after the loaves show color, in order to finish the bake in a drying oven. Loaves scaled at 1.5 pounds will bake in approximately 40 minutes.

Corn Bread

PRE-FERMENTED FLOUR: 25%

DOUGH YIELD | U.S.: About 22 loaves at 1.5 lb each | Metric: About 25 loaves at .68 kg each | Home: 2 large loaves

OVERALL FORMULA

	U.S.	Metric	Home	Baker's %
Bread flour	**15 lb**	**7.5 kg**	**1 lb, 8 oz**	**75%**
Fine cornmeal	**5 lb**	**2.5 kg**	**8 oz**	**25%**
Water	**12.6 lb**	**6.3 kg**	**1 lb, 4.2 oz**	**63%**
Salt	**.4 lb**	**.2 kg**	**.6 oz**	**2%**
Yeast	**.3 lb, fresh**	**.15 kg, fresh**	**.17 oz, instant dry**	**1.5%**
Extra-virgin olive oil	**1 lb**	**.5 kg**	**1.6 oz**	**5%**
TOTAL YIELD	**34.3 lb**	**17.15 kg**	**3 lb, 6.6 oz**	**171.5%**

POOLISH

Bread flour	5 lb	2.5 kg	8 oz (1¾ cups)	100%
Water	5 lb	2.5 kg	8 oz (1 cup)	100%
Yeast	.02 lb, fresh	.01 kg, fresh	(⅛ tsp, instant dry)	.2%
TOTAL	**10.02 lb**	**5.01 kg**	**1 lb**	

FINAL DOUGH

Bread flour	10 lb	5 kg	1 lb (3⅝ cups)
Fine cornmeal	5 lb	2.5 kg	8 oz (¼ cup)
Water	7.6 lb	3.8 kg	12.2 oz (1½ cups)
Salt	.4 lb	.2 kg	.6 oz (1 T)
Yeast	.28 lb, fresh	.14 kg, fresh	.17 oz, instant dry (1½ tsp)
Extra-virgin olive oil	1 lb	.5 kg	1.6 oz (3 T)
Poolish	10.02 lb	5.01 kg	1 lb (all of above)
TOTAL	**34.3 lb**	**17.15 kg**	**3 lb, 6.6 oz**

1. POOLISH: Disperse the yeast in the water, add the flour, and mix until smooth. Cover the bowl with plastic and let stand for 12 to 16 hours at about 70°F.

2. SOAKING AND MIXING: Add the cornmeal to the mixing bowl and pour the dough water over it. Allow it to soak for about 15 minutes. This will begin softening the cornmeal, and mixing and handling quality will improve. Add the remaining ingredients to the mixing bowl, including the poolish. In a spiral mixer, mix on first

Corn has been a staple grain for thousands of years among the native peoples of the Americas and, for the past five hundred years, throughout Europe. It is no wonder that it found its way into bread making; during times of wheat shortages, many different grains were used to extend precious wheat flour and fill the bellies of the laboring peasants (a huge proportion of whom consumed little more than bread). Nutritionally, however, corn is deficient when eaten on its own, and can cause the niacin-deficiency disease pellagra (known in Switzerland as *Maiserkrankheit*, or "maize-eater's illness"). Interestingly, when corn is processed with lime, as in the making of traditional nixtamal for tortillas in Mexico, niacin is released and the corn becomes highly nutritious. The corn bread produced from this formula has a tight crumb, a golden crumb color, a somewhat dull crust color, and a unique aroma and sweetness provided by the corn.

speed for 3 minutes in order to incorporate the ingredients. The absorption of the cornmeal can vary considerably (particularly with medium or coarse cornmeal), so it is important to check the dough carefully while it is on first speed and make corrections as necessary. The dough should be of medium consistency once the ingredients are incorporated. Turn the mixer to second speed and mix for 3 to 3½ minutes. Cornmeal tends to have a puncturing effect on gluten; nevertheless, mix until there is a moderate gluten development. Desired dough temperature: 76°F.

3. BULK FERMENTATION: 1½ hours.

4. FOLDING: Fold the dough after 45 minutes of bulk fermentation.

5. DIVIDING AND SHAPING: Divide the dough into 1.5-pound pieces (or make rolls with smaller pieces). Preshape lightly into rounds and place on a lightly floured work surface, seams up. Cover the rounds with plastic. When the dough has relaxed sufficiently (10 to 20 minutes), shape it into tight round or oval loaves. Place the loaves into floured *bannetons* or onto lightly floured baker's linen and cover with plastic.

6. FINAL FERMENTATION: Approximately 1 to 1¼ hours at 75°F.

7. BAKING: Invert the risen loaves onto the loading conveyor or peel. Score the loaves as desired. Presteam the oven, load the bread, and steam again. Bake in a 460°F oven. Open the oven vents after the loaves show color, in order to finish the bake in a drying oven. Loaves scaled at 1.5 pounds will bake in approximately 40 minutes.

Beer Bread with Roasted Barley

PRE-FERMENTED FLOUR: 30%

DOUGH YIELD | U.S.: About 23 loaves at 1.5 lb each | Metric: About 25 loaves at .68 kg each | Home: 2 large loaves

OVERALL FORMULA

	U.S.	METRIC	HOME	BAKER'S %
Bread flour	**16 lb**	**8 kg**	**1 lb, 9.6 oz**	**80%**
Whole-wheat flour	**4 lb**	**2 kg**	**6.4 oz**	**20%**
Water	**6.8 lb**	**3.4 kg**	**10.9 oz**	**34%**
Beer	**6.8 lb**	**3.4 kg**	**10.9 oz**	**34%**
Salt	**.4 lb**	**.2 kg**	**.6 oz**	**2%**
Yeast	**.24 lb, fresh**	**.12 kg, fresh**	**.13 oz, instant dry**	**1.2%**
Malted barley	**1 lb**	**.5 kg**	**1.6 oz**	**5%**
TOTAL YIELD	**35.24 lb**	**17.62 kg**	**3 lb, 8.1 oz**	**176.2%**

POOLISH

Bread flour	6 lb	3 kg	9.6 oz (2 1/4 cups)	100%
Water	6 lb	3 kg	9.6 oz (1 1/4 cups)	100%
Yeast	.012 lb, fresh	.006 kg, fresh	(1/8 tsp, instant dry)	.2%
TOTAL	**12.012 lb**	**6.006 kg**	**1 lb, 3.2 oz**	

FINAL DOUGH

Bread flour	10 lb	5 kg	1 lb (3 5/8 cups)
Whole-wheat flour	4 lb	2 kg	6.4 oz (1 1/2 cups)
Water	.8 lb	.4 kg	1.3 oz (1/8 cup)
Beer	6.8 lb	3.4 kg	10.9 oz (1 3/8 cups)
Salt	.4 lb	.2 kg	.6 oz (1 T)
Yeast	.228 lb, fresh	.114 kg, fresh	.13 oz, instant dry (1 1/4 tsp)
Malted barley	1 lb	.5 kg	1.6 oz (1/4 cup)
Poolish	12.012 lb	6.006 kg	1 lb, 3.2 oz (all of above)
TOTAL	**35.24 lb**	**17.62 kg**	**3 lb, 8.1 oz**

The process of malting involves soaking barley until it sprouts, drying it, and finally grinding it (this is the procedure when malted barley is used at mills and added to wheat flour to

1. POOLISH: Disperse the yeast in the water, add the flour, and mix until smooth. Cover the bowl with plastic and let stand for 12 to 16 hours at about 70°F.

2. PREPARING THE BARLEY: Place the barley on a sheet pan and roast at 350°F, shaking the pan occasionally, for 4 or 5 minutes. This step does two things: It brings out the full nutty flavor of the

correct amylase enzyme deficiencies). The soaking makes the barley sweet tasting, and that subtle sweetness comes through in the finished bread in this formula. Malted barley is easy to find at beer-brewing shops, but it is almost always still in its husk. While this is fine when making beer, it obviously is not when using the barley for bread. If husked malted barley is unavailable, unmalted barley can be roasted and used instead.

Working in Germany in the mid-1970s, I was taught a folk expression: "Beer is liquid bread." How true this is, considering the ingredients used for each pursuit. And for centuries the baker obtained his yeast from the brewer—skimming the foam from top-fermenting ales, and the sediment from bottom-fermenting lagers. *Bierbrot*—beer bread—was a daily part of production during my time in Germany. The bread had a hint of sweetness from the beer, along with a subtle bite from the strong southern German brew. Twenty years later, when I was a member of Baking Team USA, beer bread was one of the breads made in Paris at the Coupe du Monde de la Boulangerie (the World Cup of Baking), and it met with great approval. The beer bread detailed here is something of an amalgamation of the two, an unusual specialty bread with a lively, robust flavor.

barley, and it deactivates any enzymes that might otherwise interfere with dough fermentation. Take care to avoid overroasting, which would impart a bitter flavor to the barley. Once the barley has cooled, grind it to the desired degree of coarseness. It should be fairly fine since it will not be softened in a soaker.

3. MIXING: Place all the ingredients in the mixing bowl, including the ground barley and the poolish. When computing the desired dough temperature, mix the beer with the water and cool or warm them accordingly. In a spiral mixer, mix on first speed for 3 minutes in order to incorporate the ingredients. Make corrections to dough consistency as necessary, seeking a dough of moderately loose hydration. Turn the mixer to second speed and mix for 3 minutes. Desired dough temperature: 75°F.

4. BULK FERMENTATION: 2 hours.

5. FOLDING: Fold the dough after 1 hour of bulk fermentation.

6. DIVIDING AND SHAPING: Divide the dough into 1.5-pound pieces (or make rolls with smaller pieces). Preshape lightly into rounds and place on a lightly floured work surface, seams up. Cover the rounds with plastic. When the dough has relaxed sufficiently (10 to 20 minutes), shape it into tight round or oval loaves. Place the loaves into floured *bannetons* or onto lightly floured baker's linen and cover with plastic.

7. FINAL FERMENTATION: Approximately 1 to 1¼ hours at 75°F.

8. BAKING: Invert the risen loaves onto the loading conveyor or peel. Score the loaves as desired. Presteam the oven, load the bread, and steam again. Bake in a 460°F oven. Open the oven vents after the loaves show color, in order to finish the bake in a drying oven. Loaves scaled at 1.5 pounds will bake in approximately 40 minutes.