chapter seven

Beginner yeast breads and rolls

When flour, water, yeast, and salt are worked together in the correct proportions for the appropriate amount of time and at the proper temperature, proper gluten structure develops. The bread baker knows that the ingredients play a key role in the quality of the dough, as do the mixing and fermentation methods. The techniques in this chapter take the bread-baking process up through a finished dough.

Direct fermentation

The simplest and fastest method for producing a lean dough is *direct fermentation:* Commercially produced yeast is combined with flour, water, and salt and mixed until the dough is supple and elastic, with well-developed gluten.

Flour, as a main component, provides the structure and crumb in breads through the action of the proteins and starches it contains. The amount of water or other liquids also has an impact on the finished loaf. As the amount of liquid in a dough increases, the bread's structure changes as it promotes the formation of an open crumb.

Some breads are meant to have a more delicate texture, with a softer crust and crumb. In these formulas, sugars and fats, in the form of butter, oil, eggs, or syrups, control or affect how well the gluten develops, how long and elastic the gluten strands become, how the yeast behaves, and how open or closed the crumb is after baking.

Yeast is directly related not only to the texture of the bread but also to its flavor. The direct fermentation method of bread making requires fewer steps and less advance preparation than indirect fermentation methods; however, the lack of a pre-ferment limits the quality of the finished product by limiting fermentation time. (See Chapter 8, page 148, for pre-ferments and indirect fermentation methods.) The processes occurring during fermentation further develop the structure and flavor of the dough—the more time allotted for fermentation, the better the development of the internal structure and flavor of the dough. (For more about gluten development, starch gelatinization, and fermentation, see Chapter 4, pages 57, 65, and 60.)

The stages after mixing and bulk fermentation (i.e., shaping and baking as well as handling, cooling, and storage) also have a great deal to do with the quality of yeast-raised breads, rolls, and cakes. Bread doughs can be given a variety of shapes, ranging from simple boules and round rolls to intricately braided loaves. Proofing the dough after it has been shaped gives it additional time to develop. Simple rustic shapes, such as baguettes and bâtards, are often used for lean doughs. Enriched doughs are soft enough to twist and braid.

The straight mixing method

The straight mixing method is most often used with formulas that rely on direct fermentation. For this mixing method, the ingredients are added in a different order depending on the type of yeast used. If instant dry yeast is used, the yeast should first be blended with the flour, then all the remaining ingredients should be added to the flour-yeast mixture. If active dry or compressed fresh yeast is used, the yeast should first be blended with the water and allowed to fully dissolve. Next the flour should be added and all remaining ingredients should be placed on top of the flour.

After all the ingredients are in the mixing bowl, they should be blended together on low speed until just combined. Then turn the mixer to medium speed and blend the dough to full development.

Stages of Gluten Development

One way to know when to check for gluten development is to understand the changes that occur while mixing. There are four separate mixing stages, no matter what mixing method you use. Each stage shows a clear difference in how far along the dough has developed in gluten structure. You will know when to end the mixing process because the recipe you are using will tell you the level of development you need.

Dough that has reached short development will become a homogenous mass but will fall apart when worked with your hands.

If you are making a lean dough that requires partial or improved gluten development, for example, you should continue mixing, then check the gluten window again periodically. You will know you have reached improved development if the dough holds together more, but tears as you work it.

Dough that has reached the improved gluten development stage holds together, but tears when you check for the gluten window.

Some doughs require intense development, meaning that you need to keep mixing the dough beyond the partial development stage until it is fully developed. If, as you check the gluten window, the dough doesn't tear and holds a thin membrane you can see through, then the gluten is properly developed in this case.

The gluten window is transparent enough to see light through it. This means a dough has reached intense gluten development.

Checking the gluten window is important, and the stakes get higher when you are making an intensely developed bread. If you overmix the dough, the gluten will break down. The dough will go from being smooth and elastic to wet and sticky. Your bread will fail, meaning that it won't rise properly or bake well. On the other hand, if you don't mix the dough enough or mix it improperly, you will also wind up with low volume and poor internal structure. Poorly mixed dough may mean that the flour will not absorb the liquids properly and that the dough turns out irregular. It will have a poor gluten structure, lack elasticity, and the dough will remain wet and sticky.

The gluten window. The ability to stretch dough to a thin membrane indicates full gluten development.

Stages of mixing bread dough

In bread making, as with any baked item, the proper execution of mixing is crucial to the quality of the end product. When mixing bread dough, there are four identifiable stages that signal a change in structure and the stage of development of the dough.

Stage 1: pickup period

During the pickup period the ingredients are blended on low speed, until just combined. The dough is a wet, sticky, rough mass at this point.

Stage 2: cleanup period or preliminary development

The cleanup period is the preliminary development of the dough. At this point the dough is mixing at a moderate speed and will appear somewhat rough.

Stage 3: initial development period

During the initial development period, the elasticity of the gluten begins to develop and the dough starts to pull away from the sides of the mixing bowl. At this point the mixer should be running at medium speed; a high speed would work the dough too roughly, breaking the structure of the gluten rather than promoting its development.

Stage 4: final development period

At this point the gluten is fully developed. The dough is smooth and elastic and leaves the sides of the bowl completely clean as the mixer is running. To test for full gluten development, remove a piece of dough from the mixer, dip it in flour, and stretch it from underneath. If the dough stretches to form a thin membrane, allowing light to filter through, then the gluten has been properly and sufficiently developed.

When dough is overmixed it will be very sticky and wet and will have little or no elasticity. This occurs because the gluten strands have been broken down; the resulting product will not rise or bake properly.

Advantages of proper mixing

Optimum absorption

Proper gluten development

Slightly shorter fermentation time

TOP LEFT: Stage 1. The pickup stage of dough development

TOP RIGHT: Stage 2. The cleanup stage

BOTTOM LEFT: Stage 3. Initial dough development

BOTTOM RIGHT: Stage 4. Final dough development

substituting one yeast for another

Each of the formulas in this chapter was developed using instant dry yeast. In the past, fresh compressed yeast was the standard variety used by commercial bakers. However, today it is becoming more common for bakeshops to use dry varieties of yeast because they produce excellent results, are easier to store, and have a much longer shelf life. Generally, it is best to follow the manufacturer's instructions for use, as all dry yeast products are not alike.

The most common ratio of yeast to flour is approximately ½ oz/14 g fresh yeast to 18 oz/510 g flour, although this ratio can vary according to the type of bread, the techniques used in production, the retarding, and the ingredients in the formula. Too little yeast will not raise dough sufficiently, while too much will give the bread an overly strong yeast flavor. The bakers' percentages included in the formulas in this chapter indicate the ratios for that dough and can be used as a guide for modification of these and other formulas.

Use the accompanying table to convert from one type of yeast to another.

Active dry yeast should be reactivated in twice its volume amount of water at 105°F/41°C for 3 to 5 minutes before blending with the remaining ingredients in the formula. Combine fresh yeast with some of the milk or water in the formula to blend evenly before adding the remaining ingredients. Instant dry yeast does not have to be activated, but it should not come in direct contact with ice-cold liquids or ice. When converting a formula from fresh yeast to instant or active dry, most manufacturers suggest that the difference in weight be made up with additional water. This additional water will maintain the yield and hydration level of the dough.

TYPE OF YEAST	PERCENTAGE	EXAMPLE
Fresh yeast	100%	10 oz/284 g
Active dry yeast	40%	4 oz/113 g
Instant dry yeast	33%	3⅓ oz/94 g

Desired dough temperature and British thermal units

Dough temperature is important because it directly affects fermentation. Suggested temperatures for certain ingredients are based upon the desired dough temperature (DDT; the DDT is included in each formula). The colder the final temperature of a dough, the longer the fermentation time will be; the warmer the final dough temperature, the more quickly a dough will ferment. The fermentation time directly affects the quality and consistency of the finished product, and impacts production schedules as well, making the desired dough temperature a very important factor in bread baking.

The temperature of a directly fermented dough immediately after mixing is influenced by three factors: the temperature of the ingredients when added, the ambient (room) temperature, and the friction created by the mixer during mixing. (For a dough produced using the indirect fermentation method, all of these factors apply, along with the temperature of all pre-ferments added to the dough.) The sum of all the factors affecting the temperature of a dough is known as the total temperature factor (TTF).

The typical desired dough temperature for most yeast doughs is 75°F/24°C; however, an acceptable temperature for a finished dough may be from 65° to 85°F/18° to 29°C.

To produce a dough within this temperature range, the temperature of the water is critical because it is the easiest factor to control with precision. It is common to use ice water when it is necessary to cool a dough. Cooling a dough by this method is useful, for example, when a long mixing time is predicted, when fermentation needs to be slowed, or when the ambient temperature is high and cannot be controlled. To calculate the quantity of ice, British thermal units or Btu's are used. If a pre-ferment is added that has been stored under refrigeration, it may be necessary to use slightly warm water. See "Desired Dough Temperature" in Chapter 6, page 97, for instructions on calculating the DDT, TTF, and ice Btu factor.

Bulk fermentation

The first fermentation period, known as *bulk fermentation,* develops the flavor of the bread. Bulk fermentation is especially important when using the direct fermentation method; without the addition of pre-ferments, this is the only time to develop flavor through fermentation. Regulating the temperature may extend the time or rate of fermentation during this period. Keeping the dough at cooler temperatures will result in a longer fermentation period and thus more flavor development.

The alcohol produced during fermentation tenderizes the gluten strands, making them more elastic so they expand, allowing the bread to rise properly. More tender gluten strands produce a loaf with a tender and chewy crumb. Gluten is also further developed during this time through the process of folding.

The properly mixed dough is transferred to a lightly oiled bowl or tub (stiff or firm doughs can be placed on a lightly floured tabletop). Cover the dough with a moist cloth or plastic wrap to prevent a skin from forming on the surface and let it rest at the appropriate temperature until it has doubled in size. The times suggested in our formulas are based on fermentation at room temperature (75°F/24°C).

Retarding dough

Retarding dough means to purposely cool the dough, typically at temperatures of around 40°F/4°C, in order to slow the fermentation process. Retarding permits bakers to organize their work to meet production and employee schedules. It also allows the gluten to relax further, since the fermentation is prolonged. This results in dough that is easier to shape. A prolonged fermentation also gives dough time to develop a more pronounced sour flavor, so retarding dough can effectively enhance the quality of doughs made using direct fermentation.

The extended time at lower temperatures during bulk fermentation also means that you can properly ferment dough with a smaller amount of yeast. In fact, adding the full amount of yeast called for in a formula, usually allowed to ferment at around 75°F/24°C, would cause the dough to overferment if it were retarded and would produce a flatter loaf with a coarse grain and crumb.

Folding over the dough

Dough is folded over to redistribute the available food supply for the yeast, equalize the temperature of the dough, expel the built-up fermentation gas (carbon dioxide) and ethyl alcohol, and further develop the gluten in the dough. This may be done during bulk fermentation, bench rest, or final fermentation.

Doughs that have a typical hydration of around 67 percent or less should be treated gently during the folding process. It is more difficult for the gases resulting from the fermentation process to leaven the bread because of its density and the tightness of the gluten. For these reasons, it is important to fold carefully to preserve the already developed structure. A slack (wet) dough, such as that for ciabatta, requires more aggressive treatment when folding over. It is more difficult to develop the gluten in slack doughs; they require more gluten development to hold their shape and retain their inner structure.

In wet doughs, gluten is further developed during folding.

Fiber-enriched doughs

Whole wheat flour and flour made from grains such as rye, barley, buckwheat, rice, oats, millet, corn, and soy all contribute distinctive tastes and textures, as well as nutrition, to breads. They also make them heavier and denser. Typically, some measure of bread flour is included in formulas calling for whole wheat or nonwheat flours in order to develop a light, open crumb.

The bran in whole-grain flours interferes with the development of gluten. Bran cuts the strands of gluten, inhibiting their development and reducing their ability to trap the carbon dioxide produced by the yeast. The higher the percentage of whole wheat or nonwheat flour in a formula, the more pronounced its effect will be on the characteristics of the finished loaf.

One of the ways bread bakers aid the development of gluten in formulas containing these flours is known as *autolyse*. The flour and water are briefly combined first, just enough for a rough mixture to form. For more information, see “Autolyse” in Chapter 8, page 150.

Scaling and preshaping

Accurate scaling guarantees the correct weight of the dough pieces when dividing. However, scaling should be done quickly, so as not to over-age the dough. Scaling time should not exceed 15 to 20 minutes. Proper scaling will also allow for uniformity in proofing and baking times. Dough is usually divided either entirely by hand using a scale, or first divided into large portions by hand and then divided into smaller pieces with a dough divider.

After scaling, the dough is given a gentle first shaping or “preshaping.” Always lay the shaped pieces on the bench in the order they are shaped, in regular rows, so that you can start with the first piece when giving the dough the final shaping. The objective of preshaping is to get a smooth, tight skin that will help to trap the gases that develop during fermentation.

During scaling and preshaping, two things happen to the dough: First, because it is cut, the carbon dioxide trapped inside begins to escape, which causes the structure of the dough to begin to collapse; and second, the gluten strands are worked, which causes them to contract, making the dough tighter and tougher to work with.

Accurate scaling guarantees the correct weight of the dough pieces when dividing.

For large rounds (from 6 oz to 4½ lb/170 g to 2.04 kg)

1. Position the dough so one long edge is parallel to the edge of the work surface.
2. Fold the top edge of the dough down to the bottom edge. Using the heel of your hand, seal the two edges together. Rotate the dough 90 degrees.
3. Fold the top edge of the dough down to the bottom edge. Using the heel of your hand, seal the two edges together. Place seam on bottom.
4. Cup both hands around the dough and pull it toward you, giving it a one-quarter turn; continue until fully tightened.

For small rounds (from 2 to 6 oz/57 to 170 g)

1. Position the dough so one long edge is parallel to the edge of the work surface.
2. Fold the top edge of the dough down to the bottom edge. Using the heel of your hand, seal the two edges together. Rotate the dough 90 degrees.
3. Fold the top edge of the dough down to the bottom edge. Using the heel of your hand, seal the two edges together.
4. Place your hand over the ball of dough and curl your fingers so that the first knuckles of your fingers are touching the table. Your fingertips should almost be touching the palm of your hand, and your thumb should be out to the side and touching the table; the heel of your hand should also be touching the table. The dough should be sitting near the top of your palm, near your thumb, forefinger, and middle finger.
5. Using your palm, push the dough away from you in an arc to the right. Using your fingertips, pull the dough toward you in an arc to the left. Repeat this circular motion, applying gentle pressure while rounding the dough, to create a tight, smooth ball.

For large oblongs (from 12 oz to 1¾ lb/340 to 794 g)

1. Position the dough so one long edge is parallel to the edge of the work surface.
2. Stretch the dough into a rectangle 10 in/25 cm long. Fold the left and right edges of the rectangle into the center of the dough, pressing the dough lightly with your fingertips.
3. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips. Fold the top of the dough down to the bottom edge. Seal the two edges together, using the heel of your hand.
4. Roll the dough into an even cylinder 6 in/15 cm long.

For small oblongs (from 3 to 6 oz/85 to 170 g)

1. Turn the dough so one long edge is parallel to the edge of the work surface.
2. Stretch the dough into a rectangle 3 in/8 cm long. Fold the left and right edges of the rectangle into the center of the dough, pressing the dough lightly with your fingertips.
3. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips. Fold the top of the dough down to the bottom edge. Seal the two edges together, using the heel of your hand.
4. Roll the dough into an even cylinder 3 in/8 cm long.

Resting or intermediate fermentation

After bulk fermentation, dividing, and preshaping, the dough is allowed to ferment again. This period has various names: *bench rest, table rest,* or *secondary or intermediate fermentation.* This stage allows the dough to relax and recover from the dividing and preshaping process in preparation for final shaping: It allows the gluten to relax, so the dough will become somewhat slack and easier to manipulate into its final shape, and it allows the yeast cells to recover, rebuilding carbon dioxide and therefore the internal structure of the dough. Normally, this stage lasts from 10 to 20 minutes. It is important to keep the loaves covered with plastic wrap or a moist linen cloth to prevent the formation of a skin or dry crust.

Final shaping

After the secondary fermentation, the dough is given its final shape. Following are two of the most basic and common shaping techniques: a boule and a bâtard. Throughout this and the advanced breads and rolls chapter, various formulas will utilize and illustrate common shapes used for lean and enriched yeast doughs. Brush the dough with egg wash or water, if using, after it is shaped so that the dough can be evenly coated without affecting it after its final rise (see also “Washes,” page 113). Any simple garnishes such as seeds or coarse salt can be applied once the surface is brushed with egg wash or water; the wash will hold them in place.

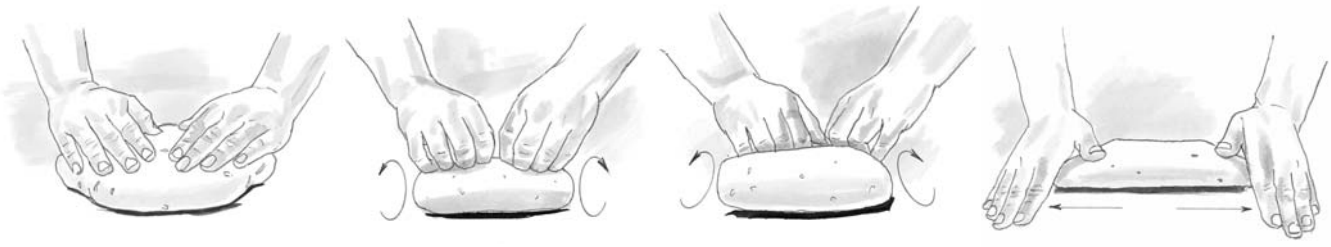
Shaping a boule

FROM LEFT TO RIGHT: Preshape the dough into a round and allow to rest uncovered until relaxed, 15 to 20 minutes.

Cup both hands around the dough. Using your thumbs, push the dough away from you in an arc to the right.

Using the edges of your palms as a guide, pull the dough toward you in an arc to the left.

Shaping a bâtard



FROM LEFT TO RIGHT: Gently flatten the preshaped oblong.

Fold the top of the dough to the center.

Press the seam with your fingertips to tighten the dough.

Roll the ends of the cylinder with the palms of your hands to taper.

French regional shapes

Final fermentation (proofing)

After shaping, the dough undergoes one more fermentation. Some doughs, such as the lean dough used to prepare boules, can simply be placed on a worktable or a board that has been dusted with flour or cornmeal. Other doughs or shapes may be placed on a linen cloth (couche), on sheet pans, in loaf pans, or in baskets (bannetons), wooden molds, or other molds. During this final rise, it is again important to ensure that a skin does not form on the surface of the dough. If you are not using a proof box for this final proof, the dough should be covered. Using the temperature and humidity controls in a proof box will prevent a skin from forming without the dough being covered.

A temperature- and humidity-controlled proof box can provide the necessary relative humidity of approximately 80 percent, so the surface of the dough does not dry out. (Conversely, if the humidity is too high, the loaves will become too sticky for proper crust formation.) The ambient temperature for the final proof should be between 80° and 90°F/27° and 32°C for maximum yeast activity; the ideal temperature is 85°F/29°C. If the temperature during this final proof is too high, insufficient yeast activity will result in poor grain and loss of flavor, and the shelf life of the bread will be shorter. A temperature that is too low will result in a longer proofing time.

Small items such as rolls must be allowed to fully ferment during final proofing because they bake quickly, leaving less time for fermentation in the oven. Large items such as loaves should be proofed to a slightly less developed state than small items, as they require longer baking times and will continue to ferment (or proof) for a longer time in the oven.

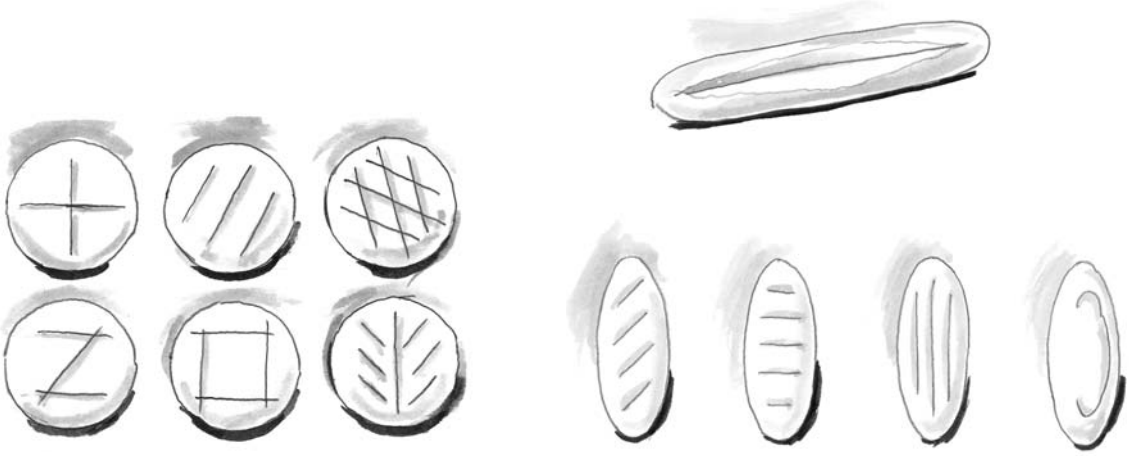
Finishing techniques

Scoring and washes, when used, enhance the overall beauty of the finished loaf or roll. Scoring allows for full expansion, as well as controlling the final expansion, so the loaf does not become misshapen. Washes control the crust development during baking.

Scoring

Many breads are scored with a razor, sharp knife, or scissors before they are loaded into the oven. Scoring helps develop a good-quality loaf with an even appearance and crumb. It allows the bread to release steam and continue to expand until the structure is set. By scoring the dough, the baker can control the final shape of the bread by determining where the product expands during baking. Baking an unscored bread results in an unevenly shaped loaf. The structure forms too early to permit full expansion and, consequently, the full development of the internal structure of the loaf.

Some breads, such as baguettes, are scored with traditional patterns that are used as a way to label the breads, making it easy for both clients and staff to identify them.



FROM LEFT TO RIGHT: **Scoring patterns for round loaves: Patterns are evenly distributed over the entire surface. Scoring patterns for oblong loaves: Notice they are at the highest points on the loaf.**

Washes

Water is often brushed or sprayed on shaped breads before baking to ensure a crisp crust and to promote the gelatinization of the starch on the surface of the bread. Beaten eggs as a wash create a glossy, shiny crust and seal in the moisture in the bread. Typically, whole eggs are used. A wash of only yolks would burn more quickly, especially at the higher temperatures required for baking most breads.

Milk or cream is often used for breads baked at lower temperatures. Because the lactose in milk (or cream) caramelizes at 170°F/77°C, it gives breads a darker crust than water. In addition, the bread will bake a little faster because the milk fat acts to conduct heat.

Baking

After it is placed in the oven, the dough continues to rise for a brief period. This is known as *oven spring,* and it continues during the first few minutes of baking, until the dough reaches an internal temperature of 140°F/60°C, at which point the yeast dies.

Most breads, except those that have been brushed with egg wash, are steamed at the outset of the baking process. The steam gives a final boost of volume, allows for maximum expansion of the dough, and adds sheen and color to the crust. Steam is typically used in baking lean doughs. It helps develop texture and keeps the surface of the dough soft so that it can expand during the beginning stages of baking. It also acts to gelatinize the starches on the surface of the dough to facilitate structure formation.

After the steam evaporates or is vented from the oven, the browning of the crust takes place. The moisture from the steam still remaining on the dough conducts heat rapidly and the surface of the bread sets quickly, thus ending the expansion of the loaf and beginning the development of a crisp, brown crust.

The length of time bread bakes is determined by a number of factors, including the type of bread, the weight of the loaf, the type of oven (hearth, rotating, convection, etc.), oven temperature, and oven humidity.

Lean doughs should be baked in a hot oven (440° to 500°F/227° to 260°C) with steam; enriched doughs should be baked at a slightly lower temperature (350° to 400°F/177° to 204°C). Beyond this, other factors that may affect the specific baking temperature are the type of oven, the size and shape of the product, and the desired crust and color development.

During baking, carbon dioxide and steam are released in the bread and expand to further leaven the bread. The gluten strands (and eggs, if used) stretch and coagulate to develop the internal structure of the bread. The starches gelatinize to form the crust, and flavor and color develop as sugar caramelizes.

Once the loaves are baked, it is important that they be cooled properly in order to preserve the crust and structure of the bread, as well as to allow for final development of flavor. All breads, but especially those made with lean doughs, should be cooled on wire racks to maintain air circulation around the entire loaf. This will prevent moisture from collecting on the bread as it cools.

Enriched doughs

The term *enriching* indicates that ingredients containing fat or sugar are added to the dough. Many different ingredients, such as milk, oil, or butter, may be used to enrich a dough. Often, enriched breads also contain a measure of sugar that as been introduced through either the addition of ingredients that contain some type of sugar (e.g., lactose, through the use of milk), or simply by the addition of a granulated or syrup form of sugar.

The addition of fat or sugar dramatically affects the finished product. The additional fat acts to shorten the gluten strands and increase the elasticity of the gluten in a dough. This will have a tenderizing effect on the finished product, yielding a more tender crumb and the development of a soft crust. Additional sugars promote quick fermentation and browning of the crust during baking.

Lean dough

MAKES 8 LB 7¾ OZ/3.85 KG DOUGH. DDT: 78°F/26°C

Bread flour	100%	5 lb	2.27 kg
Instant dry yeast	0.83%	⅔ oz	19 g
Water	66.9%	53½ fl oz	1.61 L
Salt	2.2%	1¾ oz	50 g

1 Combine the flour and yeast. Add the water and salt to the mixer and then add the flour and the yeast. Mix on low speed with the dough hook attachment for 2 minutes and mix on medium speed for 3 minutes. The dough should be smooth and elastic. Mix to the improved stage of gluten development.

2 Bulk ferment the dough until nearly doubled, about 30 minutes. Fold gently. Ferment for another 30 minutes and fold again. Ferment for another 15 minutes.

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

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

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

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

Bagels

MAKES 8 LB ½ OZ/3.64 KG DOUGH. DDT: 78°F/26°C

High-gluten flour	100%	5 lb	2.27 kg
Instant dry yeast	0.4%	⅓ oz	9 g
Water	57.5%	46 fl oz	1.38 L
Salt	2.1%	1¾ oz	50 g
Diastatic malt syrup	0.94%	¾ oz	21 g
Malt syrup (per 5 gal/18.75 L water), for boiling		5 oz	142 g
Garnishes such as sesame seeds, poppy seeds, salt		as needed	as needed

1 Combine the flour and yeast. Add the water, salt, and diastatic malt syrup to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 5 minutes. The dough should be stiff, dry, and elastic and have strong gluten development.

2 Divide the dough into 5-oz/142-g pieces.

3 Preshape each piece of dough into a small 5-in/13-cm oblong (for preshaping instructions, see page 110). Let the dough rest, covered, for 10 minutes.

4 Start with the first piece of dough that you shaped and work sequentially. Roll each piece of dough under your palms into a cylinder 10 in/25 cm long; begin rolling with your palms near the center of the dough and use even pressure from the center to the ends. Taper the ends very slightly.

5 Shape each cylinder into a ring, overlapping the ends by 1 in/3 cm; make sure the seams are aligned with the rest of the ring. Place two or three of your fingers in the center of the bagel and roll the overlapped ends gently against the worktable until they are the same diameter as the rest of the bagel. (As you work, it may become necessary to moisten your hands or the table to prevent sticking.) After rolling, the bagels should be 4 in/10 cm wide with a hole 2 in/5 cm in diameter.

6 Place the bagels seam side down on cornmeal-dusted sheet pans. Cover the bagels and proof under refrigeration (retard) for 8 hours or overnight.

7 Let the proofed bagels rest at room temperature, covered, for 15 minutes. Meanwhile, bring 5 gal/18.75 L of water to a boil and add the malt syrup.

8 Line sheet pans with silicon-coated parchment paper. Add a few bagels at a time to the water, stir once or twice to keep them from sticking together, and simmer until they rise to the top, about 20 seconds. Place the bagels on a screen to remove excess water. Add garnish as desired.

9 Transfer the bagels to a peel and load them into a 500°F/260°C deck oven. Bake until golden brown but still soft and slightly springy to the touch, 10 to 15 minutes. Cool completely on racks.

bagels

To make bagels successfully, it's important to keep a few guidelines in mind. It is important to use high-gluten flour and malt syrup in the dough. The high-gluten flour helps to develop the characteristic chewiness of a bagel. And the malt syrup contains enzymes that help break down the carbohydrates in the flour into sugars, further developing the texture and flavor of the bagels.

Bagel dough is very tight and dry. The dough should be mixed until it is very smooth. This extensive mixing will make the dough slightly tacky even though it contains little water. Unlike most other breads, bagels should be shaped immediately after the dough is mixed. Then the bagels should be retarded overnight to develop flavor and relax the gluten. Following retarding, they are poached in a mixture of water and malt. The poaching activates the yeast, and the water that remains on the bagels results in the sheen on the surface of the bagels; but most important, since the starches are gelatinized before going into the oven, they seal in moisture, creating a chewy bagel. The bagels must first dry slightly before they are put directly on the deck, or they will stick.

LEFT: Bagel dough has a consistency referred to as *bucky* because of its very stiff consistency.
MIDDLE: Roll the bagel under the palm of your hand to seal the seam and even out its diameter.
RIGHT: Poach the bagels in a malt water bath just until they float to the surface.

Whole wheat lean dough

MAKES 8 LB 10½ OZ/3.93 KG DOUGH. DDT: 78°F/26°C

Bread flour	60%	3 lb	1.36 kg
Whole wheat flour	40%	2 lb	907 g
Instant dry yeast	0.75%	⅔ oz	19 g
Water	70%	56 fl oz	1.68 L
Salt	2.2%	1¾ oz	50 g

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

2 Bulk ferment the dough until nearly doubled, about 30 minutes. Fold gently and ferment for another 30 minutes. Fold again. Ferment for another 15 minutes.

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

4 To shape as a bâtard: Position the dough lengthwise, parallel to the edge of the work surface with the seam side up, and press lightly with your fingertips. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten.

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

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

7 Score the bâtard straight down the center.

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

Durum rosemary dough

MAKES 15 LB 9 OZ/7.06 KG DOUGH. DDT: 78°F/26°C

Durum flour	74.1%	6 lb 10 oz	3.01 kg
Bread flour	25.9%	2 lb 5 oz	1.05 kg
Instant dry yeast	0.45%	¾ oz	21 g
Water	70%	100 fl oz	3 L
Salt	2.1%	3 oz	85 g
Rosemary, coarsely chopped	0.7%	1 oz	28 g

1 Combine the flours and yeast. Add the water, salt, and rosemary to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 3 minutes and on medium speed for 3 minutes. The dough should be slightly stiff with sufficient gluten development. Mix to the improved stage of gluten development.

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

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

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

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

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

Knot rolls using soft roll dough

MAKES 9 LB 4 OZ/4.20 KG DOUGH. DDT: 78°F/26°C

Bread flour	100%	5 lb	2.27 kg
Instant dry yeast	1.66%	1¼ oz	35 g
Milk, room temperature	50%	40 fl oz	1.20 L
Butter, soft	10%	8 oz	227 g
Eggs (55°F/13°C)	10%	8 oz	227 g
Sugar	10%	8 oz	227 g
Salt	2.5%	2 oz	57 g
Egg wash (page 892)		as needed	as needed

1 Combine the flour and yeast. Add the milk, butter, eggs, sugar, and salt to the mixer and then add the flour and yeast. Mix on low speed for 4 minutes with the dough hook attachment and on medium speed for 3 minutes. The dough should be firm but elastic. Mix to the improved stage of gluten development.

2 Bulk ferment the dough until nearly doubled, about 1 hour. Fold gently.

3 Divide the dough into pieces 4 lb/ 1.8 kg each. Preshape the dough into large rounds (for preshaping instructions, see page 109). Line sheet pans with parchment paper. Let the dough rest, covered, until relaxed, 15 to 20 minutes.

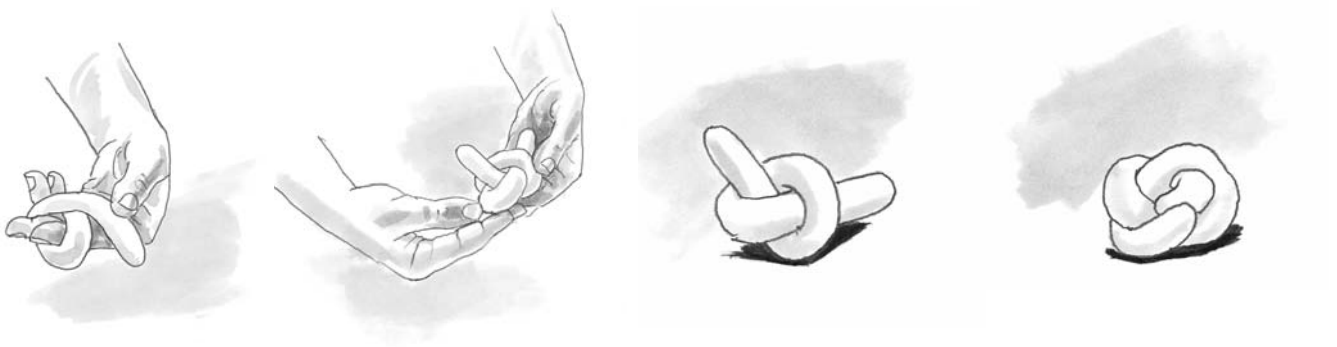
4 Divide the dough into 36 pieces (1¾ oz/50 g each) by hand or using a dough divider. Starting with the first piece of dough that you shaped and working sequentially, flatten a piece of dough slightly with your fingertips. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten the dough. Fold the dough in half again and use the heel of your hand to seal the two edges together, keeping the seam straight. Roll the dough under your palms into an even rope 6 in/15 cm long.

5 Lay 2 in/5 cm of one end of the rope over your forefinger and middle finger. There should be ½ in/1 cm of dough hanging over your fingers; bring it under your fingers and cross it over the dough sitting on your fingers.

6 Bring the longer piece of dough underneath the dough sitting on your fingers. This will be the base of the knot; there should be ½ in/1 cm of dough to the left of the knot and 2 in/5 cm of dough to the right of it. There should be one side of the roll where the knot is formed and one side of the roll that is smooth. Bring the longer piece of dough around the smooth side of the dough, and pinch the ends of the dough together. Turn the roll so that the pinched ends are on the bottom.

7 Arrange the rolls in rows on the lined sheet pans, spacing them 4 in/10 cm apart. Brush the rolls with egg wash. Proof, covered, until the dough springs back slowly to the touch but does not collapse, 30 to 50 minutes.

8 Lightly brush the rolls again with egg wash. Bake in a 375°F/191°C convection oven until the rolls are golden brown and shiny, about 15 minutes. Cool completely on the pans.



FROM LEFT TO RIGHT: Cross the dough over your hand.
Bring the longer piece of dough underneath the piece of dough sitting on your fingers.
Continue the knot.
Pinch the two ends together.

Parker House rolls

MAKES 3 DOZEN ROLLS (1¾ OZ/50 G EACH). DDT: 75°F/24°C

Soft roll dough (opposite)	4 lb	1.81 kg
Clarified butter, for brushing	as needed	as needed

1 Follow the method for Knot Rolls (opposite) through step 2. Preshape the dough into a round (for preshaping instructions, see page 109). Line sheet pans with parchment paper. Let the dough rest, covered, until relaxed, 15 to 20 minutes.

2 Divide the dough into 36 pieces (1¾ oz/50 g each) by hand or using a dough divider.

3 Reround each piece and let them rest, covered, for 10 minutes.

4 Roll each piece of dough into an oval 5 in/13 cm long and 2½ in/6 cm wide; the dough will be about ⅛ in/3 mm thick. Brush any excess flour off the dough as you work. Fold each oval in half so that they are now 2½ in/6 cm wide, 2½ in/6 cm long, and ¼ in/6 mm thick. Turn the dough so that the folded edge is facing toward you. Roll the bottom 2 in/5 cm of the dough until it is ⅛ in/3 mm thick. The remaining ½ in/1 cm of dough at the top should still be ¼ in/6 mm thick.

Shaping Parker House rolls

5 Arrange the rolls in rows on the lined sheet pans, spacing them 4 in/10 cm apart. Brush with clarified butter. Proof until the dough springs back slowly to the touch, 30 to 40 minutes.

6 Bake in a 375°F/191°C convection oven until the rolls are golden brown and shiny, about 20 minutes. Brush the rolls with clarified butter as soon as they are removed from the oven. Cool completely on the pans.

Grissini (opposite) and Lavash (page 142)

Grissini

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

High-gluten flour	100%	5 lb	2.27 kg
Instant dry yeast	1.66%	1¼ oz	35 g
Milk, room temperature	45%	36 fl oz	1.08 L
Butter, soft	15%	12 oz	340 g
Olive oil	3.75%	3 oz	85 g
Salt	2.5%	2 oz	57 g
Malt syrup	1.9%	1½ oz	43 g
Olive oil, for brushing		as needed	as needed
Optional garnishes: coarse salt, poppy seeds, sesame seeds		as needed	as needed

1 Combine the flour and yeast. Add the milk, butter, olive oil, salt, and malt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 3 minutes. The dough should be very stiff. Let the dough rest for 15 minutes.

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

3 Line sheet pans with parchment paper.

4 Using a rolling pin, roll the dough into rectangles 12 in/30 cm long and the width of the rollers on a pasta machine.

5 Starting with the rollers at the widest opening and resetting them to the next setting after each complete pass, roll the dough through the pasta machine until it is the desired thickness, about ¼ in/6 mm or setting number 5 on most pasta machines. Trim one short edge to even it; this is the edge that should be fed into the pasta machine.

6 Using the fettuccine cutter attachment or by hand, cut the dough lengthwise into strips ¼ in/6 mm wide. Lay the strips crosswise on the parchment-lined sheet pans, making sure they do not touch. Brush the strips lightly with olive oil.

Feeding grissini through a pasta machine

7 Proof, covered, until the dough rises slightly, about 30 minutes. Brush the grissini lightly with olive oil and scatter with salt and any optional garnishes.

8 Bake in a 360°F/182°C convection oven until the grissini are golden brown, 8 to 12 minutes. Cool completely on racks.

NOTE In step 1, just after mixing you may add inclusions such as cheese, sun-dried tomatoes, herbs, or roasted garlic. Just make sure any inclusions are finely chopped.

Pain de mie

MAKES 37 LB 13 OZ/17.15 KG DOUGH. DDT: 78°F/26°C

Bread flour	100%	20 lb 15 oz	9.50 kg
Instant dry yeast	0.9%	3 oz	85 g
Salt	2.3%	8 oz	227 g
Sugar	4.1%	13¾ oz	390 g
Olive oil	8.8%	1 lb 13 oz	822 g
Water	64.9%	13 lb 10 oz	6.18 kg

1 Combine the flour and yeast. Add the salt, sugar, oil, and water to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 4 minutes. The dough should be a little sticky, but with fairly good gluten development. Mix to the intense stage of gluten development.

2 Bulk ferment the dough until nearly doubled, about 45 minutes.

3 Divide the dough into pieces 2 lb 8 oz/1.13 kg each.

4 Preshape the dough into large oblongs 10 in/25 cm long (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)

5 Position the dough lengthwise, parallel to the edge of the work surface with the seam side up, and press lightly with your fingertips. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten.

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

7 Proof, uncovered, until the pans are three-quarters full and the dough springs back slowly to the touch but does not collapse, 45 to 60 minutes.

8 Place the oiled lids on the pans and bake in a 375°F/191°C oven for 40 minutes, or to an internal temperature of 205°F/96°C. Remove from the pans immediately and cool on racks.

Wheat Pullman loaves

MAKES 14 LB 14 OZ/6.75 KG DOUGH. DDT: 78°F/26°C

Bread flour	60%	4 lb 14¾ oz	2.23 kg
Whole wheat flour	40%	3 lb 4½ oz	1. 49 kg
Instant dry yeast	0.7%	1 oz	28 g
Salt	2.2%	3 oz	85 g
Sugar	4%	5¼ oz	149 g
Canola oil	6.7%	9 oz	255 g
Milk, room temperature	69.3%	5 lb 11 oz	2.58 kg

1 Combine the flours and yeast. Add the salt, sugar, oil, and milk to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 4 minutes. The dough should be a little sticky, but with fairly good gluten development. Mix to the intense stage of gluten development.

2 Bulk ferment the dough until nearly doubled, about 45 minutes.

3 Divide the dough into pieces 2 lb 8 oz/1.13 kg each.

4 Preshape the dough into 10-in/25-cm large oblongs (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)

5 Position the dough lengthwise, parallel to the edge of the work surface with the seam side up, and press lightly with your fingertips. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten.

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

7 Proof, uncovered, until the pans are three-quarters full and the dough springs back slowly to the touch but does not collapse, 45 to 60 minutes.

8 Place the oiled lids on the pans and bake in a 375°F/191°C convection oven for 35 minutes, or to an internal temperature of 205°F/96°C. Remove from the pans immediately and cool on racks.

Rye dough with caraway seeds for Pullman loaves

MAKES 25 LB 11 OZ/11.65 KG DOUGH. DDT: 78°F/26°C

Bread flour	76.25%	11 lb 7 oz	5.19 kg
Medium rye flour	23.75%	3 lb 9 oz	1.62 kg
Instant dry yeast	0.6%	1½ oz	43 g
Water	61.25%	147 fl oz	4.41 L
Sugar	1.9%	4½ oz	128 g
Salt	2.2%	5¼ oz	149 g
Vegetable oil	1.9%	4½ oz	128 g
Molasses, unsulfured	1.9%	4½ oz	128 g
Caraway seeds	1.25%	3 oz	85 g

1 Combine the flours and yeast. Add the water, sugar, salt, oil, and molasses to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 3 minutes. The dough should be firm but elastic. Blend in the caraway seeds. Mix to the intense stage of gluten development.

2 Bulk ferment the dough until nearly doubled, about 45 minutes.

3 Grease eight 3-lb/1.36-kg Pullman loaf pans and lids generously. Divide the dough into pieces 2 lb 8 oz/1.34 kg each. Preshape the dough into large rounds (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)

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

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

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

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

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

9 Place the oiled lids on the pans and bake at 400° to 375°F/204° to 191°C for 35 minutes, or to an internal temperature of 205°F/96°C. Remove from the pans immediately and cool on wire racks.

Sunflower seed rolls

MAKES 14 LB 11 OZ/6.66 KG DOUGH. DDT: 79°F/26°C

Wheat bran	11.5%	12 oz	340 g
Milk, room temperature	86.5%	90 fl oz	2.70 L
Bread flour	100%	6 lb 8 oz	2.95 kg
Instant dry yeast	0.65%	⅔ oz	19 g
Honey	7.7%	8 oz	227 g
Sunflower oil	5.75%	6 oz	170 g
Salt	2.4%	2½ oz	71 g
Sunflower seeds, lightly toasted, plus more for garnish	11.5%	12 oz	340 g

1 Soak the wheat bran in the milk overnight. Combine the flour and yeast. Add the bran-milk mixture, the honey, oil, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 4½ minutes. The dough should be slightly soft but with full gluten development. It will tighten up during bulk fermentation. Add the sunflower seeds and mix on low speed for 2 minutes. Mix to the intense stage of gluten development.

2 Bulk ferment the dough until nearly doubled, about 1 hour.

3 Divide the dough into pieces 4 lb/1.81 kg each. Preshape the dough into large rounds (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes.

4 Divide each piece of dough into 36 pieces (1⅓ oz/38 g each) by hand or using a dough divider.

5 Press each piece lightly with your fingertips to flatten. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten the dough. Rotate the dough 90 degrees, fold the dough in half, and use the heel of your hand to seal the two edges together. Cup the roll in your hand and reround the dough, applying gentle pressure to create a tight, smooth ball. Place on parchment-lined sheet pans and egg wash.

6 Proof, covered, until the dough springs halfway back slowly to the touch but does not collapse, about 40 to 50 minutes.

7 Egg wash and sprinkle with seeds.

8 Presteam a 410°F/210°C convection oven. Bake until the rolls have a golden brown crust and sound hollow when thumped on the bottom, about 15 minutes. Cool completely on racks.

VARIATION Substitute lightly toasted pumpkin seeds for the sunflower seeds.

CLOCKWISE FROM TOP LEFT: Corn Rolls (page 206), Rye Dough with Caraway Seeds for Pullman Loaves (page 126), Cheddar and Onion Rye Dough (page 133), and Sunflower Seed Rolls (opposite)

Beer bread dough

MAKES 15 LB 10½ OZ/7.10 KG DOUGH. DDT: 75°F/24°C

Bread flour	85.6%	6 lb 9¾ oz	3 kg
Medium rye flour	14.4%	1 lb 1¾ oz	503 g
Instant dry yeast	0.4%	½ oz	14 g
Dark beer	57.1%	70½ fl oz	2.12 L
Pâte fermentée (see page 148)	28.5%	2 lb 3¼ oz	1 kg
Cottage cheese	14.4%	1 lb 1¾ oz	503 g
Salt	2.4%	3 oz	85 g

1 Combine the flours and yeast. Add the beer, pâte fermentée, cottage cheese, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 3 minutes and on medium speed for 3 minutes. The dough should be sticky but have sufficient gluten development. Mix to the improved stage of gluten development.

2 Bulk ferment the dough until nearly doubled, about 45 minutes. Fold gently. Ferment for another 15 minutes.

3 Divide into pieces 1 lb/454 g each. Preshape the dough into large rounds (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes.

4 Divide each piece of dough into 36 pieces (1⅓ oz/38 g each) by hand or using a dough divider.

5 Press each piece lightly with your fingertips to flatten. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten the dough. Fold the dough in half again and use the heel of your hand to seal the two edges together, keeping the seam straight.

6 Roll a piece of dough under your palms into a cylinder 3 in/8 cm long, keeping the pressure even and holding your hands flat and parallel to the work surface to create a smooth, even roll. Using your palms, gently taper the ends of the dough by increasing the pressure as you roll outward to the ends of the dough. Mist the rolls with water.

7 Proof, covered, on parchment-lined sheet pans until the dough springs back slowly to the touch but does not collapse, about 30 minutes.

8 Score the rolls with a straight cut down the center.

9 Presteam a 460°F/238°C deck oven. Load the rolls into the oven and steam for 3 seconds. Bake until the rolls have a golden brown crust and sound hollow when thumped on the bottom, about 15 minutes. Vent the rolls when they start to brown. Cool completely on racks.

Belgian apple cider bread

MAKES 18 LB 15½ OZ/8.60 KG DOUGH. DDT: 75°F/24°C

DOUGH			
Bread flour	66.7%	4 lb 6½ oz	2 kg
Medium rye flour	33.3%	2 lb 3¼ oz	9.99 kg
Instant dry yeast	0.33%	⅓ oz	9 g
Apple cider	66.7%	70½ fl oz	2.12 L
Sour cream	33.3%	2 lb 3¼ oz	9.99 kg
Pâte fermentée (see page 148)	83.5%	5 lb 8¼ oz	2.50 kg
Salt	2.25%	2⅓ oz	66 g
APPLE CIDER PASTE			
Medium rye flour		14 oz	397 g
Instant dry yeast		1 oz	28 g
Apple cider		1 lb 8¾ oz	702 g
Salt		½ oz	14 g
White rye flour, for dusting		as needed	as needed

1 To make the dough, combine the flours and yeast. Add the cider, sour cream, pâte fermentée, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 3 minutes. The dough should be sticky but have sufficient gluten development. Mix to the improved stage of gluten development.

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

3 Divide into pieces 1 lb 8 oz/680 g each. Preshape the dough into large rounds (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)

4 To prepare the apple cider paste, combine the flour and yeast. Blend the apple cider with the salt and then mix into the flour-yeast mixture and combine thoroughly.

5 Dust the work surface and rolling pin with rye flour. Turn the dough seam side down. Work the rolling pin from one edge of the dough outward, creating a flap ¼ in/6 mm thick. Repeat this process to create three evenly spaced flaps around the edges of the dough to form a triangle.

6 Turn the dough seam side up. Fold each flap toward the center of the dough to make a triangle, and flip the dough over again, with the flaps on the bottom. Spread 3¼ oz/92 g apple cider paste over the top of the loaf. Dust the top of the loaf with white rye flour.

7 Proof, uncovered, on parchment-lined sheet pans until the dough springs back slowly to the touch, 45 to 60 minutes.

8 Presteam a 450°F/232°C deck oven. Load the bread into the oven and steam for 3 seconds. Bake until the crust is golden brown and the bread sounds hollow when thumped on the bottom, 35 to 40 minutes. Vent during the final 10 minutes. Cool completely on racks.

Prosciutto and provolone bread

MAKES 18 LB 15½ OZ/8.60 KG DOUGH. DDT: 75°F/24°C

Bread flour	100%	10 lb	4.54 kg
Instant dry yeast	1%	1½ oz	43 g
Salt	2.2%	3½ oz	99 g
Water	58.1%	5lb, 3oz	2.6 kg
Olive oil	10.1%	1 lb	454 g
Butter, soft	2.7%	4⅓ oz	122 g
Prosciutto, medium dice	32%	3 lb 4 oz	1.45 kg
Provolone, medium dice	2%	3¼ oz	92 g

1 Combine the flour and yeast. Add the salt, water, olive oil, and butter to the mixer; then add the flour and the yeast. Mix on low speed with the dough hook attachment for 4 minutes and on high speed for 3 minutes. Add the prosciutto and cheese and mix on low speed for 2 minutes. Mix to the improved stage of gluten development.

2 Bulk ferment the dough until nearly doubled, about 45 minutes. Fold gently. Ferment for another 15 minutes.

3 Divide the dough into pieces 1 lb 4 oz/567 g each. Preshape the dough into large rounds (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 10 to 15 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)

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

5 Proof until the dough springs back halfway slowly to the touch, 45 minutes. Flip the dough seam side down onto a peel and score with a straight cut down the center.

6 Bake in a 450°F/232°C deck oven until the crust is golden brown and the bread sounds hollow when thumped on the bottom, 25 to 30 minutes. Vent during the final 10 minutes. Cool completely on racks.

Cheddar and onion rye dough

MAKES 11 LB/4.99 KG DOUGH. DDT: 78°F/26°C

Bread flour	76.25%	3 lb 13 oz	1.73 kg
Medium rye flour	23.75%	1 lb 3 oz	539 g
Instant dry yeast	0.63%	½ oz	14 g
Water	71.25%	57 fl oz	1.71 L
Salt	2.5%	2 oz	57 g
Sugar	1.9%	1½ oz	43 g
Molasses, unsulfured	1.9%	1½ oz	43 g
Vegetable oil	1.9%	1½ oz	43 g
Cheddar cheese, grated	20%	1 lb	454 g
Yellow onions, medium dice	20%	1 lb	454 g

1 Combine the flours and yeast. Add the water, salt, sugar, molasses, and oil to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 4 minutes. Add the cheese and onions and mix on low speed for an additional 2 minutes. The dough should be tight with strong gluten development. Mix to the intense stage of gluten development.

2 Bulk ferment the dough until nearly doubled, 45 minutes. Fold gently.

3 Divide the dough into pieces 4 lb/1.81 kg each. Preshape the dough into large rounds (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes.

4 Divide each piece of dough into 36 pieces (1¾ oz/50 g each) by hand or using a dough divider.

5 Press each piece lightly with your fingertips to flatten. Fold the top edge of the dough down to the center of the dough, pressing lightly with your fingertips to tighten the dough. Rotate the dough 90 degrees, fold the dough in half, and use the heel of your hand to seal the two edges together. Cup the roll in your hand and reround the dough, applying gentle pressure to create a tight, smooth ball. Place on parchment-lined sheet pans.

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

7 Score the rolls with a straight cut down the center.

8 Presteam a 425°F/218°C deck oven. Load the rolls into the oven and steam for 3 seconds. Bake until the rolls have a golden brown crust and sound hollow when thumped on the bottom, about 15 minutes. Vent during the last 3 minutes. Cool completely on racks.

Challah (three-braid)

MAKES 9 LB 6½ OZ/4.27 KG DOUGH. DDT: 78°F/26°C

Bread flour	100%	5 lb 4 oz	2.38 kg
Instant dry yeast	1.2%	1 oz	28 g
Water	38%	32 fl oz	960 mL
Egg yolks	19%	1 lb	454 g
Vegetable oil	9.5%	8 oz	227 g
Sugar	9.5%	8 oz	227 g
Salt	1.8%	1½ oz	43 g
White rye (or bread) flour, for dusting		as needed	as needed
Egg wash (page 892), made with yolks only		as needed	as needed

1 Combine the flour and yeast. Add the water, egg yolks, oil, sugar, and salt to the mixer and then add flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 4 minutes. The dough should be slightly firm and smooth, not sticky. Mix to the intense stage of gluten development.

2 Bulk ferment the dough until nearly doubled, about 1 hour. Fold gently.

3 Divide the dough into 5½-oz/156-g pieces. Preshape the dough into small oblongs (for preshaping instructions, see page 110). Allow the dough to rest, covered, until relaxed, 10 to 15 minutes. Fold the dough over in thirds, then shape.

4 Start with the first piece of dough that you shaped and work sequentially. Starting at the center of the dough, roll each piece outward, applying gentle pressure with your palms. Apply very little pressure at the center of the dough, but increase the pressure as you roll toward the ends of the dough. Roll each piece of dough into an evenly tapered strand 12 in/30 cm long. It is imperative that all of the strands be the same length. If they are not, the finished braid will be uneven.

5 Dust the top of the strands very lightly with white rye flour. (This will keep the dough dry as you braid and help maintain the overall definition of the braid.) Lay three strands of dough vertically parallel to each other. Begin braiding in the center of the strands. Place the left strand over the center strand, then place the right strand over the center strand. Repeat this process until you reach the end of the dough. Pinch the ends together tightly. Turn the braid around and flip it over so that the unbraided strands are facing you. Starting again from the left, repeat the braiding process until you reach the end of the dough. Pinch the ends together tightly. Place on parchment-lined sheet pans.

6 Brush the dough lightly with the egg wash. Allow the dough to proof, covered, until the dough springs back halfway slowly to the touch but does not collapse, about 1 hour. There should be a small indentation left in the dough. Egg wash the dough, very gently, before baking.

7 Bake in a 350°F/177°C convection oven until the braids are dark golden brown and shiny, 18 to 22 minutes. Cool completely on racks.

VARIATION **CHALLAH (SIX-BRAID)**

1 Work through step 2 of the main method. Divide the dough into 2¾-oz/78-g pieces. Preshape the dough into small oblong pieces (for preshaping instructions, see page 110). Allow the dough to rest, covered, until relaxed, 15 to 20 minutes.

2 Start with the first piece of dough that you shaped and work sequentially. Starting at the center of the dough, roll each piece outward, applying gentle pressure with your palms. Apply very little pressure at the center of the dough, but increase the pressure as you roll toward the ends of the dough. Roll each piece of dough into an evenly tapered strand 12 in/30 cm long. It is imperative that all of the strands be the same length. If they are not, the finished braid will be uneven.

3 Dust the top of the strands very lightly with white rye flour. This will keep the dough dry as you braid and help maintain the overall definition of the braid.

4 Lay six strands of dough, separating them through the center, so they are grouped into three and three.

5 Move the strand of dough on the far left (1) under the center strand on the right (4).

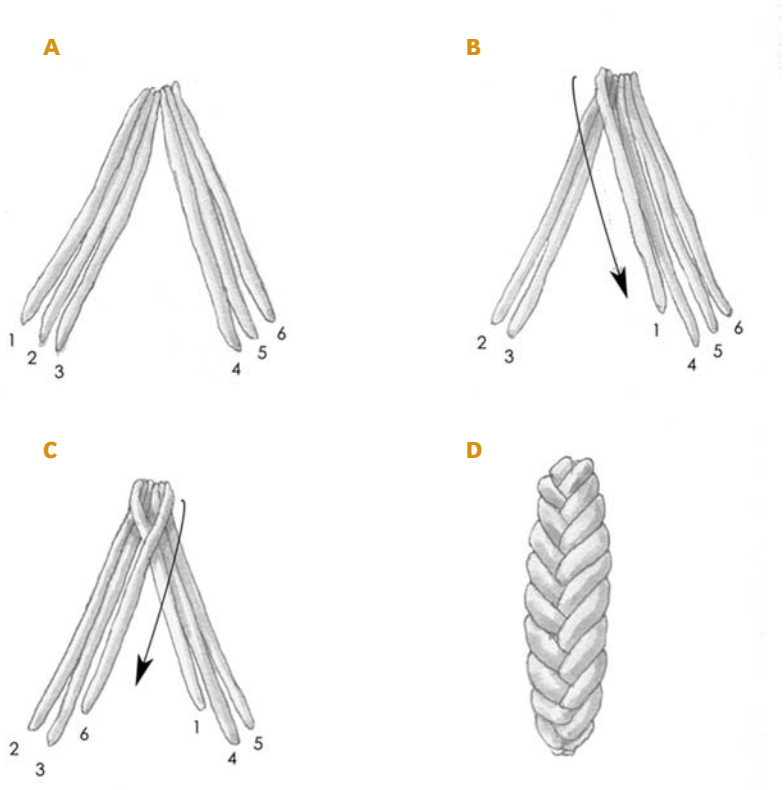
6 Bring strand 6 over to the right side. Bring strand 1 over strand 6 and place next to strand 3.

7 Bring strand 2 over to the left side. Bring strand 6 over strand 2 and place next to strand 4.

8 Continue to bring the outer strands over and under the inner strands in this manner. When finished, pinch the ends together and place on parchment-lined sheet pans.

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

10 Bake in a 350°F/177°C convection oven until the braids are dark golden brown and shiny, 20 to 25 minutes. Cool completely on racks.



Sweet dough coffee cake

MAKES 12 LB 4½ OZ/5.57 KG DOUGH. DDT: 75°F/24°C

Bread flour	100%	7 lb 8 oz	3.40 kg
Instant dry yeast	1.25%	1½ oz	43 g
Milk	26.6%	32 fl oz	960 mL
Eggs	15%	1 lb 2 oz	510 g
Sugar	10%	12 oz	340 g
Butter, soft	10%	12 oz	340 g
Salt	2%	2½ oz	71 g
Cherry filling (page 521)		3 lb	1.36 kg
Cream cheese filling (page 895)		3 lb	1.36 kg
Egg wash (page 892)		as needed	as needed
Coarse sugar, for garnish		as needed	as needed
Apricot glaze (page 426), warm		1 lb 8 oz	680 g
Fondant (optional)		as needed	as needed

1 Combine the flour and yeast. Add the milk, eggs, sugar, butter, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 4 minutes. The dough should be slightly soft but elastic.

2 Bulk ferment the dough until nearly doubled, about 1 hour.

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

4 Position the dough lengthwise, parallel to the edge of the work surface with the seam side up. Roll the dough into a rectangle 10 by 12 in/25 by 30 cm; the dough should be about ¼ in/6 mm thick. Turn the dough so that a short side is facing you.

5 Using a large plain pastry tip, pipe the cherry filling down the center of the dough and then pipe a thinner strip of the cream cheese filling on either side.

6 Make parallel diagonal cuts at a 45-degree angle evenly down both sides of the dough, spacing the cuts about 1 in/3 cm apart. Egg wash. Fold the top left strip diagonally over the filling and press it gently into the dough. Fold the strip on the opposite side over. Continue, alternating sides, for a braided effect. Trim.

7 Transfer to a parchment-lined sheet pan. Brush the dough lightly with egg wash. Proof, covered, until the dough springs back halfway slowly to the touch but does not collapse, 1 to 1½ hours.

8 Brush the dough very lightly again with egg wash. Sprinkle with coarse sugar. Bake in a 350°F/177°C convection oven until dark golden brown and shiny, about 20 to 25 minutes.

9 Brush the warm coffee cake with warm apricot glaze. When cooled, drizzle with fondant icing, if desired. Cool completely on racks.

Raisin dough

MAKES 14 LB 14½ OZ/6.76 KG DOUGH. DDT: 78°F/26°C

Bread flour	100%	6 lb 4 oz	2.84 kg
Instant dry yeast	1.5%	1½ oz	43 g
Milk, room temperature	80%	80 fl oz	2.40 L
Honey	3%	3 oz	85 g
Salt	2%	2 oz	57 g
Raisins	52%	3 lb 4 oz	1.47 kg

1 Combine the flour and yeast. Add the milk, honey, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 4 minutes. The dough should have good gluten development but also be soft and slightly moist. Blend in the raisins. Mix to the intense stage of gluten development.

2 Bulk ferment the dough until nearly doubled, about 1 hour.

3 Divide the dough into pieces 1 lb 4 oz/567 g each. Preshape the dough into large rounds (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)

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

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

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

VARIATIONS Substitute currants for the raisins.

Substitute walnuts for half of the raisins.

Brioche à tête

MAKES 11 LB 10¾ OZ/5.29 KG DOUGH. DDT: 75°F/24°C

Bread flour	100%	5 lb	2.27 kg
Instant dry yeast	1.7%	1⅓ oz	38 g
Eggs	40%	2 lb	907 g
Milk, room temperature	20%	16 fl oz	480 mL
Sugar	10%	8 oz	227 g
Salt	2%	1½ oz	43 g
Butter, soft but still pliable	60%	3 lb	1.36 kg
Egg wash (page 892)		as needed	as needed

1 Combine the flour and yeast. Add the eggs, milk, sugar, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes.

2 Gradually add the butter, with the mixer running on medium speed, scraping down the sides of the bowl as necessary. After the butter has been fully incorporated, mix until the dough begins to pull away from the sides of the bowl.

3 Line a sheet pan with parchment paper and grease the parchment. Place the dough on the prepared sheet pan. Cover tightly with plastic wrap and refrigerate overnight.

Blitzing the butter into the dough while it is mixing

Properly mixed brioche dough after mixing is complete

4 Remove the dough from the refrigerator and divide it into 4 pieces. Divide each by hand into 25 pieces (2 oz/57 g each). Preshape each piece into a round, lightly flouring the work surface as needed. Refrigerate until cool, 20 to 30 minutes.

5 Lightly oil brioche tins.

6 Start with the first piece of dough that you shaped and work sequentially. The remainder of the dough may need to be refrigerated during shaping to keep it cool and workable. Roll each piece of dough into a ball. Lightly coat the side of your hand with flour. Make a head (*tête*) by pinching off one-quarter of the dough ball with the side of your hand and rolling it back and forth on the worktable, making a depression in the dough to pinch but not detach one-quarter of the ball; the larger piece of dough should be about 2¾ in/7 cm long and the tête ¾ in/2 cm long.

7 Flour your fingertips lightly and gently press a hole all the way through the center of the larger portion of dough. Place the tête into the center of the larger piece of dough and push it through the hole. Place each brioche into a greased brioche tin, with the tête on top.

8 Brush the brioches lightly with egg wash, brushing away any excess that accumulates in the crevices. Proof, covered, until the dough springs back slowly to the touch but does not collapse, 1½ to 2 hours.

9 Gently brush the brioches again with egg wash. Bake in a 375°F/191°C deck oven until a rich golden brown, 12 to 15 minutes. Cool for 10 minutes in the tins, then promptly remove and finish cooling on racks.

VARIATION Substitute Orange Brioche Dough (page 186) for the brioche dough.

LEFT: Making the head on brioche à tête by pinching one-quarter of the dough ball with the side of your hand and rolling back and forth on the work table

MIDDLE: Using your fingertips to make a hole in the center of the larger piece of the dough

RIGHT: Pushing the head of the dough into the hole

Raisin bread with cinnamon swirl

MAKES 16 LB 5¾ OZ/7.42 KG DOUGH DDT: 78°F/26°C

Bread flour	100%	8 lb 1 oz	3.66 kg
Instant dry yeast	0.78%	1 oz	28 g
Milk, room temperature	52.7%	68 fl oz	2.04 L
Butter, soft	9.1%	11¾ oz	333 g
Sugar	9.1%	11¾ oz	333 g
Eggs	9.1%	11¾ oz	333 g
Salt	2.3%	3 oz	85 g
Raisins	18.6%	1 lb 8 oz	680 g
Ground cinnamon	1.2%	1½ oz	43 g
Egg wash (page 892)		as needed	as needed
Cinnamon sugar (page 897), made with brown sugar		12 oz	340 g

1 Combine the flour and yeast. Add the milk, butter, sugar, eggs, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 4 minutes; add the raisins and mix for 2 minutes on low speed, then add the cinnamon, mixing just long enough to create a swirl. The dough should be slightly soft. Mix to the intense stage of gluten development.

2 Bulk ferment the dough until nearly doubled, 45 to 60 minutes.

3 Divide the dough into 1lb 4-oz/567-g pieces. Preshape the dough into large oblongs (for preshaping instructions, see page 109). Lightly grease twelve 2-lb/907-g loaf pans (4½ in/11 cm wide, 8 in/20 cm long, and 3 in/8 cm deep). Let the dough rest, covered, until relaxed, 15 to 20 minutes. (Reminder: When making multiple loaves, work sequentially, starting with the first piece of dough you divided and rounded.)

4 Roll the dough into even rectangles 8 by 12 in/20 by 30 cm. Brush the dough lightly with egg wash and sprinkle 1 oz/28 g cinnamon sugar evenly over the surface. Roll the dough up along the 12-in/30-cm side under your palms into a cylinder 8 in/25 cm long, keeping the pressure even and holding your hands flat and parallel to the work surface to create a smooth, even loaf.

5 Place the dough seam side down in a greased loaf pan. The dough will spring back on itself slightly and fit snugly in the pan. Brush the loaf lightly with egg wash. Proof, covered, until the dough fills the pan and springs back slowly to the touch but does not collapse, 1½ to 2 hours.

6 Gently brush the bread again with egg wash. Score to the first layer of cinnamon. Bake in a 400°F/204°C convection oven for 25 to 30 minutes, or to an internal temperature of 205°F/96°C. Cool completely on racks.

Naan

MAKES 1 LB 11¼ OZ/773 G DOUGH. DDT: 78°F/26°C

All-purpose flour	100%	14 oz	397 g
Instant dry yeast	2.4%	⅓ oz	9 g
Water	42.9%	6 fl oz	180 mL
Clarified butter	14.3%	2 oz	57 g
Plain yogurt	14.3%	2 oz	57 g
Eggs	12.5%	2 oz	57 g
Sugar	7.2%	1 oz	28 g
Salt	1.8%	1½ tsp	7.50 g
Clarified butter, melted		as needed	as needed
Poppy seeds or black onion seeds, for garnish		2 tbsp	12 g

1 Combine the flour and yeast. Add the water, butter, yogurt, eggs, sugar, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes. The dough should be very elastic but still wet.

2 Bulk ferment the dough until nearly doubled, about 1 hour. Fold gently.

3 Divide the dough into 3-oz/85-g pieces. Preshape the dough into small rounds (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes.

4 Line sheet pans with parchment paper.

5 Work sequentially, starting with the first piece of dough you divided and rounded. Gently stretch each piece of dough into a round 7 in/18 cm in diameter, so that the center is ¼ in/6 mm thick and there is a border ½ in/1 cm wide all around. Pull one edge out to elongate each round slightly, creating a teardrop shape.

6 Place the breads on the sheet pans, brush them with clarified butter, and sprinkle with seeds.

7 Bake in a 425°F/218°C deck oven until golden brown and puffed, about 10 minutes. Cool completely on racks.

Stretching the naan into a teardrop shape

Lavash

MAKES 11 LB 5¼ OZ/5.14 KG DOUGH. DDT: 78°F/26°C

Bread flour	46%	2 lb 14 oz	1.30 kg
Durum flour	20%	1 lb 4 oz	567 g
Cake flour	17%	1 lb 1 oz	482 g
Whole wheat flour	17%	1 lb 1 oz	482 g
Instant dry yeast	0.5%	½ oz	14 g
Milk, room temperature	42.5%	42½ fl oz	1.28 L
Water	29.25%	29¼ fl oz	878 mL
Molasses, unsulfured	3.25%	3¼ oz	92 g
Honey	3.25%	3¼ oz	92 g
Salt	2.5%	2½ oz	71 g
Olive oil		as needed	as needed
Sesame seeds, for garnish		as needed	as needed
Poppy seeds, for garnish		as needed	as needed

1 Combine the flours and yeast. Add the milk, water, molasses, honey, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 10 minutes. The dough should pull cleanly away from the sides of the bowl but still be wet and soft. Mix to the intense stage of gluten development.

2 Bulk ferment the dough until nearly doubled, about 30 minutes. Fold gently. Divide the dough into 1-lb/454-g pieces and retard overnight.

3 Preshape the dough into large rounds (for preshaping instructions, see page 109). Lightly brush 11 or 12 sheet pans with olive oil. Refrigerate for 1 hour.

4 Work sequentially, starting with the first piece of dough you divided and rounded. Roll each piece of dough to 1/16 in/1.5 mm thick on a dough sheeter, flouring the dough periodically as you roll it. The dough should be 16½ by 24½ in/42 by 62 cm (see Notes). You may also roll by hand using a rolling pin.

5 Place each sheet of dough on one of the greased sheet pans. If the dough is not big enough to cover the entire pan, have another person help stretch it to fit the sheet pan; use the backs of your hands to gently stretch the dough (see Notes).

6 Brush the top of the dough lightly with water and sprinkle with seeds of your choice.

7 Allow the dough to relax for 15 to 20 minutes.

8 Bake in a 375°F/191°C convection oven until light golden brown, 12 to 15 minutes. Cool completely on racks, then wrap well.

NOTES You can also stretch the dough using the backs of your hands, similarly to the way you stretch strudel dough—for information, see "Strudel Dough," page 217, and Apple Strudel, page 550. If you shape the dough by hand, it is important to keep the dough even; if it is stretched unevenly, it will bake unevenly.

You can bake the lavash 70 percent of the way, until it is baked but not yet golden brown, and then reheat before use in a 400°F/204°C oven.

Allowing the dough to rest, covered, under refrigeration overnight (as stated in step 3), rather than for only 15 to 20 minutes, provides for better development of flavor characteristics.

Pita

MAKES 3 LB 5¾ OZ/1.52 KG DOUGH. DDT: 78°F/26°C

Bread flour	50%	1 lb	454 g
Whole wheat flour	50%	1 lb	454 g
Instant dry yeast	0.78%	¼ oz	7 g
Water	62.5%	20 fl oz	600 mL
Olive oil	3.2%	1 oz	28 g
Salt	2.3%	¾ oz	21 g
Sugar	0.4%	¾ tsp	3.75 g

1 Combine the flours and yeast. Add the water, olive oil, salt, and sugar to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 3 minutes. The dough should be slightly moist but with strong gluten development. Mix to the intense stage of gluten development.

2 Bulk ferment the dough until nearly doubled, about 60 minutes.

3 Divide the dough into 4½-oz/128-g pieces. Preshape the dough into small rounds (for preshaping instructions, see page 109). Let the dough rest, covered, until relaxed, 15 to 20 minutes.

4 Line sheet pans with parchment paper.

5 Work sequentially, starting with the first piece of dough you divided and rounded. Using a rolling pin, roll each piece of dough into a round 7 in/18 cm in diameter. Transfer the rounds to the sheet pans, cover, and let them relax for 20 minutes.

6 Load the pitas into a 500°F/260°C deck oven and bake until puffed but not browned, 3 to 4 minutes. Stack the pitas five high and wrap each stack in a cloth. Cool before serving.

Durum pizza dough

MAKES 15 LB 11¼ OZ/7.12 KG DOUGH OR 25 9-OZ ROUNDS. DDT: 75°F/24°C

Bread flour	57.8%	5 lb 5 oz	2.41 kg
Durum flour	42.2%	3 lb 14 oz	1.76 kg
Instant dry yeast	0.51%	¾ oz	21 g
Water	63.9%	94 fl oz	2.82 L
Olive oil	3.75%	5½ oz	156 g
Salt	2.7%	4 oz	113 g

1 Combine the flours and yeast. Add the water, olive oil, and salt to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 4 minutes and on medium speed for 4 minutes. The dough should have good gluten development but still be a little sticky. Mix to the intense stage of gluten development.

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

3 Divide the dough into 9-oz/255-g pieces. Preshape the dough into large rounds (for preshaping instructions, see page 109). Let the dough rest, covered, under refrigeration overnight. Remove from the refrigerator 1 hour before use.

4 Using a rolling pin, roll each piece of dough into a 9-in/23-cm round. Transfer the rounds to parchment-lined sheet pans that have been dusted with semolina flour, or place on a peel, also dusted, before topping.

5 Top the dough as desired (see toppings, pages 716 and 717), leaving a 1-in/2.5-cm border to brush with olive oil.

6 Load the pizzas into a 475°F/240°C deck oven and bake until golden brown around the edges, 8 to 12 minutes. Serve at once.

Yeast-raised doughnuts

MAKES 5 LB 5½ OZ/2.42 KG DOUGH. DDT: 80°F/27°C

Bread flour	62.4%	1 lb 10½ oz	751 g
Pastry flour	37.6%	1 lb	454 g
Instant dry yeast	3.2%	1⅓ oz	38 g
Water	50%	21¼ fl oz	638 mL
Eggs	12.4%	5¼ oz	149 g
Sugar	6.5%	2¾ oz	78 g
Nonfat dry milk	6.5%	2¾ oz	78 g
Baking powder	1.75%	¾ oz	21 g
Salt	1.75%	¾ oz	21 g
Ground nutmeg	0.35%	1 tsp	2 g
Emulsified shortening	18.8%	8 oz	227 g
Oil, for frying		as needed	as needed

1 Combine the flours and yeast. Add the water, eggs, sugar, dry milk, baking powder, salt, and nutmeg to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 2 minutes, or until the ingredients are well incorporated. Add the shortening and mix on medium speed for 8 minutes. Mix to the intense stage of gluten development.

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

3 Roll the dough to ½ in/1 cm thick. Let the dough rest, covered, until relaxed, 10 minutes.

4 Cut the doughnuts with a doughnut cutter or with two round cutters (use a 3-in/8-cm cutter for the doughnuts and a 1-in/3-cm cutter for the holes; keep the holes centered so the doughnuts fry evenly).

5 Proof covered on parchment-lined sheet pans that have been brushed with oil until the dough springs back slowly to the touch but does not collapse, 15 minutes.

6 Carefully transfer the proofed doughnuts, a few at a time, to a deep fryer at 350°F/177°C and fry until golden brown on the first side, 2 minutes. Turn and fry until the second side is golden and the doughnuts are cooked through, 2 minutes.

7 Lift the doughnuts from the hot oil with a spider or basket, allowing the oil to drain away directly over the fryer. Drain on paper towels before coating or topping as desired.

Berliners

MAKES 4 LB 8 OZ/2.04 KG DOUGH. DDT: 68°F/20°C

Bread flour	100%	2 lb 4 oz	1.02 kg
Instant dry yeast	2.8%	1 oz	28 g
Milk	45.4%	16 fl oz	480 mL
Butter, soft	14.9%	5¼ oz	149 g
Sugar	14.9%	5¼ oz	149 g
Eggs	14.9%	5¼ oz	149 g
Egg yolks	5.7%	2 oz	57 g
Salt	0.7%	1½ tsp	7.50 g
Lemon zest, grated	1.4%	½ oz	14 g
Vanilla extract	1.4%	½ fl oz	15 mL
Oil, for frying		as needed	as needed
Raspberry jam		2 lb 4 oz	1.02 kg
Granulated sugar, for coating		as needed	as needed
Confectioners' sugar, for dusting		as needed	as needed

1 Combine the flour and yeast. Add the milk, butter, sugar, eggs, egg yolks, salt, lemon zest, and vanilla to the mixer and then add the flour and yeast. Mix on low speed with the dough hook attachment for 8 to 12 minutes. The dough should have very strong gluten development and be very tight but smooth. Mix to the intense stage of gluten development.

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

3 Line a sheet pan with parchment paper and grease the parchment. Divide the dough into 36 pieces (2 oz/57 g each) by hand or with a dough divider. Shape each piece into a tight round and press lightly with the palm of your hand to flatten slightly. Transfer, seam side down, to the sheet.

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

5 Carefully transfer the proofed Berliners, a few at a time, seam side up, to a deep fryer at 350°F/177°C and fry, covered, until golden brown on the first side, 1 minute. Turn and fry, uncovered, another 1½ minutes. Turn once more and fry until the top is deep golden brown, 20 to 30 seconds. Lift the Berliners from the hot oil with a spider or basket, allowing the oil to drain away over the fryer. Drain on paper towels just until cool enough to handle.

6 Fill a pastry bag fitted with a small plain pastry tip and inject 1 oz/28 g of the raspberry jam into each Berliner. Dip both sides of each one in granulated sugar, place them seam side down on racks, and sift confectioners' sugar over them once they are fully cooled.