

# Homebrew

Making your own distinctive beers is easier than you think

BY DAVID RUGGIERO

From the beginning of Prohibition in 1919 until 1979, when the last remnants of the Volsted Act were repealed, home brewing was illegal in the United States. Prohibition's legacy to beer brewing was the loss of a traditional craft, and thereafter American beer drinkers were restricted to uniformly over-carbonated, under-flavored brews. But home brewing, something your grandparents' grandparents probably did, is coming back.

Nearly one and a half million people now make all kinds of beer—bock, stout, brown ale, Pilsner—in kitchens and basements across America. As a brewing instructor, I've taught many people to make beer easily and economically. They've discovered that making their own beer, seeing it evolve and helping it mature, is satisfying and rewarding work.

Making beer is a simple four-step process. First the malted-barley sugars, hops, and water are boiled to sterilize the ingredients, to release the bitter resins and aromatic oils in the hops, and to clarify the beer. Second, this liquid, or *wort*, is chilled, fed yeast, and transferred to a covered container where the yeast ferments sugars into alcohol and carbon dioxide. Next, the beer is primed with sugar and put into bottles. Finally, the beer is left to carbonate and to let the flavor mature.

All the ingredients and equipment needed to make beer are available at brewing-supply stores. Plan to spend between \$50 and \$100 to start home brewing, and then \$20 to \$30 per 5-gallon batch once you're set up.

## FOUR ESSENTIAL INGREDIENTS

Dark or light, sweet or bitter, all beers have four ingredients in common.

**Malted barley.** Barley is the backbone of beer. It provides the sugars that are fermented into alcohol. Other grains could be used, but historically barley has been preferred because it gives beer great flavor and body, and, frankly, it makes lousy bread.



## HOMEMADE—AND WORTH THE EFFORT.

*Brew beers to suit your taste, from caramel-colored pale ales to dark, full-bodied stouts and crisp, golden Pilsners. High-quality ingredients and inexpensive equipment now available to the home brewer make it easy to brew your own great-tasting beer.*

Before barley can be used in beer, it must first be malted; that is, the barley grains are sprouted and then dried. This process activates natural enzymes that convert starch into sugar. Next the malted barley is steeped in hot water, or mashed, which speeds up the conversion of starch into sugar and draws the sugar out into solution. Malted-barley sugar is available in thick, syrupy extract or dry malt powder.

**Hops.** When beer is fermented, most, but not all, of the malted-barley sugar is converted into alcohol. The residual sugar makes the beer sweet. Bitter hops, the cone-shaped flowers of the hop vine, balance the sweetness of the beer. They also help stabilize the flavor, retain a good head, and preserve the beer. The wonderful floral aromas of many styles of beer come from the hops, too.

**Yeast.** Yeast is the most important ingredient, because yeast, not the brewer, actually makes beer. Live yeast organisms feed on the malted-barley sugar and produce alcohol and carbon dioxide as by-products. The brewer's job is to set up the best possible conditions for the yeast to live in.

Temperature is critical. Two types of yeast are used in beermaking—ale and lager. Ale yeast ferments beer best at temperatures from 55° to 70°F, while lager yeasts like temperatures from 32° to 55°. I recommend starting with an ale yeast because unless you have a refrigerator that you want to dedicate to beer, it's easier to find a spot in your house that's 55° to 70°. Pick one brand of ale yeast and stick with it. Change recipes, change malts, change hops, but use the same yeast until you get to know how it acts, how long it takes to ferment the beer, and how it's affected by temperature changes. It helps to keep a log of temperatures and fermenting time.

**Water.** I don't think that you should get too particular about the water you use. If your water at home is clean and has no strong flavor or odor, then use it. It's helpful to know how hard your water is, that is, what its mineral content is. Many styles of beer require hard water, and most water throughout the United States is soft. That's why beer recipes, like the one for pale ale, call for added minerals.

### THE EQUIPMENT

Brewing is the first step in the process of making beer. To brew beer you need a stove, a large kettle (at least 4 gallons), a large spoon, and a timer.

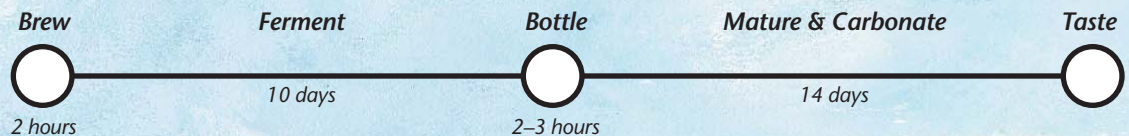


### TO BREW:

Steep crushed malted barley in 2 gallons of water. Bring the water to a boil, and add the malt extract. During the 60-minute boil, add the bittering hops and, later, the aromatic hops.

### BEERMAKING

is a simple four-step process that takes about 4 hours of work over a 3½-week period.



## ENGLISH PALE ALE

Makes fifty-two 12-ounce bottles

- 6 lb. pale liquid malt extract
- ½ lb. English Crystal malted barley
- 1 Tbs. gypsum
- 1 oz. bittering hops  
(Bullion, Northern Brewer,  
or Target)
- 1 oz. aroma hops  
(Fuggle, Willamette, Styrian,  
or Kent Goldings)
- ½ tsp. Irish moss
- 1 package ale yeast  
(Whitbread, Nottingham,  
Edme, or Muntons)
- ¾ cup corn sugar



### CHILL

Quickly chill the boiled beer down to 75°F before you add the yeast.

For fermenting you'll need a 6- to 7-gallon airtight container, an air lock, and a thermometer. You can use either a plastic bucket or a glass container. The container *must* be 1 to 2 gallons larger than the volume of beer you're making to leave room for the carbon-dioxide head. The air lock provides a vapor barrier that prevents bacteria from contaminating the beer. It also allows carbon dioxide to escape.

To bottle the beer, you'll want bottles, of course, a tube to get the beer into the bottles, a bottle capper and caps, and a large container in which to prime the beer. A bottling bucket with a spigot at the bottom and a spring-release bottle filler, though not essential, make bottling much easier.

### KEEPING THINGS CLEAN

I can't overstate the importance of clean equipment. Most off-tastes in beer are the result of inadequate sanitation. Beer becomes contaminated either by contact with unsterile equipment or with air.

Get in the habit of cleaning your equipment right after use. Then, before using it again, sterilize it with a weak solution of household bleach (1 tablespoon per 5 gallons) or a commercial cleaner and sterilizer like B-Brite or SDP-Chempro. Soak the equipment in the cleaner for 10 to 15 minutes and rinse thoroughly with hot water. Clean bottles can be sterilized in the dry cycle in a dishwasher.

### MAKING ENGLISH PALE ALE

Although I offer one of my favorite pale-ale recipes as a model, keep in mind that most beers are made essentially the same way. Hop aroma and bitterness dominate in this ale, while residual malt sugars add body and a hint of sweetness. Adding caramel-colored Crystal malt barley along with pale malt extract produces a beautiful copper-colored beer. The flavor and aroma suggest butterscotch.

### BREWING

Harden the water by dropping the gypsum into 2 gallons of cold water in your brew pot. The water will be cloudy for 5 to 10 minutes while the gypsum dissolves. If you know the mineral content of your water exceeds 300 parts per million, skip this step.

**Steep the Crystal malt** in the water to give color and flavor. First coarsely crush the Crystal malt with a grain mill or rolling pin and add it to the water. I like to make a big tea bag by putting the crushed grain in a muslin bag. Slowly heat the water, and take special care to remove the grain before the water starts to boil. If your timing is off and you boil the Crystal malt, you'll get dry, harsh flavors.

**Add the malt extract** to the boiling water. Stir vigorously until the malt dissolves. Stirring ensures that the malt doesn't settle to the bottom of the pan and burn. When the wort is boiling again, set the

timer for 60 minutes. Soon you'll see small white flakes of coagulated protein floating in the wort.

**Add the bittering hops** 10 minutes into the boil. Keep the wort boiling vigorously to extract the bitter resins from the hops.

**Add the Irish moss** to the brew pot at 30 minutes. Used exclusively as a clarifying agent, the moss bonds with malt proteins and clarifies the beer.

**Add half the aromatic hops** 50 minutes into the boil and the other half at 59 minutes. Too much heat and movement destroy the fragile aromatic oils of the hops. Short boil times are essential when imparting hop bouquet to a beer.

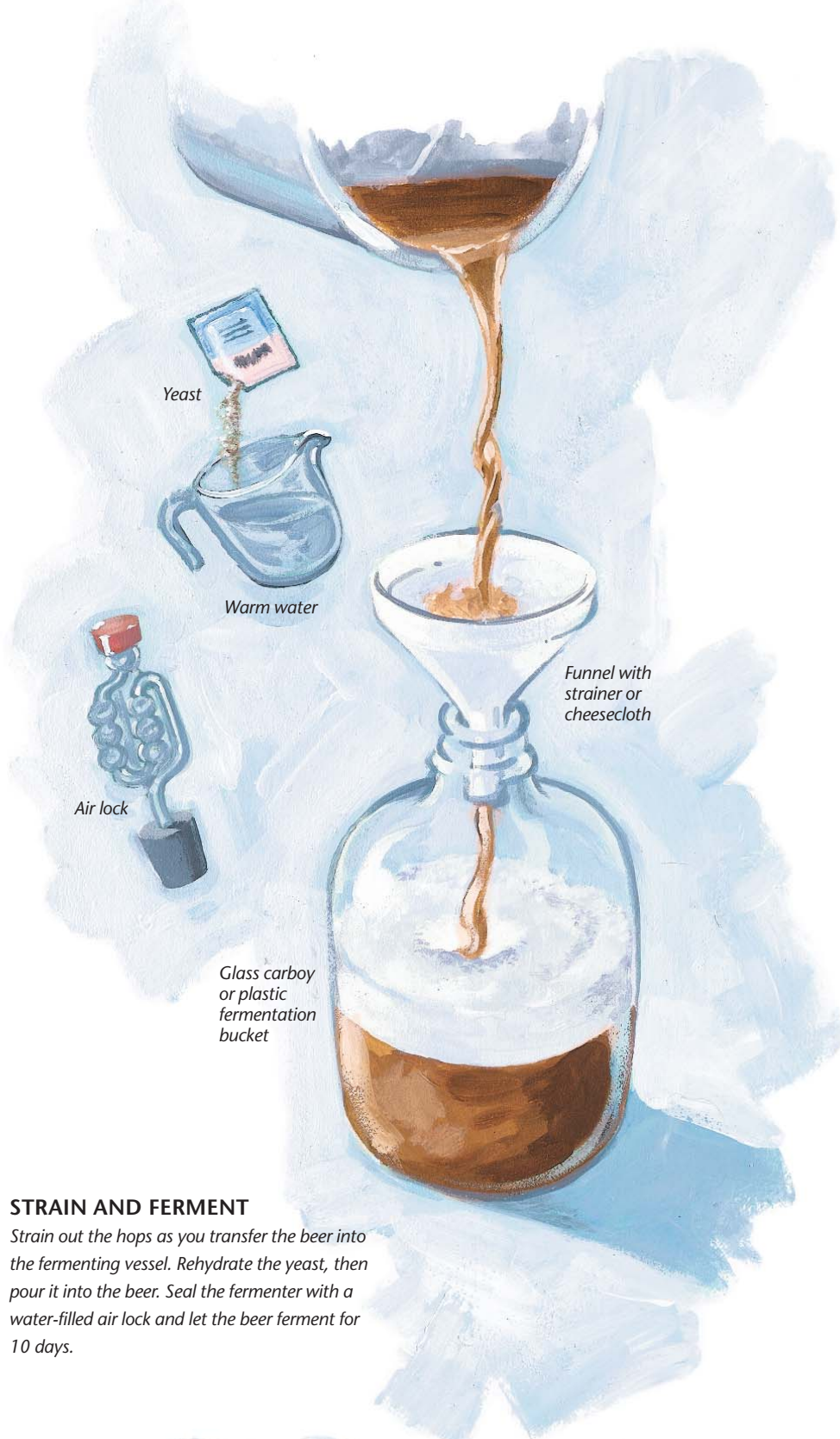
**Rehydrate the dry yeast.** Pour 1 cup of lukewarm (100° to 110°) tap water into a sterile glass. Sprinkle the yeast on top of the water, cover the glass with foil, and let it stand for 10 to 15 minutes. The mixture should bubble and release a bread-like aroma. If it does, you can use the yeast. If not, get some new yeast and repeat the procedure. It's better to find out now if the yeast is healthy and active than to wait until it's in the beer.

**Quickly cool the wort** to prevent bacterial contamination. Put ice and water in your sink and nestle the brew kettle into it. Stir the water to keep it circulating. When the wort is 120°, add enough cold water to bring it up to 5 gallons. You want to get the temperature down to 75° in less than an hour. The importance of these two procedures, rehydrating and chilling, cannot be overemphasized. They make the difference between good and superior beer.

**Strain and aerate the wort** while transferring it into the container in which the beer will ferment. The wort is rich in nutrients and sugar but lacks oxygen, which the yeast needs to grow. The surest way to introduce a sufficient amount of oxygen is to splash the wort around as you pour it into the fermenter. At the same time, strain the wort through a cheesecloth-lined colander to remove all the hops. Top off the wort to 5 gallons and check the temperature. When the wort is 75°, it's ready to ferment.

## FERMENTING

Pitch the yeast. This just means adding the yeast; no stirring is necessary. Seal the fermenter, attach the air lock, and fill it halfway with water. Put the fermenter in a place that has a constant temperature between 55° and 70° and where exposure to light and foot traffic is minimal. You'll see signs of fermentation in 6 to 12 hours. Escaping gas with a sweet aroma will bubble through the air lock. A thick brown foam, or *kraeusen*, will cover the top of the beer. In 2 to 4 days, the *kraeusen* will dissipate, signaling that the yeast has converted all the fermentable sugar into alcohol. The yeast will gradually settle to the bottom of the fermenter, clarifying the beer.



## STRAIN AND FERMENT

Strain out the hops as you transfer the beer into the fermenting vessel. Rehydrate the yeast, then pour it into the beer. Seal the fermenter with a water-filled air lock and let the beer ferment for 10 days.

## EQUIPMENT YOU NEED TO MAKE BEER

### BREWING:

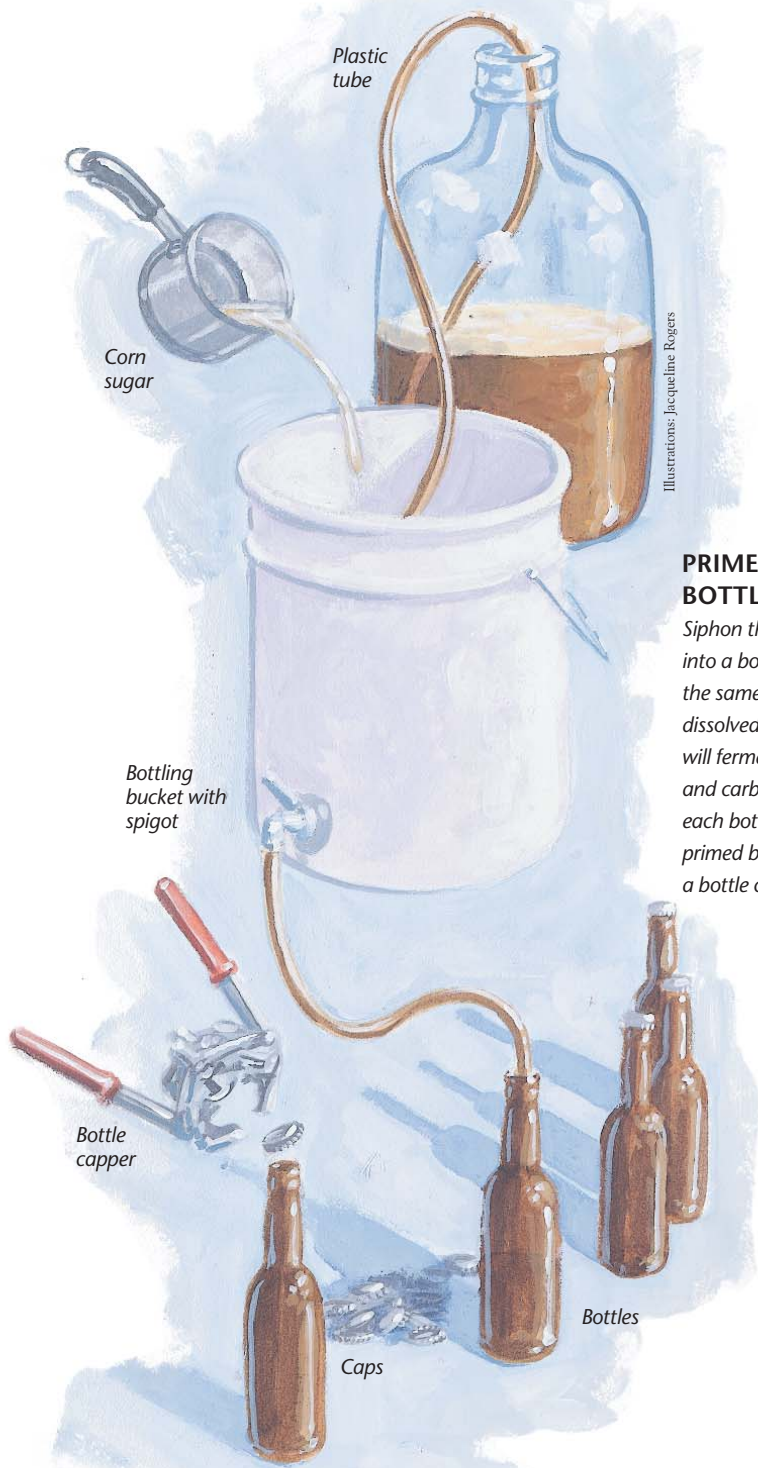
4- to 5-gallon kettle  
Long-handled spoon  
Timer  
Thermometer  
Strainer or funnel with cheesecloth

### FERMENTING:

6- to 7-gallon plastic bucket with cover or glass carboy with stopper  
Air lock  
Bleach or other sanitizer

### BOTTLING:

Siphon hose  
Bottle filler (optional)  
Bottling bucket with spigot (optional)  
52 12-ounce bottles (not screw-top)  
52 bottle caps  
Bottle capper



Illustrations: Jacqueline Rogers

### PRIME AND BOTTLE

*Siphon the fermented beer into a bottling bucket. At the same time, pour in the dissolved corn sugar, which will ferment in the bottles and carbonate the beer. Fill each bottle with the primed beer, and seal with a bottle capper.*

### BOTTLING

About 10 days after you brew the beer, it should be ready to bottle. Remove a sample of the beer from the fermenter and examine it. It should look, smell, and taste like uncarbonated beer.

**Prime the beer** with corn sugar before siphoning it into the bottles. Priming feeds the beer with a small amount of sugar, which the yeast ferments in the bottle, carbonating the beer. You can use other types of sugar, like malt extract or brown sugar, but I prefer corn sugar because it doesn't change the beer's flavor and the yeast quickly converts it into carbon dioxide. Boil  $\frac{3}{4}$  cup corn sugar in 1 cup of water for 5 minutes, and then let the solution cool. Siphon the beer from the fermenter to a bottling bucket or any clean 6-gallon container. While the priming container is filling, add the sugar solution and gently stir the beer several times to distribute the corn sugar. The beer is now ready to be bottled.

**Siphon the primed beer** from the priming vessel into the bottles without agitating the beer. Raise the bucket high above the level of the bottles so that gravity will coax the beer into the bottles. Make sure you leave about 1 inch of air space between the beer and the top of the bottle; this is necessary for the beer to carbonate properly. Tightly seal new caps onto the bottles with a bottle capper.

**Waiting for the beer to mature and carbonate** is the hardest part. Most beers, including this pale ale, will be fully carbonated and ready to drink within two weeks. The beer still contains live yeast and will continually change. You may notice after a few months that your beer is different from when you first tasted it. It might get better or it might not. Rely on your own preference to guide you in deciding when the beer is ready to drink.

### ENJOYING THE BEER

Although you can serve ale on the cool side, I prefer to taste it first at room temperature to enjoy all the natural flavors and aromas. Decant the beer, leaving behind the yeast sediment that has settled to the bottom of the bottle. A dimpled pint glass is my choice for a pale ale because the large open top lets the beer's lacy head spread out; and the dimples refract the beer's luscious copper color.

As you bring the glass to your mouth, inhale deeply. You'll detect sweet malt and floral hop aromas. Hold the beer in your mouth for a moment. You'll notice that it stimulates many parts of your tongue and has a firm feel to it. Swallowing the beer and waiting for the aftertaste are all that remain.

*David Ruggiero is a nationally certified beer judge and has taught thousands of people to brew beer at his Newton, Massachusetts, brewing-supply store, Barley-malt and Vine. ♦*

### RESOURCES

To find a beer-supply store near you, look in the yellow pages under *Brewers' Equipment & Supplies* or *Beer Homebrewing Equipment & Supplies*; or send a stamped, self-addressed envelope to **Home Wine and Beer Trade Association**, 604 North Miller Rd., Valrico, FL 33594; 813/685-4261.

**For more information, contact: The American Homebrewers Association**, PO Box 1510, Boulder, CO 80306-1510; 303/447-0816. Publishes *zymurgy* magazine five times a year. Provides information on home brewing, homebrew clubs, and beer competitions.