

How to Brew 5 Gallons of Beer

If you can boil water and follow simple directions, you can brew fresh, natural, delicious beer at home. Please read each section completely on brewing before you start. Fresh homemade beer is like homemade bread—the difference is, it gets better with age.

The Making of the Wort

■ 1. If you are using liquid malt extract, put the unopened cans in hot water. If you are using dry malt extract, do not open until step 5. Malt extract is the stickiest stuff on Earth; be careful not to make a mess. Start thinking on where you are going to get two cases of brown, non-twist off bottles—it could be ready to bottle within a week. It sometimes is better to get bigger bottles (or kegs) because the bigger they are the easier to clean and fill.

■ 2. Fill a pot 12 quarts (3 gal.) or more half full with clean water and turn the heat on medium-low.

Specialty Grains are small quantities of malted barley of different varieties or small quantities of adjuncts such as roasted barley, maize, flaked oats etc. When used in brewing, these specialty grains can enhance color, flavor, texture, head retention.

■ 3. If you are using already hopped extract, or not using specialty grains go to step 5. If the grains are already milled, go to the next step. Otherwise, take the grains out of the package and place them in a large paper or plastic bag. Gently roll a large bottle or rolling pin across the grains, just enough to crack the husks. **Do not pulverize!**

■ 4. Place the crushed grains into the muslin bag (or cheesecloth) and securely tie the end to create a “tea bag” of grains. Place the tea bag in the hot water (somewhere between 150°-170°F and steep for 30 minutes then remove the tea bag of grain and discard.

■ 5. Turn the heat on high. Add the liquid (LME) and/or dry malt extract (DME). Since malt is the most expensive part of the beer you should get all of the LME out by

ladling hot water from your brew pot into the can and swirling it around to get it all. When using DME, open the bag all the way across so you can get it out quickly before it liquefies in the bag. While adding the malt stir constantly to avoid scorching the extract and assist in dissolving it. This mixture is called “wort,” and you are going to boil it for one hour. If you are using hopped extract your total boiling time is 20 min., you still can add flavoring and aroma hops.

Hops are cone-like. There are different kinds of hops that impart different flavors and levels of compound necessary to give bitterness to counteract the sweetness of the malt. This is what is referred to as balance in beer. Some beers are made with different styles of hops; while others use only one type of hop in the brew. Apart from that there are three terms used to describe different times at which hops are added to the boil. When the wort just starts to boil, these hops are known as boiling or bittering hops because the longer a hop is in the boil the more bitterness it will impart to the beer. When the hop is added past the middle of the boil, it is known as the flavor hop because it imparts both flavor and some bitterness to the beer. Lastly, when a hop is added in the last few minutes (or later in the secondary as a dry hop) is known as the aroma or finishing hop and it imparts only a “nose” to the beer.

■ 6. Bring the wort to a boil. **Be careful not to let it boil over!!** If you see the foam rising about an inch a second, turn the gas down to simmer with gas heat, or move it to a cool burner if you have electric heat. Add the Bittering hops (in a muslin bag) to the boiling wort .

■ 7. Between 20-15 minutes before the end of the boil, add the Flavor hops (again, in a muslin bag), if any. If you are using an immersion wort chiller, place the copper coil into the boiling wort 20 minutes before the end of the boil to sanitize. If you are using Irish Moss or spices, now is the time to add it.

■ 8. Between 2-5 minutes before the end of the boil, add the Aroma hops (in a muslin bag), if any, to the wort. Remove hop bags and discard properly.

■ 9. Force chill the wort to room temperature (60-75°F). At the end of the boil carry the pot with the wort chiller in it over to the sink and attach the chiller to the cold water and chill the wort in about 10-20 minutes. Another popular method for

quickly chilling the hot wort is to place the pot with the hot wort into a sink and fill the sink with ice and water. Keep the pot covered, but **do not put a tight-fitting cover on because it will be sucked in as in canning.** Circulate the water by adding ice and stirring until the wort cools below 80°F - about an hour, which is more than enough time to sanitize and hydrate the yeast as per instructions on the packet.

Sanitizing is a term homebrewers should know about. Most kits come with a cleanser which breaks down organic deposits, but does not kill microbial life which a sanitizer does. If you are using One-Step or B-Brite they should be fine for the first time brewing since bacteria and wild yeast have no reason to hang out on new plastic. The directions are 1 tablespoon per gallon of water with a 10 minute soak time, rinse and drip dry. If you want an economical cleanser/sanitizer use regular unscented bleach—follow the previous instructions.

■ 10. Sanitize the primary (the larger bucket), lid, airlock, hydrometer, test jar (tube hydrometer came in), and racking tube (long rigid plastic tube with cup valve on the end—not the spring loaded bottle filler).

Primary Fermentation

■ 1. Pour or rack the chilled wort into the sanitized fermenting bucket or carboy (usually 6-7 gallon capacity); aerate well. Add enough cold (non-chlorinated) water to achieve the target volume of 5 gallons (where the bail connects to the bucket).

Original or Starting Gravity (O.G.) To take the reading use the long rigid tube (without the cup valve) as a straw and stick it in the wort and put your finger over the top. When you lift the tube out the wort will not leave till you put the end of the tube in the hydrometer test jar and lift the end of you finger off the end of the tube. Use the triple scale side and your reading should be 1.030 - 1.100 depending on what style of beer your making. Mark it down.

■ 2. Be sure the wort is somewhere around 60-75°—one can easily check with a stick-on thermometer. The yeast will work if you keep them happy. In the beginning, this means plenty of oxygen and a temperature that is comfortable for them.



Yeast are one-celled beings; there are countless millions in fermenting beer. There are basically two kind of yeasts for Homebrewers: Ales (top fermenting/room temperature) and Lagers (bottom fermenting/refrigerator temperature). Most beginners use dry yeast that is quick and easy. Directions are usually given on the package how to hydrate the yeast first before adding to the beer, which is good, but not necessary. Homebrewers then move on to liquid yeast which are responsible for "world class" beers. In order to use them, you must first check the date stamped on the back bottom of the package. One day is required for every month past the manufacture date. The package contains a small plastic bubble of beer that must be broke. When the package is at least 1" thick, sanitize the packet and the scissors, cut gently at the corner and pour into the cooled wort. Yeast will eat the sugars and create alcohol and carbon dioxide. The specific gravity of water is 1.000, the specific gravity of alcohol is .79 thus the yeast will attenuate (lower) the gravity during fermentation. Most liquid yeast packets state the attenuation potential.

■ 3. Insert the airlock into the lid (bucket) or stopper (carboy) and fill halfway (about 1") with water (or cheap vodka). Sprinkle the packet of dry yeast or pour the liquid yeast onto the cooled wort and stir to mix in the yeast and aerate the wort. Homebrewers call this "pitching" the yeast. Then seal the fermenting bucket or carboy and store at 65-75°F for ales and lagers. Keep carboy covered out of direct light. When active signs of fermentation are seen (bubbling in the airlock) and you are using a liquid lager yeast, slowly bring the temperature down to 45-55°F. If you are using an ale yeast keep it at 65-75°F. Fermentation is usually over when the cap is resting on the airlock. Check the Final Gravity (F.G.) reading with the hydrometer. Use the following formula:

$$\text{O.G. (1-Attenuation)} = \text{F.G.}$$

For example, to find out where the final gravity should be: Original or Starting Gravity is 50, Attenuation is 67-70%. Multiply 50 by .30 and 50 by .33 and final gravity should be between 1.015 and 1.0165. If it is not in this range, then fermentation is not over. Check the temperature, is it too cool? You may have a stuck fermentation—please call me. If it is in the desired range, congratulations—it is no longer wort, it is beer.

■ 11. So, do you have 2 cases of brown, non-twist off bottles yet?

Secondary Fermentation (optional)

■ 1. If you are doing a secondary fermentation, you will be "racking," or siphoning your beer off the primary yeast (sand-like remains of the fermentation that flocculate [settle] to the bottom of the primary fermenter) to a sanitized 5 gallon carboy fitted with an airlock. You can rack to a secondary fermenter at the end of the active fermentation period or when fermentation is complete, usually in 7 days. You should not leave your beer longer than 2 weeks on the yeast in the primary. The main purpose of the secondary fermentation is to clarify the beer. Also you can "dry hop" during the secondary to get better hop aroma. Normally, the beer will clarify (and condition) in the secondary fermenter within 10-14 days. If desired, you can safely hold the beer in the secondary up to 6 months for storage and further conditioning (Lagering). Lagering is the term use to describe the refining of the taste and character of the beer. When storing beer, care should be taken to keep the beer at the proper temperature, out of direct light and with as little agitation as possible. Use the time to find and sanitize the 2 cases of bottles.

Racking (siphoning) equipment usually consists of a rigid, hollow, clear plastic tube or cane fitted with a cap (open around the top for intake). The other end is fitted with about 4-5 feet of clear, flexible plastic tube. Sanitize anything that comes in contact with the beer. To rack, place the container with the beer a foot or two above the receiving container. Fill the siphon set-up with water and hold your finger over the opening of the flexible tubing. Place the rigid capped stem below the surface of the beer and the other end with your finger still on the end at the bottom of the receiving container. Minimize aeration or your beer will taste like cardboard! Gravity and pressure will start the siphoning action, and the beer will follow. The human mouth is full of bacteria that can potentially damage your beer. Again, do not lose the siphon, do not splash, do not pick up the cloudy yeast on the bottom.

Bottling

■ 1. To facilitate bottling a bottling bucket should be used. This is normally a 5-6 gallon plastic container, with a 1" hole drilled near the bottom to fit a bottling spigot. The important gasket is on the outside of the bucket. **Make sure the spigot is closed before transferring.** A bottle filler is normally a rigid, clear plastic tube with a spring loaded needle valve on

one end. Fit the clear plastic flexible tubing on the other end. This tubing is attached to the bottling spigot on the bucket. **Again, sanitize anything that comes in contact with the beer.**

Priming of the beer is the step before bottling that gives the yeast a measured amount of food so that they will metabolize the sugar and each bottle of beer will be carbonated to the correct amount. It is important that the gravity readings are within the range of attenuation of the yeast (i.e. fermentation is complete). If there are still remaining sugars and the yeast metabolized them, you will have glass grenades, gushers, and embarrassing homebrew.

■ 2. Boil a pint of water, turn off the heat, dissolve 3/4 priming sugar or 1 1/4 cups of DME or 1/2 cup of honey. Force chill your priming solution.

■ 3. Rack your beer to your bottling bucket. **Do not splash!**

■ 4. Gently stir the priming solution into the beer in the bottling bucket.

■ 5. Open the spigot. The beer will flow into the filler stem and stop at the spring loaded valve. When you insert the filler stem into a bottle and press down on the valve the beer will gently flow into the bottle without aerating. Fill the bottle to the top. When you remove the filler stem it will leave the desired displacement of space above the beer.

■ 6. Place a cap on the top of a bottle, place the capper over the cap and simultaneously press down on both handles with even pressure until the handles are parallel with the surface.

■ 7. Allow the bottles to stand at 65-75°F for 10-14 days, then chill one for two hours and taste in a clean beer glass. The beer should be fully carbonated and taste good. It can only get better with conditioning and clarify further with time.

■ 8. Start planning your next batch, think of what flavors you really like, what foods you like that match the beer style, then; try making up your own recipe - it is not that hard!

